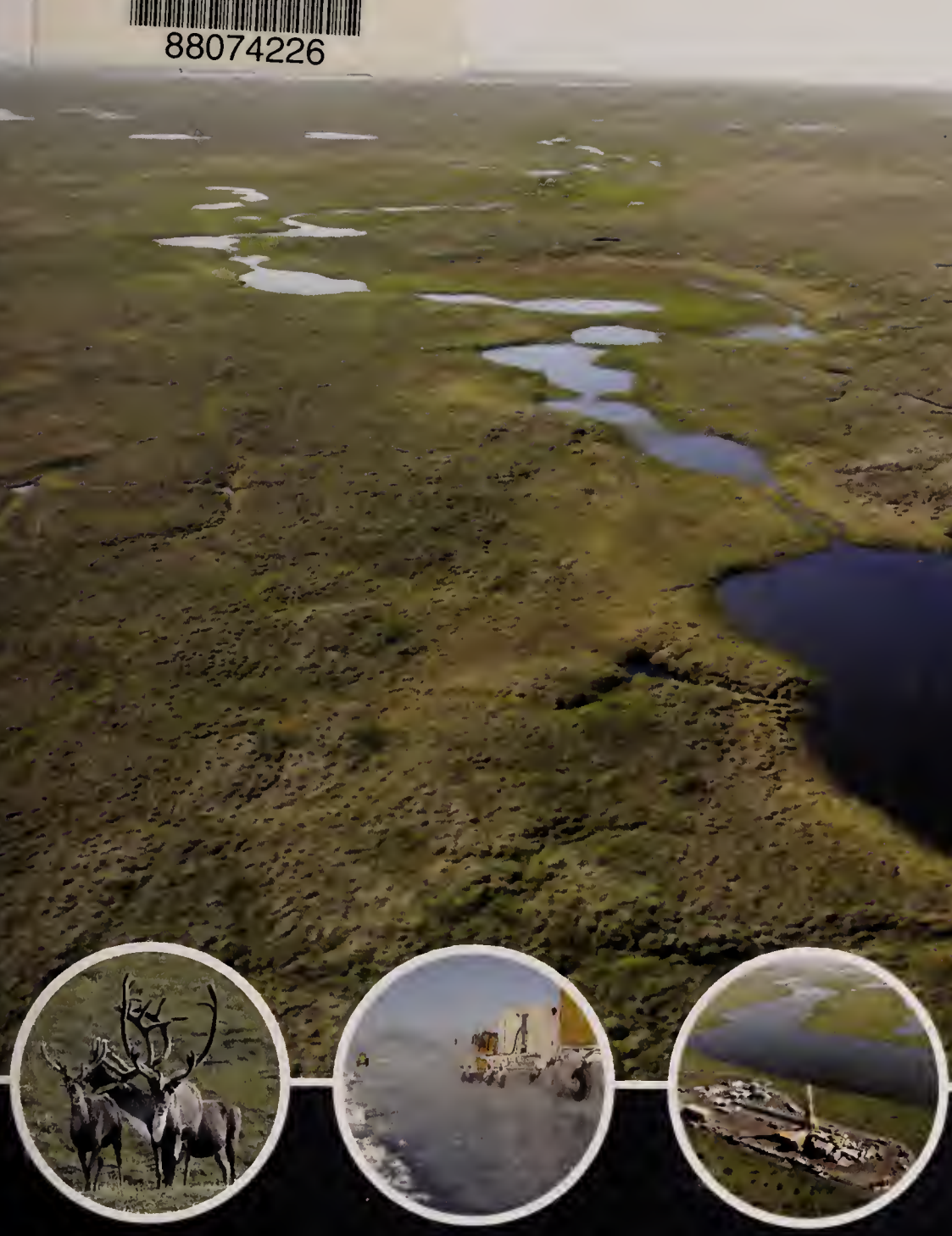


BLM

FINAL

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project

Volume 3: Chapter 8
Public Comments and BLM Responses

October 2014

Alaska

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Cooperating Agencies:
U.S. Bureau of Ocean Energy Management • U.S. Environmental Protection Agency • U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers, Alaska District • State of Alaska •North Slope Borough • Native Village of Nuiqsut

The Bureau of Land Management Today

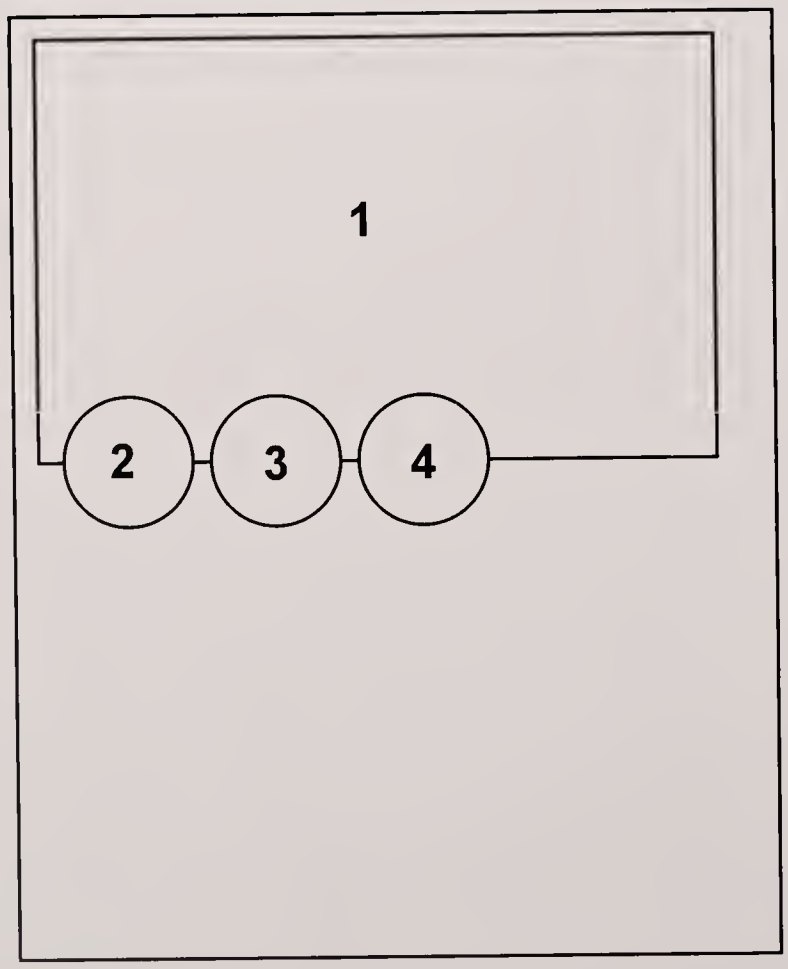
Our Vision

To enhance the quality of life for all citizens through the balanced stewardship of America's public lands and resources.

Our Mission

To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

DOI-BLM-AK-0000-2013-0001-EIS
BLM/AK/PL-15/002+5101+AK9300



Cover Photos:

1. Aerial of Blackfish Creek downstream from GMT1 Drilling pad, National Petroleum Reserve in Alaska.

2. Caribou, North Slope, Alaska

3. Ice road construction, National Petroleum Reserve in Alaska.

4. Aerial of production pad, North Slope, Alaska. © ConocoPhillips.

Alpine Satellite Development Plan GMT1 Development Project

Final

Supplemental Environmental Impact Statement

Volume 3: Chapter 8
Public Comments and BLM Responses

Prepared by:

U.S. Department of the Interior
Bureau of Land Management
Anchorage, Alaska

In cooperation with:

U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. DOI Fish and Wildlife Service
U.S. DOI Bureau of Ocean Energy Management
State of Alaska
Native Village of Nuiqsut
North Slope Borough

October 2014

Contents of Volume 3

Tables

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CHAPTER 8: PUBLIC COMMENTS AND BLM RESPONSES

This volume presents comments Bureau of Land Management (BLM) received on the Alpine Satellite Development Plan, Greater Mooses Tooth 1 (GMT1) Development Project, Draft Supplemental Environmental Impact Statement (SEIS). It also includes a description of how all comments were considered, and responses to all substantive comments.

8.1 Introduction

The Draft SEIS was made available for public review, and a 60-day public comment period for the Draft SEIS began with publication of a Notice of Availability in the Federal Register on February 21, 2014. The public comment period closed on April 22, 2014. Public comments were accepted by mail, email, fax, hand-delivery at BLM's office, and in-person at public meetings.

The BLM held public meetings during the comment period in North Slope communities, Anchorage, and Fairbanks. The public meetings in North Slope communities were also Alaska National Interest Lands Conservation Act (ANILCA) 810 hearings as noted by asterisk. A list of the meetings and meeting dates are provided below. In order to capture all relevant comments, the entirety of the public meetings in North Slope communities were captured by a court reporter and reviewed for substantive comments.

- Monday, March 10: Point Lay *
- Tuesday, March 11: Atqasuk *
- Wednesday, March 12: Barrow *
- Thursday, March 13: Nuiqsut *

- Monday, March 17: Wainwright *
- Tuesday, March 18: Anaktuvuk Pass *
- Wednesday, March 19: Fairbanks
- Thursday, March 20: Anchorage

A total of 17,558 written communications were received. Most communications were submitted via email developed for this project (17,542 messages). Much smaller numbers of comments were received by fax, mail, or hand-delivery. Of the communications received, 63 were unique communications. The other communications reflected the views of, and closely mirrored language suggested by, advocacy groups, including the Alaska Wilderness League (a single communication with 8,826 signatures), Sierra Club (8,617 copies of a single letter), and the Resource Development Council 52 communications with similar language). Example communications or talking points from each of these campaigns is presented below.

Alaska Wilderness League

From: Darcie Warden [Darcie@alaskawild.org]
Sent: April 18, 2014 8:41 AM
To: GMT1 Comments
Subject: GMT1 SEIS Comments_Alaska Wilderness League
Attachments: GMT Delivery Letter 041814.docx; moosestooth2014-20140418.csv

Dear Bridget –

Please find the attached documents directed to Secretary Jewell and BLM Director Neil Kornze.

Thank you for the opportunity to comment and provide the voices of engaged and concerned citizens from across the United States on the Greater Mooses Tooth-1 project.

Darcie Warden

ALASKA WILDERNESS LEAGUE

DARCIE WARDEN
BLM Alaska Outreach Coordinator

PO Box 74731
Fairbanks, AK 99707
Tel: 907-331-6098
Fax: 866-882-2073
Cell: 907-978-9889
www.AlaskaWild.org

Your Land. Your Voice.

* *Please consider the environment before printing this email.*

Director Kornze,

Alaska Wildemess League members wanted to comment on the Greater Mooses Tooth Supplemental Environmental Impact Statement. Greater Mooses Tooth 1 would be the first commercial oil and gas development on federal land within the Reserve, so it is critical that the Bureau of Land Management sets a high standard for this and any future oil and gas infrastructure. The cumulative impacts of GMT1 will be felt not only here, but throughout the entire Reserve. Here is the letter that our members signed urging Secretary Jewell to make sure the final analysis for this project has the smallest environmental footprint:

Dear Secretary Jewell,

As you know, the National Petroleum Reserve-Alaska (Reserve) contains some of the world's highest-quality wild lands and waters, including Teshekpuk Lake and the Colville River, both of which were established as Special Areas under the Reserve's 2012 Integrated Activity Plan. The Bureau of Land Management recently released a Supplemental Environmental Impact Statement for the Greater Mooses Tooth Unit #1 project that could result in the first commercial production of oil from federal lands in the Reserve since the finalization of the 2012 area-wide plan. The BLM must ensure that any approval of this project results in the smallest possible environmental footprint, minimizes cumulative impacts of this and future development within the Reserve, and that protective measures are put in place for the surrounding communities, wildlife, and the Teshekpuk Lake and Colville River Special Areas within close proximity to the project. Please work to improve the Greater Mooses Tooth Supplemental Environmental Impact Statement.

Thank you,

Signatures

Included in the attached files are 8,825 comments and signatures. Thanks for your efforts to ensure the public can comment on future decisions around the Greater Mooses Tooth project.

Sincerely,

Darcie Warden

Darcie Warden
Alaska State Director
Alaska Wilderness League

Sierra Club

Apr 6, 2014

Secretary Sarah Jewell
Interior Building, Room 6156
1849 C Street, NW
Mail Stop 7229
Washington, DC 20240

Subject: Set a higher standard for the Greater Mooses Tooth

Dear Secretary Jewell,

As a concerned citizen and parent, I am writing because the landscape and wildlife in the western Arctic are unlike anywhere else in the country. The National Petroleum Reserve-Alaska (Reserve) is our country's largest tract of public land at 23 million acres, including Teshekpuk Lake and the Colville River Special Areas, protected under the Reserve's 2012 Integrated Activity Plan.

The Supplemental Environmental Impact Statement for the Greater Mooses Tooth Unit #1 project would allow the first commercial production of oil from federal lands in the Reserve since the finalization of that plan. A key success of the area-wide plan was the balance it sought to achieve in the management of the Reserve, while also prioritizing best practices and protections to wildlife in areas where development could occur.

The Bureau of Land Management must ensure that any approval of this project results in the smallest possible environmental footprint, minimizes cumulative impacts of this and future development within the Reserve, and that protective measures are put in place for the surrounding communities, wildlife, and the Teshekpuk Lake and Colville River Special Areas within close proximity to the project. I am asking that you please work to improve the Greater Mooses Tooth Supplemental Environmental Impact Statement to reflect these priorities.

We as a nation cannot afford the environmental and economic costs of not realizing the true costs of continuing to depend upon fossil fuels for our energy needs. We must invest in green, sustainable energy sources. Not sacrificing our essential public wild lands for short term gains.

Thank you for working to see that we have a environmentally sound future.

Resource Development Council

Some commenters used multiple means to provide the same communication (e.g., mailing and faxing a letter, or providing the same email twice). In these cases, the comment is counted as one communication. In addition to the written comments, 59 people provided comments at public meetings in Anaktuvuk Pass, Anchorage, Atqasuk, Barrow, Fairbanks, Nuiqsut, Point Lay, and Wainwright. The following people provided comments at more than one meeting.

- Joe Nukapigak – Kuukpik Corporation (3 meetings)
- John Hopson – City of Wainwright, Arctic Slope Regional Corporation (ASRC), and self (4 meetings [5 comments])
- Teresa Imm – ASRC (2 meetings)
- Lanston Chinn – Kuukpik Corporation (2 meetings)
- Bernice Kaigelak – Kuukpik Corporation (2 meetings)
- Crawford Patkotak – ASRC (2 meetings)
- Isaac Nukapigak – Kuukpik Corporation (2 meetings)

8.2 Communications Categories

All communications received as part of the public comment process were reviewed and entered into the comment analysis database and the Administrative Record. In order to capture all relevant comments, the entirety of the public meetings in North Slope communities were captured by a court reporter and reviewed for substantive comments.

Consistent with federal regulations and BLM's National Environmental Policy Act (NEPA) Handbook, BLM has drafted responses to substantive comments. Substantive comments were directed to BLM subject matter experts (SMEs) for consideration. Responses were drafted to all such comments, and where appropriate, changes were made in the analysis in the Final SEIS.

Comments were grouped into three categories:

- **Communication:** a letter or postcard, fax, webform submission, or statement by a single individual at a public meeting submitted to the BLM during the comment period for consideration in development of the Final SEIS. A communication contains one or more comments.
- **Comment:** a distinct statement regarding an aspect of the Draft SEIS.
- **Substantive Comment:** a comment that (a) questions, with reasonable basis, the accuracy of information in the Draft SEIS; (b) questions, with reasonable basis, the adequacy of, methodology for, or assumptions used for the environmental analysis; (c) presents new information relevant to the analysis; (d) presents reasonable alternatives other than those analyzed in the Draft SEIS; or (e) causes changes or revisions in one or more of the alternatives.

The majority of communications received have not received specific responses because they did not meet the definition of "substantive." Many of these communications were expressions of personal preference that expressed the writers' views on what management actions BLM should take. While these communications may have indicated why the writers advocated a certain course of action, they did not propose a new reasonable alternative or mitigation measure or

present new information. Rather, the management action advocated was reflected in the existing alternatives or was within the range of the alternatives in the Draft SEIS, and the information provided was a part of the analysis considered by BLM in the Draft SEIS.

8.3 Correspondence and Responses

Table 2-1 lists all of the written communications with substantive comments and the pages where they and their responses appear. Table 8.3-2 lists the names of commenters who spoke or testified during public meetings and ANILCA 810 hearings, organized by meeting location. For comments provided during public meetings, only individual, substantive comments are provided. No comment number is provided for testimony that did not contain substantive comments. Complete transcripts of meetings are available by requesting them from BLM or on BLM's project website:

https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=50912

Table 8.3-1. Written Communications

Commenter	Representing	Communication Number	Page Communication Begins	Page Response Begins
Charlotte Brower	North Slope Borough (NSB)	01	11	36
Margaret Pardue, President	Native Village of Nuiqsut	02	47	54
Joe Balash, Charlotte Brower, Allen Rock, Sr.	Alaska Department of Natural Resources (ADNR), NSB, ASRC	03	59	62
Jeff Bruno	ADNR	04	63	110
Christine Reichgott	U.S. Environmental Protection Agency (EPA)	05	116	138
Mike Holley	U.S. Army Corps of Engineers (USACE)	06	149	170
Louise Smith	U.S. Fish and Wildlife Service (USFWS)	07	180	187
Catherine Collins	USFWS	08	191	192
Mark Begich (3/26/14)	U.S. Senate	09	193	195
John Dingell and Rush Holt	U.S. Congress	10	196	198
Jim Adams	Audubon Alaska	11	199	204
Rebecca Noblin, Alaska Director	Center for Biology Diversity	12	206	210
Danielle Murray	Conservation Lands Foundation	13	212	219
Pamela Miller	Northern Alaska Environmental Center	14	222	229
Nicole Whittington-Evans	The Wilderness Society	15	232	301
Wendy Loya	The Wilderness Society	16	330	341
Teresa Imm, VP of Resource Development	ASRC	17	343	353

Table 8.3-1. Written Communications (Continued)

Commenter	Representing	Communication Number	Page Communication Begins	Page Response Begins
Lynn DeGeorge	ConocoPhillips Alaska, Inc. (CPAI)	18	355	497
Issac Nukapigak, Thomas Napageak	Kuukpik Corporation	19	520	564
Edward Nukapigak, Nuiqsut Whaling Captain	Self	20	574	576
C. Barkley Lloyd	Alaska Clean Seas (ACS)	21	578	580
James Wallace	Self	22	581	582

Table 8.3-2. Comments Provided at Public Meetings

Commenter	Representing	Comment Numbers	Page Comment/ Response Begins
Anaktuvuk Pass * Tuesday, March 18			
Thomas Rulland	Self	AKP-001	583
James Nageak	City of Anaktuvuk Pass	AKP-002, AKP-003, AKP-009,	583
Anna Nageak	Nunamiut Tribal Corporation	AKP-004, ATKP-005	583
Esther Hugo	City of Anaktuvuk Pass	AKP-006, AKP-007, AKP-008	584
Lela Ahgook	City Council member		
John Hopson	ASRC		
Anchorage - Thursday, March 20			
Barrett Ristroph	The Wilderness Society	ANC-001 through ANC-009	586
Lanston Chinn	Kuukpik Corporation	ANC-010	588
William Muldoon	CPAI	ANC-011, ANC-012	588
Keith Silver	Self	ANC-013	589
Lindsey Hajduk	Sierra Club	ANC-014 through ANC-017	589
Lois Epstein	The Wilderness Society	ANC-018	590
Teresa Imm	ASRC	ANC-019	590
Stacey Aughe	Self		
Michael Jesperson	Self		
Bill Binford	Conam Construction Company		
Gary Dixon	Teamsters Local 959		
Francy Bennett	Prosperity Alaska		
Maynard Tapp	Self		
Jeanine St. John	Lynden Transport		
Carl Portman	Resource Development Council		
Caroline Higgins	Consumer Energy Alliance		
Rachael Petro	Alaska Chamber		
Grant Yutrzenka	Self		
Tom Maloney	CH2M Hill		
Micheal Heiring	Udelhoven Oilfiled System Services		
Jeff Bruno	Alaska Department of Natural Resources		
Atqasuk * - Tuesday, March 11			
Paul Bodfish, Sr.	ASRC	ATK-001, ATK-002, ATK-003	591
Kate Aiken	Self	ATK-004	592
Mary Ellen Ahmaogak	ASRC	ATK-005, ATK-006, ATK-007	592

Table 8.3-2. Comments Provided at Public Meetings (Continued)

Commenter	Representing	Comment Numbers	Page Comment/ Response Begins
Barrow * - Wednesday, March 12			
George Olemann	Self	BRW-001	594
Forrest Olemann	Self	BRW-002, BRW-003, BRW-005, BRW-011	594
Thomas Brower, III	NSB	BRW-004, BRW-006, BRW-007, BRW-010	594
Bart Ahsogeak	NSB Planning	BRW-008	596
Billy Adams	Self	BRW-009	596
Rosemary Ahtunangaruak	Self	BRW-012 through BRW-022, BRW-027	597
John Hopson	Self	BRW-023, BRW-024	600
John Hopson	ASRC	BRW-025, BRW-026	601
Geoff Carroll	Alaska Department Fish & Game		
Edward Itta	Former NSB Mayor		
John Adams	NSB		
Bernice Kaigelak	Kuukpik Corporation		
Ryan Klimstra	Self		
Fairbanks - Wednesday, March 19			
Pamela Miller	Northern Alaska Environmental Center	FAI-001 through FAI-007, FAI-015 through FAI-019	603
John Hopson	ASRC	FAI-008 through FAI-012	604
Darcie Warden	Alaska Wilderness League	FAI-013, FAI-014	606
Joseph Nukapigak	Kuukpik Corporation		
Nuiqsut * - Thursday, March 13			
Eli Nukapigak	Native Village of Nuiqsut	NUI-001, NUI-018, NUI-019, NUI-020, NUI-029	608
Dora Leavitt	Self	NUI-002, NUI-003, NUI-025, NUI-026, NUI-027	608
Bernice Kaigelak	Kuukpik Corporation	NUI-004, NUI-005, NUI-016, NUI-024	608
Isaac Nukapigak	Kuukpik Corporation	NUI-006, NUI-007, NUI-014, NUI-030	609
Joseph Nukapigak	Kuukpik Corporation	NUI-008, NUI-022	609
Gordon Brower	NSB	NUI-009, NUI-021	610
Annie Lampe [with Roy Nageak translating]	Self	NUI-010, NUI-011, NUI-012, NUI-028	610
Bart Ahsogeak	Self	NUI-013	611
Charlotte Brower	NSB	NUI-015	611
Martha Itta	Native Village of Nuiqsut	NUI-017	612
Dwayne Hopson	Native Village of Nuiqsut		
Thomas Nukapigak	Native Village of Nuiqsut	NUI-023	613

Table 8.3-2. Comments Provided at Public Meetings (Continued)

Commenter	Representing	Comment Numbers	Page Comment/ Response Begins
Crawford Patkotak	ASRC		
Rose Seilak	Self		
Tony Cabinboy	Self		
Point Lay * - Monday, March 10			
Isaac Nukapigak	Kuukpik Corporation	PIZ-001, PIZ-003, PIZ-010, PIZ-011, PIZ-012	617
Willard Neakok	Native Village of Point Lay	PIZ-002, PIZ-004, PIZ-005, PIZ-009, PIZ-015	617
Marty Awalin	Cully Corporation	PIZ-006, PIZ-007, PIZ-018	618
Marie Tracey	NSB	PIZ-008, PIZ-017	619
Crawford Patkotak	ASRC	PIZ-013, PIZ-014, PIZ-016	621
Wainwright * - Monday, March 17			
Terry Tagarook	Self	AIN-001, AIN-002, AIN-004, AIN-006, AIN-011, AIN-014, AIN-015	624
Hugh Patkokat	Olgoonik Corporation	AIN-003	624
John Hopson	City of Wainwright	AIN-005, AIN-007 through AIN-010	625
Joe Nukapigak	Kuukpik Corporation	AIN-012	627
Teresa Imm, VP of Resource Development	ASRC	AIN-013	627

North Slope Borough

OFFICE OF THE MAYOR

P.O. Box 69
Barrow, Alaska 99723
Phone: 907 852-2611 or 0200
Fax: 907 852-0337

Charlotte E. Brower, Mayor

April 22, 2014

Bud Cribley
State Director
Bureau of Land Management
GMT1 SEIS Comments
Attn: Bridget Psarianos
222 West 7th Avenue, # 13
Anchorage, AK 99513–7504
By mail: gmt1comments@slrconsulting.com

RE: Draft Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project

Dear Mr. Cribley and Ms. Psarianos:

Thank you for the opportunity to offer written comments on the Draft Supplemental Environmental Impact Statement (dSEIS) for the Alpine Satellite Development Plan for the Greater Mooses Tooth One (GMT1) Development Project proposed by ConocoPhillips Alaska, Inc. (CPAI). The proposed project is located in the National Petroleum Reserve in Alaska (NPR–A). The GMT1 project would facilitate the first production of oil and gas from Federal lands in the NPR–A, which is located on Alaska's North Slope and encompasses approximately 22.1 million acres of public land.

About the North Slope Borough

The North Slope Borough (Borough or NSB) is the regional municipal government for eight communities across the North Slope of Alaska. Our Borough is the largest municipality in the United States in terms of landmass. It is the regional government for the eight villages within the 89,000 square miles of the Alaskan Arctic, north of the Brooks Mountain Range to the Arctic Ocean. The 2011 populations of our villages ranged from under 300 in Pt. Lay to just over 4,800

in Barrow, the seat of our Borough government and the northernmost community in the country. In total we have approximately 7,840 residents, of which nearly 70 percent are Iñupiat.

The North Slope Borough has supported leasing and environmentally sound oil and gas exploration and development within the NPR-A. The taxes derived from land-based industry facilities are the primary source of municipal revenues that provide jobs and the most basic essential services for our residents. Our historical support for onshore versus offshore oil and gas leasing and operations has always been tempered by the need for these activities to be conducted in a manner which does not significantly interfere with the subsistence way of life of our residents.

[01-001] Our residents depend on subsistence resources for their physical and cultural health. Traditional foods are far more nutritious than many types of imported "store-bought" food, and their continued consumption has repeatedly been shown to be critical to the health of our people.[1] The social fabric of our communities revolves around subsistence traditions. All of our communities, whether through direct harvest or extensive sharing networks, utilize the full range of traditional marine subsistence resources that abound in arctic waters. Any threat to subsistence resources is a threat to the continued viability of our communities and the Ifiupiat culture.

Our Support for the Project and Preferred Alternative

The issue of balancing development with our ability to continue the subsistence practices that have sustained our people and culture for millennia is not a new one. Ever since oil was discovered in Prudhoe Bay in the 1960's, we have endeavored to strike the proper balance between these two critically-important activities.

[01-002] What is unique about this project is that the GMTl project is the first major project geared towards developing Ifiupiat-owned natural resources. In addition to bringing direct benefits to the shareholders of Kuukpik, ASRC, and the other Native corporations entitled to 7(i) distributions, this project will benefit the North Slope Borough and the State of Alaska through increased tax revenues and by extending the life of the Trans-Alaska Pipeline System. Itwill also bring benefits to the villages that rely heavily on funding from NPR-A grants.

[01-003] The North Slope Borough supports the GMTl project and the adoption of Alternative A as the preferred alternative. Subject to further review pursuant to each of our independent permitting processes, the Borough believes that if it is adopted by BLM, the Borough, and other responsible agencies, Alternative A incorporates rigorous mitigation and best management practices that will enable this project to move forward in a responsible manner while also protecting the ability of our local residents to continue their subsistence practices. It also has the smallest gravel footprint of all the alternatives – which is important given the scarcity of gravel on the North Slope.

---

[1] The subsistence diet protects against obesity and diabetes, and associated problems such as hypertension and cardiovascular disease. Restricted access to subsistence foods therefore places the community at increased risk for these problems. If subsistence use in the region is reduced, very significant increases in obesity and diabetes in the impacted communities would predictably ensue. *See* Ebbesson SO, Kennish J et al, Diabetes is Related to Fatty Acid Imbalance in Eskimos, *International Journal of Circumpolar Health,* 58: 108-119. 1999); Shephard R and Rode A, The Health Consequences of Modernization: Evidence from Circumpolar Peoples, Cambridge University Press (1996).

Lastly, the Borough is strongly opposed to any alternative that advocates for road-less development or seasonal drilling. These kinds of alternatives would require more air traffic than an alternative where the project area is connected by a road and present greater risks to life, health, and safety due to weather- related delays associated with air- based emergency response operations. Roadless alternatives could also have greater negative environmental consequences due to the increased difficulty in responding to an oil spill or other similar event.

Ensuring Adequate Public Process in All Phases of Development

It is important for the agency to ensure meaningful public participation in the process. We appreciate BLM's willingness and ability to host meetings about the dSEIS in the affected communities of the North Slope, including Anaktuvuk Pass, Atqasuk, Barrow, Nuiqsut, Point Lay, and Wainwright.

[01-004] Subsistence is an important issue for our people so we also appreciated the opportunity to discuss the potential impacts of the proposed project on subsistence and subsistence resources under Section 8 of the Alaska National Interest Lands Conservation Act (ANILCA) in our villages. Our only suggestion for next time would be to also include a means for people to attend telephonically.

We hope the BLM continues to incorporate this level of public participation into all activities that impact the North Slope communities.

Subsistence is of Heightened Importance

Responsible development in the NPR-A must involve measures to reduce adverse impacts to subsistence species such as caribou, waterfowl, furbearers, and fish. We know that BLM fully understands the critical importance of caribou to North Slope and other communities, and the importance of certain regions of the NPR-A to the herds relied upon by these communities.

We also appreciate that our residents would have access to the proposed project road, which will allow increased access to areas around Fish Creek for subsistence purposes. We encourage BLM and ConocoPhillips to continue to work to mitigate the impacts to subsistence from the increased air traffic in the area.

In reviewing the dSEIS, the two subsistence sections, 3.4.3 and 4.4.3, were written well and covered ongoing concerns hunters have such as air traffic, pipeline height, and potential increase in impact with more development on the west side of the village of Nuiqsut. This dSEIS, in addition to the 2004 and 2012 EISs, addresses subsistence in great detail and adequately addresses the changes and concerns that have arisen since the earlier documents.

We also appreciate the addition of new potential mitigation measures to protect wildlife and the environment from an oil spill. We hope BLM considers these measures and adopts those that have a demonstrable record for spill prevention.

Some issues remain

With our support for the GMT1 project and Alternatie A, we still want to ensure that the dSEIS is accurate and the analysis of the Alternatives is complete. We also want to be sure that the Alternative selected balances development while minimizing impacts to subsistence and mitigating any impacts to the citizens of Nuiqsut. **[01-005]** Finally, public health analyses must be complete in oil and gas projects that have the potential to affect the health of a community (in this instance, Nuiqsut) and the final project must include the public health measures adopted in the NPR-A IAP/EIS.

For these reasons, we are attaching technical comments from our Department of Wildlife staff and our Air Quality consultant. It is our hope and expectation that the current review process will result in an improved Final SEIS, that all permitting agencies, including the Borough, will have the opportunity to thoughtfully consider that document prior to undertaking their independent reviews of CPAI's permit applications, and that ultimately, we will all authorize the same project and adopt consistent mitigation measures.

Conclusion

Thank you for the opportunity to provide comments on this dSEIS for GMT1. We look forward to continuing to work together as a Cooperating Agency on this project.

Sincerely,

Charlotte E. Brower

Charlotte E. Brower
Mayor

Cc: Jacob Adams, Sr., CAO
Lauren Berdow, Borough Attorney
Rhoda Ahmaogak, Director, Planning Department
Taqulik Hepa, Director, Wildlife Management

Attachment

ASDP Supplemental EIS for GMT1: Cooperating Agency Comments

Agency	Commenter Name	Document Section or Figure Number	Comment
NSB	NSB	Table 1.4-3	Threatened/Endangered = Critical habitat for polar bear was proposed but overturned by the court. Not sure saying it was proposed is accurate.
NSB	NSB	2.4.5.1 **[T01-001]**	• On Page 27, Section 2.4.5.1 Tiŋmiaqsiġvik (Ublutuoch) River Bridge, Paragraph 2 notes that "[t]he 350-foot-long Tiŋmiaqsiġvik (Ublutuoch) River bridge would extend bank to bank, and is designed to avoid impacts to the main channel and be wide enough to span a 50-year flood (approximately 11.9 feet BPMSL). I cannot determine from the GMT1 Draft whether the "50-year flood" event approximates additional hydrological change anticipated by climate change, which the Draft SEIS acknowledges: Page 77, Section 3.2.4.3 Potential Climate Change Effects in the Project Study Area, Paragraph 1 notes that "[a] number of hydrologic shifts related to climate change will affect water resources, including seasonal flow patterns, . . . The effects of these climatic and hydrologic changes will result in river systems that increasingly move or migrate over the landscape compared to a period of relatively stable climate, thus, causing potential disruptions to infrastructure (such as roads and bridges) . . ."
NSB	NSB	2.4.4 **[T01-002]**	Include a description of the gravel road– if there are turnouts for safety and subsistence, they should be described. Also we should emphasis access, as discussed at the hearings
NSB	NSB	2.4.7.5 **[T01-003]**	Page 34, Access, notes that aircraft would be required to maintain elevations of at least 1000 feet except during takeoffs and touchdowns defined as being within 3.6 miles of the airstrip. On page 72, sound levels received at the ground generated by fixed-wing and twin-engine aircraft flying at 1000 feet, and helicopters flying at 1300 feet, are described. It seems that over the relatively short flight distances involved, aircraft could spend a high percentage of their time well below established flight elevation minimums, with resultant high levels of noise received on the ground. A concern is that the potential exists,

		[T01-003]	especially during periods of high flight numbers, to create a wall of sound that could impede the free passage of caribou and other wildlife, and disrupt subsistence activities either through direct disturbance of hunts, or through deflection of animals from hunting areas.
NSB	NSB	2.4.8.4 **[T01-004]**	Spill response on p. 43 – does it change if there aren't people? Or does this explain why the Road is preferable?
NSB	NSB	2.7 **[T01-005]**	Page 47 - the mention of the "change from an unmanned facility (post-drilling) to a manned facility" –The plan to have an unmanned facility should discussed under Alternative A. This changes some of the analysis
NSB	NSB	3.1.3.2 **[T01-006]**	Page 53, Alpine Spill History, para. 2, states that "Spills of unknown origin accounted for 795 gallons of the total volume spilled." This statement should be more fully explained. In particular, how many spills accounted for the 795 gallons, where did they occur, what was spilled, and why is their origin unknown?
NSB	NSB	3.2.3.2	• On Page 68, Section 3.2.3.2, paragraph 3: The following sentence is poorly worded, implying that good air quality is due to man-made emissions: "Air quality in the project area is generally good, due to the few sources of both man-made and naturally occurring emissions and the dispersion by prevailing winds." Re-word: Due to low levels of man-made and natural emissions in the general area, air quality is good. Also, it should have a citation that notes the measurements that established the "good" quality.
NSB	NSB	3.2.3.2	Is there no newer info on Air Quality than the 2004 EIS? There have been a lot of new projects. Additional
NSB	NSB	**[T01-007]**	p. 74 – decrease in tundra travel days – if the trend continues, does this get reflected in Alt D and the increase in aircraft use in later years?

NSB	NSB	3.2.4.3	Page 76, second paragraph, the first sentence is exactly the same as the last. You can remove one of them.
NSB	NSB	3.2.4.3 **[T01-008]**	• On Page 76 Section 3.2.4.3 Potential Climate Change Effects in the Project Study Area Paragraph 3 notes that "[w]armer water temperatures alone can increase susceptibility to diseases and parasites, increase the effects of contaminants, . . . However, the precise effect that warmer water temperatures could have on Arctic fish is complicated beyond these simplified examples since fish largely thermoregulate behaviorally, depending on habitat accessibility (BLM 2012, § 3.3.4.5, p. 241). A. There is no plan in any of the alternatives that describes how industry is preparing to differentiate the effects of increased warmer waters via climate change vs. industrial-caused effects. As noted above, there can be an "increase susceptibility to diseases and parasites." An increase in warm water has been speculated as one of the causes of broad whitefish stress in October 2013 leading to the outbreak of the freshwater mold Saprolegnia near Nuiqsut. The debate over whether this was a naturally occurring event or related to industrial activity needs to be examined since an increase in stress in organisms due to climate change will likely overlap with increased industrial activity. See the following references for Saprolegnia: Van den Berg AH, McLaggan D, Di_eguez-Uribeondo J, van West P, 2013. The impact of the water moulds Saprolegnia diclina and Saprolegnia parasitica on natural ecosystems and the aquaculture industry. Fungal Biology Reviews 27: 33e42. Beakes, G.W., Bartinicki-Garcia, S., 1989. Ultrastructure of mature oogonium-oospore wall complexs in Phytophthora megasperma: a comparison of in vivo and in vitro dissolution of the oospore wall. Mycological Research 93, 321e334. Beakes, G.W., Wood, S.E., Burr, A.W., 1994. Features which

			Characterize Saprolegnia Isolates from Salmon Fish Lesions. A Review. In: Salmon Saprolegniasis, pp. 33e66. B. The last sentence in the above paragraph is curious in that it can be taken as explaining away the effects of increased water temperatures on fish, i.e., they behaviorally thermoregulate and can avoid warmer temperatures. The phrase at the end "depending on habitat accessibility" does qualify the statement, but I am not sure what the point is in stating fish behaviorally thermoregulate in relation to the topic of potential climate change effects, unless in each section that describes "animals" the GMT1 Draft will note which animals either behaviorally and/or physiologically thermoregulate.
NSB	NSB	**[T01-009]**	Page 77, para. 5, asserts that by the 2090s, breakup is expected to occur in the Arctic Coastal Plain (ACP) "about 7 days earlier than at present", while freezeup is expected to occur 2 to 4 weeks later by that decade. The citation is to the now-two-year old BLM 2012. That document in turn, on page 202 as cited, references a Scenarios Network For Alaska Planning 2010 document which projected dates of thaw and freeze based on a comparison of average temperatures above and below freezing with the 1961-1990 historic 30-year average. This method of projecting the extent of the ongoing warming trend and shortening of the frozen season on the ACP ignores clear evidence that the rate of change has accelerated, especially in the past 20-25 years, and that an average based on data of that age is of low predictive value today. References to the Scenarios Network abound in BLM 2012. As is the case with the breakup and freezeup predictions, much of the data relied upon seems outdated. Given the dynamic and what has often proven to be conservative nature of predictions relating to the effects of climate change, BLM should, wherever citation in the current document is without update to BLM 2012 sections that in turn cite the 2010 Scenarios Network, determine whether more recent relevant data are available.
NSB	NSB	3.3.1	p. 84 – is there any mitigation targeted at non-native species?

NSB	NSB	3.3.1	• Page 84, Section 3.3.1 Vegetation and Wetlands, Paragraph 2 states that "[t]he common dandelion (*Taraxacum officinale*) has been found north of the Brooks Range and there has been anecdotal observation of dandelion in the NPR-A (BLM 2012, § 3.3.1.3, p. 216)." In fact, it occurs on the coastal areas of Barrow and has been present from at least (probably much longer) 1996 (T. Sformo, Per. Obs).
NSB	NSB	3.3.3	Birds – discussion of YBLs, and Spectacled and Steller's Eiders - Please mention that they are discussed later in the document.
NSB	NSB		p. 106 – km2 can you make it superscript?
NSB	NSB		p. 123 – near the bottom, Inupiat is missing the tilde over the N
NSB	NSB	3.3.2.2 **[T01-010]**	• On Page 142, Section Subsistence Use Areas and Access notes that "[t]he project study area overlaps with the Nuiqsut subsistence use areas," the figures/maps on Pages ** Section 3.3-3 and 3.3-4 also note that GMT1 Alts 2.5-Mile Buffer encompasses the village of Nuiqsut, and Page 144 notes that "both Arctic cisco and geese use areas within the project study area were reported by 76 percent of respondents." However, on Page 86, Section 3.3.2.2 Fish Species, paragraph 2 does not include Arctic cisco as one of the "most prevalent fish: "Arctic grayling, broad whitefish, and ninespine stickleback are the most prevalent fish in the project study area." In 2013, 77.8% of the estimated 17, 172 fish caught in the Nuiqsut fishery were Arctic cisco (Seigle and Gottschalk. 2013). Arctic cisco should be added.
NSB	NSB	**[T01-011]**	• In addition, since "[t]he project study area overlaps with the Nuiqsut subsistence use areas, then the Draft SEIS should cite the long series of fish reports on the "Nuisqut" fishery for Arctic cisco (see below) rather than only Seigle and Gottschalk (2013) and report the size of catch per year, rather than only report subsistence use areas as the DEIS does on

		[T01-012]	Figure 4.4-5, Page 497, Vol. II: "In Nuiqsut, 66 Arctic Cisco use areas were reported by 33 respondents. By citing these numbers and categories alone, one does not get a sense of the size of this fishery. Please report the estimated number of fish taken per year, which for 2013 was 17,172 of which 77.8% were Arctic cisco and 19.8% were least cisco (Seigle and Gottschalk. 2013). • P. 367, Section 4.6.4.2 Biological Resources, Fish and Fish Habitat, Paragraph 2 notes "If predicted shifts in physiochemical characteristics of the environment occur with climate change, this could contribute to an increased level of cumulative impacts on fish in the Arctic." What is stated in the rest of the paragraph is good, but changes in disease type, disease prevalence or parasites are not noted. Please include. Seigle, J.C., S.M. Murphy, and S.R. Braund. 2007. Fall subsistence fishery monitoring on the Colville River: Stakeholder engagement and monitoring plan. Report by ABR, Inc., Anchorage, AK, for ConocoPhillips Alaska, Inc., Anchorage, AK and Kuukpik Subsistence Oversight Panel, Inc., Nuiqsut, AK. 6 pp. Seigle, J.C., S.M. Murphy, and S.R. Braund. 2008. Fall 2007 fishery monitoring on the Colville River. Report by ABR, Inc, Anchorage, AK, for ConocoPhillips Alaska, Inc., Anchorage, AK. 34 pp. Seigle, J.C., and J.P. Parrett. 2009. Fall 2008 subsistence fishery monitoring on the Colville River. Report by ABR, Inc.—Environmental Research & Services, Anchorage, AK, for ConocoPhillips Alaska, Inc., Anchorage, AK. 49 pp. Seigle, J.C., L.B. Attanas, J.R. Rose, and J.P. Parrett. 2010. Fall 2009 subsistence fishery monitoring on the Colville River. Report by ABR, Inc.—Environmental Research & Services, Anchorage, AK, for ConocoPhillips Alaska, Inc., Anchorage, AK. 51 pp. Seigle, J.C., J.M. Gottschalk, and J.R. Rose. 2011. Fall 2010 subsistence fishery monitoring on the Colville River. Report by ABR, Inc.—Environmental Research & Services, Anchorage, AK, for ConocoPhillips Alaska, Inc.,

		[T01-012]	Anchorage, AK. 78 pp. Seigle, J.C., and J.M. Gottschalk. 2012. Fall 2011 subsistence fishery monitoring on the Colville River. Report by ABR, Inc.—Environmental Research & Services, Anchorage, AK, for ConocoPhillips Alaska, Inc., Anchorage, AK. 84 pp. Seigle, J.C., and J.M. Gottschalk. 2013. Fall 2012 subsistence fishery monitoring on the Colville River. Report by ABR, Inc.—Environmental Research & Services, Anchorage, AK, for ConocoPhillips Alaska, Inc., Anchorage, AK. 152 pp. Seigle, J.C., J.M. Gottschalk, and S. Garcia. 2014. Fall 2013 subsistence fishery monitoring on the Colville River. Report by ABR, Inc.—Environmental Research & Services, Anchorage, AK, for ConocoPhillips Alaska, Inc., Anchorage, AK. Near completion . pp.
NSB	NSB	4.3.3.1 **[T01-013]**	For mitigation, we suggest doing these activities in the winter. If completing these activities in the winter is not possible, consider shut down periods such as June 1 to July 15 in addition if there is a large aggregation of molting or staging birds nears near the development area, operations should be shut down.
NSB	NSB	4.3.3.1 **[T01-014]**	p. 262 3rd paragraph is a significant impact
NSB	NSB	4.3.3.1 **[T01-015]**	p. 264 Mitigation measures are needed. This could include using available methods for bird deterrence from manmade structures; limits to vehicle speed and road access in addition to reporting the number of collisions if they occur; monitoring the occurrence of predators in order to create a baseline data for further years to detect increase or decrease occurrence/abundance of predators.
NSB	NSB	4.3.3.2	After abandonment, re-vegetation should be done.
NSB	NSB	4.4.2 **[T01-016]**	The estimated property tax revenue of $100,000 for the North Slope Borough is grossly underestimated. Assuming that only ¼ of the project's $400M cost could be taxable as a tangible portion of investment, yearly tax revenues for the Borough from the project would be around $1.85M.
NSB	NSB	4.6.2.1 **[T01-017]**	For cumulative impacts p. 343 – Umiat Road and Pipeline is included in the Proposed and Current Activities section. However, the operator has not currently

		[T01-017]	sanctioned the project, and the "EIS is on hold." This project should not be considered proposed or current. The Chukchi pipeline is described on p. 346, in "Reasonably Foreseeable Development." However, given the uncertainty around how the District Court will handle the Ninth Circuit decision on the Lease Sale, other outstanding regulatory uncertainties surrounding OCS development, and the announcement by Shell and other operators to cease all OCS activities for the foreseeable future, the development of Chukchi pipeline does not rise to the level of reasonably foreseeable development. BLM should also better define the criteria used by the agency in making reasonably foreseeable determinations.

Air Quality Comments on the Draft Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One

The air quality modeling analyses performed by the BLM for the draft Supplemental Environmental Impact Statement (dSEIS) for the proposed development of petroleum resources in the Greater Mooses Tooth Unit — at the proposed GMT1 drilling and production pad — indicate that adverse impacts on air quality would occur due to the proposed development sources alone and cumulatively when considering other sources in the region.

Specifically, these comments detail the following air quality issues that the BLM should consider addressing in the final EIS:

- BLM's air quality modeling analysis predicts significant NO_2 and PM impacts.
- BLM's air quality modeling analysis does not assure the prevention of significant deterioration of air quality.
- BLM's air quality modeling analysis may underestimate impacts.
- The dSEIS does not include mitigation measures that will help to ensure there will be no adverse impacts from the proposed development.

The dSEIS may not adequately analyze the air quality impacts that could occur as a result of the actions authorized under all of the proposed alternatives. The air analysis included in the dSEIS is not a comprehensive assessment of the environmental and public health impacts resulting from the proposed development. Without a more thorough analysis, BLM cannot know what the full impacts of the development activities under the various Alternatives proposed in the dSEIS will be on air quality, human health and the natural environment or whether the BLM will prevent significant deterioration in air quality.

[01-006] BLM only conducted an air quality impact analysis for the Proposed Action (A - CP AI Proposed Project) and for Alternative D (the roadless alternative). No impact assessment was completed for Alternatives B and C. **[01-007]** BLM should propose a detailed and enforceable mitigation plan and consider that plan in detail as a component of alternatives in the dSEIS.

BLM's Assessment Indicates the Proposed Development Will Have Adverse Impacts on Air Quality

BLM's analysis in the dSEIS shows adverse impacts on air quality. Under NEPA, BLM has obligations to assess and report the near-field, far-field and cumulative impacts of expected air emissions from the proposed development on the NAAQS, prevention of significant deterioration (PSD) increments, and air quality related values (AQRVs), and to identify alternatives or other mitigation measures sufficient to prevent expected violations of NAAQS, PSD increments and adverse impacts on AQRVs. (40 C.F.R. §§ 1502.14(a), (f), 40 C.F.R. § 1502.16(h) and 40 C.F.R. § 1508.27(b)(10)). NEPA explicitly requires that the EIS for the

development "shall include discussions of: [(] Means to mitigate adverse environmental impacts (if not fully covered under § 1502.14(f))." Where "[m]itigation includes: (a) avoiding the impact altogether by not taking a certain action or parts of the action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation." 40 C.F.R.§ 1508.20. **[01-008]** In its EIS analysis, BLM should include all information relevant to reasonably foreseeable significant adverse impacts and must fully justify any incomplete or unavailable information per the requirements of 40 CFR.§ 1502.22.

BLM's Air Quality Modeling Analysis Predicts Significant NO_2 Impacts and May Underpredict Impacts

The BLM's air quality impact assessment shows NO_2 concentrations that, when added to background concentrations, exceed the NAAQS. The dSEIS reports that "[h]igh ambient NO2 impacts in excess of the NAAQS/AAAQS[2] were predicted during the access road and pad construction due to emissions from construction equipment."[3] Specifically, the dSEIS shows a total 1-hour average NO_2 concentration of 220.1 micrograms per cubic meter ($\mu g/m^3$), or 117 percent of the NAAQS.[4]

According to the dSEIS:

> Elevated 1-hour NO2 impacts predicted during the Access Road and Pad Construction Scenario are dominated by construction equipment engaged in road and pad construction. Because of highly conservative assumptions required to represent this highly transient activity in the dispersion modeling, the elevated impacts may be higher than what is expected in reality. The most conservative of the assumptions leading to significant over predictions include:
>
> 1) All potential construction equipment engaged in road and pad construction was assumed to be operating concurrent when in reality the equipment will be staged depending on what is being constructed (i.e., the access road construction will be completed prior to pad construction rather than concurrently as modeled) and which phase of construction is occurring (i.e., gravel placement and gravel compaction are unlikely to occur concurrently).
>
> 2) All potential construction equipment engaged in road and pad construction was assumed to operate every day of the entire construction phase.
>
> As a first step in mitigating these impacts, the modeling should be refined to reduce the conservatism to understand if mitigation is even necessary.[5]

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[2] Alaska Ambient Air Quality Standards
[3] dSEIS at 207.
[4] *See* dSEIS Appendix K Alternative A modeling at 5-9.
[5] *See* dSEIS Appendix K Alternative A modeling at 5-1.

According to the revised modeling completed for Alternative A, "[r]efinements were made specifically to the construction equipment NO_2 emissions for the Pad Construction scenario ... to reduce the conservatism leading to significant over predictions that were presented in the GMT1 Alternative A AQIA."[6] As a result of these "refinements" project impacts presented in the dSEIS are below the NAAQS "without mitigation".[7] **[01-009]** BLM should consider the refinements assumed in the revised modeling as operating requirements in order to prevent impacts that would result in exceedances of the NAAQS.

For example, the revised modeling assumes only half of the 14 off-highway tractors with bottom dump trailers would be on the GMT1 pad at a given time, instead of the original assumption of all tractors.[8] Limiting the number of tractors on the pad to seven at a time would ensure the modeled results more accurately predict short-term NO_2 concentrations during the pad and construction phase of development. This is important, since this limitation seems to be required in order to demonstrate that concentrations would not exceed the NAAQS.

As an additional refinement in the dSEIS, modeling results for Alternative D and for the revised impact analysis for Pad and Access Road Construction rely on "seasonally varying background concentrations"[9].Specifically, instead of adding a single representative background concentration to the modeled design value concentration, the dSEIS relies on a different background concentration for each hour of the day, by season. According to the dSEIS, the seasonally varying hourly NO_2 background values are based on air monitoring data from Nuiqsut for calendar years 2010, 2011 and 2012. For each of four 3-month seasons (*e.g.*, Season 1 =January, February, December) each hour of the day is represented by the 3-year average of the 98th percentile value of all valid observations for that hour during the season. **[01-0110** While not explicitly described in the dSEIS, it appears that this analysis method pairs the 3-year average of 98th percentile monitored N02 concentrations by hour, in a given season, with corresponding modeled concentrations for that hour. This method of pairing data, in time, may underestimate impacts by overlooking hours when higher background concentrations coincide with the highest modeled concentrations. And while EPA guidance discusses cases where this type of methodology might be used, EPA 0 admits that these alternative analyses result in "a less conservative" estimate of impacts.[10] **[01-011]** This type of analysis could be considered appropriate if, for example, there is a concern about double-counting of monitored and modeled contributions but this does not seem likely for this situation. BLM should explain why this less conservative analysis is warranted. Fundamentally, the modeling for the dSEIS should be used as a tool to

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[6] December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, p. 1.
[7] December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, p. 2.
[8] December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, p. 2.
[9] dSEIS, Appendix K, ..., Appendix A, Table A-3, p. A-3.
[10] March 1, 2011 EPA Memo Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard

[01-012] ensure that adverse impacts will not occur in the future, not simply to determine whether or not an adverse impact occurred over the period of time modeled. Therefore, the more protective approach, and one recommended by EPA without need for further justification, would be to add the overall highest hourly background N02 concentration (across the three year monitoring record) to the modeled design value based on the maximum emissions scenario.[11] Given the fact that the 1-hour average N02 modeled impacts, when added to a single representative background concentration (as in Alternative A), are already predicted to exceed the standard during Pad and Access Road Construction, BLM should ensure that the modeling is not under-predicting impacts. **[01-013]** The method of seasonally varying background concentrations likely results in a less conservative analysis and, given that the modeling shows impacts very close to the NAAQS, this approach does not seem warranted.

[01-014] In addition to potential underestimates of N02 impacts from the use of varying background concentrations in the modeling, N02 impacts may be further under-predicted by the use of source-specific in-stack NOz/NOx ratios in the modeling analysis. The dSEIS uses ratios based on source test data for all sources except for explosives detonation (for which the analysis uses the EPA-approved screening value of 0.05). These in-stack ratios can be important parameters in the modeling and, therefore, BLM must ensure the ratios used are protective of the NAAQS since small changes to the ratios used could have a measurable impact on predicted concentrations. **[01-015]** Of potential concern is the source-specific in-stack ratio used for small diesel-fired heaters/boilers. The ratio of 0.05 used in the analysis is based on two small diesel-fired, uncontrolled boilers operating at 100% load. This does not seem like a sufficient sample size or load range to determine a source-specific ratio. Given that the N02/NOx ratio for the larger gas-fired heaters and boilers is based on a much higher value from a lower operating load (i.e., at 40% load) it would seem that the value used to represent the smaller engines (at 100% load) could under-represent ratios at lower loads. The two data points used to determine the ratio for the larger gas-fired engines range from 0.05 (at 60% load) to 0.34 (at 40% load), spanning a wide gap. **[01-015]** If BLM wants to rely on source-specific data it should consider a larger sample size representing a wider load range for these sources.

[01-016] Another concern with the ratio used for the large gas-fired boilers is the fact that the two data points are both from the same engine, equipped with a low NOx burner, which may not be representative of the engines used for the proposed development. If BLM will be relying on this data it should explain how this particular engine is a suitable single surrogate for this analysis. **[01-017]** For the onroad mobile sources a ratio of 0.15 was used to represent both light and medium duty gasoline and diesel engines and heavy duty diesel engines yet the maximum N02/NOx ratio reported for this group of engines was as high as 0.25. **[01-018]** The dSEIS states that "[b]ased on Table 1-6, a proposed N02/NOx Ratio of 0.01 or more for heavy duty diesel vehicles and 0.20 or more for light and medium duty diesel vehicles for the purposes of modeling is conservative" yet Table 1-6 shows maximum values of 0.11 (heavy duty diesel) and 0.25 (light and medium duty gasoline/diesel), both of which exceed the ratios described as representative of these sources.

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[11] March 1, 2011 EPA Memo Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard, p. 17.

[01-019] BLM must ensure the ratio used for this source category sufficiently represents the ratios expected from light and medium duty gasoline engines.

BLM's Air Quality Modeling Analysis Predicts Significant PM Impacts

The BLM's air quality impact assessment results shown in the dSEIS include PM_{10} and $PM_{2.5}$ concentrations that, when added to background concentrations, exceed the NAAQS. The following table summarizes the modeled scenarios where concentrations are predicted to exceed the NAAQS:

Modeled Results for PM_{10} and $PM_{2.5}$ Compared with the NAAQS
(dSEIS, Appendix K, Alternative A modeling results)

Alternative	Modeled Scenario	Total 24hr PM_{10} Concentration [$\mu g/m^3$]	% of NAAQS	Total 24hr $PM_{2.5}$ Concentration [$\mu g/m^3$]	% of NAAQS
A	Infill Drilling[1]	230.1	**153**	37.1	**106**
A	Well Intervention[1]	266.6	**178**	35.1	**100**
A	Pad and Access Road Construction[1]	266.6	**178**	43.1	**123**
D	Infill Drilling	152	**102**	35[2]	**100**
D	Well Intervention	152	**102**	35	**100**
D	Pad and Access Road Construction	152	**102**	44	**125**
D	Clover Material Source Activities	101	67	35	**101**

[1] "Unmitigated Fugitive Dust case" (assumes 75% control of fugitive dust emissions)
[2] Total *annual* $PM_{2.5}$ concentrations are also predicted to exceed the NAAQS (at 109% of NAAQS)

According to the dSEIS:

> The high 24-hour PM2.5 and 24-hour PM10 impacts shown in the tables can be attributed to fugitive dust associated with windblown and vehicular disturbance of dirt on the drilling pad and access road. For the unmitigated case, 75 percent control of fugitive dust based on watering was assumed.[12]

For the revised modeling completed for Alternative A, "emissions were assumed to only occur from June to September of each year as freezing conditions in the region prevent fugitive dust emissions for the remainder of the year".[13]

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[12] *See* dSEIS Appendix K Alternative A modeling at 5-1.
[13] December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, p. 3.

[01-020] Assuming the revised modeling is also based on the assumption that fugitive dust will be controlled by 75% BLM could consider making this level of control an enforceable requirement in the final SEIS.

As an additional refinement in the dSEIS, the revised analysis for Alternative A also includes changes to the reported impacts, as follows:

> Reported model-predicted PM10 impacts were switched from a conservative highest-second-high value to the true design value, which is based on not exceeding the standard more than once per year on average over 3 years, or in this case, not to be exceeded more than once per year on average over 5 years (equivalent to the highest-sixth-high value).
>
> Reported model-predicted PM2.5 impacts were switched from a conservative highest-first-high value averaged over 5 years to the true design value which is based on the multi-year average of the 98th percentile of the annual distribution of 24-hour average.14

[01-021] These less conservative methods of reporting impacts may not be warranted given the fact that impacts are predicted to be so close to the NAAQS (and were predicted to exceed the NAAQS before these "refinements" were made to the modeling). According to EPA guidance, demonstrating compliance with the 24-hour PM2.5 NAAQS requires the 98th percentile monitored background value be added to the average of the lst highest modeled 24-hour average concentration over the five meteorological years modeled.15 Therefore, a multi-year average of the 98th percentile 24-hour modeled concentrations may underestimate PM2.5 impacts. EPA addressed this specifically in a model clearinghouse review of modeling procedures for demonstrating compliance with PM2.5 NAAQS:

> Specifically, [EPA] cannot concur with the use of the highest of the 8th highest (98th percentile) modeled 24-hour impacts from the 5-year meteorological record for the modeled component of the cumulative impact assessment. [EPA's] position is based on a concern that cumulative PM2.5 impacts estimated based on this approach may not be protective of the 24-hour PM2.5 NAAQS, due to the method proposed for combining the 98th percentile monitored background concentration with the 98th percentile modeled concentration, in the form of the highest 8th high (H8H) value over five years of modeling. Combining the 98th percentile monitored value with the 98th percentile modeled concentrations for a cumulative impact assessment would result in a value that is below the 98th percentile of the combined cumulative distribution and would therefore not be protective of the NAAQS. The Model Clearinghouse recommends use of the

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[14] December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, pp. 1-2.

[15] *See* February 26, 2010 MEMO from Tyler Fox, EPA Air Quality Modeling Group to Erik Snyder, Lead Regional Modeler EPA Region 6, Regarding "Model Clearinghouse Review of Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS", http://www.epa.gov/ttn/scram/guidance/mch/new_mch/MCmemo_Region6_PM25_NAAQS_Compliance.pdf.

> average of the 1st highest modeled 24-hour impacts over 5 years as the modeled contribution to the cumulative NAAQS compliance analysis.[16]

And EPA addressed this again in its modeling procedures for demonstrating compliance with the $PM_{2.5}$ NAAQS when it stated that:

> [C]ombining the 98th percentile monitored with the 98th percentile modeled concentrations for a cumulative impact assessment could result in a value that is below the 98th percentile of the combined cumulative distribution and would, therefore, not be protective of the NAAQS.[17]

[01-022] This decision to not use the highest $PM_{2.5}$ modeled values when evaluating impacts calls some question to BLM' s qualitative secondary $PM_{2.5}$ analysis. Specifically, BLM relies on several "conservative" assumptions to justify not directly addressing secondary $PM_{2.5}$ in the dSEIS modeling, including the use of the highest- first- high modeled value in determining $PM_{2.5}$ impacts. In the dSEIS BLM states:

> This conservatism [that has been built into the analysis] includes: 1) assuming that maximum direct and secondary PM2.5 impacts occur at the same location and time, and 2) comparing *highest-first-high model predicted impacts* to the NAAQS/AAAQS in accordance with the USEPA-recommended screening approach. Based on this assessment, it is clear that the PM2.5 NAAQS/AAAQS will be protected when accounting for secondary precursors and that it is not appropriate or necessary to use a photochemical model to further evaluate secondary PM2.5 formation in this near-field AERMOD modeling exercise.[18] [*emphasis added*]

[01-023] BLM should consider using the more conservative methods of assessing PM impacts (*i.e.*, the highest- second- high PM_{10} concentrations and the highest- first- high $PM_{2.5}$ concentration) given that predicted PM levels are close to the NAAQS and in order to sufficiently account for secondary $PM_{2.5}$ impacts.

[01-024] BLM must also address what mitigations would be required to ensure no significant PM impacts would result from development under Alternative D.

BLM's Air Quality Modeling Analysis Does Not Ensure Prevention of Significant Deterioration of Air Quality

As mentioned in our scoping comments on the SEIS, BLM is required under NEPA to satisfy all CAA requirements, and thus the BLM cannot authorize an action unless it has ensured that the

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[16] *Id. at 2*

[17] *See* March 23, 2010 MEMO from Stephen Page, Director, EPA Office of Air Quality Planning and Standards, Regarding "Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS", p. 8.

[18] *See* dSEIS, Appendix K, Alternative A modeling at 5-5.

incremental amount of air pollution allowed in clean air areas (i.e., PSD increment) is not exceeded. (40 C.F.R. §§ 1508.27(b)(7)). The PSD increments are separate ambient air quality standards not to be exceeded, as set out in § 163 of the CAA, that apply in addition to the national ambient air quality standards in clean air areas. **[01-025]** At a minimum, BLM should compare direct project impacts to Class II PSD increments as a measure of how much increment would be consumed by project sources alone.

[01-026] In fact, the dSEIS directly compares modeled project impacts to Class II PSD increments for the Infill Drilling modeling scenario under Alternatives A and D. According to these comparisons, predicted modeled concentrations from project development alone consume more than the available PSD Class II increments for N02, PM10 and PM2.5.[19] BLM should address how it will ensure the proposed development will not result in significant deterioration of air quality and should include appropriate mitigation measures to ensure protection of Class II PSD increments.

Given the fact that project sources alone consume more than the Class II N02 and PM increments, **[01-027]** BLM should complete a proper PSD increment analysis to determine how much of the available increments have already been consumed in the affected area and how much additional increment is available for consumption from the proposed action. Without this level of analysis, BLM is not adequately ensuring that air quality will not deteriorate more than allowed under the CAA. Specifically, **[01-028]** BLM should complete an analysis of all increment consuming and increment expanding sources that impact the same area impacted by the proposed action, including an inventory of increment-affecting emissions (i.e., emissions from major stationary sources which commenced construction or modification after the applicable "major source baseline date" and emissions increases from minor, area and mobile sources that occurred after the relevant "minor source baseline date").[20]

BLM's Air Quality Analysis is Incomplete and May Underestimate Air Quality Impacts

BLM's own modeling, as described in the previous section, shows air quality impacts. However, the modeling, including the emissions inputs and the ways in which the BLM performed the modeling analyses, may not be adequate to fully assess the potential impacts from the proposed development. The result of this modeling is that the adverse air quality impacts from the development may be worse than what is disclosed in the dSEIS. The areas of greatest concern are discussed in more detail below.

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[19] dSEIS, Appendix K, Alternative D modeling analysis, Table 5-6, p. 5-13 and December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, Table A-7, p. A-6.

[20] The major source baseline dates are January 6, 1975 for SO_2 and PM_{10} and February 8, 1988 for NO_2 (40 CFR 52.21(b)(14)(i)). The minor source baseline dates in Alaska differ by pollutant and by [baseline] area and were triggered on the date that a complete PSD permit application was received by the State. See definitions of "major source baseline date", "minor source baseline date" and "baseline area" in 40 CFR 52.21(b)(14)(i), 52.21(b)(14)(ii) and 52.21(b)(15).

BLM's Air Quality Impact Analysis Only Assesses Impacts Under Alternatives A and D

[01-029]Near-field and far-field impacts were only assessed for Alternative A (the applicant proposed project) and Alternative D. No impact assessment was completed for Alternatives B and C). According to the dSEIS, "Alternatives B and C have emission sources of the same types as proposed under Alternative A, from which emissions related to the construction and operation of the longer access road could be estimated." [21]

[01-030] This is problematic because, according to the emissions summary tables in the dSEIS, Alternative C represents the highest level of NOx emissions from construction and the highest level of PM10 and PM2.5 emissions from both construction and operation.[22] In fact, Alternative D only represents the highest level of NOx emissions from operation sources. **[01-031]** In order to provide a conservative estimate of the highest possible emissions, BLM should have modeled the construction inventory for Alternative C to assess worst-case NOx, PM10 and PM2.5 impacts and should have modeled the operational inventory for Alternative C to assess worst-case PM10 and PM2.5 impacts. Of greatest concern is the fact that Alternative C emissions are significantly higher for PM10 and PM2.5 than what was modeled for Alternatives A and D. Specifically: (1) PM10 emissions from construction sources for Alternative C are 40% higher than Alternative A and 220% higher than Alternative D; (2) PM10 emissions from operational sources for Alternative C are 23% higher than Alternative A and 178% higher than Alternative D; (3) PM2.5 emissions from construction sources for Alternative C are 80% higher than Alternatives A and D; and (4) PM2.s emissions from operational sources for Alternative C are 62% higher than Alternative A and 189% higher than Alternative D.

[01-032] This is also concerning because the road construction under Alternative C brings air quality impacts closer to Nuiqsut than the other Alternatives. [23]

[01-033] The dSEIS states that, "Alternative A dispersion modeling analyses are considered to be representative of Alternative B and C" yet this is clearly not the case given the significant difference in PM and NOx emissions for these Alternatives. Similar source types for Alternatives A, B and C mean that larger emissions estimates for Alternatives B and C would result in greater modeled air quality impacts. BLM is not presenting an analysis of the highest possible emissions by choosing to only model Alternatives A and D.

BLM's Air Quality Modeling Analysis Does Not Rely on Conservative Representative Background Concentrations

[01-034] In our comments we provided as a cooperating agency on the preliminary dSEIS, we requested that BLM consult EPA regarding the revised background concentrations used for N02 and PM2.5. According to the preliminary dSEIS, BLM replaced EPA's recommended representative

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[21] dSEIS at 201.
[22] dSEIS Table 4.2-44 and 4.2-45 at 225.
[23] *See* dSEIS Figure 2.6-1 at 463 Alternative C Nuiqsut Alternative Access

[01-034] background concentrations for Nuiqsut with data collected at the Nuiqsut ambient air quality monitor from 2010-2012. The replaced values for N02 and PM2.5 represented a significant decrease over the representative background concentration recommended by EPA in 2011.[24] The 24-hour average PM2.5 background concentration in the dSEIS is now 7.1 ug/m3 (compared with 3 ug/m3 in the preliminary draft we reviewed and compared with EPA's recommended 17 ug/m3).[25] The PM2.5 annual background concentration dropped from 3 ug/m3 to 2.2 ug/m3, the PM10 background concentration dropped from 53 ug/m3 to 48 ug/m3 and 1-hour average N02 background concentration in the dSEIS is now 20 ppb (compared with 19 ppb in the preliminary draft and compared with EPA's recommended 50 ppb).[26] **[01-034]** Given that the near-field modeling analysis presented in the dSEIS predicts significant NOx and PM impacts, it is imperative that BLM base its assessment on the most conservative data available (not on less conservative data) to help ensure no significant impacts from the proposed development. Of particular concern is the background concentration for PM2.5 since the revised modeling results for pad and access road construction show that a background concentration above 7.4 ug/m3 would result in total concentrations that exceed the NAAQS.[27]

[01-035] It appears that the monitored PM 2.5 background concentration relied on in the dSEIS is based on the 3-year average of the 98th percentile 24-hour average concentration.[28] According to recent guidance from EPA, demonstrating compliance with the 24-hour PM2.5 NAAQS requires the 98th percentile monitored background value be added to the average of the 1st highest modeled 24-hour average concentration over the five meteorological years modeled.[29] Therefore, a three-year average of the 98th percentile 24-hour monitored concentrations, as presented in the dSEIS, likely underestimates bacground concentrations for PM2.5. Background concentrations for PM2.5 should be based on the highest 98th percentile 24-hour concentration from a single year, or 9 ug/m3. At this level, total PM2.5 concentrations would exceed the NAAQS - according to the revised modeling for Alternative A - during pad and access road construction and would be 99.4% of the NAAQS for activities within the Clover Material Source.[30]

[01-036] In addition, it appears that the 1-hour average N02 concentration relied on in the dSEIS is based on the 98th percentile concentration averaged over three years, instead of the overall highest

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[24] June 23, 2011 EPA Memo Re: EPA Region 10 Determination of Background Values for the Chukchi Sea and Beaufort Sea OCS Permits, OEA-095.
[25] dSEIS, Table 3.2-6 at 70.
[26] *Id.*
[27] *See* December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, Table A-3, p. A-3.
[28] *See* December 20, 2013 AECOM ConocoPhillips GMT1 – Representative Background Air Pollutant Concentrations for the GMT1 Project Location – REVISED, Table 5, p. A-4.
[29] *See* February 26, 2010 MEMO from Tyler Fox, EPA Air Quality Modeling Group to Erik Snyder, Lead Regional Modeler EPA Region 6, Regarding "Model Clearinghouse Review of Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS", http://www.epa.gov/ttn/scram/guidance/mch/new_mch/MCmemo_Region6_PM25_NAAQS_Compliance.pdf.
[30] *See* December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, Tables A-3 and A-4, pp. A-3 and A-4

[01-036] hourly observation.[31] EPA has issued recent guidance on combining modeled results and monitored background concentrations to determine compliance with the 1-hour N02 NAAQS and BLM should adhere to this guidance.32 Specifically, when determining compliance with the 1 - hour N02 NAAQS, the BLM should add the overall highest hourly representative background concentration from a representative year to the modeled design value that is based on the form of the standard (i.e., the 98th percentile ofthe annual distribution of daily maximum 1-hour concentrations averaged across the number ofyears modeled). The overall highest hourly background concentration from the Nuiqsut monitoring data (2010-2012) is 47 ug/m3 (88 ppb).[33,34] At this level, total N02 concentrations would exceed the NAAQS - according to the revised modeling for Alternative A - for all modeled scenarios.[35]

The Emissions Inventory for the Air Quality Analysis Is Incomplete

Flaring

[01-037] The dSEIS and emissions inventory do not include any information on flaring yet it is assumed that flaring will occur during the proposed development. Production flaring can be a significant source of formaldehyde emissions and would also contribute to NOx, CO, VOC and methane emissions from new wells. Leaving out this source from the impact analysis could have a significant impact on the ability to safely predict formaldehyde and other air quality impacts. **[01-038]** Flaring emissions can be difficult to accurately estimate and control effectiveness of flares is especially uncertain in situations where flares are installed at removed sites without continuous surveillance. BLM should include a conservative estimate of flaring emissions in the dSEIS and shouldt assess the potential air quality impacts from flaring that will occur from the proposed development. In addition, as discussed below, **[01-039]** BLM should take steps to mitigate the impacts from flaring.

Offsite Sources

The dSEIS states that no offsite sources were included in the near-field modeling analysis. Specifically the dSEIS says:

> [B]ackground pollutant concentrations are assumed to include impacts from emissions from existing emission sources in the region. Background concentrations calculated for this project were based on monitoring data collected through 2012. Thus, any significant

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[31] *See* December 20, 2013 AECOM ConocoPhillips GMT1 – Representative Background Air Pollutant Concentrations for the GMT1 Project Location – REVISED, Table 3, p. A-3.
[32] EPA MEMO, "Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard", June 28, 2010 at 18.
[33] December 20, 2013 AECOM ConocoPhillips GMT1 – Representative Background Air Pollutant Concentrations for the GMT1 Project Location – REVISED, Table 3, p. A-3
[34] 1 ppb NO_2 = 1.88 $\mu g/m^3$ NO_2
[35] *See* December 24, 2013 AECOM Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A, Tables A-3 through A-6, pp. A-3 and A-6

offsite sources would be reflected in the background concentrations. There are no other reasonably foreseeable development sources that would be large enough to create a significant concentration gradient in the impact area. Therefore, no offsite source inventory was included in the near field dispersion modeling analysis.[36]

[01-040] The approach of assuming certain sources are reflected in monitored background concentrations is not consistent with current practice for analyzing emissions impacts. Background air monitoring data is generally added to the results of a cumulative source modeling analysis in determining compliance with the NAAQS. However, as discussed in EPA's Guideline on Air Quality Models, if the source being modeled is not isolated, as is the case in this modeling assessment, then modeling of existing sources is necessary to determine the potential contribution of background sources. See Section 9.2.1 of 40 C.F.R. Part 51, Appendix W. **[01-041]** Monitoring data also do not capture the maximum potential emissions from sources impacting background concentrations and are therefore less conservative than a modeling analysis of background concentrations that accounts for all sources during maximum operating scenarios.

BLM Must Include Adequate Plans to Protect Air Quality in the Area as Part of This dSEIS

The dSEIS relies on certain mitigation measures for "elimination or reduction of potential impacts to air quality from GMT1 project development".[37] Specifically, **[01-042]** BLM references mitigation measures described in Section 4.7 and the following Best Management Practices in the 2013 NPR-A IAP ROD: A-9, A-10, E-1 and E-8. Section 4.7 of the dSEIS (Mitigation Measures) addresses lease stipulations and includes a table (Table 4.7-1) summarizing all the mitigation measures in place, including those in the 2013 NPR-A IAP ROD, the 2004 ASDP ROD and "CP AI Design Features and Other Agency Permit Requirements" implemented for ASDP projects, including GMT1. The compulsory air quality mitigations summarized in this table include the need for an approved fugitive dust control plan, the use of reduced-sulfur fuel in drill rigs and the use of block heaters under certain temperatures. There are other practices included in the referenced mitigation measures that are discretionary measures that do not assure measurable impact reduction. The dSEIS states, "to the extent practicable, all oil and gas operations (vehicles and equipment) must be powered by natural gas or electric power rather than diesel fuel.[38] This is identified as a "requirement/standard" but it's unclear what, specifically, would be considered impractical. As stated in previous comments on NOx, and on preventing significant deterioration of air quality, BLM should include a more comprehensive set of required, measurable and enforceable mitigations to ensure there will be no significant impacts to air quality from the proposed project.

[01-043] Near-field N02 impacts indicate the potential need for additional NOx reductions. This could be achieved through field electrification, requirement of Tier 4 drill rigs and Tier 2 or better

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[36] dSEIS, Appendix K, Alternative A modeling analysis, 3-20.
[37] dSEIS at 203
[38] dSEIS at 229

[01-043] construction equipment, and centralization of well pad production facilities. Fugitive dust impacts and other PM impacts support requirements for field electrification, steps to minimize traffic (e.g., through centralization of well pad production facilities), and Tier 2 or better construction equipment. Concern about formaldehyde concentrations further necessitates the need to limit flare emissions and institute requirements that ensure proper operation of flares.

[01-001]
Although this is explained in depth in previous IAPs and EISs from which this tiers, BLM recognizes that subsistence is one of if not the most important resources discussed in the SEIS. As such, sections on subsistence will include language on the holistic nature and wide-ranging health benefits of subsistence.

[01-002]
The Final SEIS has been updated to reflect the suggested edit.

[01-003]
The relative scarcity of gravel on the North Slope is noted in the Final SEIS.

[01-004]
BLM will make every effort to provide teleconferencing at future ANILCA 810 hearings.

[01-005]
Impacts to the public health of Nuiqsut are discussed in Section 4.4.6, including a discussion of the mitigation adopted in the BLM 2012 IAP and newly proposed mitigation specific to the GMT1 SEIS.

[01-006]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well.

Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub.

[01-007]
Mitigation measures are listed in Section 4.7, and new project-specific mitigation measures are incorporated in Chapter 4 resource sections where applicable. These measures are subject to monitoring to evaluate the effectiveness of project designs and mitigation measures and guide BLM's adaptive management. See page 7 of NPR-A IAP Record of Decision.

[01-008]
The projects included in the Final SEIS as reasonably foreseeable were in at least the proposal stage. Other potential projects are considered speculative and are not included.

[01-009]
BLM uses an adaptive management strategy in its mitigation measures, so operational requirements will be drafted and required in terms of control efficiencies (for example, road watering). Certain refinements made to the model to reduce air quality impacts will be included as operational requirements as part of BLM's authorization at GMT1. To the extent the model

includes other control restrictions on equipment and turbines, these will also be incorporated as mitigation. Modeling assumptions that reflect average work practices, for example the average number of vehicle trips to and from the GMT1 pad, will not be incorporated as specific requirements, as such a regime would be unworkable in practice.

[01-010]
While using seasonally varying background concentrations is not the most conservative approach recommended by USEPA, it is still conservative for the project area considering the lack of near-field sources (which would be responsible for any highly variable and elevated background concentrations) and the fact that the background data used were measurements collected in the community of Nuiqsut. The background concentrations measured at Nuiqsut are known to be impacted by near-field source activity resulting in a measured background that has more variability and higher impacts than what would be expected in the project area. The use of the 98th percentile value in this case simply serves to decrease the effect of sources, such as residential heating and power generation, which impact the Nuiqsut measurements, but will not exist in the project area.

[01-011]
While using seasonally varying background concentrations is not the most conservative approach recommended by USEPA, it is still conservative for the project area considering the lack of near-field sources (which would be responsible for any highly variable and elevated background concentrations) and the fact that the background data used were measurements collected in the community of Nuiqsut. The background concentrations measured at Nuiqsut are known to be impacted by near-field source activity resulting in a measured background that has more variability and higher impacts than what would be expected in the project area. The use of the 98th percentile value in this case simply serves to decrease the effect of sources, such as residential heating and power generation, which impact the Nuiqsut measurements, but will not exist in the project area.

[01-012]
While using seasonally varying background concentrations is not the most conservative approach recommended by USEPA, it is still conservative for the project area considering the lack of near-field sources (which would be responsible for any highly variable and elevated background concentrations) and the fact that the background data used were measurements collected in the community of Nuiqsut. The background concentrations measured at Nuiqsut are known to be impacted by near-field source activity resulting in a measured background that has more variability and higher impacts than what would be expected in the project area. The use of the 98th percentile value in this case simply serves to decrease the effect of sources, such as residential heating and power generation, which impact the Nuiqsut measurements, but will not exist in the project area.

[01-013]
While using seasonally varying background concentrations is not the most conservative approach recommended by USEPA, it is still conservative for the project area considering the lack of near-field sources (which would be responsible for any highly variable and elevated background concentrations) and the fact that the background data used were measurements collected in the community of Nuiqsut. The background concentrations measured at Nuiqsut are known to be impacted by near-field source activity resulting in a measured background that has more variability and higher impacts than what would be expected in the project area. The use of the 98th percentile value in this case simply serves to decrease the effect of sources, such as

residential heating and power generation, which impact the Nuiqsut measurements, but will not exist in the project area.

[01-014]
The NO2 to NOx in-stack ratios developed were neither the smallest (least conservative) nor the largest (most conservative) and were based on a review of relevant and available literature. Ratios were determined using a USEPA database that is the most robust available and using approaches and ratios previously approved by ADEC (for explosives detonation, the EPA-approved screening in-stack ratio of 0.5, not 0.05 as in comment, is used). There is no justification for using different in-stack ratios as all input data and methods were reviewed by the air quality MOU participants and deemed representative for the project based on the information available.

[01-015]
The NO2 to NOx in-stack ratios developed were neither the smallest (least conservative) nor the largest (most conservative) and were based on a review of relevant and available literature. Ratios were determined using a USEPA database that is the most robust available and using approaches and ratios previously approved by ADEC (for explosives detonation, the EPA-approved screening in-stack ratio of 0.5, not 0.05 as in comment, is used). There is no justification for using different in-stack ratios as all input data and methods were reviewed by the air quality MOU participants and deemed representative for the project based on the information available.

[01-016]
The NO2 to NOx in-stack ratios developed were neither the smallest (least conservative) nor the largest (most conservative) and were based on a review of relevant and available literature. Ratios were determined using a USEPA database that is the most robust available and using approaches and ratios previously approved by ADEC (for explosives detonation, the EPA-approved screening in-stack ratio of 0.5, not 0.05 as in comment, is used). There is no justification for using different in-stack ratios as all input data and methods were reviewed by the air quality MOU participants and deemed representative for the project based on the information available.

[01-017]
The NO2 to NOx in-stack ratios developed were neither the smallest (least conservative) nor the largest (most conservative) and were based on a review of relevant and available literature. Ratios were determined using a USEPA database that is the most robust available and using approaches and ratios previously approved by ADEC (for explosives detonation, the EPA-approved screening in-stack ratio of 0.5, not 0.05 as in comment, is used). There is no justification for using different in-stack ratios as all input data and methods were reviewed by the air quality MOU participants and deemed representative for the project based on the information available.

[01-018]
The NO2 to NOx in-stack ratios developed were neither the smallest (least conservative) nor the largest (most conservative) and were based on a review of relevant and available literature. Ratios were determined using a USEPA database that is the most robust available and using approaches and ratios previously approved by ADEC (for explosives detonation, the EPA-approved screening in-stack ratio of 0.5, not 0.05 as in comment, is used). There is no justification for using different in-stack ratios as all input data and methods were reviewed by the

air quality MOU participants and deemed representative for the project based on the information available.

[01-019]
The NO2 to NOx in-stack ratios developed were neither the smallest (least conservative) nor the largest (most conservative) and were based on a review of relevant and available literature. Ratios were determined using a USEPA database that is the most robust available and using approaches and ratios previously approved by ADEC (for explosives detonation, the EPA-approved screening in-stack ratio of 0.5, not 0.05 as in comment, is used). There is no justification for using different in-stack ratios as all input data and methods were reviewed by the air quality MOU participants and deemed representative for the project based on the information available.

[01-020]
The permittee will implement a plan approved by the Authorized Officer for limiting fugitive dust. See Table 4.7-1 (Mitigation section).

[01-021]
For PM2.5, the approach in question ("the 98th + 98th approach") was only used for the Alternative A and D Infill Drilling and Well Intervention scenarios and the Alternative D Pad Construction scenario. For all other Alternative A and D scenarios, the maximum modeled value was added to the 98th percentile monitored value ("the high + 98th approach") as required by the 2010 EPA guidance referenced. This 2010 guidance, however, has been superseded by draft guidance issued by the EPA in 2013 and then the final guidance issued by the EPA on May 20, 2014, ""Guidance for PM2.5 Permit Modeling.

Based on the final EPA 2014 guidance, all the scenarios qualified for the 98th + 98th approach because the expected role of secondary particulate formation on air quality impacts was fully documented in the ambient air quality impact analysis for both alternatives. Though all scenarios qualified, the 98th + 98th approach was only used for the Alternative A and D Infill Drilling and Well Intervention scenarios and the Alternative D Pad Construction scenario consistent with the standard practice of making refinements only as necessary. Therefore, the 98th + 98th approach was appropriate for those scenarios though not the most conservative of currently approved approaches.

Though the less conservative 98th + 98th approach was used to predict cumulative impacts from some scenarios, it is important to point out that techniques used to predict impacts from project sources employed considerable conservatism. For example, the Alternative A Infill Drilling and Well Intervention scenarios were modeled as occurring continuously over the modeled 5-year period. In reality, well intervention will last 45 days, once per year at most, and the infill drilling will have approximately the same duration. Therefore, the approach taken was very conservative and sufficiently accounts for PM impacts.

[01-022]
Secondary PM2.5 cannot be fully addressed with the AERMOD or CalPuff models. A photochemical grid (ozone) model would have to be used. However, given the size of the project, current ozone monitoring data and the time and cost of running an ozone model, such a model is not appropriate for this project. (Nicholls)

[01-023]
For PM2.5, the approach in question ("the 98th + 98th approach") was only used for the Alternative A and D Infill Drilling and Well Intervention scenarios and the Alternative D Pad Construction scenario. For all other Alternative A and D scenarios, the maximum modeled value was added to the 98th percentile monitored value ("the high + 98th approach") as required by the 2010 EPA guidance referenced. This 2010 guidance, however, has been superseded by draft guidance issued by the EPA in 2013 and then the final guidance issued by the EPA on May 20, 2014, "Guidance for PM2.5 Permit Modeling."

Based on the final EPA 2014 guidance, all the scenarios qualified for the 98th + 98th approach because the expected role of secondary particulate formation on air quality impacts was fully documented in the ambient air quality impact analysis for both alternatives. Though all scenarios qualified, the 98th + 98th approach was only used for the Alternative A and D Infill Drilling and Well Intervention scenarios and the Alternative D Pad Construction scenario consistent with the standard practice of making refinements only as necessary. Therefore, the 98th + 98th approach was appropriate for those scenarios though not the most conservative of currently approved approaches.

Though the less conservative 98th + 98th approach was used to predict cumulative impacts from some scenarios, it is important to point out that techniques used to predict impacts from project sources employed considerable conservatism. For example, the Alternative A Infill Drilling and Well Intervention scenarios were modeled as occurring continuously over the modeled 5-year period. In reality, well intervention will last 45 days, once per year at most, and the infill drilling will have approximately the same duration. Therefore, the approach taken was very conservative and sufficiently accounts for PM impacts

[01-024]
The requested information has been included in Table 4.7-1 of the Final SEIS.

[01-025]
The air quality analysis performed for SEIS is not, and should not be considered a regulatory PSD Increment Consumption Analysis. Any comparison of modeled results to applicable PSD Increments are for informational purposes only.

[01-026]
The air quality analysis performed for SEIS is not, and should not be considered a regulatory PSD Increment Consumption Analysis (ICA). Any comparison of modeled results to applicable PSD Increments are for informational purposes only. (Nicholls)

[01-027]
A regulatory PSD ICA is not the responsibility of BLM but would be performed by a permit applicant in cooperation of the State Air Regulatory Agency. (Nicholls)

[01-028]
A regulatory PSD ICA is not the responsibility of BLM but would be performed by a permit applicant in cooperation of the State Air Regulatory Agency. (Nicholls)

[01-029]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality

modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well. Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-030]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well. Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-031]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well. Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-032]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well. Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-033]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well. Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-034]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well.
Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-035]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well.
Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-036]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest

ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well.
Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub."

[01-037]
Flaring is not part of the GMT1 project design, nor will there be an increase in flaring at the Alpine CPF as a result of GMT1; therefore, emissions from flaring were not documented and mitigation measures do not need to be considered.

[01-038]
Flaring is not part of the GMT1 project design, nor will there be an increase in flaring at the Alpine CPF as a result of GMT1; therefore, emissions from flaring were not documented and mitigation measures do not need to be considered.

[01-039]
Any additional flared volume of gas associated with the project would likely be negligible compared to existing flaring events, barring any significant process design flaws that may work themselves out as volumes are increased. There is no current regulation that prevents CPAI from flaring in non-emergency cases without approval, however, the BLM has the discretion to limit these events to those determined to be absolutely necessary for safe production handling. [Maxwell]

[01-040]
See comment # [006-117A. It is standard practice in NEPA air quality analyses to model the project sources only and add background concentrations for comparison to the National Ambient Air Quality standards. (Nicholls)

[01-041]
See comment # 007-021D. It is standard practice in NEPA air quality analyses to model the project sources only and add background concentrations for comparison to the National Ambient Air Quality standards. (Nicholls)

[01-042]
BLM will consider including additional mitigation measures that are required rather than voluntary. (Nicholls)

[01-043]
Modeled near-field impacts in the SEIS for NO2 do not exceed applicable criteria. Modeled near-field impacts and risk calculations do not exceed applicable thresholds. (Nicholls)

[T01-001]
The 50-year flood event is based on historical flooding events.

[T01-002]
A potential mitigation measure for roaded alternatives requires CPAI to provide Nuiqsut residents clear written policies regarding resident use of the road for subsistence purposes. BLM will work with CPAI and residents of Nuiqsut to determine the best placement for turn-outs. The text of this mitigation measure will be edited to require CPAI to consult with residents of Nuiqsut and BLM regarding placement of pullouts during the final road design.

[T01-003]
Published literature does report that caribou have a startle response to low flying aircraft. The response is short (less than 30 seconds as per Table 3, Harrington and Veitch 1991) but most intense when aircraft make a direct overpass. The likelihood that caribou would become habituated to this type is stimulus is thought to be low, so it would be a continual concern. There is also concern that caribou during calving would be more sensitive to this type of stimulus and could affect calving success. BLM works with permittees to decrease the number direct overpasses, and to limit the number of flights during calving season. If it is not possible to limit flights in this manner then monitoring herd populations in the area over time may be warranted and incorporated into an adaptive management process to adjust flights at a later date if the population is being affected.

[T01-004]
Trained responders are needed in an oil spill event. There is no analysis of response capabilities without the use of personnel.

[T01-005]
Under Alternative A, GMT1 would be an unmanned facility similar to CD5 and CD4 as they are currently operated. Routine inspections and work occurs, but no one remains on site overnight in a camp. Work would still occur in the evening or early morning because the field operates around the clock.

[T01-006]
The Draft SEIS, Section 3.1.3.2 provides the Alpine Spill History. These data (195 spills) were obtained from ADEC's spill database and are analyzed throughout this section. The paragraph mentioning spills of unknown origin totaling 795 gallons is part of the discussion on spill volume by source. The ADEC spill database does not include information on the source of these spills. These same spills are covered in the previous paragraph which describes spill volume by type.

[T01-007]
BLM recognizes that climate change has impacted the length of the ice road season, and increased reliance on aircraft has been incorporated into the climate change discussion and cumulative impacts.

[T01-008]
A. In order for oil and gas activities to increase water temperatures, there has to be a physical mechanism of doing so. Just because there is industrial activity doesn't mean water temperatures may rise due to unknown causes that can be attributed to industry. Essentially, there are two ways any industrial activity could cause increased water temperatures: (1) discharge of warm water (or other fluids) into lakes and or streams, bringing up the overall temperature of the waterbody; or (2) by removing landscape attributes that provide shading and keep temperatures down, such as streamside trees (there are none in Arctic AK) or brushy vegetation. TBLM has been monitoring water temperatures in lakes and streams since 2009 (and much longer in major rivers) that will

likely be in basins with oil and gas development as well as a number of reference streams and lakes that will not likely have oil and gas land-use influencing them, at least in the near future (decade or more). A lot of these data are already available to the public at the following website and will continue to be available once data is processed for quality control: http://ine.uaf.edu/werc/projects/arp-fishcreek/data.html. Further, the *Saprolegnia* issue and associated discussion is analyzed in the Subsistence section of the Final SEIS. BLM is coordinating with NSB on language to describe last year's observations with broad whitefish and what is known in general about the "water mold".

B. The Final SEIS has been edited to address concerns over the statement about fish thermoregulating behaviorally.

[T01-009]
BLM reviewed the climate change sections and new numbers are incorporated into the Final SEIS where appropriate.

[T01-010]
The Final SEIS has been updated to reflect the suggested edit.

[T01-011]
Data from the annual fall fishery study were excluded from data tables because they do not represent harvests for a full calendar year (as do other harvest studies). BLM agrees that it is useful to cite these reports in the text and provide estimates on the average size of the fall fishery (or the range over all study years). We agree that these data are valuable in describing subsistence uses of the Project Study Area.

[T01-012]
BLM is analyzing an alternative in the Final SEIS which would not allow drilling activity during the months captured in this comment, and thus will analyze differing impacts to birds as a result of limited activity during summer months. The suggestion to shut down activity as a result of large aggregations of molting or staging birds near developments is not a reasonable new mitigation measure. If molting or staging birds choose to gather in areas near development the birds are choosing to locate themselves near the activity, and are likely not being affected by the activity.

[T01-013]
BLM does not agree that tundra ice roads build for the construction of the facilities would have a significant impact on birds or bird populations in the project area due to the limited amount of damage to the vegetation types that birds in the project area tend to nest in. Please see page 239 of the Draft SEIS for conclusions of vegetation damage due to ice roads during the construction period.

[T01-014]
Most of these issues are addressed in Section 4.3.3.4 Mitigation of the Final SEIS. Others are addressed by BMPs A-1 through A-7 and E-9, which ensure that solid, liquid, and hazardous wastes (including fuels) do not impact birds or their habitats, and to reduce the potential for garbage and shelters that attract predators. The protection of bird habitats and food sources are addressed by BMPs B-1, C-3, C-4, and Stipulations E-2 and L-1, among others. In addition, there are BMPs and stipulations that regulate the types of activities that can occur near water bodies, including rivers and streams, types of equipment that can be used in the planning area,

will serve to protect birds and their habitats. A required Wildlife Avoidance and Interaction Plan and a Predator Management Plan will help to mitigation other types of potential issues to birds.

[T01-015]
The Final SEIS has been updated to reflect the suggested edit. A different approach was used based on total facilities cost of $400 million.

[T01-016]
Although the Umiat road and Chuckchi Sea pipeline are on hold, environmental planning action has been undertaken, so these are beyond speculative. The cumulative impacts analyses will include these proposed projects.

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April 22. 2014

Bridget Psarianos. Project Manager
GMT1 Draft SEIS Comments
222 West 7th Avenue. Stop #13
Anchorage. AK 99513
gmt1comments@slrconsulting.com

Re: Comments on the Draft Supplemental Environmental Impact Statement for Greater Mooses Tooth-1

Dear Ms. Psarianos:

Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Statement ("EIS") for the Great Mooses Tooth-1 Development ("GMT1"). We appreciate the government-to-government consultation that has taken place during the planning for this document. We have many concerns regarding impacts to our traditional lands. hunting. and fishing. and the health of our community.

We would like to emphasize that the Native Village of Nuiqsut speaks on its own behalf. and that our opinion may differ from that of Kuukpik Corporation. While Kuukpik has described the benefits to our shareholders that will come from the proposed development. many of our residents are not shareholders. are not married to original shareholders. and may not inherit shares. Those of us who are not shareholders will feel the impacts of this project without getting the benefits.

[02-001] If the project goes forward in a manner that address our concerns, we would prefer Alternative C, which would make Nuiqsut a hub for operations. This would bring competitive airlines in our village, help reduce the cost of living, and provide more job opportunities.
[02-002] We would prefer no action if our concerns are not adequately addressed.

I. Subsistence

A. Impacts of Aircraft and Studies

The noise and disturbance caused by aircraft has been a concern for many years. As far back as the 1979 Nuiqsut Paisanich. the people of Nuiqsut said, "Too many airplanes and helicopters scare away the moose and caribou" (p. 39). We have shared this concern with the Bureau of Land Management ("BLM") many times without a solution. We understand that aircraft is used in many studies that are required and that are important to us. But it is time to start thinking about practical ways to cut down on the use of aircraft.

1. Reduce flights and use more boats and other transportation methods.

[02-003] The number of flights used for studies and activities like stick-picking can be reduced by using other methods of transportation. **[02-004]** Researchers may be able to collaborate with subsistence hunters who have boats and can assist with studies. Likewise, industry can hire local people to pick up trash and debris rather than making multiple helicopter flights. Some "stick-picking" can be accomplished by boat or 4-wheeler, or simply by making fewer helicopter landings and walking more. Bear safety training could be required to minimize bear-human conflicts.

[02-005] As much as possible, workers should pick up trash as they go rather than leaving it for later. Trash should be stockpiled in fewer areas so fewer stops are required to pick it up. As much as possible, trash should be picked up in May before the ice road closes. To avoid interfering with subsistence, the remaining trash could be picked up in August (not in July during the height of subsistence season). The route for stick-picking should be minimized and streamlined, and it should be given to the Native Village of Nuiqsut ahead of time for review.

2. Strengthen Best Management Practice F-1 (regarding aircraft).

[02-006] BMP F-1 from the 2013 Record of Decision for NPRA has some mitigation measures for aircraft, but more mitigation is needed to address the situation around our community. We suggest that BMP F-1 be strengthened as follows:

- By April of each year, an oil and gas operator must submit and aircraft use plan listing the number of flights, type of aircraft, and flight altitudes and routes, and a plan to monitor flights to tribes, municipalities, and corporations within 30 miles of the expected flight paths. The aircraft use plan shall include a calendar of activity as well as a map showing where activity is expected to take place on the relevant dates. The plan shall include photographs of each plane used and identify each plane by number and color.
- **[02-007]** The number of takeoffs and landings to support oil and gas operations with necessary materials and supplies must be limited to the maximum extent possible. Trips shall be combined when possible, and studies shall be conducted by boat and foot when possible.
- **[02-008]** Use of aircraft, especially rotary wing aircraft, near known subsistence camps, cabins, and allotments, or during sensitive subsistence hunting periods (spring goose hunting and

[02-008] fall caribou and moose hunting) must be kept to a minimum. To the extent practical, research shall be planned in stages or staggered in order to reduce contact with subsistence users and avoid bird, caribou, and fish migration.

- **[02-009]** Unless necessary to protect human health and safety, traffic (including that of vehicles, vessels, and aircraft) shall not take place at altitudes, distances, or volumes that disturb subsistence activities at times and in places when subsistence activities are taking place. Aircraft used in support of permit activities must maintain an altitude sufficient to avoid harassing concentrations of 25 or more caribou to avoid interfering with or disturbing them.
- **[02-010]** Operations shall not restrict the boating routes, mooring spots or safe harbor of any subsistence hunters or vessels.
- **[02-011]** A telephone system shall be established so that, on a weekly or daily basis (depending on season and village preference), an operator and/or its contractors can communicate to a village representative and BLM the schedule and routes of upcoming flights and any deviations from the aircraft use plan. In the event that the lead of a caribou herd is migrating within the vicinity of the flight path, the village representative may request a deviation or temporary suspension. The operator should honor such a request to the maximum extent practicable.
- **[02-012]** Studies and operations must not restrict the boating routes, mooring spots or safe harbor of any subsistence hunters or vessels.
- **[02-013]** The following requirements are specific to studies:
    - Prior to conducting a study, the study proponent must contact the Native Village of Nuiqsut regarding the schedule and routes of upcoming flights as well as the number and color of the aircraft, so that the Native Village of Nuiqsut can communicate this information by VHF radio to subsistence users known to be in the area(s) of those flights. If requested, the proponent must provide a proposed travel routes to and between development sites, and notify the Native Village of Nuiqsut in the event of any deviations from said routes.
    - **[02-014]** The study proponent must obtain information regarding probable location and timing of subsistence and plan the study to avoid conflict with subsistence.
    - **[02-015]** When the proponent is a government agency or when a government agency is authorizing the study, formal government to government consultation must be held in a time and manner amenable to the Native Village of Nuiqsut.
    - **[02-016]** To the maximum extent practicable, studies must be conducted outside of subsistence use areas while subsistence is taking place.

3. Work with FAA to develop minimum altitudes over subsistence and herds.

We suggest that BLM work with Federal Aviation Administration (FAA) and tribes to develop regulations with specific altitude restrictions around subsistence activities. This would provide more certainty and a longer-term solution than reliance on BMP F-1.

B. Use of Roads and Location of Hunting

Since Alpine was developed to the east of Nuiqsut, the community has not been able to hunt in those areas. We were told that the community would be able to hunt and subsist on the west side, but now we face a project that could be much bigger than Alpine. **[02-017]** It is not clear whether Nuiqsut residents will be able to use ATVs and other vehicles for hunting on the roads associated with GMT-1. This should be clarified. **[02-018]** As a mitigation measure, BLM could require that these roads must be accessible for subsistence purposes, and that hunting can take place from the roads. BLM needs to make clear how traffic will be managed so that there won't be conflicts between ATVs and industry vehicles. Further, how will the community be able to hunt around drilling wells and pipelines? **[02-019]** To avoid accidents and damage to pipelines, clarification is needed as to where hunting is allowed. This could be in the form of orientation or guidance as to where hunting is still permitted.

C. Pipelines

We are concerned about the effect of above-ground pipelines on caribou migration, especially in combination with roads. **[02-020]** Please consider placing pipelines underground in persistent caribou migratory corridors and where they will have negative impacts on subsistence. Additionally, pipelines should be buried if they are located within 500 feet of a permanent road and can be buried under the road; or the pipeline will only be used to transport gas.

[02-021] Above-ground pipelines should be elevated a minimum of seven feet from the ground to the bottom of the pipe (including cables and vibration dampeners), and greater elevations should be required where needed due to the topography or snow accumulation. Pipelines should be located on the upslope side of roadways and construction pads. Pipelines that would corral caribou, including pipelines aligned east to west in areas where pipelines are aligned north to south, should not be allowed.

[02-022] To avoid visual impacts and glare that interferes with subsistence, pipelines should be painted with non-reflective paint.

D. Noise

[02-023] As a mitigation measure, the Native Village of Nuiqsut would like to be provided with a tool capable of monitoring the decibels of helicopter noise. This could help assess the impact on hunting and establish an appropriate buffer/distance between helicopters and hunting activity.

E. Mitigation and Restoration

Long-term food security is a major issue for our tribe. **[02-024]** We are concerned about how ConocoPhillips, Alaska Inc. ("CPAI") will preserve or restore the vegetation and land needed to sustain the animals we depend on. In the event that the food source of these animals is destroyed

[02-024] and they no longer come through our hunting areas, we will need a replacement food source . We have heard that there is no way to mitigate our loss of land, food, animals, and we are looking to BLM and the EIS for clear answers and guarantees of food security.

[02-025] One suggestion we have is that BLM should require the restoration and recovery of areas previously important to subsistence, including Oliktok to the east of the Nigliq channel.

II. Emergency Planning

After the Repsol well blowout in February 2013, neither the oil company nor any governmental entity came forward to provide us with an explanation of what happened or address what went wrong. We found out about the blowout by a field worker on Facebook. There was no community liaison we could contact. **[02-026]** BLM should require a contingency plan for blowouts that addresses not just equipment, but also communication with affected residents.

[02-027] We are concerned that an evacuation plan is not discussed anywhere in the EIS. With GMT-I , more than ever we will be surrounded by wells, and an evacuation plan needs to be in place in case of a disaster. We would like BLM and other government entities to have a town meeting to discuss the best route of evacuation and how it will be done properly, effectively and safely. CPAI should be required to prepare an evacuation plan.

[02-028] We believe that the Colville River Access Road, which is currently in the design phase, could be the best evacuation route. A requirement that CPAI contribute financially to this road or assist with gravel procurement could be a reasonable mitigation measure. This would also help mitigate subsistence impacts, since it would provide access to the Colville River and then to other subsistence regions.

III. Air Pollution and Health

[02-029] We are concerned that the EIS did not pay enough attention to human health impacts, and that no supplemental Health Impact Assessment was done for this project. There are many potential health impacts associated with this project, including increased air emissions, social problems related to displacement and the loss of livelihoods (such as drug and alcohol abuse, violence, depression, anxiety, and suicide), reduction of the food supply and food security, and the risk of a large spill.

[02-030] Our community is already impacted with health problems related to the air pollution, including birth defects. Children as young as three or four have been developing asthma, and newborns are having kidney problems that require treatment out of Alaska. Elders are dying of pneumonia and cancer. They are impacted by Alpine and projects by Repsol, ENI, and Pioneer.

[02-031] We want to see mitigation and reduction of air emissions. We need air monitoring stations in place so we can be assured that VOCs, NOx, and other pollutants are complying with federal and state standards. **[02-032]** Flaring and venting should be limited to the smallest amount needed for safety. Operators should implement gas control practices such as "green completions" that capture gas in accordance with the Environmental Protection Agency's New Source Performance Standards for Oil and Natural Gas, 77 Fed. Reg. 49,490. If gas cannot be piped to market or re-injected, it should be used near wells for electrical generation or for engines.

[02-033] We appreciate the stipulation on page 229 providing for all oil and gas operations (vehicles and equipment) to be powered by natural gas or electric power rather than diesel fuel. Any diesel fuels allowed should be "ultra-low sulfur" diesel as defined by the Alaska Department of Environmental Conservation-Division of Air Quality. BLM should specifically require the use of electronic vehicles.

[02-034] Fracking is a big concern for us because of all the additional air emissions that will result from methane leaks and the additional wells required in unconventional production. We are very concerned about the risk of contamination from chemicals used in fracking, which can easily happen with older wells that lack integrity. We don't want to see fracking on our lands.

[02-035] Further, we would like to see some kind of mitigation measure such as a social program or activities for youth.

IV. Employment

[02-036] We have heard that one of the benefits of the project will be employment opportunities for our community members. Yet so often these projects bring in outsiders and do not utilize our residents, leading to more tension in our community. Prejudice has been a hurdle in employing our residents-many of those who have worked in the field have quit because they have subject to racism and prejudice. Others do not want a career in the oilfield because they do not want to destroy the land that feeds us and provides our drinking water. The EIS should address these issues.

V. Raptors

Nuiqsut residents have been seeing more golden eagles (tingmiak) and peregrine falcon (kirgavik) around Fish Creek and Oglitok during molting and nesting season over the past three or four years. These birds of prey are hunting other nesting birds.

[02-037] Section 3.3.3 on bird species in the area refers to the golden eagle as uncommon and notes that it is a BLM sensitive species. Page 102 says "There is no area-wide systematic survey of golden eagles that can be linked to the ASDP Area and they are considered rare within the ASDP Area

[02-037] (BLM 2012, § 3.3.8.2, pp. 334-335)." Since these golden eagles are now increasingly common and they are a sensitive species, studies should be done on the impacts of GMT -1 to these birds.

[02-038] Section 3.3.3 lists the peregrine falcon as a bird of critical concern to the U.S. Fish and Wildlife Service and does not provide information on how common it is. Studies may be needed to assess the impacts of GMT -1 on the peregrine falcon.

VI. Planning for Restoration

[02-039] There is very little in the EISon how the lands of the GMT1 area will be restored when the project is over. Lease Stipulation G-1 requires lands to be reclaimed "to ensure eventual restoration of ecosystem function" but there are no specific standards or time frames. There should be more consideration of how and when restoration takes place.

Appended from NV Nuiqsut 4.29.14.pdf

[02-040] **Decision of ROD.** Before there is a decision the Community ask to put this to a vote. Our community has been divided by Oil and Gas development and since we cannot come to an agreement we request that they put it to a vote to see what the outcome would be and base the decision on that.

Thank you for considering our comments.

Sincerely,

Margaret Pardue

President, Margaret Pardue Date 4/21/14

[02-001]
Comment is noted.

[02-002]
Comment is noted.

[02-003]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources.

[02-004]
Potential new mitigation measure 9 in the Subsistence section called "Reduce Helicopter Flights Associated with Ice Road Cleanup" is included in the Final SEIS. In addition, BMP A-8 from the NPR-A IAP ROD requires oil and gas lessees and their contractors and subcontractors, as a part of preparation of lease operation planning, prepare and implement bear-interaction plans to minimize conflicts between bears and humans, and thus this comment is not substantive.

[02-005]
This potential new mitigation measure will be considered in the Final SEIS.

[02-006]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources to the Final SEIS.

[02-007]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources to the Final SEIS

[02-008]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources to the Final SEIS.

[02-009]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources to the Final SEIS.

[02-010]
The addition to BMP F-1 has been put forward in the potential new mitigation measures subsection of 4.4.5 Subsistence, Effectiveness of Stipulations and BMPs on Avoiding Conflict, Aircraft Traffic Mitigations.

[02-011]
BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[02-012]
The addition to BMP F-1 has been put forward in the potential new mitigation measures subsection of 4.453 Subsistence, Effectiveness of Stipulations and BMPs on Avoiding Conflict, Aircraft Traffic Mitigations.

[02-013]
BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[02-014]
BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS. .

[02-015]
BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[02-016]
BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[02-017]
A mitigation measure is proposed in the Final SEIS that would require the applicant to provide a legally-binding Right of Access Agreement to oil field roads for Nuiqsut residents. This Agreement would clearly define hunting rights and restrictions on a GMT1 road. Hunting directly from roads is illegal throughout the State of Alaska.

[02-018]
A mitigation measure is proposed in the Final SEIS that would require the applicant to provide a legally-binding Right of Access Agreement to oil field roads for Nuiqsut residents. This Agreement would clearly define hunting rights and restrictions on a GMT1 road. Hunting directly from roads is illegal throughout the State of Alaska.

[02-019]
A mitigation measure is proposed in the Final SEIS that would require the applicant to provide a legally-binding Right of Access Agreement to oil field roads for Nuiqsut residents. This Agreement would clearly define hunting rights and restrictions on a GMT1 road. Hunting directly from roads is illegal throughout the State of Alaska.

[02-020]
Buried pipelines were considered in the 2004 ASDP EIS but were eliminated from detailed analysis. This document is incorporated by reference: ASDP EIS, Section 2.6.1 Buried Pipelines.

[02-021]
Buried pipelines were considered in the 2004 ASDP EIS but were eliminated from detailed analysis. This document is incorporated by reference: ASDP EIS, Section 2.6.1 Buried Pipelines.

[02-022]
As noted in Table 4.7-1 Visual Resources of the FSIES, the 2004 ADSP ROD requires "use a non-reflective finish on all pipelines." In addition, BMP E-17 requires consultation with the AO in regard to the best ways to minimize visual impacts prior to submitting a plan to do so.

[02-023]
BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[02-024]
BLM is working closely with residents of Nuiqsut to identify mitigation measures for this project, in addition to those already in place from CPAI's 2008 lease stipulations and the 2013 NPR-A IAP/EIS ROD. These potential new mitigation measures, found in Ch 4 of the document, are intended to avoid and minimize impacts to subsistence and thus public health.

[02-025]
The BLM has analyzed the project proposed by the applicant to ensure that appropriate avoid and minimization efforts have been incorporated and has also developed appropriate stipulations to mitigate for unavoidable impacts. The BLM does not have jurisdiction pursuant to the Clean Water Act Section 404, which gives the Corps authority to require compensatory mitigation. BLM is reviewing its new draft manual on Regional Mitigation as part of its authorization for this project.

[02-026]
The ODPCP will be amended with the addition of GMT1. Communications are addressed in Section 1.4 of the ODPCP. State regulations found at 18 AAC 75.445(d)(2) require the plan holder to certify a blowout contingency plan is in place and available for ADEC inspection upon request. The Alpine ODPCP addresses the BOP under Section 2.1.5, subsection "Blowout Prevention and Emergency Shutdown".

[02-027]
The BLM agrees that the local community of Nuiqsut needs to be aware of the actions to be taken by community residents should a catastrophic event occur at the GMT development that has the potential to affect their health and safety. BLM has proposed a new mitigation measure regarding health and safety within 64.4.7, Public Health, to address this need. Additionally, the North Slope Borough has prepared an evacuation plan for Nuiqsut, which is revised on a cyclical basis. As part of its zoning permit, NSB will hold additional public meetings in Nuiqsut.

[02-028]
BLM will evaluate if a potential mitigation measure requiring the permittee to provide for financial and technical assistance in permitting the Colville River Access Road should be included in the Final SEIS.

[02-029]
The Baseline Health Community Health Assessment prepared by the North Slope Borough (2012) as well as the analysis of Public Health in the NPR-A IAP (BLM 2012) consist of the most current and complete synthesis of information regarding the impacts of oil and gas development such as the GMT1 project on Public Health for the community of Nuiqsut, and can be used as a baseline from which to compare future monitoring of Public Health in Nuiqsut. New Potential Mitigation Measure Public Health Monitoring requires the operator of GMT1 to put in place a plan to monitor relevant Public Health parameters that could be affected by the operation of GMT1.

[02-030]
Comment has been included as a direct quote to the Public Health Section 4.4.6.

[02-031]
Section 4.7 (Mitigation section), Table 4.7-1 shows specific air pollution reduction measures. The Nuiqsut ambient air quality monitoring station has been operational since April 1999. The data indicate that all Federal and State of Alaska Air Quality Standards are being met. The station is properly located downwind of the prevailing wind direction (northeast to east-northeast and upwind of Nuiqsut. The overall quality of the data being reported is very good.

[02-032]
Any additional flared volume of gas associated with the project would likely be negligible compared to existing flaring events, barring any significant process design flaws that may work themselves out as volumes are increased. There is no current regulation that prevents CPAI from flaring in non-emergency cases without approval, however, the BLM has the discretion to limit these events to those determined to be absolutely necessary for safe production handling.

[02-033]
Section 4.7 (Mitigation section), Table 4.7-1 includes the requirement for using low sulfur fuel. The BLM can recommend, but not require the use of electric vehicles.

[02-034]
Any fracking that occurs would be in accordance with an approved plan.

[02-035]
Generally, agencies are not required to adopt mitigation. The standard BLM must follow regarding what new potential mitigation measures (PMM) must be considered and evaluated in an EIS is found in the BLM NEPA Handbook Q&A, number 19(b). This provides that all relevant and reasonable mitigation measures that could improve the project should be identified if they are within jurisdiction of the agency. If the PMM passes the screening process as being reasonable and relevant, BLM must give it due consideration in the EIS. While social programs for youth are valuable for the community, it is not relevant to the proposed project - to construct and maintain a drill site. BLM cannot require the project applicant to fund such a program, however, BLM will make CPAI aware of these requests in the event CPAI would like to voluntarily contribute to such programs.

[02-036]
Comment is noted. This was addressed in the Draft SEIS, Section 4.6.4.3 (p. 381).

[02-037]
There is no evidence that BLM has indicating that golden eagles are increasing in the project area or on the ACP. BLM does not believe that a study can or should be done for these birds as requested, given the rarity of observations of the species. However, the discussion of raptors has been revised and site-specific data for GMT1 is provided in the Final SEIS.

[02-038]
The discussion of raptors has been revised and site-specific data for GMT1 is provided in the Final SEIS.

[02-039]
The generic feel of the reclamation of the project area are based on what will need to be done at the time of the reclamation. If the plan had specifics of the reclamation listed in the SEIS, it would make it difficult for the various interested parties to make requests for what to leave unreclaimed, such as the roads that have been requested to be left open by the villages. The

timeline for development of the project is known. The unknown is the time frame (approximately 30 years) of the recovery of the resources that are available in the reservoir. Since the exact quantity and difficulty in extracting the resources are only estimated, it is not possible to give specific time frames.

[02-040]
BLM's decision, under NEPA, cannot be based upon a vote, even the vote of a closely affected community. However, BLM has actively engaged with residents of Nuiqsut throughout the EIS process, and will continue to do so into the future.

arctic slope
reqional corporation

April 22. 2014

Bud Cribley. State Director
Bureau of Land Management
Alaska State Office
222 W 7th Avenue #13
Anchorage. Alaska 99513

Dear Mr. Cribley.

The Arctic Slope Regional Corporation (ASRC). North Slope Borough (NSB). and the State of Alaska. Department of Natural Resources (DNR) are writing this letter to express concerns regarding the current development and conclusions reached within the Environmental Justice (EJ) section in the Greater Moose's Tooth – 1 (GMT-1) draft Supplemental Environmental Impact Statement (SEIS). **[03-001]** We underscore the important benefits to the local, state, and national economies through the opportunity for local hire created during construction and operation of the proposed GMT-1 project. **[03-002]** The proposed peak production of 30,000 barrels of oil per day will provide significant economic benefit to Alaska Natives on the North Slope and throughout the state through direct payment of royalties and revenue sharing among the Alaska Native Regional Corporations. **[03-003]** New resource production in Alaska will help offset the current North Slope production decline and help meet the current energy demands in the state and nation.

[03-004] Given the important economic benefits of the project, we are concerned that the draft SEIS currently finds "disproportionately high and adverse effects" on Environmental Justice. We contend that the positive impacts of any development alternative have been dramatically and erroneously understated in the DSEIS, and similarly the negative impacts have been overstated. especially for Alternative A of the DSEIS. **[03-005]** We question the analysis the agency used to make this determination and ask the Bureau of Land Management (BLM) to revisit the royalty calculations used on potential production forecasts as they appear to be flawed and perhaps inappropriately factored into making this conclusion on environmental justice.

[03-006] The finding of "disproportionately high and adverse effect" seems to differ from the EJ outcome provided in the recent National Petroleum Reserve-Alaska (NPR-A) Integrated Activity Plan (IAP) Environmental Impacts Statement (EIS) where BLM concludes "the substantially greater economic stability brought by oil development on the North Slope has helped mitigate much of the stress commonly associated with poverty and other issues in recently settled indigenous populations but does not remove issues of environmental justice" (Section 4.8.7.15).

[03-007] The EJ impact conclusion in Section 4.12.4.15 of the IAP EIS further identifies the unlikely event of a large oil spill could disproportionately affect subsistence resources and harvest practices, but this finding does not make a broader claim of "disproportionately high and adverse effects" on EJ as the GMT-1 Draft SEIS is currently suggesting and concluding.

[03-008] The 2004 Alpine Satellite Development Plan, Record of Decision (ROD) concludes that appropriate mitigation would avoid impacts from an unlikely large oil spill incident. Since 2004, the GMT-1 project has been modified and now includes a smaller environmental footprint, increased mitigation measures, and increased and continued community involvement (i.e. NPR-A Subsistence Advisory Panel and the NPR-A working group). It seems unreasonable and subjective that BLM has concluded that the EJ impacts have drastically changed and worsened considering that GMT-1 project modifications have resulted in less impacts to the surrounding area and does not thoroughly address why mitigation is no longer an effective tool to avoid "disproportionately high and adverse effects".

[03-009] The analysis in the draft SEIS appears to give disproportionate deference to adverse impacts and does not appropriately balance the positive benefits that would be realized from effective mitigation and regulatory oversight of the proposed project. This type of skewed analysis has resulted in an Environmental Justice impact outcome that is in essence assuming a "worst case scenario" and the current conclusions are based on misinformed assumptions. While there is some mention of economic benefits in the EJ section of the draft SEIS, these benefits seem to be given less importance when weighing and concluding the impacts of this project. It is difficult to understand how BLM reached these conclusions and how each impact was synthesized and weighted in the final impact determination. It appears that adverse impacts were assumed and fully addressed, but mitigation was not appropriately weighed and considered resulting in a scenario where perhaps positive benefits were marginalized or overlooked.

[03-010] We are unaware of any other EJ impact determination statement that has broadly claimed an adverse effect on the overall proposed or approved North Slope oil or gas development project. We question what makes the proposed GMT-1 project so different from other recently evaluated North Slope oil and gas development projects, for example, the EJ impact determination from the Point Thomson Final EIS concluded "potential impacts to subsistence resources, subsistence use access, and human health would not result in disproportionately high adverse impacts on the minority and low-income communities of Kaktovik and Nuiqsut".

We are concerned the proposed GMT-1 EJ determination is unprecedented, given the provided examples of recent more balanced approaches to determining EJ impact outcomes, factoring how mitigation could offset possible impacts in the final finding.

SEE National Petroleum Reserve-Alaska, Final Integrated Activity Plan/Environmental impact Statement (NPR-A IAP/EIS), Chapter 4: Environmental Consequences Cumulative Effects- Environmental Justice sec.4.8.7.15,pg 268

Id., Chapter 4. Environmental Consequences, Very Large Oil Spill, pg 340

U S Army Corps of Engineers, Point Thomson EIS, Anal Environmental Statement, Executive Summary (July 2012) at pg. 74

[03-011] We ask the BLM to revisit their approach to determining Environmental Justice impact outcomes as currently presented in the draft SEIS. All parties represented in this letter support the GMT-I project and the timely development of the SEIS and BLM's record of decision (ROD). We appreciate your consideration and look forward to a more balanced analysis and realistic conclusion in the final SEIS.

Sincerely,

Joe Balash
Commissioner, Department of Natural Resources
State of Alaska

The Honorable Mayor Charlotte Brower
North Slope Borough

Rex Allen Rock, Sr.
President and Chief Executive Officer
Arctic Slope Regional Corporation

cc: Sara Longan, Executive Director, Office of Project Management and Permitting

SEE National Petroleum Reserve-Alaska, Final Integrated Activity Plan/Environmental Impact Statement (NPR-A IAP/EIS), Chapter 4: Environmental Consequences Cumulative Effects –Environmental Justice sec. 4.8.7.15,pg. 268

Id.,Chapter 4:EnvironmentalConsequences, Very Large Oil Spill, pg. 340

U.S. Army Corps of Engineers, Point Thomson EIS, Final Environmental Statement, Executive Summary (July 2012) at pg. 74

[03-001]
Comment is noted.

[03-002]
Comment is noted.

[03-003]
Comment is noted.

[03-004]
Benefits from the project are more clearly explained and emphasized in the Final. However, CEQ guidance directs BLM to clearly disclose any negative impacts in the Environmental Justice analysis. Those impacts and the Environmental Justice logic are made much clearer in the Final SEIS.

[03-005]
Text was revised to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

[03-006]
The statement made in the 2012 IAP is correct: economic benefits are substantial but do not remove issues of Environmental Justice. New information considered in the GMT1 analysis led to findings of significant impacts to subsistence and sociocultural systems. BLM has reviewed the CEQ guidance on evaluating Environmental Justice in NEPA. It is clear that if impacts to subsistence or sociocultural systems are identified, the Environmental Justice section must disclose them. Those impacts and the Environmental Justice logic are made much clearer in the Final SEIS.

[03-007]
Environmental Justice impacts in the GMT1 SEIS are related to findings of major impacts to subsistence and sociocultural systems, not to the chance of a spill.

[03-008]
The Environmental Justice analysis is based on findings of major impacts to subsistence and sociocultural systems. Those findings were based on information that was not available at the time the ASDP was considered.

[03-009]
The CEQ guidance on analyzing Environmental Justice in NEPA directs the BLM, once an Environmental Justice population has been identified, to consider any negative impact as an Environmental Justice issue separately from considerations of beneficial impacts.

[03-010]
The Environmental Justice analysis in the Final SEIS is much clearer and more precise. It explains why negative impacts to subsistence and sociocultural systems must be considered as Environmental Justice issues.

[03-011]
The BLM has revised sections on subsistence, sociocultural systems, and Environmental Justice in the Final SEIS to more clearly justify findings.

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Environmental Conservation
OFFICE OF THE COMMISSIONER

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April 22, 2014

Ms. Bridget Psarianos, Project Lead
Bureau of Land Management
222 West 7th Avenue, Stop #13
Anchorage, AK 99513

Re: DRAFT SEIS for GMT-1, Section 4: Impacts of Oil, Saltwater and Hazardous Material Spills

Dear Ms. Psarianos:

The Alaska Department of Environmental Conservation (ADEC) is reviewing the Draft Supplemental Environmental Impact Statement for the Greater Mooses Tooth (GMT-1) proposed development. I am concerned that although rigorous oil spill prevention and contingency planning standards already exist in Alaska, there was very little mention of these Alaska standards in the Draft Supplemental Environmental Impact Statement (SEIS) and a casual reader might come away with the wrong impression regarding environmental protection standards in Alaska. The following comments refer to the page numbers, paragraphs and text in Draft SEIS released on February 21, 2014.

1. Page 333, New Potential Mitigation Measure 2, bullet three: "***Equipment must be designed in accordance with standard arctic engineering practices for use in arctic conditions***". Please note that Alaska standards at 18 AAC 75.425(e)(4) address Best Available Technology (BAT) Review. This review requires a plan holder to address items technologies such as leak detection, for tanks and pipelines, maintenance for buried pipelines, and liquid level determination devices for above ground oil storage tanks. The department holds a technology conference every five years as required by 18 AAC 75.447(a)(1). These technology conferences bring together interested parties to discuss the status of existing technologies as well as technologies that are being developed. These BAT standards are in some cases more rigorous than "standard arctic engineering practices".

2. Page 333, New Potential Mitigation Measure 3, bullet two: "*Design criteria must be based on actual measurements of the worst-case data in recorded history for the exploration or development site, or based on conservative estimates (as determined by the authorizing officer).*" This section suggests that the oil spill response planning environmental assessment and cumulative effects analysis should be based upon a "worst-case" scenario.

Applicable NEPA case law holds that a "worst-case" scenario is not required, but instead an agency should "*in the face of unavailable information concerning a reasonably foreseeable significant environmental consequence, prepare a summary of existing credible scientific evidence which is relevant to evaluating the...adverse impacts and prepare an evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.*"[1] Alaska's oil spill prevention and contingency planning standards take the approach discussed in the case law and require the following:

- 18 AAC 75.425(e)(1)(F) - spill response plans to address strategies to account for variations in the receiving environment and seasonal conditions, address a response scenario that demonstrates a plan holder's ability to respond to a discharge of each applicable response planning standard volume within the required timeframes
- 18 AAC 75.425(e)(3)(D) - discuss the realistic maximum response operating limitations
- AS 46.04.030(r)(3) and 18 AAC 75.434 address specific response planning standard volumes that must be used for calculating response and cleanup actions for exploration or production facilities, rather than basing the cleanup on "conservative estimates" of the BLM authorizing officer, which could be subject to individual interpretation.

3. Page 334, New Potential Mitigation Measure 4, bullet 3: "*An emergency countermeasures plan must include well capping if technically feasible, and a Blowout Prevention (BOP) System capable of handling 150 percent of the maximum anticipated surface pressure. All wells must be secured with at least two independent pressure tested flow barriers prior to removing the BOP. The BOP must have two sets of blind shear rams to prevent failure, and must be tested weekly to ensure proper functioning.*" These systems are subject to detailed regulation under Alaska statutes and regulations. The applicable Alaska standards for blowout preventer systems can be found at the Alaska Oil & Gas Conservation Commission regulations at 20 AAC 25.035 – 037, 20 AAC 25.286 – 286 and 20 AAC 25.527.

These regulations specify different standards for exploration wells versus development wells. AOGCC rules require the testing of blowout preventers every seven days on exploration wells or workover wells and every fourteen days on new production wells being drilled to ensure that they are working properly. Additionally, the AOGCC conducts a BOP test and inspection prior to drilling activities beginning. The department also requires that the plan holder certifies that a blowout contingency plan is in place prior to approving an ODPCP. The department retains the authority to inspect the blowout contingency plan as part of the ODPCP.

4. Page 333, New Potential Mitigation Measure 4, bullet two: "*The spill response section must contain: specific response measures which must be immediately taken when a spill is reported or detected; a detailed probabilistic risk assessment of a very large volume spill and a most likely trajectory for various environmental conditions related to a catastrophic spill; a list of response equipment proven in the Arctic; training programs for responders and contractors; and proof of contract(s) with well control experts, personnel and equipment.* Please note that Alaska Statutes at AS 46.03.740 – 900 and AS 46.04.010 - 900 and regulations at 18 AAC 75 (Articles 1 – 3) provide much more detailed and specific standards for oil spill cleanup than those proposed in these new mitigation measures.

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[1] See Robertson v. Methow Valley Citizens Council (490 US 332 (1989)

Please consider these clarifications as you revise the draft supplemental environmental impact statement for this project. We believe it is important that requisite "hard look" required by NEPA include a discussion of the regulatory landscape that this project, so that the environmental consequences have been fairly evaluated.

Sincerely,

Gary Mendivil
Environmental Program Specialist

Section Number	Page	Original Language	Proposed Language or Comment	Explanation
Volume 1 Contents: Acronyms	Xiii	AAC = Alaska Air Quality Control Regulations	Not sure what acronym is being described here. Typically AAC means the Alaska Administrative Code. The Alaska Air Quality Control regulations at found at 18 AAC 50	
	Xvi	[missing acronym]	Please add the acronym RFF = Reasonably Foreseeable Future	
Chapter 1, Section 1.3	3	Paragraph one uses the acronym APF	Spell out APF: Alpine Central Processing Facility	For readability, it would help the public if acronyms were spelled out the first time they are used in a section. Some readers may only be interested in a particular topic and will not have seen the acronym used elsewhere.
Chapter 1, Section 1.4.2.1	8	**[T04-001]** Bullet 2 notes: ADEC issues a Certificate of Reasonable Assurance/NPDES and Mixing Zone Approval for wastewater disposal into all state waters.	ADEC does not issue a certificate of reasonable assurance (401 certification) on its own permits. 401 certifications are only issued on EPA permits or Corp permits. ADEC now has regulatory authority for all wastewater discharges in state waters.	This bullet needs to be clearer that ADEC issues an APDES permit rather than an NPDES permit.
Chapter1, Section 1.4.2.1	9	Bullet 2 cites AS 46.04.030	Should read AS 46.04.030	For clearer readability the Alaska Statute acronym (AS) needs to appear on the same line as the chapter and section number
Chapter 1, Section 1.4.2.1	9	Bullet 2 cites the regulatory authority for spill response	Add a citation to the Oil Pollution Act of 1990 (OPA-90)	
Chapter 1, Section	9	Bullet 4 notes: ADEC issues APDES permits under	This bullet can be combined with bullet 2 on page 8 to make the explanation clearer.	
1.4.2.1		Section 402, Federal Water Pollution Control Act of 1972		
Chapter 3, Section 3.1.3.2	53	**[T04-002]** The most prevalent geomorphic units...	Add new section heading. Geomorphic unit discussion does not appear to have anything to do with the Alpine Spill History section.	The final two paragraphs on this page appear to be an orphan. Needs new section heading.

Chapter 3, Section 3.4.1.5	127, 129	**[T04-003]** Water Quality Summary shown on Table 3.4-1	Provide citation	Would it be possible to provide a citation for this data?
Chapter 4, Section 4.2.3.2	229	Mitigation Standard: To the extent practicable, all oil and gas operations (vehicles and equipment) must be powered by natural gas or electrical power rather than diesel fuel.		
Chapter 4, Section 4.2.4	236	Final paragraph, final sentence quote marks don't make sense.		
Chapter 4, Section 4.2.4	237		Delete duplicate statement at the top of the page	
Chapter 4, Section 4.3.3.3	267	Overall, Alternative D is expected to result in minor to birds.	Overall, Alternative D is expected to result in minor **impacts** to birds	The word "impacts" is missing.
Chapter 4, Section 4.4.7	319		**[T04-004]** Do not combine subsistence activities with recreational activities.	Based on earlier discussion it is not clear how subsistence can be considered a recreational activity
Chapter 4, Section 4.4.8.4	323	**[T04-005]** Self weathering steel or best management practice will be used on all metal structures not otherwise painted, including but not limited to pipelines, communication towers and drill rigs, thus providing a more natural color of brown	Please note that the Point Thomson export pipeline outer jacket is a dull grey metallic surface (bonderized stainless steel jacket) to avoid a bright reflective visual barrier and reduce the visual impact on hunters and caribou.	
Chapter 4, Section 4.5.6	335	**[T04-006]** As discussed under mitigations measures, CPAI places a high priority on spill prevention	It might be useful to provide a citation to the specific section where these mitigation measures are discussed, rather than a generic mention	

Chapter 4, Section 4.6.1.2	338	**[T04-007]** Table 4.6-1 Parameters: Period of Analysis	Add information on what topics were analyzed through the year 2100 and what topics were analyzed in terms of a shorter time scale.	It is difficult to understand the general statements made in the table under the topic of Period of Analysis. The 2012 NPR-A IAP/EIS may have had some sections that were analyzed through the year 2100, I don't believe that that statement is true for all the topics discussed.
Chapter 4, Section 4.6.1.2	338	Table 4.6 -1 Parameters: Number of Discovered Oil Resources	Replace the word "Resources" with "Wells"	The word "resources" is too generic. I would assume from the context of the column entry to the right that you are discussing 33 producing wells
Chapter 4, Section 4.5.1.2	338	**[T04-008]** Table 4.6 -1 Parameters: Threatened and Endangered Species	Under 2012 NPR-A IAP/EIS delete the reference to polar bear critical habitat being designated.	On January 10, 2013, the U.S. District Court for the District of Alaska issued an order vacating and remanding to the Service our December 7, 2010, Final Rule designating critical habitat for the polar bear. Therefore, at this time, there is no critical habitat designated for the polar bear.

Chapter 4, Section 4.6.2	343	**[T04-009]** Colville River Access Road	The description at the bottom of page 343 needs to be updated to reflect the fact that the Colville River Road was public notice by the Corp of Engineers in February 2014.	
Chapter 4, Section 4.6.2	344	**[T04-010]** Umiat Road and Pipeline	Add a discussion of the Meltwater Road Alternative	There is not discussion in the draft EIS of the Meltwater Road Alternative. This alternative would restrict public access, which would affect the subsistence discussions
Chapter 4, Section 4.6.2	346	**[T04-011]** Offshore Development and Onshore Support Infrastructure	Double check BOEM projections	Someone may want to check the recent 9th Circuit Court decision on Lease Sale 193 to make sure that these BOEM projections are not called into question. I suspect not, but better safe than sorry
Chapter 4, Section 4.6.2	353	**[T04-012]** A large amount of debris was left on the North Slope from Legacy Well exploration and military activities from 1940 to 1970 that impacted water quality, but on- going clean-up efforts since the 1970's have removed some of the remaining debris.	Mention should be made of the "*Charter for Development of the Alaskan North Slope*" , which was entered into by BP, ARCO and the State of Alaska on December 2, 1999. http://dec.alaska.gov/spar/ipp/docs/Charter%20Agreement.pdf	The Charter required BP and ARCO to clean up debris and areas creating an environmental hazard on the North Slope.
Chapter 4, Section 4.6.2	353	**[T04-013]** Sentence two in paragraph three under the heading: Air Quality does not make sense.	Suggested edit: The cumulative effects of all projects affecting the North Slope of Alaska in the past have caused some deterioration ~~in~~ and contributed to increased ~~is~~ in criteria pollutants, hazardous air pollutants, hydrocarbons, and greenhouse gases.	Not sure if this was what the sentence was trying to say…

Chapter 4, Section 4.6.2	354	**[T04-014]** Paragraph four cites to the Air Quality MOU	Cite to a source of additional information on this Air Quality MOU	There was not any prior mention of the Air Quality MOU in this section. Needs better reference.
Chapter 4, Section 4.6.4.2	367	**[T04-015]** Paragraph four notes: *To date, very little abandonment (except for single exploration or development wells) has occurred anywhere on the North Slope.*	Mention should be made of the BLM's *National Petroleum Reserve in Alaska (NPR- A) 2013 Legacy Wells Strategic Plan* . From the State of Alaska's perspective use of the word "abandonment" may be misleading in this context. The legacy wells in question have not been officially "abandoned" according to AOGCC regulations, but they could certainly be considered forsaken, neglected or left behind.	Alaska regulations at 20 AAC 25.105(a) require that all wells on a property must be abandoned within one year following permanent cessation of the operator's oil and gas activity within the field where the wells are located. Since there has been no BLM operated oil and gas activity anywhere in the NPR-A since 1981, all of the legacy wells that are not currently abandoned are out of compliance
Chapter 4, Section 4.6.4.2	371	**[T04-016]** Paragraph two on this page mentions that the proposed Umiat Road could be used by non-local hunters to hunt caribou.	Please mention the Meltwater Alternative for road access to Umiat.	The Meltwater Alternative does not involve public access and would not have effect noted in paragraph two

Chapter 4, Section 4.6.4.2	380	**[T04-017]** The final paragraph on this page notes that "*development of the Umiat Road/Pipeline which is proposed to extend from the Dalton Highway to Umiat on the Colville River….*"	As noted earlier, please mention the Meltwater Alternative for road access to Umiat. Also, please check facts on reference to Umiat Road/Pipeline.	The project proposed by Alaska DOT did not identify a pipeline as being part of the project. The Corp of Engineers noted in their scoping letter of May 24, 2011 "*While subsequent efforts by industry to develop infrastructure such as oil and gas pipelines and their associated components are reasonably foreseeable, these elements are not proposed by this action.*
Chapter 4, Section 4.6.4.2	385	**[T04-018]** The first paragraph on this page mentions a foothills route for the Umiat Road/Pipeline from the Dalton Highway to the Colville River	As noted earlier, please mention the Meltwater Alternative for road access to Umiat. Also, please check facts on reference to Umiat Road/Pipeline	See above for removing the reference to the Umiat pipeline from the text
Chapter 4, Section 4.6.4.2	387	**[T04-019]** The third and fifth paragraphs on this page mentions a proposed road and associated pipeline to Umiat from the	As noted earlier, please mention the Meltwater Alternative for road access to Umiat. Also, please check facts on reference to Umiat Road/Pipeline	See above for removing the reference to the Umiat pipeline from the text
Chapter 4, Section 4.6.4.2	388	**[T04-020]** The third paragraph on this page mentions the proposed Umiat Road / Pipeline twice.	As noted earlier, please mention the Meltwater Alternative for road access to Umiat. Also, please check facts on reference to Umiat Road/Pipeline	See above for removing the reference to the Umiat pipeline from the text
Chapter 4, Section 4.6.4.2	395	**[T04-021]** The final paragraph on this page mentions the Umiat Road and Pipeline having the greatest potential to impact recreational opportunities	As noted earlier, please mention the Meltwater Alternative for road access to Umiat. Also, please check facts on reference to Umiat Road/Pipeline	See above for removing the reference to the Umiat pipeline from the text

Chapter 4, Section 4.6.4.4	399	**[T04-022]** To date, the majority of spills on the North Slope have been less than 100 gallons with releases primarily occurring within secondary containment or onto gravel pads or roads.	Mention should be made here of the February 2013 drilling mud spill at Repsol's Q2 pad near Nuiqsut. http://dec.alaska.gov/spar/perp/response/sum_fy12/120215301/120215301_index.htm	A substantial effort went into cleanup of this well mud blowout extending into April.
Chapter 4, Section 4.1	414	**[T04-023]** Irreversible and Irretrievable Commitments of Resources: Surface water consumption for drilling and other industrial purposes with wastewater disposal via underground injection	It is not clear if the consumption of surface water is irreversible and irretrievable since the surface water sources are recharged annually during the melt season.	The volume of surface water consumed is miniscule compared to the volume of surface water that flows down the Colville River to the Chukchi Sea each spring.
Chapter 5, Section 5.1.2	416	Tribal Consultation	**[T04-024]** It is not clear why Tribal Consultation was combined with ANCSA Corporation Consultation. The government-to- government consultation responsibilites with Tribes differs from the ANCSA consulatation.	Suggest separating the two issues into two separare headings, one following the other.

Section # (i.e. 2.1.4)	Page #	Figure # / Table #	Comment
1.4.2.1	9		**[T04-025]** AS16.05.841 – Fishway Act deals exclusively with fish passage, applies to streams with documented resident fish use and without documented use by anadromous fish, AS16.05.871 – Anadromous Fish Act – applies to streams specified in the Anadromous Waters Catalog (AWC) as important for the spawning, rearing or migration of anadromous fishes – much broader authority and extends to anadromous fish habitat. The ADF&G is also responsible for evaluating potential impacts to fish, wildlife and fish and wildlife users, and presenting any related recommendations to State land managers (ADNR) or, via the Fish and Wildlife Coordination Act, to Federal permitting agencies.
		1.4-1	**[T04-026]** ADF&G Title 16 Fish Habitat Permits for all activities occurring below OHW of anadromous waters and often resident fish streams, including vehicle crossings (summer and winter), bridges, culverts, water withdrawals, pipeline VSM installation, etc.

		1.4-2	It is difficult to understand how the 6 changes in the GMT 1 project since 2004, all of which represent reduced impacts to the biological environment have led to the need for 450 + pages of evaluation as presented in this SEIS.
2.4.5	27		Fish Habitat Permits FH14-III-0049 and FH14-III-0050 have been issued to CPAI for geotechnical exploration program at the proposed Crea creek and Tinmiaqsiugvik River bridge crossing in
			support of the GMT 1 Development
2.4.7.4			**[T04-027]** Building up ice on the Ublutoch River will require a Fish Habitat permit. It is not likely that water for building up the ice will be authorized to be withdrawn from the river.
3.2.2.2			**[T04-028]** Shallow ponds less than 6 feet do not dominate the Alpine Area
3.2.2.2			**[T04-029]** Deep lakes and river channels do provide important overwintering fish habitat however, depth needed to support overwintering is highly variable and related to thermal regime, flow etc. Lakes and channels over 7 feet most important for wintering, not feeding, or spawning – some very significant subsistence fish species do not spawn in lakes (broad whitefish)
		Figure 3.3-2	Figure will not load for review
3.2.2.2	63		**[T04-030]** It would be better to add the additional studies that have been conducted since the 2004 EIS (E.G. MJM 2013) rather than reiterating old information. Where is the fish presence/absence information?
3.3.4.1			**[T04-031]** Teshekpuk caribou is referred to TH not the appropriate TCH throughout the document.
4.2-8	199		**[T04-032]** Dewatering of lakes is not very likely – is that a reasonable potential impact?
4.2-8	199		**[T04-033]** We don't design an ice road to not block drainage – we remove them from rivers prior to break-up or substantially weaken floating ice bridges
4.2.3.3	234		**[T04-034]** The effects of noise/ aircraft on wildlife are not well understood..See Weisenberger et al. 1996, Krausman et al 1998
4.3.2.1	253		**[T04-035]** Regarding Saprolegnia infections are principally thought to be temperature and stress related. this discussion does not appear to be based on fact.
		3.4.14	**[T04-036]** Does this map imply that the project area for GMT-1 includes already approved parts for the Alpine Satellite Development (i.e. CD-1 -5)? That seems somewhat inappropriate and could lead BLM to miscalculate impacts from the GMT-1 project vs the already approved portions of the Alpine Satellite Development.

			The following maps were attached electronically. Maps were generated from PTT and GPS location data, show TCH caribou migration movements and routes based on Brownian Bridge Movement Analysis (BBMM), see Sawyer et al. 2009 for methods (citation is attached). BBMM_GMT_SPRING_FEMALE (TCH female population-level spring migration; whole range view) BBMM_GMT_SPRING_MALE (TCH male population-level spring migration; whole range
			view) BBMM_GMT_FALL_MALE (TCH male population-level fall migration; whole range view) BBMM_GMT_FALL_FEMALE (TCH female population-level fall migration; whole range view) BBMM_GME_SPRING_FEMALE_CLOSEUP (Alpine-GMT Roads, close view) BBMM_GMT_SPRING_MALE_CLOSEUP (Alpine-GMT Roads, close view) BBMM_GMT_FALL_MALE_CLOSEUP (Alpine-GMT Roads, close view) BBMM_GMT_FALL_FEMALE_CLOSEUP (Alpine-GMT Roads, close view)
			The proposed roads to GMT1 and GMT2 extend approximately 15km into the most heavily used fall migration corridor for TCH females, which spans approximately 145 km in the Nuiqsut area (BBMM_GMT_FALL_FEMALE and BBMM_GMT_FALL_FEMALE_CLOSEUP). This is a route commonly used by caribou that eventually winter in the central Brooks range. Concomitantly, it also extends into the most heavily utilized spring migratory routes for females (BBMM_GMT_SPRING_FEMALE and BBMM_GMT_SPRING_FEMALE_CLOSEUP), although not as deeply as the fall movement period. While the proposed road does extend into the spring and fall migratory routes for male caribou, it does not extend into the most frequently used areas (BBMM_GMT_FALL_MALE, BBMM_GMT_SPRING_MALE, BBMM_GMT_FALL_MALE_CLOSEUP, and BBMM_GMT_SPRING_MALE_CLOSEUP); this may be an artifact of the much smaller sample sizes available for bulls (i.e. 41 males versus 186 females).

			[T04-037] TCH MIGRATION MAPS 1. The shapefile for the proposed road was digitized from a previous EIS; as a result it may not be completely accurate in placement. It does not include the option for a road from Nuiqsut. I do not have a current shapefile for the proposed roads; you are aware of our difficulties in obtaining that shapefile. 2. The caribou data shown in these maps are the product of Brownian Bridge Movement Models (see attached Sawyer et al 2009 for methods) spanning 1990-2012 for both male and female caribou from the TCH that have carried PTT and GPS satellite collars. The maps depict spring and fall migration; rather than use fixed dates, we opted to use individual migration periods, delimited by the beginning and cessation of migratory movements, as defined by changes in movement rate and directionality (see attached Bunnefeld et al. 2011 for methods), The proposed roads to GMT1 and GMT2 extend approximately 15km into the most heavily used fall migration corridor for TCH females, which spans approximately 145 km in the Nuiqsut area (BBMM_GMT_FALL_FEMALE and BBMM_GMT_FALL_FEMALE_CLOSEUP). This is a route commonly used by caribou that eventually winter in the central Brooks range. Concomitantly, it also extends into the most heavily utilized spring migratory routes for females (BBMM_GMT_SPRING_FEMALE and BBMM_GMT_SPRING_FEMALE_CLOSEUP), although not as deeply as the fall movement period. While the proposed road does extend into the spring and fall migratory routes for male caribou, it does not extend into the most frequently used areas (BBMM_GMT_FALL_MALE, BBMM_GMT_SPRING_MALE, BBMM_GMT_FALL_MALE_CLOSEUP, and BBMM_GMT_SPRING_MALE_CLOSEUP); this may be an artifact of the much smaller sample sizes available for bulls (i.e. 41 males versus 186 females). Of the two primary development options, it is difficult to compare the roaded option to the overall effects of a roadless option, particularly because, in the roadless option, we do not know much about the larger-scale, long-term effects of air traffic on caribou movements. In contrast, reduced and or delayed crossing success is a common observation in studies of caribou-road interactions (e.g. Panzachi et al 2013, Mahoney & Schaefer 2002; Vistnes et al. 2004; Curatolo & Murphy 1986; Dau & Cameron 1986; Murphy & Curatolo 1987, and see Lawhead et al 2005 for literature review).
			RED DOG AREA MAP Comparative BBMM analysis of GPS location data for the TCH and Western Arctic Herd (WAH) is shown for the Red Dog area in Game Management Unit 23: BBMM_GMT_REDDOG_CLOSEUP_FALL_FEMALE (TCH + WAH female population-level fall migration; Red Dog Port Access Road, close view) If we were to anticipate an effect of GMT proposed roads on TCH caribou movements in the fall, it might be similar to that observed near the Red Dog Mine Port Access Road (BBMM_GMT_REDDOG_CLOSEUP_FALL_FEMALE). In the Red Dog area, delayed crossing appears evident in some years. Preliminary results from a comprehensive analysis of variation in movements of caribou that came within 15km of the road indicated that, while movements were partially explained by environmental attributes, movements were strongly affected by how far a

			caribou was from the road. The overall result was that caribou spent more time on the north side of the road during fall migration, rapidly increasing movement rates following crossing. This pattern in movement can be seen visually, with some indication that caribou movements begin to be effected at a distance of 30 km (BBMM_GMT_REDDOG_CLOSEUP_FALL_FEMALE). There is some speculation that 30km is not the distance at which caribou detect or respond to the road infrastructure, but rather the distance at which caribou begin responding to other caribou that have responded to the road. It should be noted that the TCH maps prepared for the GMT proposed roads includes
			OTHER TCH SEASONS Other seasons when the TCH might encounter GMT proposed roads, particularly summer (Jul-Aug) and winter(Dec-April), have not been comprehensively analyzed. The literature and staff observations suggest that effects in the summer are likely to vary greatly, primarily as responses to environmental factors, in particular the level of insect harassment. The literature suggests that winter use patterns may be influenced near infrastructure, with the result being slightly lower densities near the roads as individual caribou that are more sensitive to disturbance choose (move to) other habitats. The overall effect on population dynamics from this road is unknown, but unlikely to be great based on our experience with the CAH.

			[T04-038] **TCH NEAR NUIQSUT** For residents of Nuiqsut, I would anticipate that the road may have an effect on TCH caribou movements near the village, possibly by deflecting or diverting them, or by reducing the time spent in proximity to the village. Anticipating the magnitude of the effect, and the likelihood of diversion or deflection versus delay, is difficult. It is possible that the relatively short length of the proposed road may make diversion more likely than long-term delay. Any potential effects on hunting might be mitigated in several ways; for example, hunters could be allowed access to the road and traffic levels could be monitored and adjusted seasonally. If caribou do spend more time on the north side of the road, it may actually increase access to caribou, if hunting is allowed from the road, or even through other means of access, if caribou predictably spend a greater proportion of their time in that area. However, allowing hunting from the road may decrease any potential for future habituation. If hunting is allowed from the road, I would suggest that the pipeline be placed on the south side of the road for safety. Additionally, if the difference in male and female movement patterns are real, and not an artifact of sample size, there may simply be more of an effect on female caribou than males for this particular road, which would reduce the potential effect on caribou hunting success for males, in particular. Because caribou are likely to encounter this road in potentially high sample sizes, there is potential to evaluate mitigative approaches and effects on post-road construction behavior of caribou. Our inability to effectively compare roaded and roadless options highlights a knowledge gap in terms of the effect of aircraft traffic on caribou movements, and the oft repeated local assertion that small aircraft can have a large effect on caribou movements.
			WESTERN ARCTIC HERD The GMT proposed roads are in the northeast portion of peripheral range used by the WAH. Due to typically low numbers of WAH caribou in the GMT zone, no biological effect from these roads is anticipated on this herd. However, WAH caribou in this portion of their range are often harvested by the community of Anaktuvuk Pass. If GMT roads cause deflection of WAH caribou away from the Anaktuvuk Pass area, this could affect access to caribou by local hunters even though this could have a negligible biological impact on the herd.
			[T04-039] It seems that several reports (SRB&A caribou use area and harvest data from the Nuiqsut Caribou Subsistence Monitoring Project 2010b, 2011, 2012, and 2013) were mostly available during the 2013 NPR-A IAP NEPA process and have been used to change fundamental conclusions in this supplemental draft. Why weren't the available reports used in the NPR-A IAP NEPA process but are being used in this supplemental draft.
			[T04-040] What are the impacts associated with seasonal ice roads under the roadless alternative?

			The Division of Oil and Gas (DO&G) supports this opportunity for oil and gas development in the National Petroleum Reserve. The exploration, development, production and transportation of oil and gas resources are primary purposes of NPR-A (hereinafter "Reserve"). As such, DO&G supports adoption of the GMT-1 Project as . This alternative satisfies the federal purpose of developing oil and gas resources in the Reserve, while also fulfilling Alaska's goals of boosting oil production and increasing flow through the Trans-Alaska Pipeline System. *Development and production of hydrocarbons from GMT-1 will help offset declines in production from the Alaskan North Slope. Development will also provide benefits to local, state, and national economies through local hire for jobs created during construction and operations, tax revenues,*
			revenue sharing, royalties, and new resources to help meet US domestic energy demand. (Vol 1, Chapter 1, Page 4) Alternative "A" has the smallest overall footprint in the Reserve with the least amount of negative impacts. Thus, DO&G opposes all other alternatives ("B", "C", and "D"), with Alternative "D" being the most disfavored.
			Alternative "D" should not be considered as a viable option for this project because the potential benefits of a roadless alternative are limited by the short tundra travel season and are not in sync with the federally sanctioned purpose of the reserve. Given the primary purpose of the Reserve, linking infrastructure will be crucial for responsible oil and gas development in an incremental build out approach. This project is the second to be developed within the Reserve, building off the Alpine field and allows for more to follow. The Division of Oil and Gas believes that construction of essential transportation corridors, and associated road and pipeline routes within the Reserve provides for the best interest of the state, nation and stakeholders. Expanding roads further into the reserve will allow oil and gas project developers to utilize the existing year round infrastructure established on the state lands consistent with DO&G' s best interest findings which have led to our present infrastructure. In making this recommendation, it is important to recognize that access for exploration, development, and for locating associated infrastructure that link fields has proven successful on the North Slope state lands and can be successfully constructed concurrently with other multiple beneficial land uses in the Reserve.
			[T04-041] What are the impacts associated with seasonal ice roads under the roadless alternative? What are the cumulative impacts of seasonal ice roads under the roadless alternative?
			[T04-042] The sections on EJ seems to make conclusions that are speculative and go against findings in past EIS's. The 2004 ROD implied that mitigation would avoid "disproportionality high adverse impacts" to the village of Nuiqsut. Why is mitigation no longer an appropriate tool to avoid disproportionality high adverse impacts?
			[T04-043] Were impacts to Nuiqsut in the Environmental Justice section using effects from past development to conclude disproportionality high adverse impacts? If so more discussion is needed on any benefits that may have been received from past development in the area.

			DNR Understands that a preferred alternative has not been selected at this point but would like to proactively point out the additional impacts that Alternative D, the Roadless alternative, would impose.
			When comparing the Roadless Alternative to the proposed alternative which proposes to connect CD-5, already permitted and currently being constructed, to the GMT-1 development, via road the increased impacts are as follows: The Roadless alternative would require additional construction of an airstrip and related facilities, extra storage pads, and a large number of redundant resources, equipment, and processes that could no longer be relied upon without road access to the Alpine production facility. This additional infrastructure would result in in approximately 15 acres of increased project footprint, nearly 220,000 more cubic yards of fill, 20 million additional gallons of water during construction, 75 million more gallons of water during the first 6 years after construction (due mainly to additional ice roads and an ice bridge), 6 additional Mega Watts (MW) of power, the proposed alternative only requires 1 MW of power, higher air emissions from increased flights, and increased pipeline risk due to limited access for routine maintenance or response activities. The Roadless alternative also has the greatest impacts on subsistence. As stated in the draft SEIS: *"Alternative D would likely have the greatest impact to subsistence uses and activities of all the alternatives, as it would result in increased air traffic in hunting areas west of the community and would create a new source of air traffic that did not exist before."* Lastly this alternative would subsequently requires each connected development thereafter to follow the same design considerations and include the same redundant processes and systems which would result in exponential cumulative impacts to the surrounding area. For these reasons the Roadless alternative seems to be an unrealistic Environmentally Preferred Alternative and ultimately not appropriate for the selected alternative. Roads add increased reliability, safety, and efficiencies and should be part of the selected alternative.
			Please see the attached letter from DEC for additional comments

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A model-driven approach to quantify migration patterns: individual, regional and yearly differences

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Summary

1. Animal migration has long intrigued scientists and wildlife managers alike, yet migratory species face increasing challenges because of habitat fragmentation, climate change and over-exploitation. Central to the understanding migratory species is the objective discrimination between migratory and nonmigratory individuals in a given population, quantifying the timing, duration and distance of migration and the ability to predict migratory movements.

2. Here, we propose a uniform statistical framework to (i) separate migration from other movement behaviours, (ii) quantify migration parameters without the need for arbitrary cut-off criteria and (iii) test predictability across individuals, time and space.

3. We first validated our novel approach by simulating data based on established theoretical movement patterns. We then formulated the expected shapes of squared displacement patterns as nonlinear models for a suite of movement behaviours to test the ability of our method to distinguish between migratory movement and other movement types.

4. We then tested our approached empirically using 108 wild Global Positioning System (GPS)-collared moose *Alces alces* in Scandinavia as a study system because they exhibit a wide range of movement behaviours, including resident, migrating and dispersing individuals, within the same population. Applying our approach showed that 87% and 67% of our Swedish and Norwegian subpopulations, respectively, can be classified as migratory.

5. Using nonlinear mixed effects models for all migratory individuals we showed that the distance, timing and duration of migration differed between the sexes and between years, with additional individual differences accounting for a large part of the variation in the distance of migration but not in the timing or duration. Overall, the model explained most of the variation (92%) and also had high predictive power for the same individuals over time (69%) as well as between study populations (74%).

6. The high predictive ability of the approach suggests that it can help increase our understanding of the drivers of migration and could provide key quantitative information for understanding and managing a broad range of migratory species.

Key-words: animal movement, moose, net squared displacement, nonlinear mixed models, spatial ecology

Introduction

Migration is part of a species' life-history strategy and has wide ranging consequences for individual reproduction and survival (Stearns 1992) and in turn population dynamics. Migratory strategies have been studied in species ranging from birds and mammals to fish, amphibians and insects (Lundberg 1988; Dingle 1996; Alerstam, Hedenström & Åkesson 2003; Grayson & Wilbur 2009). However, anthropogenic impacts are growing and animals face increasing challenges to follow their migration routes because of habitat fragmentation, exploitation and climate change (Both *et al.* 2006; Sanderson *et al.* 2006; Bolger *et al.* 2008), making it important for wildlife management and conservation to quantify their spatio-temporal movement patterns to be able to secure their seasonal ranges (Harris *et al.* 2009).

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Ecological research has used five main variables to quantify migration and to distinguish between migratory and other movement: (i) the proportion of a population that migrates, (ii) the distance individuals migrate, (iii) the timing (onset, termination) of migration, (iv) the duration and (v) the fidelity to a specific site (Ball, Nordengren & Wallin 2001; Nelson, Mech & Frame 2004; Alerstam, Hake & Kjellen 2006; Jonzén, Hedenström & Lundberg 2007; Brodersen *et al.* 2008, Gillis *et al.* 2008). Migration has been observed and studied at multiple spatial scales (Fryxell & Sinclair 1988; Dingle 1996), but a uniform scale-independent approach to analyse individual migration patterns based on spatio-temporal data and ecological theory has not been developed (Bauer *et al.* 2009). New technological advances in tagging and following animals, such as global positioning system (GPS) tracking, now make it possible to collect high-resolution data in space and time on many less easily observable species, and on species migrating over large distances, such as ungulates, pelagic sea birds and fish (e.g. Nelson, Mech & Frame 2004; Rutz & Hays 2009; Sims *et al.* 2009; Wakefield, Phillips & Matthiopoulos 2009). In this paper, we propose a novel method to (i) distinguish migration from other movement behaviours, especially dispersal, home range and nomadic behaviour, and (ii) quantify the three main variables of migration (distance, timing and duration) in a single, integrated frame work. This method is scale-independent and is therefore applicable to movement patterns of a wide range of species and data.

To distinguish from other movement patterns and to quantify migration, we used a single measurement, the net squared displacement (NSD), which measures the straight line distances between the starting location and the subsequent locations for the movement path of a given individual. The NSD, as its related mean, is a statistic of fundamental importance for movement research as it provides a synthetic measure of key properties of movement paths (Turchin 1998; Nouvellet, Bacon & Waxman 2009). Here, we show that the NSD can provide valuable information also for migration studies. We expect the following behaviour of NSD when applied to migration (see also Kolzsch & Blasius 2008). At the winter site, we expect the NSD of a given migratory animal to be stable, with values close to zero as animals remain stationary inside their winter ranges. As spring approaches, we expect animals to migrate to their summer ranges, and thus a rapid increase in NSD. Once individuals have reached the summer ranges, we expect a relatively stable NSD (second stationary phase), indicated by an asymptote in the s-shaped curve. During the second movement phase (autumn migration), a reverse s-shaped curve appears where the NSD is expected to decrease and again reach zero as the animal moves back to the winter range where it remains until the next movement phase. Given these patterns, summarized in Fig. 1, we can use NSD in this study to develop a set of hypotheses. We test them using competing models to distinguish between different movement patterns and quantify the distance, timing and duration of migration.

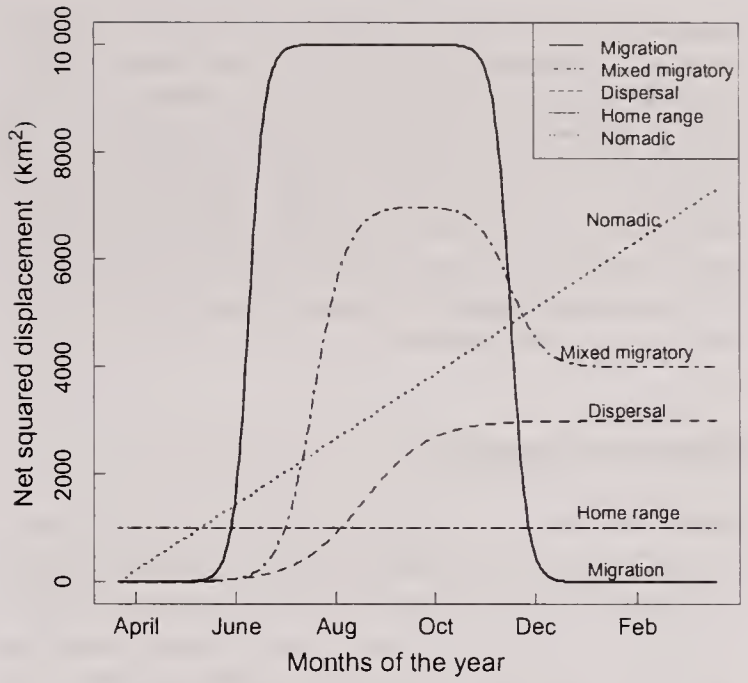

Fig. 1. Demonstration of the five movement types: Migration (solid line: $\delta_s = \delta_a = 10\,000$, $\theta_s = 80$, $\theta_a = 240$, $\varphi_s = \varphi_a = 5$); mixed migratory (dotted dashed line: $\delta_s = 7000$, $\delta_a = 3000$, $\theta_s = 120$, $\theta_a = 240$, $\varphi_s = \varphi_a = 10$); dispersal (dashed line: $\delta = 3000$, $\theta_s = 50$, $\varphi_s = 20$); home range (twodash line: intercept = 1000, slope = 0); nomadic (dotted line: intercept = 0, slope = 20).

Research has shown that for an animal moving according to a random walk, the expected squared distance, rather than the linear distance, increases linearly with time (Turchin 1998; Börger, Dalziel & Fryxell 2008). It is also known that for animals restricting their movement to stable home ranges, the form of the NSD curve over time will be asymptotic (Moorcroft & Lewis 2006; Börger, Dalziel & Fryxell 2008). It has recently been suggested that the functional form of NSD patterns of dispersers will be a sigmoid curve (L. Börger, T. McIntosh, M. Ryckman, R.C. Rosatte, J. Hamr, J.M. Fryxell, unpublished). Thus, NSD has recently received increased attention in the random walk and animal movement theory and combines characteristics of movement trajectories in a single synthetic measurement (Turchin 1998; Moorcroft & Lewis 2006; Börger, Dalziel & Fryxell 2008).

In this study, we first simulate the NSD in a random walk framework to see how our predictions fit the theory of animal movement and especially how NSD patterns vary under assumptions of resident, dispersal, migratory and random walk ('nomadic') behaviour. Then we classify individual movement behaviour as migratory, dispersing, resident, or nomadic, by fitting competing models to each individual NSD and comparing the models using information-theoretic methods (Burnham & Anderson 2002). In the next step, we use the migratory individuals to develop an objective and repeatable method to estimate the population-level migration parameters (distance, timing and duration), as well as to quantify and decompose the variation within and between individuals and between years in a nonlinear mixed effects model framework (Pinheiro & Bates 2000).

We used moose (*Alces alces*) as our empirical study system. Moose have been observed to shift between resident,

dispersing and migratory behaviours, with only a part of a given population migrating, and migration distances differing between individuals (Hundertmark 1998; Ball, Nordengren & Wallin 2001; Hjeljord 2001). Furthermore, the consistency of an individual moose movement strategy across years has never been quantified. Therefore, the movement behaviour of moose is ideal to explore the usefulness of the proposed method compared to a species with more consistent movement patterns.

Material and methods

STUDY AREA

The 108 GPS-collared moose for this study were distributed between 63°N 10°E and 67°N 20°E in Norway and Sweden (Fig. 2). The study area ranges from inland boreal forest in the eastern part (mostly Sweden) to the North-Atlantic coast in Norway. The low alpine area at the border between Norway and Sweden is partly covered by mountain birch forests (*Betula sp*) and partly above the woodland limit. The inland boreal forest is characterized by regenerating monocultures of Scots Pine (*Pinus silvestris*). The forest cover west of the alpine area (mostly in Norway) is dominated by Norway spruce (*Picea abies*) and to a lesser extent Scots pine on less productive land. Birch often dominates at the woodland limit. Coniferous forests in Sweden and Norway are typically managed by modern forestry practices, generating a patchwork of even-aged forest stands.

DATA

We immobilized moose from a helicopter using a dart gun to inject a mixture of an anaesthetic and a tranquilizer (ethorphine and xylazine; Arnemo *et al.* 2006). We equipped each moose with a GPS/Global System for Mobile communications (GSM) collar including a traditional VHF beacon (Vectronic Aerospace GmbH, Berlin, Germany). In the Swedish study area, moose were immobilized during four capture events: November 2004, 2005, 2006 and February/March 2007. In the Norwegian study area, moose were captured during February–March or November 2006 and February–March 2007. Collars weighed approximately 1·2–1·5 kg with an estimated battery lifetime of 3 years. Each collar acquired a position every 0·5–2 h and stored them internally for later download using the GSM network in Europe. Locations with two consecutive movements of more than 10 km distance for hourly intervals were removed as these were most likely location errors.

From the moose locations recorded, one position per day and moose closest in time to 12·00 h was extracted to study the seasonal patterns of movement (diurnal patterns were not of interest in this study). Location data were included for the years 2005/06, 2006/07 and 2007/08. To be able to develop the migration model and test the predictive ability of the model, we created three subdata sets. First, moose were assigned to be Norwegian and Swedish depending on their first capture location (Fig. 2). Second, the Swedish moose were divided into two data sets. The first Swedish data set consisted of 77 individual moose (66 females, 11 males) recorded for 1 year. This data set, called the Swedish base data set, consisted of 28 108 positions and was used to develop the model. The second Swedish data set consisted of 7676 positions for 14 females. These individuals are a subset of the 77 individuals of the first data, for which a second year of data was available. The 14 Swedish females were used to test the temporal predictive power of the base data for the same individuals in different years. The Norwegian data set consisted of 31 moose (22 females, 9 males) and a total of 11 315 positions. This data set was used to test the predictive ability of the model based on the Swedish base data set in a different location.

CALCULATING NET SQUARED DISPLACEMENT

The first step to obtain the NSD from the GPS location data was to calculate the net distance, which is the straight line distance in kilometres between the first location, given the coordinates north $N(t)$ and east $E(t)$, and the subsequent locations $N(t + n)$ and $E(t + n)$; n is the total number of locations of the movement path of an individual in a given year (Turchin 1998). The first position was set to 21st March, when moose are still in their winter ranges (Ball, Nordengren & Wallin 2001). The distances between the location obtained on the 21st March and

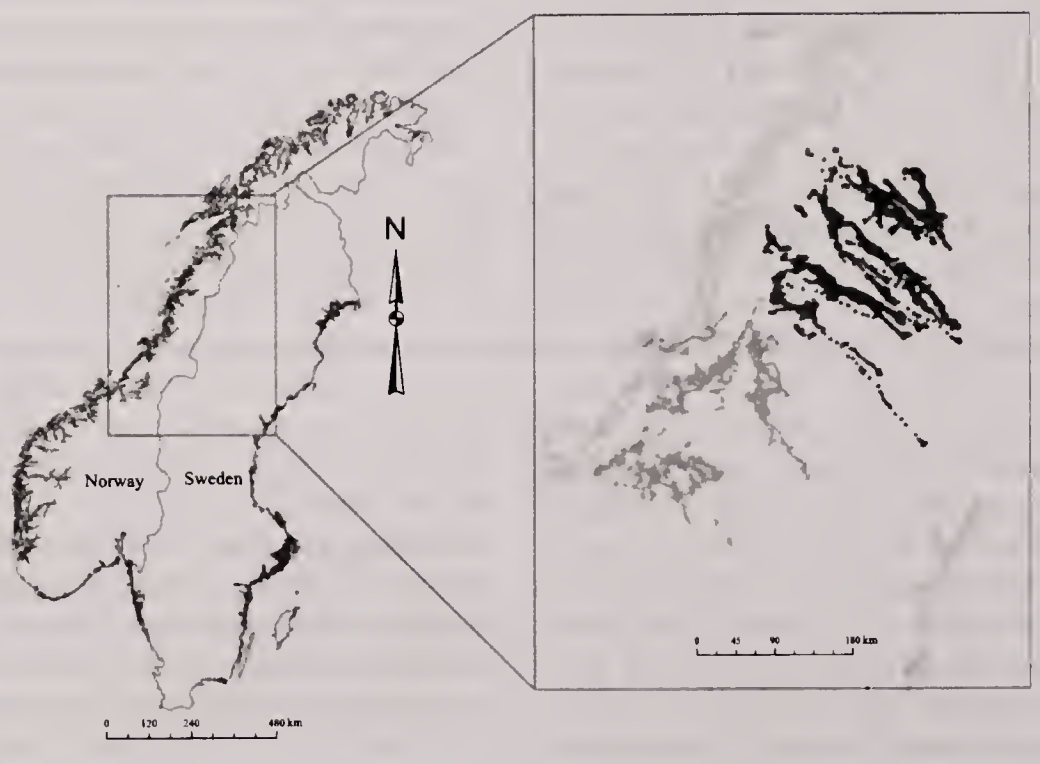

Fig. 2. Distributions of moose locations. Moose captured in Norway are given in grey and moose captured in Sweden in black.

the subsequent locations for each moose and year were then squared, which resulted in the measurement of square kilometres for the NSD. We calculated the NSD for each individual and year using the adehabitat package version 1.6 (Calenge 2006) in the open-source programme R for statistical computing (R Development Core Team 2009, R version 2.9.0).

MOVEMENT MODELS

The simplest model for the NSD patterns of migrants (eqn 1) is a double sigmoid or s-shaped function, which is repeated within a year, leading to an exact return to the departure locations (e.g. winter range, spring migrations, summer range, autumn migration, winter range).

$$\mathrm{NSD} = \frac{\delta}{1+\exp\left(\frac{\theta_s - t}{\varphi_s}\right)} + \frac{-\delta}{1+\exp\left(\frac{\theta_a - t}{\varphi_a}\right)} \qquad \text{eqn 1}$$

where δ is the asymptotic height, θ_s and θ_a are the timing at which the migration reaches half its asymptotic height in spring and autumn, respectively, φ_s and φ_a models the timing elapsed between reaching half and $\frac{1}{1+e^{-1}} \cong \frac{3}{4}$ of migration in spring and autumn, respectively, and t as number of days since 21st March for each year. The different parameters for spring and autumn allow the timing and speed of migration to differ between spring and autumn. All model parameters have a clear biological interpretation: the asymptotic height δ is the distance of migration between the winter and the summer range; the inflection point θ is the timing of migration, i.e. the time at which the curve reaches half its asymptotic height; and the scale parameter φ models the duration of migration. At between ¼ and 3/4 of the migration period, moose are moving at their fastest speed; thus, the curve shows essentially linearity. Therefore, we use twice the time φ as half of the duration of migration as between ¼ and 3/4 of the migration period. The double sigmoid function is an extension of the logistic curve model as provided by Pinheiro & Bates (2000, p 274).

Often, animals return to the same geographical area but not to the exact location of the preceding year, leading to a different distance moved between the start and the return areas. To model moose not returning to exactly the location of departure, but to a nearby area (called mixed migratory strategy), we let the asymptote vary between spring and autumn $\delta_s \neq \delta_a$ in eqn 2).

$$\mathrm{NSD} = \frac{\delta_s}{1+\exp\left(\frac{\theta_s - t}{\varphi_s}\right)} + \frac{-\delta_a}{1+\exp\left(\frac{\theta_a - t}{\varphi_a}\right)} \qquad \text{eqn 2}$$

where the asymptote δ can vary according to patterns in spring and autumn.

For a dispersal strategy, we used a logistic model to model moose that disperse from the initial location and settle in a new area (Pinheiro & Bates 2000 p274, L. Börger, T. McIntosh, M. Ryckman, R.C. Rosatte, J. Hamr, J.M. Fryxell revised for resubmission).

$$\mathrm{NSD} = \frac{\delta}{1+\exp\left(\frac{\theta - t}{\varphi}\right)} \qquad \text{eqn 3}$$

where δ is the asymptotic height, θ is the timing at which the migration reaches half its asymptotic height, φ models the timing elapsed between reaching half and 3/4 of migration and t as number of days since 21st March for each year.

To test if the NSD data would be best described by a simple home range model, we fitted an intercept model to the data

$$\mathrm{NSD} = c \qquad \text{eqn 4}$$

where c is a constant. Such a model reflects a lack of large changes in NSD over time, indicating that the moose is stationary within a restricted area during the entire year. The same results were obtained by using an asymptotic regression model, which is a more adequate home range model (Börger, Dalziel & Fryxell 2008). The constant model is more parsimonious because only one parameter is estimated (c), in comparison with two parameters in an asymptotic model.

The last model was a linear equation:

$$\mathrm{NSD} = \beta \times t \qquad \text{eqn 5}$$

where β is a constant and t the number of days since 21st March for each year, which we take here as a simple example of a nomadic individual. This was a simple linear model with zero intercept, allowing moose to increase in distance throughout the year relative to the starting location.

SIMULATED MOVEMENT BEHAVIOUR

To exemplify our theoretical framework, we start the analysis by fitting space use models to simulated random walk data. We simulated all five movement types (nomadic, home range, dispersal, migration and the mixed dispersal-migration movement) for 365 time steps (corresponding to the year tracking duration of the moose in our study). The nomadic movement type was simulated with a random walk (scaled to show realistic median step lengths around 400 m for moose). For home range movement, we used an 2-D Ornstein Uhlenbeck process (with symmetric attraction (0·05) and noise (325) matrices leading to realistic median step lengths around 400 m and home range radii around 2,000 m for moose). An Ornstein Uhlenbeck process is a random walk towards an attractor, in this instance the origin, which results in the emergence of a stable home range. For the dispersal movement, we simulated the home-range using an Ornstein Uhlenbeck process. At time step 71 (onset of spring), the transient phase started, using a Brownian bridge of 30 time steps towards the settlement located 70 km away (which corresponds roughly to the mean migration distance of moose). The Brownian bridge model estimates the probability of occurrence given a set of locations, the time between them and the mobility of the specific study object (Bullard 1999; Horne *et al.* 2007). The settlement phase was again simulated using an Ornstein Uhlenbeck process with the attraction point located at the new area at 70 km distance. In the migration simulation, we modified the dispersal process with an additional Brownian bridge of 30 steps at time step 275 back to the origin, where we simulated a third seasonal home range with a Ornstein Uhlenbeck process. Finally, for the mixed movement, we simulated a migration movement, where the second displacement of the attractor is not back to the origin, but mid-way between the origin and the second attractor. We used the implementations of the random walk, Ornstein Uhlenbeck process and Brownian bridge in the R library adehabitat (Calenge 2006). For each movement type, we ran 100 simulations, hence a total of five movement types times 100 simulations each consisting of 365 time steps. The outcome of the simulation models is exemplified in Fig. 3.

STATISTICAL ANALYSIS OF MOVEMENT BEHAVIOUR

Given the nonlinearity in the hypothesized shape of the NSD curves, we used nonlinear models for the analysis (Pinheiro & Bates 2000). The advantage of using nonlinear models is that competing *a priori*

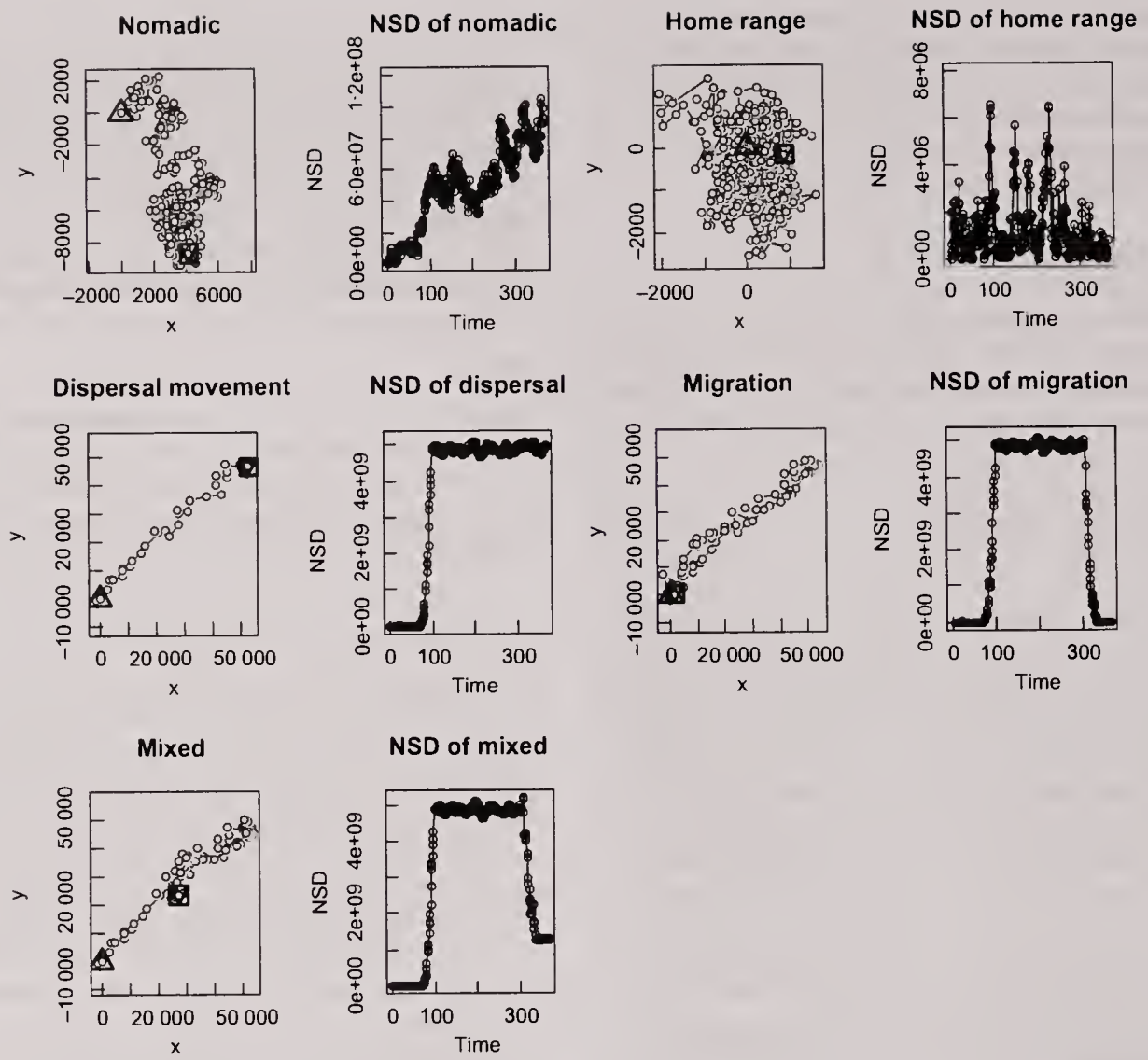

Fig. 3. Net squared displacement patterns from simulated random walk data. See Methods for more detail.

models (derived from hypotheses) can be translated into parameters that have a direct biological interpretation. Furthermore, in general fewer parameters are estimated for nonlinear models than for linear models (e.g. polynomial) and thus the fitted model is more parsimonious, and nonlinear models provide more reliable predictions than linear models outside the parameter range (Pinheiro & Bates 2000).

We analysed the simulated data and the NSD data of individual moose with nonlinear least squares models (*nls* function in R) fitted to each individual moose and simulated data set separately. Nonlinear least squares allow specifying the form of the function according to the hypothesis set above and thus five different models (migration, mixed migration, dispersal nomadic, home range) were fitted to the data. Model parameters were constrained to fall within realistic parameter space, i.e. $\delta > 0$ and $0 < \theta < 365$. All five models were compared, and the best model was selected using an information theoretic approach (Akaike Information Criteria, AIC, Burnham & Anderson 2002). AIC weights were calculated for each individual (Appendices S1 and S2) to take into account that for some moose the data may lend similar support to different movement models. Akaike weights give the probability that a model is the best model, given the data and the set of candidate models (Burnham & Anderson 2002). Given the complexity and specific functional form of the migratory, mixed migratory and dispersal model, the data might not support the model and thus convergence is not reached. As there is no support for the model in cases of nonconvergence, we set AIC to zero.

To quantify the migration parameters at the population level, we included all moose identified by the method above as migratory into a mixed effects nonlinear model (nlme package version 3.1-89; Pinheiro & Bates 2000; sample code in Appendix S3). Individual moose ID was added as a random effect to avoid pseudo-replication and to include individual variation in the parameters that estimate the migration function. We also tested for the most parsimonious random effects structure, including individual differences in the distance, duration and timing of migration (Pinheiro & Bates 2000). We included the sex of the moose and the year as fixed effects to study population-level differences of moose movement behaviour. We identified a set of 17 models to test hypotheses based on the biology of the species, such as the need for females to be constrained to be at calving grounds in the spring and the joint rut of both sexes. Yearly differences were hypothesized to be apparent for all parameters and we tested explicitly the timing of migration to be constrained by rutting and calving more than environmental effects, such as the start of the spring and autumn.

PREDICTIBILITY OF MIGRATION PATTERNS

Setting apart a certain proportion of data for model validation or using cross-validation methods are customary approaches used in ecological research. We used an integrated approach to fully evaluate the predictive ability of the models (i) within individuals over time; (ii) between individuals from the same capture area (Sweden); and (iii) between individuals from different capture areas, i.e. the Norwegian and Swedish moose.

To assess the predictive ability within individuals over time, we first extracted the predicted values at the individual level from the mixed effects model based on the Swedish base data set for the first year. We then calculated the squared correlation (analogue to R^2 in linear regression analysis) between the predicted values for the first year of data and the data from the following year for the same moose in the base data and in the second Swedish data set. The derived squared correlation thus provides an estimate of how repeatable the movement patterns are between years for the same individual.

To make predictions on the population level, we calculated the predicted values for different years and sexes from the migration model using the Swedish base data set. We then calculated the squared correlation between the predicted values for a specific year and sex from the Swedish base data set and compared these with the data from the second Swedish data set and the Norwegian data set. Only females were considered at the population level because of limited data for males.

Results

MOVEMENT BEHAVIOUR

The results of fitting the five different statistical models (mixed migratory, migratory, dispersal, home range, nomadic) to the simulated movement data showed that the two migration patterns and the dispersal pattern were mostly correctly classified (99% for mixed migratory, 83% for migratory, 90% for dispersal). All misclassified migratory movements (17%) fell in the other migration category: mixed migration. Dispersal misclassification was low, with 10% misclassified as mixed migratory. The nomadic movement type's realized NSD shows large variability in their behaviour and was categorized as dispersal for nearly half of the cases. Similarly, the simulated home range data were in about one-third of the cases (36%) categorized as dispersal. The movement type with the highest proportion of misclassifications is the nomadic type with 49% categorized as dispersal. See Table 1 for an overview.

The same approach was then applied to real data where we divided moose movement patterns into five different movement behaviours – mixed migratory, migratory, dispersal, resident and nomadic. We found that 87% (n = 67) of the Swedish moose and 67% (n = 21) of the Norwegian moose were migratory, defined here as regular seasonal return movements. Of these, more than half of the moose (52%, n = 40) in the Swedish base data set returned to the same area, compared to only 32% of the Norwegian moose (n = 10). The remaining migratory moose (55% of all individuals; n = 27 Swedish, n = 11 Norwegian) returned in winter to a similar geographical area, but not close to the same location used during the previous winter (here we call this a mixed strategy). Using AIC weights as a proxy for the relative support of a movement model given the AIC of the alternatives, the results show for the Swedish moose that slightly higher support was found for the mixed migratory behaviour (AIC_{weight}, Swedish: 0·50, Norwegian 0·39), followed by the migratory one (AIC_{weight}, Swedish 0·38, Norwegian 0·32).

The remaining moose did not migrate: 8% (n = 6) of the Swedish moose and 16% (n = 5) of the Norwegian moose in our study dispersed to a different location and did not return to their initial starting point the year before, whereas 4% (n = 3) and 3% (n = 1) stayed in their home range and 1% (n = 1) and 10% (n = 3) showed a nomadic movement pattern (Appendices S1 and S2). In comparison with the two migratory patterns, there was considerably less support for the dispersal, home range and nomadic behaviour (AIC_{weight}, Swedish 0·07, 0·04, 0·01; Norwegian 0·16, 0·03, 0·10, respectively). See Appendices S1 and S2 for detailed information.

MIGRATION PARAMETERS AND SEX AND YEAR DIFFERENCES

The most parsimonious model included variation of sex and year for the distance, timing of spring and autumn migration and duration of spring migration. It also included differences between years in the autumn duration but no difference between the sexes in this parameter (Appendix S4, model M17). Of the 67 Swedish moose that followed a migratory or mixed strategy, the estimated migration distance for females was 60, 107 and 114 km in 2005/2006, 2006/2007 and 2007/2008, respectively (Fig. 4, summary in Table 2). Males migrated further than females, but overlapping confidence intervals indicate large variation around these estimates and a competing model without sex differences in the migration distances receives some support (AIC_{weight} = 0·24, Appendix S4) compared to the model with sex differences in the migration distance (AIC_{weight} = 0·48, Appendix S4). Distance estimates did not differ between spring and autumn

Table 1. Each row gives the simulated movement types (nomadic, home range, dispersal, migration and mixed dispersal-migration) and the proportion classified for these movement types fitted to the net squared displacement. Numbers in bold represent the matching movement types from the fitted model and the simulated data

	MixedMigratory	Migratory	Dispersal	HomeRange	Nomadic
MixedMigratory	**0·99**	0·01	0	0	0
Migratory	0·17	**0·83**	0	0	0
Dispersal	0·10	0	**0·90**	0	0
HomeRange	0·09	0·06	0·36	**0·42**	0·07
Nomadic	0·13	0·04	0·49	0·03	**0·31**

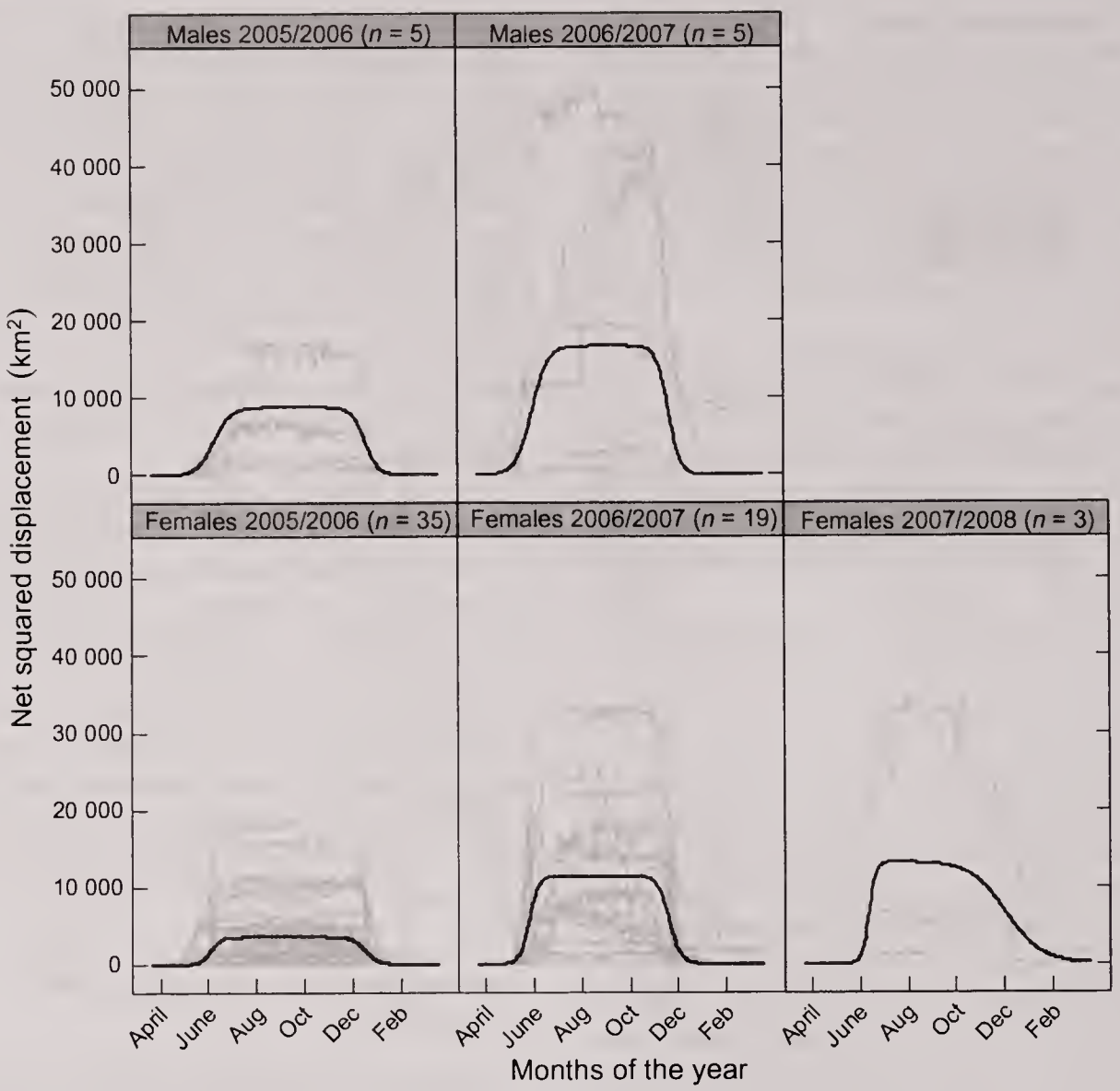

Fig. 4. The population-level nonlinear mixed effects model for net squared displacement of the 69 moose in the Swedish base data set. The sample size *n* represents the number of individual moose trajectories in each panel of the plot. Day 1 is the 21st March.

Table 2. Estimated migration parameters (95% confidence intervals) for the Swedish moose population. The fixed effect estimates for the nonlinear mixed effects model are shown. Distance (km) represents the asymptotic height (δ), the timing of migration (θ) where the curves reaches half its asymptotic height, and duration (φ) is the time spent on half of the migration. Parameters relate to eqn 1 in the methods. The duration of autumn migration did not differ between males and females

Migration parameter	2005/2006		2006/2007		2007/2008	
	Females	Males	Females	Males	Females	Males
Distance (km)	60 (31 79)	94 (58 119)	107 (89 122)	129 (106 149)	114 (63 150)	135 (88 171)
Timing (Date)						
Spring	4/6 (3/6 4/6)	9/6 (8/6 10/6)	26/5 (25/5 27/5)	31/5 (31/5 1/6)	12/6 (11/6 12/6)	17/6 (16/6 18/6)
Autumn	17/12 (16/12 18/12)	19/12 (18/12 20/12)	19/11 (19/11 20/11)	21/11 (21/11 22/11)	3/12 (1/12 4/12)	4/12 (3/12 6/12)
Duration (Days)						
Spring	13 (12 14)	21 (20 23)	12 (11 13)	20 (19 21)	9 (7 10)	17 (15 19)
Autumn	17 (15 18)		15 (14 15)		45 (42 48)	

migration. We did not test for an interaction between sex and year because no data were available for males in the last year (2007/2008).

The timing of migration differed between years and sex. Females reached half of their spring migration distance between 26th May and 12th June in the years 2005–2007, whereas males arrived 5 days later in all years. During the autumn migration, females reached half of their migration distance between 19th November and 19th December. Males reached the same point 2 days later in all years. As for migration distance, we could not test for an interaction between year and sex.

Spring migration (half distance) lasted between 9 and 13 days in the years 2005–2007 for females and 8 days longer in all years for males. Autumn migration tended to last longer, between 15 and 45 days for both females and males (2005–2007, Table 2, see Methods for definitions). The duration of autumn migration did not differ between males and females. Overall, the variation explained by differences between years and sexes accounted for 37% of the total variation.

In addition to differences between years and sex, the distance of migration varied between individuals, but there was no additional individual variation in the duration and timing of migration. By taking into account additional individual differences, the model for the migratory moose explained 92% of the total variation in movement behaviour.

PREDICTABILITY OF MIGRATION PATTERNS

The predictability analysis within the Swedish individuals revealed that on average 69% of individual movement patterns in a given year can be predicted based on movement patterns for the same individuals during the previous year. The variation in predictability was generally high across individuals (range: 36–95%, Appendix S5), indicating that some individuals showed relatively low consistency in their migration behaviour while others showed similar migration patterns between years.

Population-level predictability from Swedish moose in 1 year to a different set of Swedish moose within the same year and capture area was 73% (range: 30–97%) for females in 2006/2007 and 74% (range: 30–88%) for females in 2007/2008. To assess the predictability across sites, the NSD of 13 female Norwegian moose classified as migratory were included in the analysis. The analysis showed that 45% of the NSD could be predicted from Swedish females in the same year. The variation across individuals ranged between 1% and 86%. Predictability for males was not assessed at population level because of small sample size.

Discussion

Many species restrict their movements to a limited and stable range during a given period of their life, which is commonly called the home range of an individual (Burt 1943; Börger, Dalziel & Fryxell 2008; Van Moorter *et al.* 2009). Two major life-history events disrupt the pattern of stable space use: dispersal and migration. We present a modelling approach to objectively distinguish between migration and other movement strategies, particularly dispersal, home range and nomadic behaviour, by using a multi-model selection approach. A clear categorization of animal movement strategies is doubtful, and therefore we suggest using Akaike weights to quantify the likelihood of a given model to be the best model relative to other models (Burnham & Anderson 2002). Hence, instead of categorizing the movement strategy we show how mixed strategies can be described and how likely it is that a particular animal follows a set of movement strategies. Using simulations, we showed that our nonlinear models were able to categorize simulated data drawn from theoretical movement theory. The main aim of the study, to be able to separate migratory (including mixed migratory) movement from other movement patterns (dispersal, nomadic, home range), was achieved with high certainty for the simulated data (100–87% correctly classified). The method showed uncertainty in classifying nomadic and home range behaviour with both categories being misclassified as dispersal to a considerable degree. The simulated data also showed that the method is biased towards describing migratory individuals as mixed migratory. The mixed migratory behaviour can be seen as more flexible migration behaviour as individuals do not need to return to their exact position.

Fitting the models to GPS-collared moose data showed that 87% and 67% of the Swedish and Norwegian moose, respectively, follow a migratory pattern. These results are in line with earlier research where 88% and 60% of the moose were categorized as migratory (Canada: Mauer 1998; Sweden: Ball, Nordengren & Wallin 2001). Furthermore, we show that models that allow moose not to return to exactly the same location as the year before was more parsimonious and received slightly higher support ($AIC_{weights}$) in the Swedish and Norwegian moose. For the Norwegian moose, considerable support is also given to dispersal behaviour where moose do not return at all but find a new location to move to after the summer. This is in line with the simulated data, where a movement was to some degree classified as dispersal when it was simulated as home-range or nomadic behaviour. Our results not only confirm earlier findings of a wide range of movement patterns observed for moose in the field (Hundertmark 1998; Ball, Nordengren & Wallin 2001; Hjeljord 2001) but also quantify these in an objective and repeatable way.

The migration model presented in this study was able to quantify the population-level migration distances from the original starting point accurately with 92% of the total variation in the NSD data explained. Despite recent achievements in understanding migration, the ability to predict migration is still limited (Bauer *et al.* 2009). Our method contributes to understanding the predictability of migration of the same individual, with on average 69% of the NSD variation explained from 1 year to the next. Individuals returning to a given site are observed in a variety of species, for example albatrosses *Thalassarche melanophrys* (Phillips *et al.* 2005), and are of major importance for conservation planning (Thirgood *et al.* 2004). Here, we quantified that around 74% of the NSD in a given year can be explained by modelling other individuals in the same population and year. Life-history data on individual moose will likely increase the predictability as we expect moose at earlier stages and experience to be more variable in their behaviour than older moose with a successful movement history.

Across regions the predictive power was somewhat lower with 45% of NSD explained when aiming to predict

Norwegian moose migration patterns from Swedish moose. Norwegian moose start slightly earlier and migrate less far, but the overall pattern of migration is similar to the Swedish moose. It is suggested from studies on northern-temperate cervids that migration takes place along an altitudinal gradient to increase energy intake (Demarais & Krausman 2000; Mysterud *et al.* 2001). Accordingly, differences in the landscape topology east and west of the mountain divide might explain the differences in migration patterns between the Swedish and Norwegian moose. In the east, the altitudinal change is less abrupt and thus moose have to move further to get to lower altitude during winter, whereas in the west this can be achieved within short distances. We therefore predict that future models, using landscape features and other environmental data as covariates, will explain more of the spatial variation in movement pattern observed between Swedish and Norwegian moose.

Yearly differences in the timing and duration of migration were identified in this study. In an earlier study, autumn migration in moose was found to be related to snow accumulation (Hundertmark 1998), whereas the triggering factors in spring are less clear (Hjeljord 2001). In red deer *Cervus elaphus*, Pettorelli *et al.* (2005) found an earlier start of migration in years with an earlier onset of spring measured using the normalized difference vegetation index, and possibly a similar mechanism may apply for moose. Using our model approach will provide an objective way to test these predictions.

A second influential fixed effect was the sex of the individual with male moose migrating consistently greater distances than females. The opposite trend has been observed in albatrosses (Phillips *et al.* 2005) and hermit thrushes (*Catharus guttatus faxoni*, Stouffer & Dwyer 2003) where females travelled further than males. The estimates for the different years in our moose model are derived from different individuals and we were not able to separate sex, cohort and environmental effects. Multi-year data for the same individual would help to identify the relative roles of the environment, the cohort and the individual. The timing of migration also varied between the sexes with female moose starting to migrate earlier than males. Possibly, this is because females are constrained by calving, which for Scandinavian moose show much variation in time but are mainly taking place at the end of May and the first 2 weeks of June (Saether & Heim 1993; Solberg *et al.* 2007).

The timing and duration did not vary between individuals, but did vary between years. Thus, our results suggest that the timing and duration of migration is mostly determined by environmental differences between years and less by individual characters. Given different experience and life-history, we expected the timing and duration of migration to depend on the individual. In the most parsimonious model, migration distance (asymptotic height) explained a considerable amount of variation between individuals, which indicates that individual moose make different decisions on how far they go. Thus, moose that walk further, but over the same time period, move at a faster speed to cover a longer distance.

Research on intraspecific variation in behaviour is increasing, and studies of temperament have recently been performed on a variety of animals, including mammals (e.g. Réale *et al.* 2000). Estimates of individual temperament can be directly incorporated into our modelling framework to test their ability to explain individual differences in migration. Given our results showing a large influence of individual variability, this should be an interesting direction for future research.

Why individuals differ in behaviour and why it is consistent over time is still rather unclear. Biro & Stamps (2008) hypothesized that personal traits are correlated with productivity (growth, reproduction) where the most bold and active individuals are the more productive. This suggests that individual variation in migration patterns might have consequences for viability and population dynamics. By using an objective approach, our method can contribute to the understanding of what limits migratory populations by linking estimates of the timing, duration and distance of migration to vital rates. For example, Hebblewhite & Merrill (2007) found predation risk in migratory elk *C. elaphus* to be highest during the migratory phase, and L. Börger, T. McIntosh, M. Ryckman, R.C. Rosatte, J. Hamr, J.M. Fryxell (revised for resubmission) showed that the distance and timing of dispersal both were strongly related to individual variation in long-term survival. A combination of movement path analysis and the analysis of disturbed and undisturbed habitats is needed to increase our knowledge on the causes and mechanism of population limitations.

Migration patterns vary among and within species, and have been described as partial when part of the population migrates (Lundberg 1988) and differential if migration distances vary within a species (Cristol, Baker & Carbone 1999). To determine whether an individual migrates and how far it migrates, studies have used the initial and the new capture or resighting locations as the starting and end point of migration, respectively (Lundberg 1988). A similar approach is to use the proportion of different age and sex classes at the different capture locations and seasons to determine which age and sex classes migrate and to what extent (e.g. Brodersen *et al.* 2008; Gillis *et al.* 2008). In ungulates, the degree of overlap of summer and winter home ranges has been used to distinguish between migratory and nonmigratory patterns (Ball, Nordengren & Wallin 2001; Nelson, Mech & Frame 2004). Bergman, Schaefer & Luttich (2000) have used comparisons of movement paths with expected patterns from correlated random walk to determine migratory and nonmigratory movement patterns. Johnson *et al.* (2002) used nonlinear models to distinguish between intra- and interpatch movements. Dettki & Ericsson (2008) calculated the NSD to distinguish between migrating and nonmigrating individuals but did not apply nonlinear models. Here, we use features of existing approaches to develop a framework that incorporates random walk theory with nonlinear models to

understand key parameters of migration studies and the proportion of migratory individuals in a population.

The uniform framework for migration presented here is a parsimonious and objective way to study migration and requires few assumptions about seasonality of migration, but instead derives these parameters from a combination of models. Only three parameters were needed to describe a baseline migration pattern using nonlinear mixed effect models: the distance, timing and duration of migration, which showed good predictive ability of time and space. In line with the movement ecology paradigm proposed by Nathan *et al.* (2008), our approach facilitates the identification of different movement phases, such as stable range use or migration phases, which according to the paradigm should be at the beginning of each movement analysis.

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Supporting Information

Additional Supporting Information may be found in the online version of this article.

Appendix S1. The AIC weights for the models describing a mixed strategy (MixedMigratory), a migratory strategy (Migratory), a dispersal strategy (Dispersal), home-range (HomeRange) and nomadic (Nomadic) strategy for the Swedish moose (base data).

Appendix S2. The AIC weights for the models describing a mixed strategy (MixedMigratory), a migratory strategy (Migratory), a dispersal strategy (Dispersal), home-range (HomeRange) and nomadic (Nomadic) strategy for the Norwegian moose.

Appendix S3. Example R code for migration analysis.

Appendix S4. Candidate models from which the model with the lowest AIC was found.

Appendix S5. The variation (%) explained by the non-linear mixed effect model from 1 year to the next and the number of individuals that fall within each category ($n = 14$).

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Identifying and prioritizing ungulate migration routes for landscape-level conservation

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Abstract. As habitat loss and fragmentation increase across ungulate ranges, identifying and prioritizing migration routes for conservation has taken on new urgency. Here we present a general framework using the Brownian bridge movement model (BBMM) that: (1) provides a probabilistic estimate of the migration routes of a sampled population, (2) distinguishes between route segments that function as stopover sites vs. those used primarily as movement corridors, and (3) prioritizes routes for conservation based upon the proportion of the sampled population that uses them. We applied this approach to a migratory mule deer (*Odocoileus hemionus*) population in a pristine area of southwest Wyoming, USA, where 2000 gas wells and 1609 km of pipelines and roads have been proposed for development. Our analysis clearly delineated where migration routes occurred relative to proposed development and provided guidance for on-the-ground conservation efforts. Mule deer migration routes were characterized by a series of stopover sites where deer spent most of their time, connected by movement corridors through which deer moved quickly. Our findings suggest management strategies that differentiate between stopover sites and movement corridors may be warranted. Because some migration routes were used by more mule deer than others, proportional level of use may provide a reasonable metric by which routes can be prioritized for conservation. The methods we outline should be applicable to a wide range of species that inhabit regions where migration routes are threatened or poorly understood.

Key words: Brownian bridge movement model (BBMM); global positioning system (GPS); migration; movement corridors; mule deer, Odocoileus hemionus; *natural gas development cf. migration routes; stopover site; utilization distribution (UD); Wyoming, USA.*

Introduction

The conservation of ungulate migration routes has received considerable attention across the globe (Fryxell and Sinclair 1988, Berger 2004, Thirgood et al. 2004, Bolger et al. 2008), in large part because the landscapes necessary to maintain them are becoming increasingly fragmented (Leu et al. 2008). Across the Intermountain West, elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), moose (*Alces alces*), and bighorn sheep (*Ovis canadensis*) commonly migrate 50–100 km between seasonal ranges. The traditional migration routes of these ungulates are threatened by unprecedented levels of energy development (BLM [Bureau of Land Management] 2005), amplifying the need to identify and prioritize migration routes for conservation. Unfortunately, the quantitative tools needed to achieve this have not kept pace with technological advances (e.g., global positioning system [GPS] telemetry) that facilitate collection of fine-scale movement data. Here, we present an analytical framework to: (1) identify the network of migration routes for a sampled population, (2) identify route segments used as stopover sites vs. those used primarily for movement, and (3) prioritize routes for conservation based upon their proportional levels of use. Our approach combines fine-scale movement data with an innovative application of the Brownian bridge movement model (BBMM: Horne et al. 2007), to identify and prioritize migration routes for conservation. We apply these methods to a mule deer population in Wyoming, USA, whose range is undergoing rapid energy development.

Migration is an adaptive behavioral strategy that allows ungulates to avoid resource shortages (Baker 1978) and possibly reduce the risk of predation (Fryxell and Sinclair 1988, Hebblewhite and Merrill 2007). Across the Intermountain West, it is common for ungulates to seasonally migrate from low-elevation winter ranges to high-elevation summer ranges, allowing them access to high-quality forage necessary for successful breeding and recruitment of young (Albon et al. 1987, Singer et al. 1997, Cook et al. 2004).

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Accordingly, the loss of migration routes is expected to have population-level consequences for ungulates, including local extirpations (Bolger et al. 2008). Given that ungulate migrations generally occur along traditional routes that are learned and passed on from mother to young (McCullough 1985, Sweanor and Sandegren 1988), the protection of relatively small corridors may benefit large numbers of ungulates.

A common perception is that ungulate populations migrate between seasonal ranges along one well-defined route (Fig. 1A). Portions of a single migration route are assumed to have equal importance, and therefore maintaining the migration requires only that we identify the route and protect it (e.g., Berger 2004). While this migratory pattern is known to occur (Berger 2004, Berger et al. 2006), it is likely restricted to populations that occupy relatively small winter and summer ranges (Fig. 1A). We suggest that it is more common for temperate ungulates to utilize a summer range that is considerably larger than their winter range, which necessitates the use of multiple routes by different parts of the populations (Fig. 1B). This migratory pattern is especially evident across the Intermountain West, where winter ranges are restricted to relatively small areas due to snow cover and limited forage availability, whereas summer ranges often consist of entire mountain ranges. In these cases, individuals share a common winter range and then migrate to distinct locales within summer range (Fig. 1B). Ideally, managers could protect all migration routes, but in regions with high energy-, agricultural-, or housing-development potential, prioritizing specific route segments for management and conservation is necessary to minimize the impacts of development and sustain functional migration routes.

Although recent advances in GPS technology have improved our ability to study ungulate movements, identifying migration routes from discrete location data has remained problematic. Specifically, it is difficult to account for the uncertainty in animal movements between known locations (Horne et al. 2007, Patterson et al. 2007) and it has been unclear how to combine migration routes of individuals to make population-level inference. For example, the method of connecting the dots between GPS locations of marked animals (Sawyer et al. 2005, Berger et al. 2006, White et al. 2007) has improved our understanding of ungulate migrations, including the timing, distances traveled, and movement rates. Yet, such approaches ignore the uncertainty in both the locations and the trajectory of movement, thereby producing a line with no associated area or error (e.g., is the route 10 m or 1 km wide?) and no means of combining individual routes to characterize the population-level route network.

An alternative approach proposed by Horne et al. (2007) uses time-specific location data and the BBMM to quantify the probability of use along a route by estimating a probability density or utilization distribution (UD). Provided that movement data are collected at

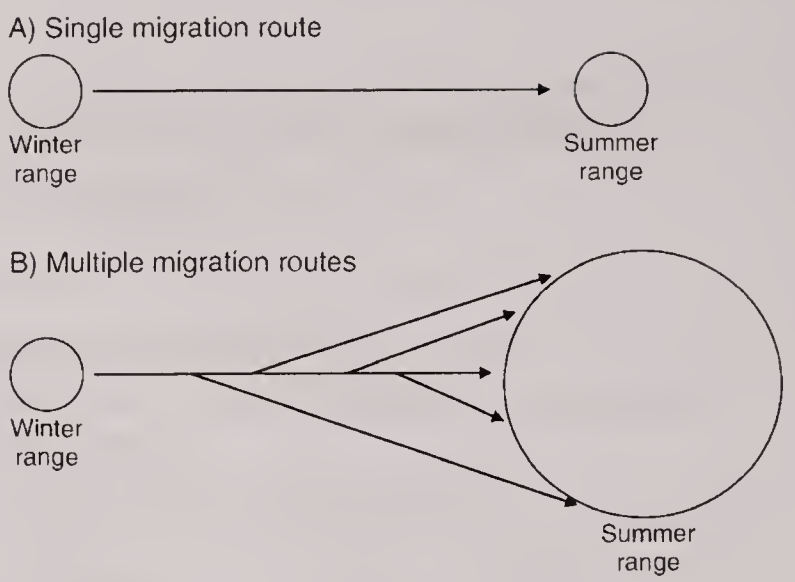

FIG. 1. Conceptual model illustrating (A) a scenario where one distinct migration route occurs between two relatively small seasonal ranges and (B) a scenario where the migration route from a small winter range splinters into multiple routes in order to access a larger summer range.

frequent intervals and with some measure of error (Horne et al. 2007) the BBMM provides a probabilistic estimate of a migration route by accounting for location error and the uncertainty of the movement trajectory between locations. This advancement allows the estimation of the relative amount of use along a migration route, and, importantly, provides a quantitative method for combining multiple individual routes into a population-level estimate of migration corridors. Delineation of the population-level migration route provides a basis for conserving all routes or prioritizing which routes should be targeted for conservation or management.

Western Wyoming is a region where some of the world's largest mule deer populations coincide with some of the world's largest natural-gas reserves. As the level of natural gas development expands across the region (BLM 2005), large areas of mule deer habitat are rapidly being converted into producing gas fields, characterized by networks of access roads, well pads, pipelines, and other infrastructure that may impede deer migration. Agencies, industry, and non-governmental organizations recognize the need to incorporate migration routes into current planning and policy, but their efforts have been limited by the quantitative tools available to them. In this study, we provide a general framework to identify and prioritize mule deer migration routes for landscape-level conservation and management.

Study area

Our study was conducted in the 1093-km^2 Atlantic Rim Project Area (ARPA) located in southwest Wyoming, immediately west of the Sierra Madre mountain range (BLM 2006). The ARPA is characterized by rolling topography, prominent ridges, and dry canyons dominated by sagebrush (*Artemisia* sp.), black greasewood (*Sacrobatus vermiculatus*), Utah juniper (*Juniperus*

osteosperma), and other shrub species (*Purshia tridentata*, *Prunus virginiana*, *Amelanchier alnifolia*, *Chrysothamnus* sp., *Cercocarpus* sp.). Elevations range from 1920 m to 2530 m. The ARPA supports ~2000–3000 mule deer and contains two distinct winter ranges, locally known as Dad (40 km^2) and Wild Horse (141 km^2). At the time of study (2005–2006), there were approximately ~116 natural gas wells in the ARPA, but an additional 2000 wells and 1609 km of pipeline and access roads were approved for construction in 2007 (BLM 2006).

Materials and Methods

Capture, collaring, and data collection

We used helicopter net-gunning to capture 31 adult female mule deer across the Wild Horse and Dad winter ranges (Wyoming, USA) in February 2005, with another 16 captured in December 2005. We attempted to sample deer in proportion to their abundance, as determined by pre-capture aerial surveys that indicated approximately 1/3 of deer occurred in Dad and 2/3 in Wild Horse. We fitted deer with store-on-board GPS radio collars (TGW 3500, Telonics, Mesa, Arizona, USA) programmed to collect one location every 2.5 h. Between 10 February 2005 and 15 November 2006 we collected 116 494 GPS locations from 47 deer. Three deer did not migrate and were excluded from analysis. We collected data for 80 migrations (56 spring, 24 fall) from 44 deer (Appendices A and B).

Estimating migration routes

We used the Brownian bridge movement model (BBMM; Horne et al. 2007) to estimate a utilization distribution (UD) for each individual migration route collected from GPS-collared mule deer. The BBMM requires (1) the sequence of time-specific location data, (2) the estimated error associated with the location data, and (3) grid-cell size for the output UD. We used a sequence of GPS locations (i.e., the migration path) that occurred between winter and summer range during a specific migration (spring or fall), including the 24-hour period prior to, and following migration. We defined the start and end of migrations as locations occurring outside a minimum convex polygon generated from winter and summer range locations (Saher and Scmiegelow 2005). Missing observations or fix-rate bias (Nielson et al. 2009) were not a concern, because 99% of our GPS fix attempts were successful. Nonetheless, we took precautions to ensure that occasional missing observations were accounted for by restricting the BBMM calculations to sequential locations. We used an estimated location error of 20 m because 86% of our GPS locations were three-dimensional (3-D) fixes, which typically have <20-m error (Di Orio et al. 2003). We used a grid-cell size of 50 × 50 m that was intended to provide high-resolution mapping, while maintaining a reasonable processing time.

The BBMM is a continuous-time stochastic movement model, where the probability of being in an area is conditioned on the distance and elapsed time between successive locations, the location error, and an estimate of the animal's mobility, referred to as the "Brownian-motion variance" (BMV; Horne et al. 2007). Assuming that odd-numbered locations are independent observations from Brownian bridges connecting even-numbered locations, the BMV can be estimated by maximizing the likelihood of observing the odd locations (Horne et al. 2007). The two assumptions associated with the BBMM are that location errors correspond to a bivariate normal distribution and that movement between successive locations is random. The assumption of normally distributed errors is appropriate for GPS telemetry, but the assumption of conditional random movement between successive locations may become less likely as time between locations increases (Horne et al. 2007). Given that our locations were only 2.5 h apart, and Horne et al. (2007) successfully applied the BBMM to migratory data collected at 7-h intervals, we considered the assumption of conditional random movement to be reasonable. We programmed the BBMM calculations in the R language for statistical computing (R Development Core Team 2007; see Supplement).

Estimating population-level migration routes

Application of the BBMM resulted in a UD for each migration route of each collared deer. For deer that had >1 migration recorded ($n = 20$ deer), we summed the cell values of all their UDs and then re-scaled their cumulative cell values to sum to 1, such that the migratory route of each deer was represented by one UD. Next, we sought to characterize the network of migration routes used by the entire sampled population, which we refer to as a *population-level migration route*. We then followed this same re-scaling procedure with the UDs of all deer to estimate population-level migration routes. Because deer migrations originated from two winter ranges, we created a population-level migration route for each winter range. Once the individual UDs were combined, the resulting surface provided an estimate of the relative amount of use across the population-level route. We categorized the UD values for each population-level migration route into 25% quartiles, so that the top 25% were classified as high use and the lowest 25% were low use. Estimating population-level UDs for separate seasons (spring and fall) was not necessary because individual deer showed fidelity to their migration routes (Appendix C).

Although the amount of time an animal spends in a particular area is the most common metric in resource-use studies, it is not particularly effective at capturing rare events, such as visiting watering sites, seeking mates, or quick migration bouts (Buskirk and Millspaugh 2006). The population-level migration routes estimated by the BBMM are unique in that they reflect two metrics of migratory behavior: time spent in an area

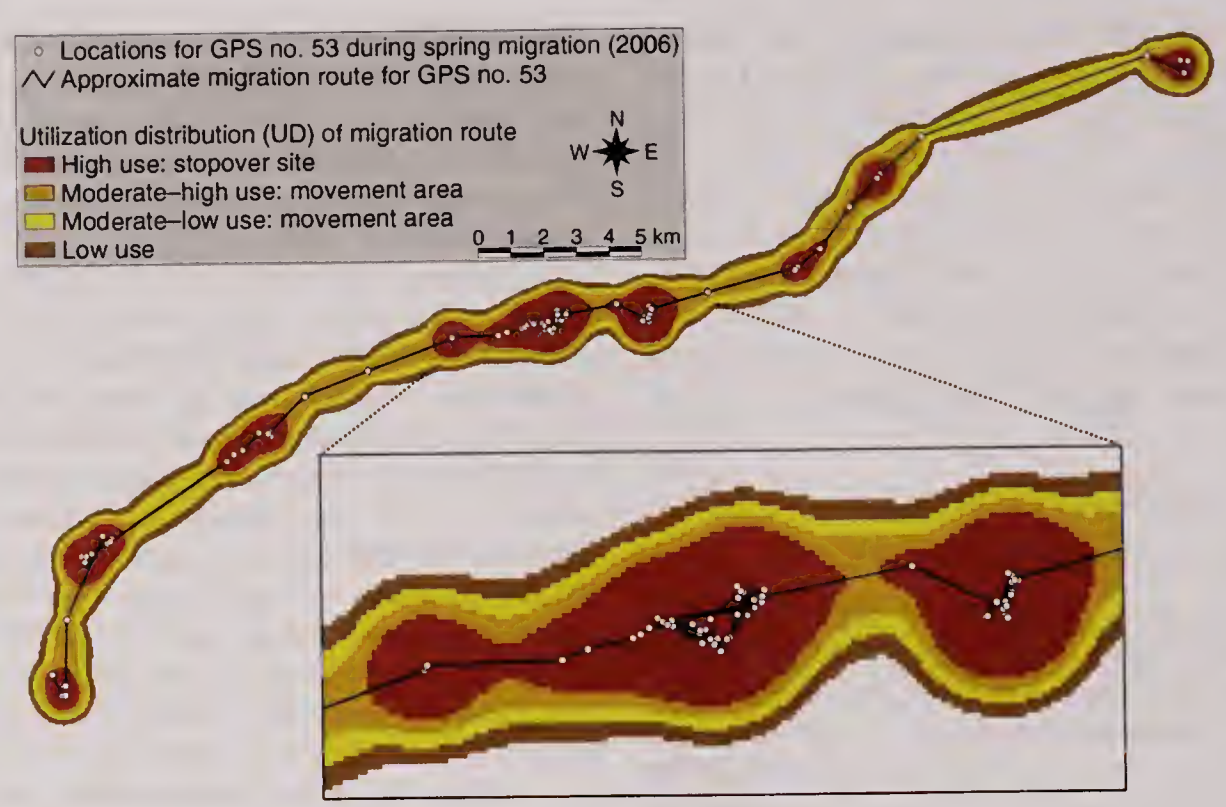

FIG. 2. Utilization distribution (UD) estimated for individual mule deer (*Odocoileus hemionus*; GPS no. 53) during spring migration of 2006. High-use areas correspond with stopover sites, where the deer spent most time (i.e., tortuous movements). Moderate-use areas located between stopover sites correspond with migratory segments through which mule deer moved quickly in one direction. Low-use areas reflect the uncertainty in the entire route.

and rate of movement. We considered both metrics by recognizing that high-use areas represent areas where animals spend the most time and move slowly (e.g., stop moving or make a series of tortuous movements), while moderate-use areas represent areas where animals spend the least time and move quickly. Thus, we assumed that high-use areas represent stopover sites, presumably used for foraging and resting habitat, whereas moderate-use areas located between stopover sites represent movement corridors (Fig. 2). Similar to other movement models (Johnson et al. 2002, Morales et al. 2004, Frair et al. 2005, Forester et al. 2007, Barraquand and Benhamou 2008), our analysis implicitly assumed that behavioral state (i.e., stopover or migratory movement; Saher and Schmielgelow 2005) could be inferred from movement rates. The validity of this assumption depends on the frequency of the movement data, the type of behaviors to be distinguished, and how likely those behaviors are to be associated with different movement rates. In our application, we collected movement data at frequent (2.5-h) intervals and attempted to differentiate between two coarse-scale behavioral states (i.e., stopover vs. migratory movement) that were characterized by pronounced differences in movement rates. Our analysis was not designed to distinguish between fine-scale behaviors, such as foraging and resting.

To prioritize routes, we assumed that route segments used by a larger proportion of the population had higher conservation priority than those used by a small proportion of the population. We determined the proportion of the sampled population that used each route segment by calculating how many of the individual migration routes (99% UD) occurred within each 50 × 50-m cell of the estimated population-level route. Thus, cell values ranged from 1 to a possible maximum value equal to the total number of marked deer in each winter range. We then considered migration routes used by >10% of the sampled population to have higher conservation priority than others. The 10% criterion was a subjective decision intended to reflect routes used by more than one marked animal. We recognize that other criteria could be used, but in the absence of a metric directly related to fitness, we found proportional use to be an intuitive metric to prioritize migration routes.

RESULTS

We estimated utilization distributions (UDs) for 80 migration routes (56 spring, 24 fall) collected from 44 radio-collared deer. The Brownian motion variance (BMV) of individual migration routes in the Dad and Wild Horse winter ranges (Wyoming, USA) was 3310 ± 685 m^2 (mean ± SE; $n = 19$ migrations) and 2679 ± 280 m^2 ($n = 61$ migrations), respectively. The population-level route for the Wild Horse winter range (Fig. 3A) included 61 migrations by 32 deer, whereas the population-level route for the Dad winter range (Fig. 4A) included 19 migrations by 12 deer. The population-level migration routes represent a probabilistic measure of where both spring and fall migrations occurred during 2005 and 2006. Population-level migration routes were characterized by stopover sites, where deer spent most of their time, connected by movement corridors

through which deer moved quickly (Figs. 3A and 4A). Stopover sites corresponded with high-use areas that were presumably used as foraging and resting areas, whereas movement corridors were reflected by moderate-use segments, located between stopovers, through which deer moved quickly. Low-use areas reflected the uncertainty across the entire the migration route and did not appear to be associated with stopovers or movement corridors.

Marked deer from both populations used a network of migration routes to access their respective summer ranges, however the population-level route for the Wild Horse population (718 km^2) was nearly 3 times larger than that for the Dad population (258 km^2). Proportional use of route segments within the population-level migration routes had a range of 3–56% in the Wild Horse population and 8–75% in the Dad population. Routes used by >10% of the sampled populations were considered to have the highest conservation priority and were mapped against the population-level routes. The highest priority routes (Figs. 3B and 4B) for the Wild Horse and Dad populations covered ~20% (146 km^2) and 53% (137 km^2) of their respective population-level migration routes. Three areas proposed for gas development overlapped with the population-level migration routes, including two in the Wild Horse and one in the Dad population (Figs. 3 and 4).

Discussion

Our application of the Brownian-bridge movement model (BBMM) was successful at identifying population-level migration routes for conservation planning. Mule deer from two subpopulations in our study area used a network of migration routes, rather than one distinct route per subpopulation. We suggest that for temperate ungulates a multiple-route migratory pattern is more common than a single route. This pattern is likely to occur when seasonal ranges are disproportionate in size, whether it be large summer and small winter ranges as in our study, or large winter and small summer ranges as observed in caribou (*Rangifer tarandus*; Bergman et al. 2000). Compared to a single migration route, the conservation of multiple migration routes is complicated by the increased likelihood that route segments will overlap with development projects or other anthropogenic disturbances. Additionally, because individual mule deer showed a strong fidelity to their migration routes across seasons and years, the fact that multiple routes were used by these subpopulations does not necessarily mean that individual animals can modify their migratory behavior or have alternative options available to them if their route is blocked. Estimation of a population-level migration route provides a basis from which all migration routes may either be protected, or from which a prioritization process may be initiated to identify which routes should be targeted for conservation or management.

Our work suggests that the BBMM may be a useful tool for distinguishing between areas associated with different behavioral states, as others have done with nonlinear curve fitting (Johnson et al. 2002, Saher and Schmiegelow 2005), state–space models (Forester et al. 2007), Markov models (Franke et al. 2004), random walks (Morales et al. 2004), and first-passage-time approaches (Frair et al. 2005, Bailey and Thompson 2006). We found the migration routes of mule deer were characterized by a series of stopover sites, presumably used for foraging and resting, connected by movement corridors. Similarly, Alerstam and Hedenström (1998) characterized bird migrations as alternating between flights, when distance is covered and energy consumed, and stopover periods when energy is accumulated. Similar to migratory bird conservation (Klassen et al. 2008, Newton 2008), we suggest that migratory ungulates may benefit from the identification and subsequent management of stopover sites. For ungulates, such stopover sites are typically referred to as "transition range" and are thought to aid individuals in meeting their nutritional requirements by providing better forage than is often available on winter ranges, allowing them to recover body condition earlier in the spring and maintain body condition later in the fall, before entering winter (Short 1981).

Migration theory suggests that the function of stopover sites is to provide animals with areas where they can accumulate energy reserves necessary to complete the migration or movement to the next stopover site, whereas the function of movement corridors is to facilitate movement between stopover sites (Alerstam and Hedonström 1998, Hedenström 2003). In general, a migration strategy that involves many stopover sites is energetically preferable to one with few stopovers because animals may travel shorter distances with lighter fuel loads (Alerstam 2001). A key consideration for land migrants is that management strategies that differentiate between the type of migratory segments (i.e., stopover site vs. movement corridor) may be warranted. For instance, in our study area hundreds of kilometers of road will be constructed as part of a large-scale energy development project (BLM 2006). When a road must be built across a migration route, is it least likely to affect mule deer migration if it bisects a stopover site or a movement corridor? Given that ungulates tend to avoid disturbances associated

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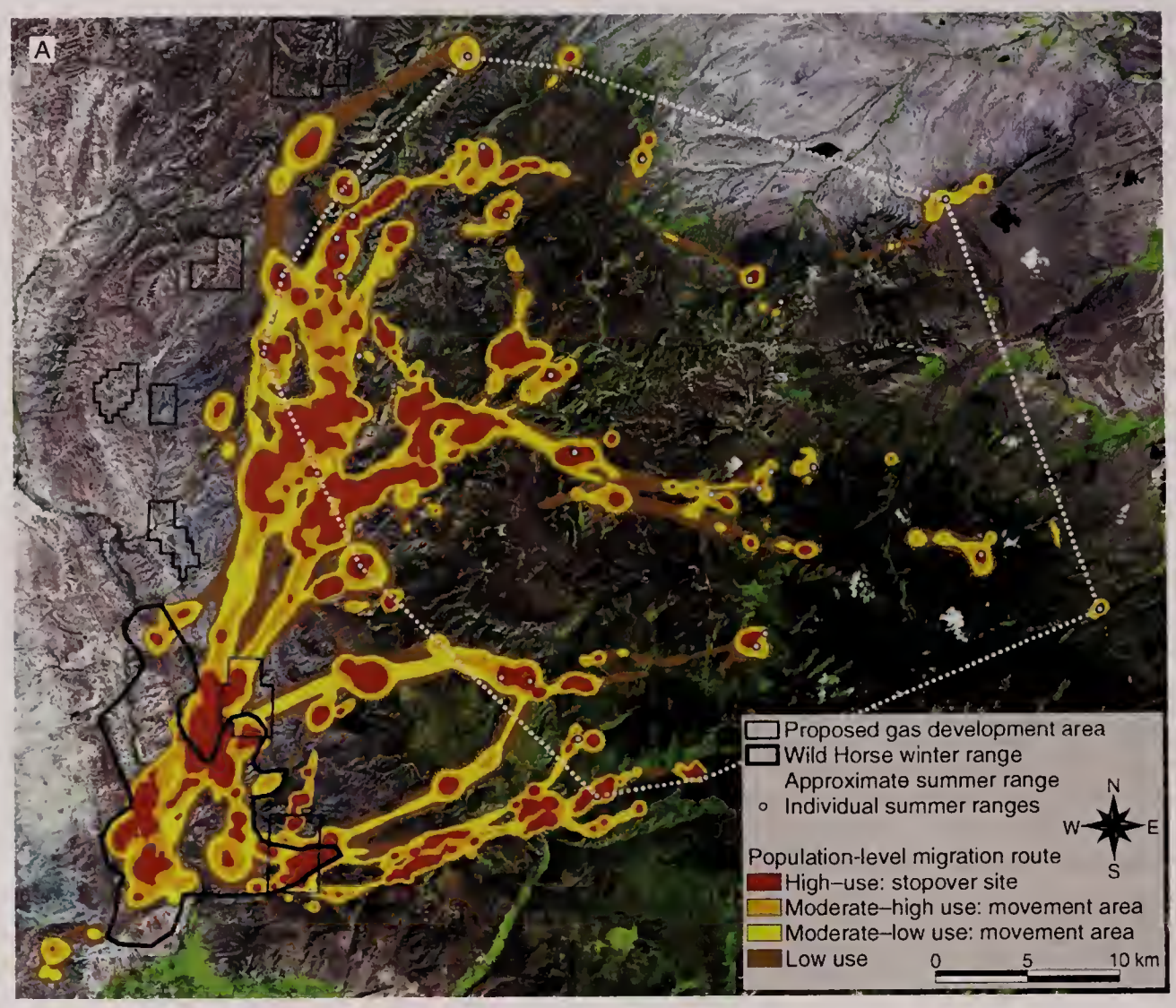
Fig. 3. (A) Estimated population-level migration route and relative amounts of use for mule deer in the Wild Horse winter range, southwest Wyoming, USA. High-use areas represent stopover sites presumably used as foraging and resting habitat, whereas moderate-use areas represent movement corridors. (B) Prioritization of migration routes based on proportion of sampled mule deer population (>10%) using routes segments across the Wild Horse population-level migration route.


A
Proposed gas development area
Wild Horse winter range
Approximate summer range
Individual summer ranges
N
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S
Population-level migration route
High–use: stopover site
Moderate–high use: movement area
Moderate–low use: movement area
Low use
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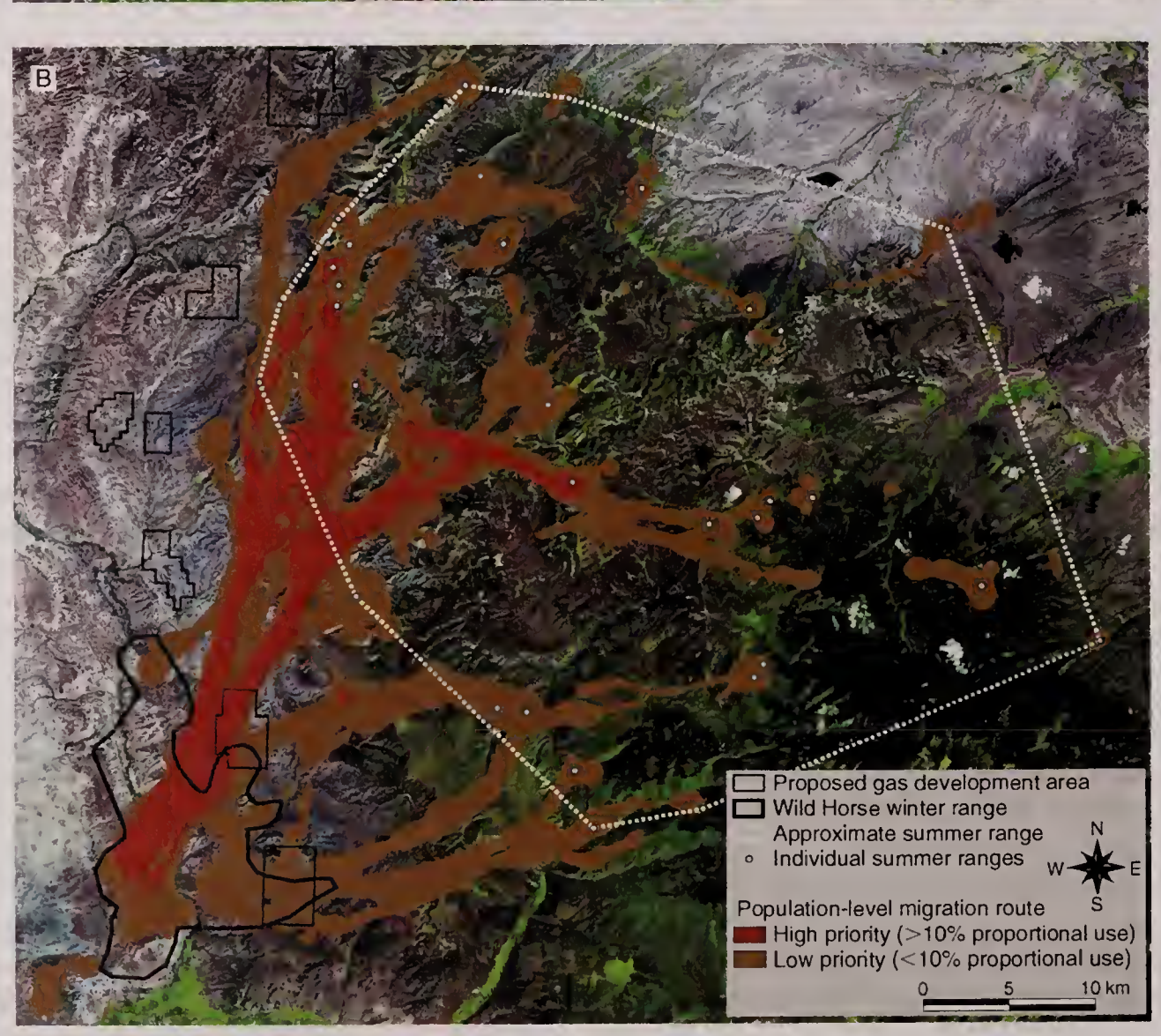
B
Proposed gas development area
Wild Horse winter range
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Individual summer ranges
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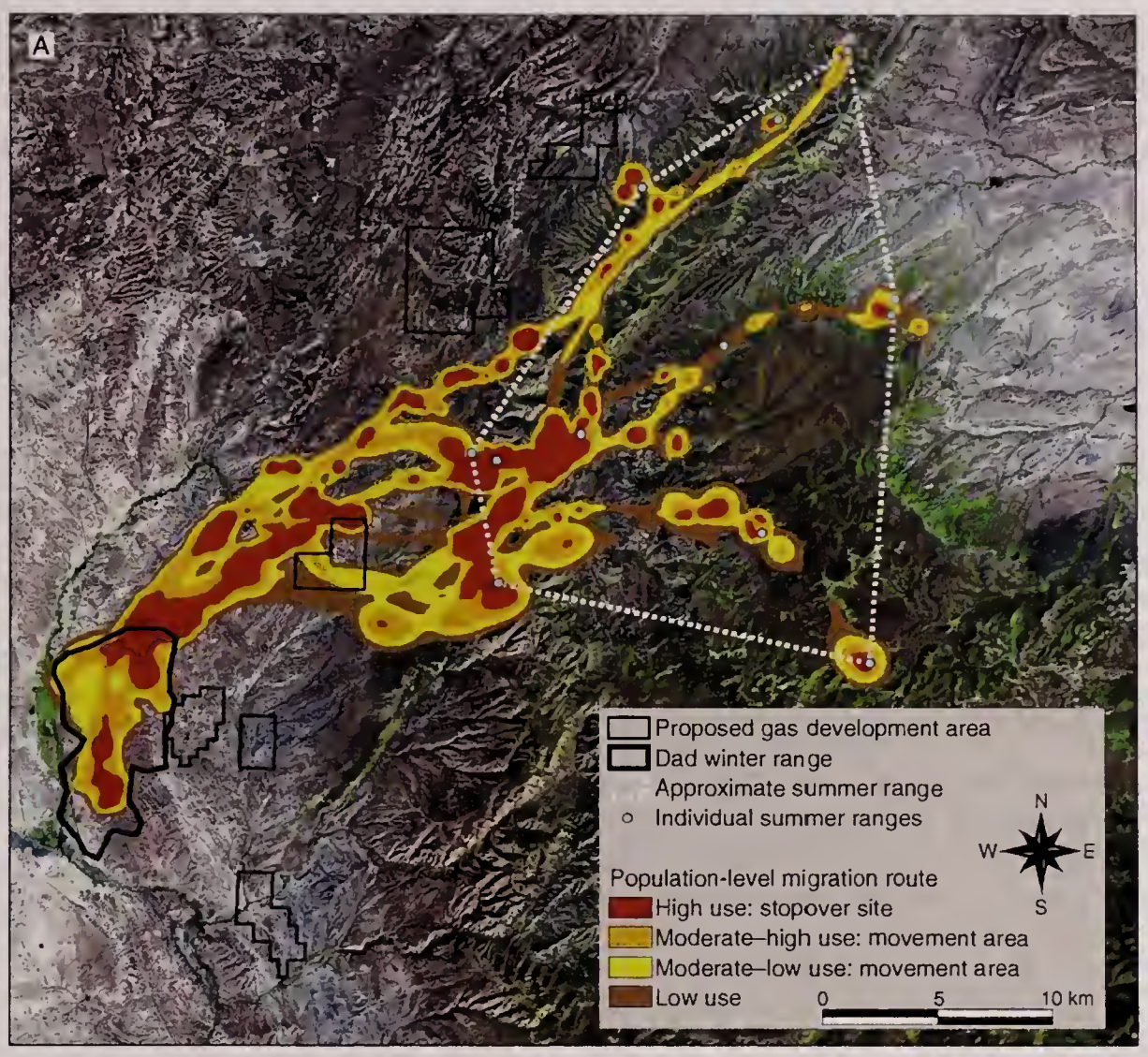
Population-level migration route
High priority (>10% proportional use)
Low priority (<10% proportional use)
0 5 10 km


A
Proposed gas development area
Dad winter range
Approximate summer range
Individual summer ranges
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Population-level migration route
High use: stopover site
Moderate–high use: movement area
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Low use
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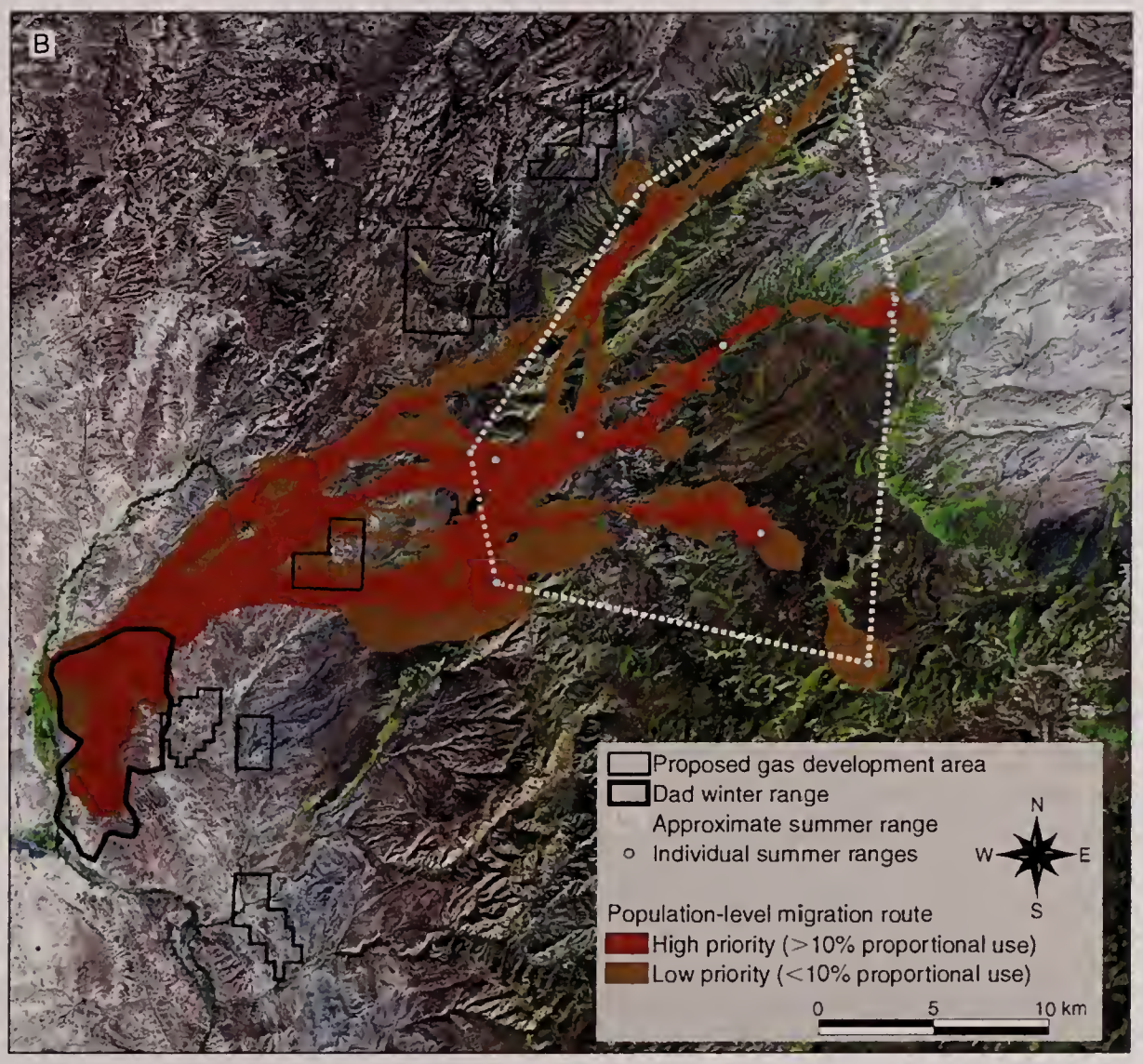
B
Proposed gas development area
Dad winter range
Approximate summer range
Individual summer ranges
N
W
E
S
Population-level migration route
High priority (>10% proportional use)
Low priority (<10% proportional use)
0
5
10 km

with energy development on their seasonal ranges (Dyer et al. 2001, Nellemann et al. 2003, Cameron et al. 2005, Sawyer et al. 2006), it is likely that human disturbance (e.g., traffic, noise) and habitat loss (e.g., road, pipeline, and well-pad construction) that occur in stopover sites will reduce foraging opportunities and increase energy expenditures. In contrast, similar disturbances in movement corridors appear less likely to reduce migration-route function, assuming that animals can safely cross the road and anthropogenic features (e.g., fences) do not restrict animal movement. Following this argument, we recommend stopover segments be managed to minimize habitat loss and human disturbance, while movement segments be managed to maintain connectivity (i.e., ensure animal movement is not impeded). However, given our limited understanding of how development impedes ungulate movement (Frair et al. 2008), careful consideration should be given to the potential barrier effects created by development.

Our results indicate that when multiple migration routes exist, some route segments are used by a larger proportion of the population than others. In birds, such migratory patterns are influenced by energy and behavioral constraints (Alerstam and Hedenström 1998, Alerstam 2001) and predation risk (Lindström 1990, Pomeroy et al. 2006). The disproportionate use of migration-route segments suggests that potential impacts to migratory ungulate populations may be minimized by focusing management or conservation efforts on routes used by a large proportion of the population. Unfortunately, our analysis does not allow us to evaluate the population-level consequences of targeting conservation efforts at migration routes used by >10% of the sampled population. Further, we recognize that routes used less frequently may have higher conservation value under different climate conditions or disturbance regimes, although archaeological records suggest at least some ungulate migration routes in the region have been used for several thousand years (Sawyer et al. 2005, Berger et al. 2006). Nonetheless, when large-scale development poses a threat to migratory routes, managers must make difficult decisions, often with imperfect data. Conserving migratory routes used by a large proportion of the population should minimize the number of animals that are potentially impacted by such disturbances. We characterized high-priority routes as those used by >10% of the sampled population; however, we note that prioritizing route segments based upon a fixed level of proportional use will always maintain a larger degree of connectivity in populations that utilize fewer migration routes (Fig. 3B) compared to those that utilize many (Fig. 2B).

Migration is an important, but often neglected, life-history component that should be considered in conservation planning (Saher and Schmiegelow 2005). Sustaining current numbers of migratory mule deer in our study area will likely require that migration routes be maintained during and after the construction of 2000 gas wells and associated infrastructure. An inherent assumption of migration and migratory routes is that they are positively correlated with fitness (Fryxell et al. 1988). Yet, the empirical evidence describing the potential demographic consequences of migration routes that are blocked or converted to unusable habitat is scant (but see Bolger et al. [2008]). Future research should focus on the demographic consequences of migration routes that are altered or lost due to development. We successfully identified where migration routes occurred relative to a 1000-km^2 proposed gas development project (BLM 2006), which provided common ground for stakeholders to assess the potential impact to migrating mule deer. Additionally, by distinguishing between migratory segments used as stopover sites vs. those used primarily for movement, we provided a basis for modifying development plans to minimize habitat loss and human disturbance in stopover sites, while maintaining connectivity in movement corridors. Because complete protection of migration-route networks is unlikely in our study area, we provided stakeholders with a means to prioritize routes (H. Sawyer and M. J. Kauffman, *unpublished data*), which they have used to identify areas appropriate for seasonal timing restrictions and other mitigation measures (e.g., habitat improvements, fence modifications, and conservation easements). Together, these tools have provided agencies, industry, and conservation groups with the information necessary to make informed land-use decisions and improve the conservation of migratory ungulates in an area of the West (Wyoming, USA) experiencing unprecedented levels of energy development.

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FIG. 4. Mule deer migration in the Dad winter range, southwest Wyoming, USA. (A) Estimated population-level migration route and relative amounts of use for mule deer. High-use areas represent stopover sites presumably used as foraging and resting habitat, whereas moderate-use areas represent movement corridors. (B) Prioritization of migration routes based on proportion of sampled mule deer population (>10%) using routes segments across the Dad population-level migration route.

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APPENDIX A

Migratory GPS locations collected from a sample of 12 adult female mule deer captured in the Dad Winter Range located in the Atlantic Rim Project Area of southwest Wyoming, USA, February 2005–November 2006 (*Ecological Archives* A019-083-A1).

APPENDIX B

Migratory GPS locations collected form a sample of 32 adult female mule deer captured in the Wild Horse Winter Range located in the Atlantic Rim Project Area of southwest Wyoming, USA, February 2005–November 2006 (*Ecological Archives* A019-083-A2).

APPENDIX C

Approximate migration routes of mule deer that had at least one spring and one fall migration recorded (*Ecological Archives* A019-083-A3).

SUPPLEMENT

R source code for the Brownian bridge movement model (BBMM) that estimates a utilization distribution (UD) for a migration route of a GPS-collared mule deer, as depicted in Fig. 2 (*Ecological Archives* A019-083-S1).

Barrow
Wainwright
Atqasuk
Nuiqsut
Deadhorse
Kaktovik
Point Lay
Umiat
Point Hope
Anaktuvuk Pass
Noatak
Wiseman
Kotzebue
Ambler
Kobuk
Bettles
Nome
0 25 50 100 150
Miles

Alpine-GMT
Roads

Teshekpuk Lake

Female population-level fall migration

High use
Moderate-high use
Moderate-low use
Low-use

N

Beaufort Sea

Deadhorse

Nuiqsut

Umiat

0 5 10 20 30
Miles

Alpine-GMT Roads

Teshekpuk Lake

Female population-level fall migration

- High use
- Moderate-high use
- Moderate-low use
- Low-use

N

Barrow
Wainwright
Atqasuk
Point Lay
Nuiqsut
Deadhorse
Kaktovik
Umiat
Point Hope
Anaktuvuk Pass
Noatak
Wiseman
Kotzebue
Ambler
Kobuk
Bettles
Nome
0 25 50 100 150
Miles

Alpine-GMT
Roads

Teshekpuk Lake

Male population-level fall migration

High use
Moderate-high use
Moderate-low use
Low-use

N

Beaufort Sea

Deadhorse

Nuiqsut

Umiat

0 5 10 20 30
Miles

Alpine-GMT Roads

Teshekpuk Lake

Male population-level fall migration

- High use
- Moderate-high use
- Moderate-low use
- Low-use

N

Kivalina

Noatak

Kotzebue

0 5 10 20 30
Miles

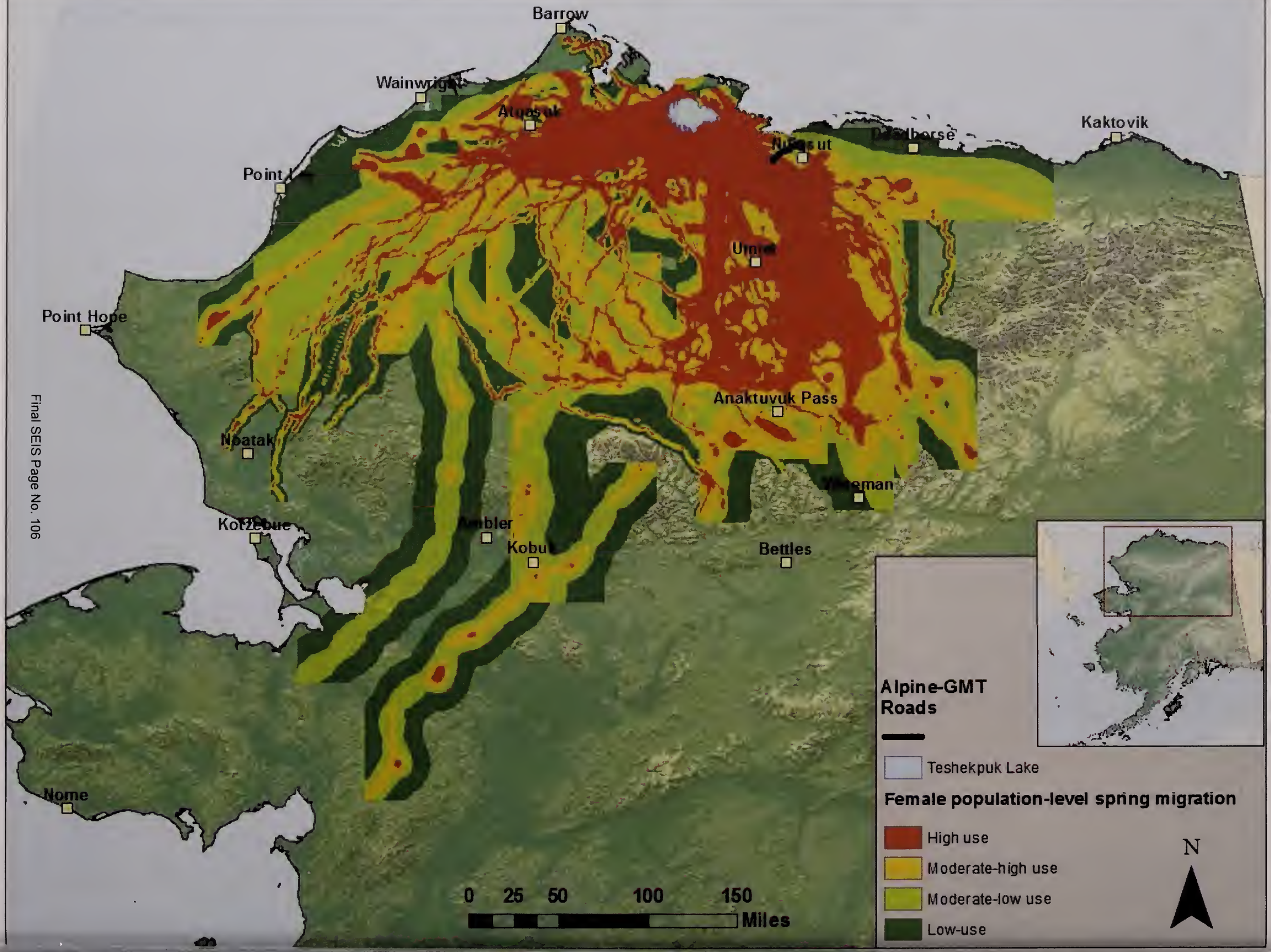
Red Dog Mine
Port Access
Road

Teshekpuk Lake

Female population-level fall migration

- High use
- Moderate-high use
- Moderate-low use
- Low-use

N


Barrow
Wainwright
Atqasuk
Nuiqsut
Deadhorse
Kaktovik
Point Lay
Umiat
Point Hope
Anaktuvuk Pass
Noatak
Kotzebue
Ambler
Kobuk
Bettles
Nome
0 25 50 100 150
Miles
Alpine-GMT Roads
Teshekpuk Lake
Female population-level spring migration
High use
Moderate-high use
Moderate-low use
Low-use
N

Beaufort Sea

Nuiqsut

Umiat

0 5 10 20 30
Miles

Alpine-GMT Roads

Teshekpuk Lake

Female population-level spring migration

High use

Moderate-high use

Moderate-low use

Low-use

N

Barrow
Wainwright
Atqasuk
Point Lay
Point Hope
Noatak
Kotzebue
Ambler
Kobuk
Umiat
Anaktuvuk Pass
Deadhorse
Kaktovik
Bettles
Nome

0 25 50 100 150
Miles

Alpine-GMT
Roads

Teshekpuk Lake

Male population-level spring migration

High use
Moderate-high use
Moderate-low use
Low-use

N

Beaufort Sea

Nuiqsut

Deadhorse

Umiat

0 5 10 20 30
Miles

Alpine-GMT Roads

Teshekpuk Lake

Male population-level spring migration

- High use
- Moderate-high use
- Moderate-low use
- Low-use

N

[04-001]
Additional information regarding oil spill not included in the Final SEIS is provided elsewhere. The ADEC reviews and approves the ODPCP and the Certificate of Financial Responsibility for storage or transport of oil under AS 46.04.030 and 18 AAC Chapter 75. ADEC review applies to oil exploration and production facilities, crude oil pipelines, oil terminals, tank vessels and barges, and certain non-tank vessels. The ODPCP will include more detailed information on oil spill prevention and contingency planning. This ODPCP will not be completed until a preferred alternative is selected.

[04-002]
Despite agreement that the BAT review process is beneficial to all parties, the BLM is not authorized to enforce the standards enacted by State of Alaska and therefore cannot require CPAI's participation in this program. The BLM's oil and gas regulatory requirements for equipment design are minimum standards only but do require that equipment be properly designed for all specific applications. All equipment must be designed for Arctic service and will undergo a technical review for adequacy prior to construction. CPAI would be obligated to meet or exceed these BAT expectations to any extent required under these State standards and as a result the federal Applications for Permit to Drill would include this equipment for review in their proposal. It is important to note that CPAI is an active participant in these BAT conferences and does have a history of self-adherence to many BAT practices.

[04-003]
Spill response planning is based on the varied requirements of multiple participating agencies, some of which do not use "worst-case scenarios". The ODPCP will not be developed until a preferred alternative is selected. This potential mitigation measure is referencing facility equipment and design criteria.

[04-004]
The environmental consequences are described in Chapter 4 of the Final SEIS. More information will be included in the ODPCP after the preferred alternative is selected.

[04-005]
BLM's Onshore Oil and Gas Order No. 2 specifies exact well control design and testing requirements for oil & gas drilling and abandonment operations on Federal oil & gas leases and these regulations are in effect for all GMT1 operations. Well control designs and Blowout Prevention Equipment (BOPE) are based on a technical engineering and geologic analysis of known or suspected risks and hazards using special design factors or criteria specific to each well and within the confines of proven federal engineering design factors and methods. The BLM cannot enforce or alter the regulations of the State of Alaska but understands the State of Alaska also enforces their own regulations for oil & gas drilling operations on Federal lands. The BLM's regulations authorized under 43 CFR Part 3100 and all other Federal Onshore Oil and Gas Orders, Notices to Lessees (NTLs), lease stipulations, and project conditions of approval govern all activity on Federal oil & gas leases. The BLM will not require excessive well control equipment without a technical justification proving reasonable necessity; however, should the State of Alaska's regulations exceed federal regulations, the BLM will authorize the higher rated equipment or more frequent testing as long as they comply with the BLM's minimum standards. The BLM performs independent inspections of drilling rig equipment, BOPE, operational safety, and environmental conditions before, during, and after drilling operations. Inspection frequency will occur based on the approved annual Federal oil & gas inspection and enforcement risk-based strategies in effect at the time of drilling. Federal Oil & Gas Inspectors are highly trained, tested, and certified to perform thorough and detailed inspections of all drilling, abandonment,

and production handling or measurement operations. All blowout response contingency plans on Federal oil & gas leases are subject to technical review and approval of the BLM Authorized Officer.

[04-006]
This potential mitigation measure will be evaluated and edited if necessary to ensure that it meets all applicable Alaska Statutes and Regulations, specifically 20 AAC 25.

[04-007]
In addition to the minimum additional spill response countermeasure requirements of the BLM, CPAI's Spill Response and Prevention Plan would also be subject to approval by State of Alaska under the Alaska Statutes as cited by the commenter. The plan additions defined by the BLM in this document are not limiting of the standard plan regulatory requirements of other Federal or State agencies.

[T04-001]
The Final SEIS has been updated to reflect the suggested edit.

[T04-002]
The Final SEIS has been updated to reflect the suggested edit.

[T04-003]
The Final SEIS has been updated to reflect the suggested edit.

[T04-004]
Discussion of subsistence and recreation are not combined here; the statement is explaining that the road is for subsistence, not recreation.

[T04-005]
BLM will analyze the project proposal and may elect to determine a more appropriate non-reflective color for facilities, pipelines, and other equipment in accordance with current visual resources management policies and best management practices on federal lands.

[T04-006]
The Final SEIS has been updated to reflect the suggested edit.

[T04-007]
Table 4.6-1 included in the Draft SEIS outlines the parameters of analysis is the 2004 ASDP EIS and 2012 NPR-A IAP/EIS. This table is for background purposes, and the actual time frame for the GMT1 project is described in Table 4.6.4.

[T04-008]
The Final SEIS has been updated to reflect the suggested edit.

[T04-009]
The Final SEIS has been updated to reflect the suggested edit.

[T04-010]
BLM is taking the Umiat road into account in its cumulative analysis, but does not intend include alternatives that were under consideration before the Umiat Road EIS was put on hold, because

it would be speculative. The Meltwater alternative to the road to Umiat is speculative at this time and will not be included in the analysis.

[T04-011]
BLM confirmed that the correct numbers were used in the Draft SEIS.

[T04-012]
The Final SEIS has been updated to reflect the suggested edit.

[T04-013]
The Final SEIS has been updated to reflect the suggested edit.

[T04-014]
The Final SEIS has been updated to reflect the suggested edit.

[T04-015]
Comment is noted and the citation to BLM's National Petroleum Reserve in Alaska (NPR-A) 2013 Legacy Wells Strategic Plan has been added to the Final SEIS. As far as "abandonment" is concerned that is BLM vernacular for closure of all wells, even when they are cleaned up.

[T04-016]
BLM is taking the Umiat road into account in its cumulative analysis, but does not intend include alternatives that were under consideration before the Umiat Road EIS was put on hold, because it would be speculative. The Meltwater alternative to the road to Umiat is speculative at this time and will not be included in the analysis.

[T04-017]
BLM is taking the Umiat road into account in its cumulative analysis, but does not intend include alternatives that were under consideration before the Umiat Road EIS was put on hold, because it would be speculative. The Meltwater alternative to the road to Umiat is speculative at this time and will not be included in the analysis.

[T04-018]
BLM is taking the Umiat road into account in its cumulative analysis, but does not intend include alternatives that were under consideration before the Umiat Road EIS was put on hold, because it would be speculative. The Meltwater alternative to the road to Umiat is speculative at this time and will not be included in the analysis.

[T04-019]
BLM is taking the Umiat road into account in its cumulative analysis, but does not intend include alternatives that were under consideration before the Umiat Road EIS was put on hold, because it would be speculative. The Meltwater alternative to the road to Umiat is speculative at this time and will not be included in the analysis.

[T04-020]
BLM is taking the Umiat road into account in its cumulative analysis, but does not intend include alternatives that were under consideration before the Umiat Road EIS was put on hold, because it would be speculative. The Meltwater alternative to the road to Umiat is speculative at this time and will not be included in the analysis.

[T04-021]
BLM is taking the Umiat road into account in its cumulative analysis, but does not intend include alternatives that were under consideration before the Umiat Road EIS was put on hold, because it would be speculative. The Meltwater alternative to the road to Umiat is speculative at this time and will not be included in the analysis.

[T04-022]
The BLM will consider including the impacts of the 2012 drilling mud spill at Repsol's Q2 pad near Nuiqsut. The Repsol event was a spill of approximately 1,000 barrels of drilling mud and should be considered in the analysis of spills to the environment.

[T04-023]
The removal of surface water to locations outside the drainage basin would be irreversible and irretrievable. The loss of this resource is resupplied annually via precipitation and overbank flooding from adjacent rivers and streams.

[T04-024]
BLM guidance on consultation with Tribes and Alaska Native Corporations is clear: BLM Alaska will consult with both on a government-to-government basis. This was not part of the EO, it is an Alaska-specific requirement. There is only a slight difference in the requirements for Tribes vs corporations.

[T04-025]
These additional authorities have been added to Section 1.4.2.1: Lead & Cooperating Agency Authorities.

[T04-026]
The Final SEIS has been updated to reflect the suggested edit.

[T04-027]
Water for the ice bridge crossing over the Ublutuoch River with be taken from adjacent permitted lakes.

[T04-028]
It is correct that shallow ponds less than 6 feet do not dominate the Alpine Area. They do, however, dominate the ACP which is what is included in the Final SEIS.

[T04-029]
The Final SEIS has been updated to reflect the suggested edit.

[T04-030]
The reference to older fish studies in this section relates to the discussion of lake water use studies conducted in the early 2000s. Reference to pre-2004 and post-2004 fish studies and inventories are in Section 3.3.2.2 Fish Species. All of this fish presence information is incorporated into Map 3.3-4 Fish species distribution.

[T04-031]
The Final SEIS has been updated to reflect the suggested edit.

[T04-032]
The Final SEIS has been updated to reflect the suggested edit.

[T04-033]
The Final SEIS has been updated to reflect the suggested edit.

[T04-034]
Comment is noted.

[T04-035]
This paragraph on *Saprolegnia* is deleted from the 4.3.2 Fish section. Information on *Saprolegnia* and the presence of it observed on broad whitefish in fall 2013 has been developed in coordination with the NSB, Department of Wildlife Management and is discussed in the Subsistence section of the Final SEIS.

[T04-036]
The main intention of map 3.4-14 in the Draft SEIS was to clarify and point out that the area used in Visual and Noise impact analysis was larger than just the project study area. The project area does overlap with existing Alpine Satellite Development, but only features added within this area specifically for GMT1 were analyzed. By not including the already approved Alpine Satellite Development, BLM feels it avoided miscalculating impacts and only included the impacts from the GMT1 project.

[T04-037]
This observation has already been noted in the Draft SEIS on page 276, but to clarify the issue a sentence has been added to the Final SEIS to say "This effect may be most evident with the proposed GMT1 road in fall, and to a lesser extent spring, migration when the area is most heavily used by the TCH."

[T04-038]
The potential for a road to divert subsistence resources is discussed in the Environmental Consequences: Subsistence (Section 4.4.5). Resident access to the GMT1 has been clearly offered by the Applicant and a potential mitigation measure requiring a legally binding Right of Access Agreement is offered in the SEIS. Hunting directly from roads is illegal in the State of Alaska. Having similar questions about the placement of the pipeline in regards to hunting, BLM investigated whether the pipeline could be located on the south side of the road. However, the pipeline needs to be on the north side of the road as a safety precaution in the event of an oil spill. Monitoring of caribou movement and subsistence hunting from the road will continue.

[T04-039]
The BLM accepts responsibility for omission of these sources in the 2012 NPR-A IAP. Those reports were available but the BLM subsistence specialist was focused on the impacts of leasing areas to the entire NPR-A to the detriment of a complete analysis of subsistence impacts in Nuiqsut.

[T04-040]
Impacts from ice roads are discussed in Section 4.2.2 - Water Resources - which compares impacts across alternatives.

[T04-041]
Impacts from ice roads are discussed in Section 4.2.2 - Water Resources - which compares impacts across alternatives. The cumulative impacts from ice roads are also included in cumulative effects on water resources.

[T04-042]
The Environmental Justice section has been revised and expanded to be in accordance with CEQ guidance. Since 2004, BLM has recognized that its mitigation measures are not effectively reducing all impacts.

[T04-043]
The Environmental Justice section has been revised and expanded to be in accordance with CEQ guidance. Since 2004, BLM has recognized that its mitigation measures are not effectively reducing all impacts.

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ECOSYSTEMS,
TRIBAL AND PUBLIC
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April 22, 2014

Bridget Psarianos, Project Lead c/
o GMT-1 Draft SEIS Comments
222 West 7th Avenue, Stop#13
Anchorage, Alaska 99513

RE: EPA comments on the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth Unit Development Project Draft Supplemental Environmental Impact Statement, EPA Project# 04-005-BLM.

Dear Ms. Psarianos:

We have reviewed the above-mentioned Draft Supplemental Environmental Impact Statement in accordance with our responsibilities under National Environmental Policy Act and Section 309 of the Clean Air Act, as well as our role as NEPA cooperating agency. The Draft SEIS evaluates several alternatives for developing the Greater Mooses Tooth-I (GMT-I) project within the National Petroleum Reserve-Alaska, as well as the No Action alternative. The Bureau of Land Management (BLM) did not identify a preferred alternative in the Draft SEIS.

Under our NEPA Review policy and procedures, we rate draft EIS documents by considering both the adequacy of the document, and the potential environmental impacts of the action. We appreciate the full range of alternatives developed in the Draft SEIS and find that, in general, the document does an excellent job of describing the environmental impacts of the alternatives. However, because we believe additional information is needed to decide whether alternatives and/or mitigation should be modified, we are assigning an adequacy rating of "2" (Insufficient Information) to the document.

We have identified concerns regarding air quality and aquatic resources (specifically, vegetation, wetlands, and hydrology). **[05-001]** Based on the analysis of potential effects in the Draft SEIS, we find that Alternatives A (CPAI Proposed GMTl), C (Alternative Access-Nuiqsut) and D (Roadless Access) warrant a rating of EC (Environmental Concern) due to potential limitations to emergency response capabilities, greater impacts to the residents of Nuiqsut, greater emissions, avoidable impacts to Fish Creek and/or additional fill requirements. We rate the Avoid Fish Creek Setback alternative (Alternative B) LO (Lack of Objections) due to the superior emergency response capability (as a road alternative), fewer direct impacts to the Fish Creek watershed, fewer impacts to Nuiqsut residents, as well as generally less fill requirements than Alternatives C and D. We also commend the BLM and the applicant, ConocoPhillips Alaska, for incorporating additional mitigation measures which were previously considered in the original Alpine Satellites Development Plan EIS into the proposed project and alternatives. **[05-001]** Additional detail about our concerns and an explanation of our rating system are attached (Enclosures 1 and 3).

In our review role and as a cooperating agency, we also often assist the lead federal agency in identifying the environmentally prefen·ed alternative. Per guidance from the Council on Environmental Quality1 the environmentally preferred alternative is the alternative that causes the least damage to the biological and physical environment. **[05-002]** At this stage of planning and analysis, it appears that Alternative B would best promote the national environmental policy as expressed in NEPA's Section 101, and that it would be a valid choice for the environmentally preferred alternative in the Final SEIS.

However, we recognize that further, more detailed analyses or modifications of alternatives can tip the scales toward the choice of another alternative as environmentally preferable. **[05-003]** We understand that an additional roadless alternative incorporating seasonal drilling may be considered in the Final SETS. Because this alternative would address many of the concerns related to impacts on air quality, Nuiqsut residents, caribou, and emergency response, while lessening the need for an all-season road, we believe that, when fully analyzed, this alternative may prove to be environmentally preferable. A caveat to such a choice would be the potential for this alternative to exceed the national or state air quality standards due to increased frequency or type of aircraft, or other emission sources. If such exceedances are anticipated, and cannot be fully mitigated, this alternative could not be identified as environmentally preferred. If this alternative is determined to be reasonable, we recommend that it be fully analyzed.

Finally, we want to emphasize that in order to be permitted, **[05-004]** the selected alternative must comply with the 404(b)(1) guidelines under Section 404 of the Clean Water Act, and must be the least environmentally damaging practicable alternative (LEDPA). We encourage the applicant, the BLM and the U.S. Army Corps of Engineers to continue to work closely with the EPA to determine the LEDPA in the 404 permitting process. Part of the basis for the LEDPA decision is consideration of the functions and values of the wetlands potentially impacted in the project area. We have identified specific deficiencies in the wetlands functional assessment (Appendix E) that we believe need to be addressed in order to appropriately analyze and address these impacts to wetlands in the project area, particularly for the 404 permitting process (Enclosure 2).

We appreciate the opportunity to review this Draft SEIS. If you have questions concerning our comments, please contact me at (206) 553-1601 or reichgott.christine@epa.gov, or you may contact Jennifer Curtis of my staff in Anchorage at (907) 271-6324 or curtis.jennifer@epa.gov.

Sincerely,

Christine B. Reichgott

Christine B. Reichgott, Manager
Environmental Review and Sediments Management Unit

Enclosures

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[1] http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm

Enclosure 1
EPA Region 10 Detailed Comments on the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth Unit Development Project Draft Supplemental Environmental Impact Statement

Comparison of Alternatives

In general, all alternatives represent fewer impacts to a variety ofresources as compared to alternatives identified in the Alpine Satellites Development Plan Final EIS. We are particularly pleased with the reduced fill, thus resulting in reduced impacts to wetlands and other waters of the U.S. We believe that the impacts analysis does a good job at differentiating among alternatives, although we have concerns regarding the evaluation ofwetlands functions (please see below and enclosure 2).

[05-005] Based on this comparison, we have concluded that Alternative B, represents the most protective of resources, with a particular focus on greater emergency response capability due to year-round road access, fewer direct impacts to the Fish Creek watershed, generally less fill requirements, and fewer impacts to Nuiqsut residents due to reduced aircraft traffic and improved road access.

Air Quality

The following comments and questions regarding the air analysis are offered according to the specific sections in the Draft SEIS.

[05-006] In Section 3.2.3.1, please provide references for the discussed meteorological variable and period of record. Explain why the ConocoPhillips Alaska monitoring station data wasnotincluded.

[05-007] The second paragraph on page 68 mentions twelve stations in the NPR-A. Please clarify why temperatures and winds from the twelve stations are not discussed and presented in this section. We recommend that air quality dispersion potential be discussed in this section (e.g. prevailing winds, mixing height, onshore/offshore wind flows, etc.).

[05-008] In 3.2.3.2, please include information regarding the meteorology, representativeness, period of record, and Alaska Department of Environmental Conservation acceptability for use in dispersion modeling.

[05-009] On page 69, second paragraph, we recommend additional information on new construction after 2004 as well as to the east and the west, ifapplicable.

[05-010] Under 4.2.3.2, for the first paragraph on page 202, ifthe project schedule is extended, please identify if the additional hours ofmeteorology would change the impacts and your conclusion. Also, we recommend that this section include a sentence that there are no Class I areas within X-number of miles ofGMT-1 in the second paragraph. **[05-011]** In first sentence ofthe third paragraph, please provide a list ofthe equipment and emission rates. Also for the third paragraph, please show the emission rates in a table (or location ofthe table in the EIS.), identify "other regulated pollutants", provide a justification for limiting consideration to PM10, and provide information concerning any secondary PM10 formation.

[05-012] In the fourth paragraph on page 202, please define "seasons". In the fifth paragraph, first sentence, please provide location ofthe table for Alternative A in the EIS.

[05-013] In the fourth paragraph on page 203, we recommend that all activities and alternatives should be compared with Class II increments and NAAQS. **[05-014]** In the fifth paragraph, we recommend that appropriate references be provided.

For Table 4.2-9, please explain how the modeling was completed in terms of the meteorological year used. **[05-015]** For Table 4.2-10, please clarify if emissions were modeled for 3 or 5 separate years. **[05-016]** Under the Hazardous Air Pollutants, please consider including a table for all emission source types.

[05-017] On page 205, second paragraph, please clarify if a cumulative analysis was performed (i.e., alternative plus nearby sources). In the final paragraph on page 205, please describe if there is any concurrent operations of the five scenarios (i.e., source contributions).

[05-018] For first paragraph on page 207, please include reference to calculation methodology. **[05-019]** In the second paragraph, please clarify if a PM monitor will be employed to verify the adequacy of watering. **[05-020]** In the fourth paragraph, please explain why only an increment analysis was performed for the Infill Drilling scenario.

[05-021] For Table 4.2-12, please clarify if the State of Alaska has increment consumption limitations for N02, PM10 and PM2.5 in their regulations. **[05-022]** For Table 4.2-13, please clarify if a cumulative analysis was performed (i.e., alternative plus nearby sources).

[05-023] On page 209, first paragraph, statements are made regarding ozone in the polar region. Please provide references for those statements. In the second paragraph, please provide a reference regarding the EPA evidence and discuss Deadhorse speciation measurements.

[05-024] On page 210, first paragraph, please reference the table showing that Class increments are not exceeded.

[05-025] On page 213, first paragraph, please consider if additional hours of modeling could create a significant impact. **[05-026]** In the third paragraph, please define "slightly higher".

[05-027] On page 215, in the second paragraph, please explain how much higher ongoing mobile source emissions in Nuiqsut would be, and how much higher construction and operational emissions for Alternative C. **[05-028]** For the third paragraph, please include an extrapolated emissions table.

[05-029] For Table 4.2-32, please identify if there is a State of Alaska regulation on increment exceedance. **[05-030]** For Table 4.2-33, please consider secondary PM formation contribution.

[05-031] Table 4.2-44 shows PM emissions as being greatest in Alternative C. As such, we believe Alternative C should be modeled.

Appendix K

[05-032] In the *ConocoPhillips Alaska, Inc. Greater Mosses Tooth 1 Alternative D (Roadless) Air Quality Impact Analysis, Final,* Section 1.0, first paragraph, we recommend that BLM compare concentrations to Calss II increments at maximum point of impact at well. Also, please confirm that the 33 wells identified in the second paragraph were modeled. **[05-033]** In Section 1.1.2, please confirm if the new emissions were modeled.

[05-034] Under Section 2.0, please confirm ifthe U.S. Fish and Wildlife Service, as signatory to the air quality Memorandum ofUnderstanding, has reviewed and accepted the emissions inventory. **[05-035]** Under Table 2-15, we recommend an additional table be developed to compare the preferred alternative emissions and the roadless alternative for GMT1.

[05-036] For 3.5.1,please provide a reference for this technique discussed in the last sentence (page 3-5) and if used inthe compliance demonstration. **[05-037]** For 3.5.2 please provide a reference for this modeling technique. **[05-038]** In Section 3.6, please provide each reference used in this technique as well. **[05-039]** In Section 3.9, please discuss project ambient boundary with respect state and federal definitions. **[05-040]** In Section 3.10ft appears that a cumulative analysis has not been included in this appendix. We recommend that one is developed and included in the Final SEIS Appendix K.

[05-041] In Tables 5-:1, 5-2, 5-3, 5-4, and 5-6, for the predicted violations, please provide possible mitigation measures. **[05-042]** For 5.1.3 we recommend that a N02 quantitative analysis be included as it is preferable over a qualitative analysis. **[05-043]** Please add "and subject to PSD" to end offirst sentence ofthird paragraph on page 5-14. **[05-044]** Also, please clarify the first sentence under "CCP Emissions and CCP Ambient Monitoring Data Analysis" on page 5-14.

[05-045] Table 5-8 is shown on page 5-14 but not referenced in the text. Please clarify.

[05-046] In the last paragraph of5.1 .6, we note that there are secondary PM 2.5 measurements at Deadhorse and Wainwright. We recommend that the secondary measurements be discussed in the EIS.

[05-047] In 5. 1.8 please compare the predicted Class II increments and cumulative impacts oftheproposed alternative (Alternative A) with the roadless alternative (Alternative D).

[05-048] Finally, in October 2013, Julie Wroble from the EPA Region 10provided comments relating to air toxics analysis in Appendix K. These comments were responded to on October 18, 2013, in a document entitled "ConocoPhillips Alaska, Inc. Greater Mooses Tooth 1 Air Quality Impact Analysis - Final, ATTACHMENT F - Response to Comments". While we were satisfied with the responses to these comments, subsequent changes were not incorporated into the Draft SEIS or Appendix K. We recommend that these responses be reflected in some manner, (e.g. attached to Appendix K) in the Final SEIS.

Vegetation and Wetlands

Impacts to vegetation and wetlands are evaluated in the Draft SEIS using the impact criteria explained in Table 4.3-1. These impact criteria measure the magnitude of impacts, in part, by wetland functional categories, as determined by the "Wetland Functional Assessment for the Greater Mooses Tooth Unit Development Project - 2013, Final Report" by ABR, Inc., dated December 2013, found in Appendix E ofthe Draft SEIS. In general, we have concerns regarding both the wetland functional assessment and the impact criteria as they are used to compare impacts to vegetation and wetlands between alternatives.

Wetland s Functional Assessment

The adequacy ofthis wetland functional assessment (WFA) is important for two reasons. First, the findings ofthe WFA are used in the impact criteria for evaluating impacts to vegetation and wetlands for the four action alternatives. See, for example, Table 4.3-1,where "low intensity" is defined as,
"Impacting <5% ofany vegetation type or <5% ofthe total area of Functional Category I and II

wetlands within the project study area". Second, in the Clean Water Act Section 404 (CWA 404) permitting context, wetland functional assessments are used to derive measures ofvalues; values are used to derive a measure ofloss ofaquatic resources; and losses are used to derive the amount of compensatory mitigation that may be required ofa project applicant to offset those losses. An inadequate WFA may lead to erroneous conclusions about the extent ofenvironmental impacts as analyzed in the EIS, and the extent oflosses of aquatic resources as evaluated in a CWA 404 permit.

[05-049] We believe the WFA to be inadequate for three reasons. First, it employs a methodology that is deficient. Second, we have conducted a thorough re-assessment ofthe saturated graminoid shrub wetland type (the most prevalent type in the GMT-I project area), using the same data sheet and evaluation questions as are used in the WFA, and we have come to the conclusion that these wetlands perform functions at a higher level than stated in the WFA. Third, the U.S. Army Corps ofEngineers has ranked the functional performance of wetlands ofthe same types in a project area immediately adjacent to the GMT-1 project at a higher level than that proposed in the WFA.

[05-050] *The wetland assessment methodology is deficient.* The WFA is based on the Literature Review and Evaluation Rationale of the Wetland Evaluation Technique (Adamus et al. 1991) and the Rapid Proced ure for Assessing Wetland Functional C a pacity (Magee 1998). These two methods apply to.temperate ecosystems in the Lower 48. **[05-051]** The assessment is carried out by answering evaluation questions on a data form (one data form for each wetland functional class), "Waters and Wetland Functions Data Form - Alaska Regulatory Best Professional Judgment, Characterization for North Slope, Alaska (Modified by ABR Inc. Feb 2013)". The WFA states that this data form was derived in consultation with USACE-Alaska District personnel, and modified from Adamus et al. (1991) and Magee (1998) to address the functions that reflect North Slope wetlands and waters ofthe U.S.

We find that many ofthe questions onthe data form do not apply well to the very different Arctic ecosystems (i.e. permafrost-driven, not discrete, and with decumbent vegetation) that the Adamus et al (1991)and Magee (1998) methods were designed to address. **[05-052]** We are not aware ofany consultation with the Corps which modified the data form, and have not received any guidance from the Corps indicating that a different procedure should be followed starting in February 2013. **[05-053]** Whereas Adamus et al (1991) takes more than 200 pages to explain how to evaluate a suite offunctions in Lower 48 systems, this WFA does not explain how the evaluation questions are to be interpreted and answered. Many ofthe questions are vague such that meaningful answers cannot be determined. A desktop analysis does not adequately capture many functional attributes that on-the-ground observations would confirm. For all of these reasons, erroneous conclusions in ranking functional categories may have been drawn in the GMT- 1 WFA.

EPA reevaluation of wetland functions performed by the saturated graminoid shrub type. **[05-054]** We have performed a reevaluation ofthe functions performed by the saturated graminoid shrub wetland functional class, using the same data form and answering the same evaluation questions as were used in the GMT-1 WFA (see Attachment 2). We chose to reevaluate this wetland type because it is the most prevalent type in the project footprint, mapped as 82.6 acres out ofa total wetland impact acreage of 91 .22, or 90.55% ofthe impacted area (WFA, Table 3). Instances where the evaluation question does not apply to Arctic ecosystems, is vague, or for which answers cannot be determined using a desktop analysis are explained in the Rationale column ofeach table in the reevaluation. ABR ranked the wetland functional classes into functional categories using the Alaska Region Regulatory Guidance Letter 09-01 criteria, and based on its analysis, found the saturated graminoid shrub type to have an

[05-054] overall Moderate to Low ranking, assigning it as Category III. Our overall finding is that the saturated graminoid shrub type instead performs wetland functions at a High level. Our analysis and reasoning is explained in detail in Enclosure 2.

The Corps has determined a higher functional ranking for the same type of wetlands for the Nuiqsut Spur Road project, an area immediately adjacent to the GMT-1 project area. **[05-055]** The U.S. army Corps of Engineers, Alaska District, has recently issued a CWA 404 permit for the Nuiqsut Spur Road project (POA-2013-68, Colville River, issued on March 12, 2014). The Nuiqsut Spur Road project is located immediately adjacent to the GMT-1 project area, and consists of a 5.8 mile long road running from the village of Nuiqsut northward to the CD-5 access road, and an 11-acre laydown pad located at the junction of the two roads. The adequacy of the wetland functional assessment performed for the Nuiqsut Spur Road project as originally proposed was questioned by the reviewing agencies, including EPA and U.S. Fish and Wildlife Service. The most prevalent wetland functional class is the same for both projects: for the GMT-1 project, it is called saturated graminoid shrub, and for the Nuiqsut Spur Road project, it consists of moist tussock tundra and moist sedge/shrub meadow. (Note: the GMT-1 WF A, Table 2 identifies the saturated graminoid shrub type as including, or "lumping" the moist tussock tundra and moist sedge/ shrub meadow types together.) The wetland functional classes for both the Nuiqsut Spur Road project and the GMT -1 project were derived from the same ITU mapping performed by Jorgenson et al. (2002, 2003).

[05-055] In its decision on the Nuiqsut Spur Road project, the Corps assigned Category II to the moist tussock tundra and moist sedge/shrub meadow types. Because the moist tussock tundra and moist sedge/shrub meadow types for the Nuiqsut Spur Road project were determined bythe Corps to be rated as Category II, we believe that the same type for the GMT-1 project, saturated graminoid shrub, would also merit no less a ranking than Category II.

Impact Criteria for Vegetation and Wetlands

[05-056] The impact criteria for vegetation and wetlands are given in Table 4.3-1. Ifthe purpose ofconducting an impact analysis using these criteria is to identify differences betweel) the alternatives, such that one may stand out as having more or fewer impacts when compared to the others, we find that these criteria do not serve well to make such a distinction. In particular, the "medium intensity" impact is defined as "Impacting 5 to 25% ofa vegetation type or 5% to 10% ofthe total area of Functional Category I and II wetlands within the project study area."

[05-057] Considering the second partofthis criterion (impacting 5%to 10% ofthe total area ofFunctional Category I and II wetlands within the project study area), Table 4.3-4 indicates the total project study area to be 102,487 acres. Five percent of 102,487 acres is 5,124 acres. The entire acreage, across all vegetation types and including indirect impacts, for Alternative A is 595.3 acres; this equates to 0.58% ofthe total project study area, and is only about one-tenth ofthe 5,124 acre threshold to be considered medium intensity. In the case of Alternative C, the alternative with the largest acreage ofdirect and indirect impacts, 1,368.7 acres equates to 1.33% ofthe total project study area, still far from the 5% threshold tobe considered ofmedium intensity. Inother words, considering allofthe vegetation types, and assuming that they would allbe Functional Category I or II wetlands, there is no possibility of exceeding the 5% threshold to meet medium intensity.

[05-058] The first part ofthe criterion, (impacting 5 to 25% ofa vegetation type), is skewed toward capturing only the rarest (least acreage) vegetation types. In fact, Alternatives A and C were rated as exceeding

[05-058] the 5% intensity threshold based solely on one vegetation type, Cassiope dwarf shrub tundra, which occupies only 85.6 acres out of the entire 102,487 acre project study area (0.1%), and then only when the 300 ft. indirect zone of impact is applied. By this decision alone, and with all other impact criteria findings (duration, extent, context) being equal, were Alternatives A and C bumped up from an overall Minor impact ranking to an overall Moderate impact rating (Table 4.1-2). These impact criteria, therefore, have pointed out the importance of one rare vegetation type, but have not captured the differences in other impacts to vegetation and wetlands across alternatives. This is not a very meaningful way to differentiate between alternatives for vegetation and wetlands.

[05-059] Impacts to vegetation and wetlands are qualitatively very well described in Section 4.3.1 of the Draft SEIS. To grasp a more quantitative view of differences in impacts to vegetation and wetlands across alternatives, we suggest augmenting the impact criteria with the information in Table 4.3-4, where acreages of indirect impacts of construction on vegetation and wetlands based on a 300-foot zone of impact are listed. Alternative C will impact more than twice the acreage of Alternative A (1,368.7 vs 595.3). Alternatives A and B will impact similar amounts of acreage (595.3 vs. 613.7). Alternative D will impact about half the acreage of Alternative A (275.9 vs. 595.3).

Hydrology

[05-060] The Draft SEIS concludes that impacts to water resources "tend to be proportional to the amount of area impacted by infrastructure, with modifications due to specific activities and locations. However, for all action alternatives the intensity of impacts is characterized as minor and of localized extent." (Section 4.2.2.6). With respect to impacts on hydrology, we do not agree. The effects of gravel fill for an airstrip, road or pad are well described in Section 4.2.2.1. Quantitative differences between the alternatives for inundation resulting from new roads are given in Table 4.2-6, where the areas of increased stage and decreased stage for Alternative D are shown as "negligible". Likewise, in Table 4.2-7, Summary of Major Components Potentially Impacting Hydrology, Alternative D is shown with a much shorter road, no bridges, and a fraction of the number of culverts when compared to the other alternatives. **[05-061]** The gravel fill for Alternative D will be consolidated in one locality. By contrast, the road required under the other three alternatives will perpendicularly cross the hydrologic gradient, the topographic gradient, and the wind direction gradient. The likelihood of the road behaving as a dam to disrupt hydrology is discussed in the Draft SEIS. We believe that the intensity of impacts to hydrology is less for Alternative D, and that the extent is more localized for Alternative D, than for the other three alternatives. The impacts to hydrology are not proportional to the amount of area impacted by infrastructure, but are rather related to the configuration of gravel fill. Whether the fill is strung across the landscape (as for a road) or consolidated at one location (as for a pad) makes a difference in impacts to hydrology, and this difference has not been captured in the impacts analysis in Section 4.2.2.6.

Monitoring

[05-062] As per the 2013 NPR-A Integrated Activity Plan Record of Decision, we encourage the BLM to develop a comprehensive monitoring plan for the project in consultation with the applicable resource agencies and local stakeholders. This monitoring should occur during construction and operation and have particular focus on air quality, hydrology, and subsistence. We believe this information will be helpful not only for the understanding of this project, but also for future projects within the NPR-A.

Enclosure 2
EPA Evaluation of Functions for the Saturated Graminoid Shrub Wetland Functional Class in the Appendix E Wetland Functional Assessment for the Greater Mooses Tooth Unit Development Project - 2013

EPA offers a reevaluation of functions for the Saturated Graminoid Shrub wetland functional class in the tables (1-A through 1-H) that follow. There is a table for seven of the eight functions that ABR evaluated in the *Wetland Functional Assessment For The Greater Mooses Tooth Unit Development Project - 2013* (WFA) (ABR 2013) on pp. A-20 and A-21, and summarized on p. A-22. In the first column of each table are the best professional judgment characterization questions for each function. In the second column are the answers to these questions as given by ABR. In the third column are EPA's answers to these questions. In the fourth column are EPA's rationales for its answers to the questions.

A summary of ABR's and EPA's rankings of the functions is given in Table 2.

Table 1-A. Flood Flow Regulation (Storage and Desynchronization)

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
A1. Wetland occurs in a zone with relatively deep active layers.	No	Not deter-mined (N/D)	This attribute cannot be determined from a desktop analysis, without ground-derived data. Further, "relatively deep" is not defined, and even if depth of active layer were available for this wetland type, the break-point between the type exhibiting relatively deep active layers (a "Y" answer) and not having relatively deep active layers (an "N") answer is not determined. The saturated graminoid shrub type develops an active layer tens of centimeters deep every summer.
A2. Wetland has a dense herbaceous or woody layer.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
A3. Wetland or water is capable of retaining much higher volumes of water during storm events than under normal rainfall conditions.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
A4. Wetland or water is a closed (depressional) system subject to flooding or shows evidence of flooding.	No	Yes	The saturated graminoid shrub type is not a closed depressional system. However, it is subject to annual flooding during break-up. Michael Baker Jr., Inc. (2013) (hereinafter, "Baker 2013") documents overbank flooding from the Ublutuoch River onto adjacent tundra during June 2013 break-up (see pp. 27-36, including photos).
A5. If flow-through, wetland or water has constricted outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.	No	Not appli-cable (N/A)	This characterization question does not apply to the saturated graminoid shrub type, because it is not a "flow-through" system. During breakup and subsequent thaw, however, it does act partly as a "flow-through" system, delivering surface and very shallow subsurface flow to adjacent waters.
A6. Wetland or water receives floodwater from an adjacent water course at least once every 10 years.	No	Yes	Receipt of floodwater by adjacent wetlands from the Ublutuoch River during 2013 break-up is documented by Baker (2013). Table 4.4 gives peak annual stages estimates for the Ublutuoch

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
			River as 9.8 feet BPMSL for the 2-year recurrence interval, 10.6 feet BPMSL for the 5-year recurrence interval, and 10.8 feet BPMSL for the 10-year recurrence interval. The flattening-out of peak annual stage estimates at approximately 10.8 feet BPMSL for all recurrence intervals above 10 years (as shown in Graph 4.2) is explained by floodwater from the Ublutuoch River overtopping the river banks and flowing onto adjacent wetlands during break-up at an interval of 10 years. The same is true at other water course crossings of the proposed GMT-1 road route, that saturated graminoid shrub wetlands could receive floodwater from adjacent streams once every 10 years (e.g. S4 and S5 streams as identified in Baker (2013)). Note also that ABR answered question B2 (slow-moving or still water is present or occurs during flooding that happens at least once every 10 years) as a "Y", which is inconsistent with ABR's answer to this A6 question.
A7. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	No	Yes	In addition to saturated graminoid shrub type wetlands adjacent to water courses (e.g. Ublutuoch River, S4 and S5 streams) receiving floodwaters from those water courses, the saturated graminoid shrub type wetlands contribute sheet flow every year at break-up, due to snow melt. Baker (2013) demonstrates sheet flow in numerous photographs taken during the 2013 spring break-up (e.g. Photos 3.2, 3.6, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, 3.14).

Rating for Flood Flow Regulation. ABR rated the saturated graminoid shrub type for the flood flow regulation function as moderate, based on two "Y" answers out of seven possible questions. ABR also comments (on page A-22) that the wetland is found commonly throughout the study area, and that it is well vegetated but not subject to frequent flood events so only provides moderate value for this function.

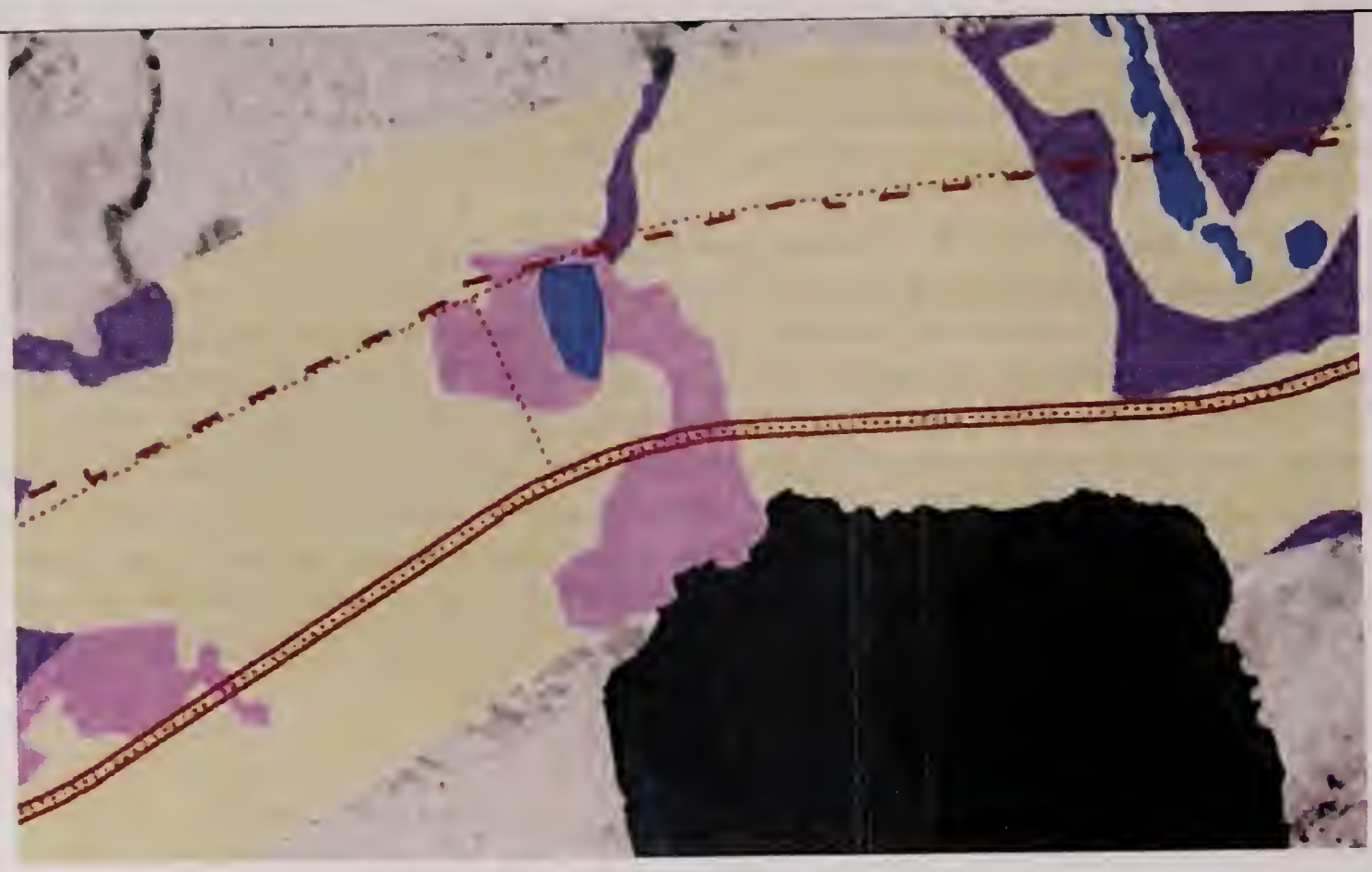
EPA finds five "Y" answers out of five possible questions. (Note that two of the seven questions could not be answered because one of the questions was not applicable to this wetland type, and the answer to another question could not be determined based on a desktop analysis.) Further, the fact that this wetland type is common throughout the study area does not affect its ability to perform the flood flow regulation function. This wetland type functions to regulate flood flow every spring during the break-up event, by receiving and transmitting snow melt down-gradient, and by receiving overbank flooding from adjacent water courses, which occurs at least every 10 years. EPA rates saturated graminoid shrub as high for the flood flow regulation function.

Table 1-B. Sediment, Nutrient (N and P), Toxicant Removal

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
B1. Sediment, nutrients and/or toxicants (from tillage, mining, construction or other sources of pollution) appear to be or are likely to be entering the wetland or water.	Yes	Yes	EPA agrees with ABR's characterization of this attribute. Dust and gravel will be deposited onto saturated graminoid shrub wetlands adjacent to the GMT-1 road and pad.
B2. Slow-moving or still water is present or occurs during flooding that happens at least once every 10 years.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
B3. Dense (>50% cover) herbaceous vegetation is present.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
B4. At least moderate interspersion of vegetation and water is present or occurs during flooding that happens at least once every 10 years	No	Yes	Baker (2013) documents many observations of interspersion of water and vegetation during and after the spring break-up, especially noted as occurring in polygon depressions (i.e. patterned ground tundra, which is in the saturated graminoid shrub wetland type). Some examples: • "On June 9, the Clover C area was mostly snow-free with local melt present in surrounding tundra polygons." (p. 25) • "On June 28…Flow was contained within polygon depressions (Photo 3.4)" (p. 25) • "On June 1, local melt was present within polygon depressions on the surrounding tundra." (p. 27) • "On June 6,…surrounding tundra polygon depressions were filled with local melt or persistent snow." (p. 29) • "local melt accumulating in polygon depressions" (p. 58) Further, the interspersion of water and vegetation persists after break-up and into the end of the growing season. This is plainly seen in Figure 1 below. The saturated graminoid shrub wetlands are characterized by patterened ground with polygon troughs full of water in mid-August.
B5. Sediment deposits are present (evidence of deposition during floods).	No	N/D, N/A	EPA believes that this attribute cannot be determined using a desktop analysis. It is very likely, however, that sediments (specifically, dust and gravel) will be carried by wind and vehicle spray from the GMT-1 road and pad onto adjacent saturated graminoid shrub wetlands. On the Arctic coastal plain, the primary vector for deposition of sediments (which are pollutants) is from wind, not water.
B6. Thick surface organic horizon and/or abundant fine organic litter is present.	No	Yes	Table 2 in the WFA describes the saturated graminoid shrub class, and states that dwarf and low ericaceous shrubs are common. These shrubs produce fine organic litter every growing season. Further, moist tussock tundra is a component of the saturated graminoid shrub class (as stated in Table 2 of the WFA.) Tussocks form because of profuse growth of vascular plants, and organic litter would be present.

Rating for Sediment, Nutrient, and Toxicant Removal. ABR rated the saturated graminoid shrub wetlands as moderate for the sediment, nutrient and toxicant removal function, based on three "Y" answers out of a possible six questions. ABR also comments (on page A-22) that the wetland is not exposed to frequent flood events so only provides moderate value for this function.

EPA finds five "Y" answers out of five possible questions. (Note that one of the six questions could not be answered because the answer could not be determined using a desktop analysis, and because the question was not applicable to the Arctic coastal plain.) At the current time, the saturated graminoid shrub wetlands are in an unpolluted, undisturbed state. After GMT-1 road and pad construction, these wetlands will be exposed to indirect impacts including gravel spray and covering by wind-borne fugitive dust. Saturated graminoid shrub wetlands, being characterized by 100% vegetative cover and water, would intercept windborne dust until smothered, dessicated and no longer able to sustain vegetative growth. Annual flooding during spring break-up will convey pollutants down-gradient, and removal will continue to occur especially in polygon troughs connected to adjacent waterbodies. EPA ranks saturated graminoid shrub wetlands as high in performing the sediment, nutrient and toxicant removal function.



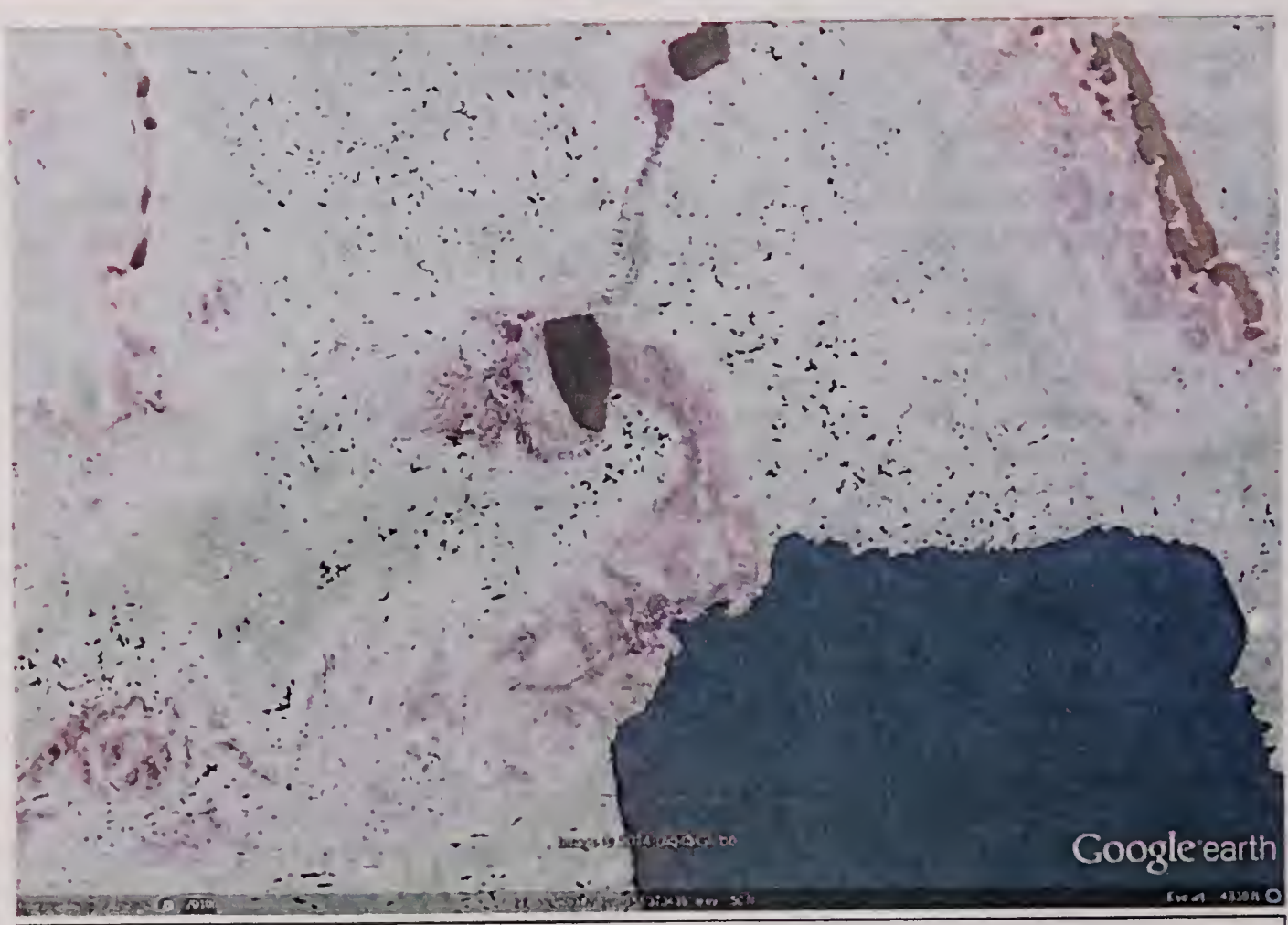


Figure 1. Top photo is excerpted from Figure 2 of GMT-1 Wetland Functional Assessment; light green shading is saturated graminoid shrub type. Bottom photo is from GoogleEarth image dated August 12, 2012; note water in polygon troughs interspersed with vegetation, in the saturated graminoid type. The geographic area depicted here corresponds to Michael Baker Jr.,

Table 1-C. Erosion Control and Shoreline Stabilization

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
C1. Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.	N/A	Yes	On Figure 2 of the WFA, saturated graminoid shrub wetlands (coded in light green) are shown as directly abutting water courses (lower perennial stream, coded in turquoise) at three places where the proposed GMT-1 road would cross: • Ublutuoch River (70.2846 N, 151.2575 W) • Stream S4 (as identified in Baker 2013), a beaded stream (70.28113 N, 151.29356 W) • Stream S5 (as identified in Baker 2013), a beaded stream (70.27906 N, 151.3294 W). The saturated graminoid shrub wetlands' functioning to absorb flood energy during spring break-up without eroding is shown in photographs from Baker (2013): Photos 3.8, 3.9, 3.10, 3.11, and 3.12 for Ublutuoch River; Photo 3.17 for Stream S4; Photos 3.19 and 3.20 for Stream S5.
C2. Historical aerial photography (if available) indicates stable shoreline features.	N/A	N/D	The only "historical" aerial photography that EPA has ready access to is dated in 2007. We do not have aerial photography available from long enough ago to determine if streambank features have remained stable at the Ublutuoch River, Stream S4 and Stream S5 where these water courses would be crossed by the GMT-1 road.

Rating for Erosion Control and Shoreline Stabilization. ABR found that this function did not apply to the saturated graminoid shrub wetlands. No explanation is given in the WFA as to why this function would not apply to saturated graminoid shrub wetlands.

EPA finds that the saturated graminoid shrub wetlands perform the erosion control and shoreline stabilization function at a high level, based on answering one question out of two as "Y", with the answer to the other question being not determinable. According to the decision rule contained in ABR's data form, one or two "Y" answers result in a high functional rating.

Table 1-D. Organic Matter Production and Export

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
D1. Wetland is flooded at least once every 10 years. If no, proceed no further, wetland is low functioning.	N/A	Yes	Baker (2013) documents flooding at least once every 10 years. See EPA rationale for question A6 above for additional discussion.
D2. Wetland has at least 30% cover of herbaceous vegetation.	N/A	Yes	The saturated graminoid shrub wetlands have an herbaceous vegetative cover of nearly 100%, as can plainly be seen on aerial imagery.
D3. Woody plants in wetland are mostly deciduous.	N/A	Yes	The saturated graminoid shrub wetland functional class is comprised of moist sedge shrub tundra and moist tussock tundra (WFA Table 2); these two vegetation classes are described in Jorgenson et al 2003 (Table 7). Woody plants in the moist sedge-shrub tundra vegetation type include *Dryas integrifolia, Salix reticulata, Salix lanata*

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
			richardsonii, and *Salix planifoia pulchra*. Woody plants in the tussock tundra vegetation type include *Vaccinium vitis-idaea, Salix planifolia pulchra, Betula nana, Salix phlebophylla, Dryas integrifolia,* and *Salix reticulata*. These woody plants are mostly deciduous.
D4. High degree of plant community structure, vegetation density, and species richness present.	N/A	Yes	These attributes cannot be determined from aerial photography or satellite imagery alone; ground studies would be required to describe these vegetation attributes. The WFA also relies, however, on ITU mapping as described in Jorgenson et al (2003). Descriptions for the moist sedge shrub tundra and tussock tundra vegetation classes are given in Jorgensen et al (2003), at Table 7. • For plant community structure, both moist sedge shrub tundra and tussock tundra vegetation types contain non-vascular plants, sedges, grasses, and shrubs; EPA concludes this to be a high degree of plant community structure, especially when considered in the Arctic context. • In its current state, vegetation density in the proposed GMT-1 road and pad area is high because, except for waterbodies and water courses, vegetative cover is nearly 100%. This attribute is plainly seen on aerial photography and imagery. Neither the wetland functional class map (Figure 2 of WFA) nor the vegetation map in Jorgenson 2003 (Figure 8) show any barren or partially vegetated areas in the GMT-1 road corridor study area. • For species richness, 15 plant species are listed for moist sedge shrub tundra, and 12 plant species are listed for tussock tundra; EPA concludes these numbers of species to indicate a high degree of species richness when contrasted to other vegetation types in the NE NPR-A area, e.g. fresh sedge marsh (which can consist of only a single plant species).
D5. Interspersion of vegetation and water is at least moderate.	N/A	Yes	Refer to EPA rationale in B4 above.

Rating for Organic Matter Production and Export. ABR found that this function did not apply to the saturated graminoid shrub wetlands. No explanation is given in the WFA as to why this function would not apply to saturated graminoid shrub wetlands.

EPA finds that saturated graminoid shrub wetlands perform the organic matter production and export function at a high level, based on five "Y" answers out of a possible five questions, using this dataform.

The saturated graminoid shrub wetlands are vegetated to a high degree, with a deciduous shrub component, and are exposed to annual flooding during spring break-up.

Table 1-E. General Habitat Suitability

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
E1. Wetland or water is not fragmented.	No	Yes	The question, as stated, is vague because "fragmented" is not defined. The WFA on p. 2 states that the functional assessment procedure was based, in part, on the U.S. Army Corps of Engineers Regulatory Guidance Letter (RGL 09-01). If, then, this question is derived from the RGL 09-01, Wetland Functions Data Form-Alaska Regulatory Best Professional Judgment Characterization, then the corresponding question there reads, "Wetland is not fragmented by development." The answer is, "Yes, this wetland is not fragmented by development", because, to date, no oil and gas infrastructure development has occurred in the proposed GMT-1 project area.
E2. Area surrounding wetland or water is undisturbed.	No	Yes	We disagree that the area surrounding the saturated graminoid shrub wetlands in the GMT-1 project area are disturbed. Figure 2 of the WFA shows that the GMT-1 road, drill pad and pipelines will be placed in a previously undisturbed area, with no existing oil and gas infrastructure aside from the to-be-built CD5 pad. According to Table 3 of the WFA, the total acreage of saturated graminoid shrub wetlands to be impacted by the GMT-1 road, drill site, CD5 to GMT-1 pipeline VSMs, Clover material site and valve pads is 82.59 acres. Figure 3 of the WFA (depicted at an entirely different scale than Figure 2) shows the wetland types surrounding the proposed new VSMs for a new, third pipe rack running from CD1 to CD4N; according to Table 3 of the WFA, the associated acreage for saturated graminoid shrub wetlands along this path is only 0.01 acres. Although the CD1 to CD4N pipe rack would be situated in previously disturbed area, its saturated graminoid shrub footprint is less than a thousandth of a percent of the area of saturated graminoid shrub that will be constructed in an entirely undisturbed area.
E3. Evidence of wildlife use (e.g. nests, tracks, scat, gnawed stumps, survey data) is present. Waters only high functioning if wildlife survey or direct observation data are available.	Yes	Yes	EPA agrees with ABR's characterization of this attribute. The GMT-1 Draft Supplemental EIS documents moist sedge-shrub tundra and moist tussock tundra as potential high value bird habitat in the GMT-1 project study area (BLM 2014, Table 4.3-8). The saturated graminoid shrub wetland functional class is comprised of these two types, moist sedge shrub tundra and moist tussock tundra (WFA Table 2).

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
E4. Plant community has two or more strata, with at least two of those strata having >10% total cover.	Yes	Yes	EPA agrees with ABR's characterization of this attribute. The saturated graminoid shrub wetland type consists of non-vascular plants (mosses and lichens), graminoids (grasses and sedges) and shrubs (including the woody plants *Dryas integrifolia, Salix reticulata, Salix lanata richardsonii, Salix planifoia pulchra, Vaccinium vitis-idaea, Betula nana,* and *Salix phlebophylla*; Jorgensen et al 2003). There are thus at least three strata in this wetland type. All three of these strata exceed 10% total cover, as documented in Figure 16 of Jorgensen et al (2003).
E5. Wetland has at least a moderate degree of Cowardin Class interspersion.	No	Yes	EPA assumes that this question is derived from the WET method, Predictor #16, Vegetation Class Interspersion (predictor for breeding, migration, and wintering) (Adamus et al. 1991). This predictor was originally targeted to identify use by waterbirds and other specific water-dependent species groups. In the lower 48 states, interspersion of vegetation types is selectively favored by these groups. EPA suggests that the interspersion identified in WET takes on a different definition on the Arctic tundra. Furthermore, many species of wildlife do not require interspersion of vegetation classes to support habitat uses such as shorebird nesting, hunting bird habitat, grazing by caribou, feeding by brown bears, feeding and denning by arctic foxes. In this WFA, the amount of interspersion that would constitute a "moderate degree" is not defined or described, making it not possible to answer the question with predictability and repeatability. Study of imagery of the proposed GMT-1 project footprint area shows a high degree of interspersion of vegetation types across the NE NPR-A landscape. This can also clearly be seen on Figures 2 and 3 of the WFA, which focus on the wetland types immediately adjacent to the proposed project footprint. On Figure 2, the saturated graminoid shrub wetland type (in light green) in the GMT-1 road and pipeline corridor is interspersed with 53 map-polygons of different colors (i.e. different Cowardin classes). On Figure 3, the smaller area for the new pipe rack between CD1 and CD4N shows 16 map-polygons of different colors (i.e. different Cowardin classes) than the saturated graminoid shrub wetland type.
E6. Diversity (evenness of cover) of plant species is moderately high (≥ 5% species with at least 10% cover each).	No	N/D	It is not possible to determine plant species diversity without ground-derived information.

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
			The rapid desktop analysis will not capture this attribute. Furthermore, EPA suggests that plant species diversity is less important to general habitat suitability in the Arctic than in the temperate systems where this attribute was identified as having importance, and that importance being limited to wetland-dependent birds (Adamus et al. 1991, Predictor #17). For example, wetlands dominated by *Arctophila fulva* are very important in supporting grazing by waterfowl; wetlands which support lemmings will provide feeding for foxes and bears, and rodent support is not dependent on high plant species diversity. Therefore, plant species diversity seems inappropriate as an identifier of general habitat suitability.

Rating for General Habitat Suitability. ABR rated the saturated graminoid shrub wetlands as moderate for the general habitat suitability function, based on two "Y" answers out of a possible six questions. ABR also comments (on page A-22) that the wetland provides moderate function in this general category, and that the wetland is fragmented by disturbance but represents the majority of the landcover in the area and would provide general habitat function for a variety of common wildlife species in the area.

EPA finds that the saturated graminoid shrub wetland type performs the general habitat suitability function at a high level, based on five "Y" answers out of five possible questions. (Note that one of the six questions could not be answered because the answer could not be determined using a desktop analysis, and because the question was not applicable to the Arctic.) These wetlands in the proposed GMT-1 project area have not been fragmented by development, are not disturbed, have a complex vegetative structure, have been documented as high potential bird habitat (BLM 2014), are interspersed with other wetland types and provide habitat for a variety of invertebrate, avian and mammal species.

Function F. Fish Habitat: Function only applicable if a water or if wetland has perennial or intermittent surface water connection to a fish bearing water body.

EPA agrees with ABR's assessment that the fish habitat function does not apply to the saturated graminoid shrub wetland type.

Table 1-G. Educational, Scientific, Recreational, or Subsistence Use

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
G1. Site has documented scientific or educational use.	No	Yes	The GMT-1 project area (formerly known as the proposed CD-6 development area) has been studied by several disciplines for more than a decade, for purposes of determining baseline information and preparing environmental documents (such as the Draft Supplemental EIS currently under review). For example, vegetation and ecological surveys were conducted in the Fish Creek drainage starting in August 2001 (Jorgenson et al. 2003, p. 3); the results – prepared for ConocoPhillips – form the cornerstone of the ITU analysis used in this WFA. Other targeted, scientific studies in this area that are referenced in the EIS relate to soils and permafrost, water resources, hydrology, fish, birds, mammals, threatened and endangered species, and subsistence use (BLM 2014, Chapters 3 and 6).
G2. Wetland or water is in public ownership.	Yes	Yes	We agree with ABR's answer to this question. The proposed GMT-1 drill site and gravel source are wholly on federal lands within the northeastern portion of the NPR-A. The proposed road and pipeline corridors cross both federal and private lands (held by Kuukpik Corporation) within the NPR-A (BLM 2014, p. 1).
G3. Accessible trails are available.	No	Yes	The Draft Supplemental EIS documents overland use areas, with transportation primarily by snowmachine in the winter months, but also by 4-wheeler during the summer and fall (BLM 2014, p. 148). A map of Nuiqsut Travel Routes in the Project Area shows seven trails that would cross the proposed footprint of the GMT-1 development (*ibid.*, Figure 3.4-10).
G4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	Yes	Yes	We agree with ABR's answer to this question. Subsistence use of the area, including of the extent of saturated graminoid shrub wetland type evaluated in the WFA, is shown to be of high intensity (BLM 2014, Figure 3.4-1).

Rating for Educational, Scientific, Recreational, or Subsistence Use. ABR rated the saturated graminoid shrub wetlands as moderate for the educational, scientific, recreational or subsistence use function, based on two "Y" answers out of a possible four questions. ABR also comments (on page A-22) that the project area is in close proximity to Nuiqsut and both the Fish Creek and Colville River Delta which have considerable value for subsistence activities.

EPA finds that the saturated graminoid shrub wetland type performs the general educational, scientific, recreation or subsistence use function at a high level, based on four "Y" answers out of four possible questions. The northeastern portion of the NPR-A has been the subject of numerous scientific studies for at least a decade in preparation for opening this region to oil and gas development. Subsistence use is high, and is well documented.

Table 1-H. Uniqueness and Special Status

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
H1. Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. *If yes, wetland is high functioning.*	No	No	The Draft SEIS, Section 3.3.5 (BLM 2014) does not document use of the saturated graminoid shrub wetland type by threatened or endangered species.
H2. Wetland or water contains documented critical habitat, high quality ecosystems, or priority species, respectively designated by the U.S. Fish and Wildlife Service	No	No	The Draft SEIS, Section 3.3.5 (BLM 2014) does not document these attributes in the saturated graminoid shrub wetland type.
H3. Wetland or water has biological, geological, or other features that are determined to be rare.	No	No	The scope of this question is not clear. Although we agree that the saturated graminoid shrub wetland type is not a rare type on the Arctic Coastal Plain, it may be globally rare.
H4. Wetland or water has been determined significant because it provides functions scarce for the area.	No	No	We agree with ABR's answer to this question.
H5. Wetland complex contains one or more of the following habitats: 1) Tall shrub habitat (>.5 ft in height) dominated by *Salix* sp. 2) Aquatic herb habitat dominated by *Arctophila fulva.* 3) Semi-permanently flooded to permanently flooded vegetated portions of drained lake basins. 4) Anadromous fish overwintering habitat. 5) Patterned wet sedge meadow or low center polygons. 6) High center polygon complex. 7) Riverine coastal mudflats. 8) Non-patterned wet meadow adjacent to streams and river bluffs.	No	Yes	Patterned ground – including both high center polygon complex and low center polygons – is plainly seen on GoogleEarth imagery dated August 12, 2012 along the proposed GMT-1 road and pipeline route, within the saturated graminoid shrub wetland type as it is mapped in the WFA Figure 2. The association of moist sedge-shrub tundra and tussock tundra vegetation types – which make up the saturated graminoid shrub wetland type – with ice-wedge polygons is further described in Jorgenson 2003 (in Table 7).

Rating for Uniqueness and Special Status. ABR rated the saturated graminoid shrub wetlands as low for the uniqueness and special status function, based on no "Y" answers out of a possible five questions. ABR also comments (on page A-22) that this wetland type is not designated as critical habitat, and there are no documented occurrences of TES species.

EPA finds that the saturated graminoid shrub wetland type performs the uniqueness and special status function at a moderate level, based on one "Y" answer, in accordance with the rating criteria for this function (≥2 attributes (Y) – High, 1 attribute (Y) – Moderate, None – Low). The saturated graminoid shrub wetlands in the project area are typified by patterned ground (both high center and low center polygons).

Table 2 summarizes the ABR and EPA wetland functional rankings for the saturated graminoid shrub wetland type. Out of the eight functions evaluated, ABR has found four to be Moderate, one to be Low and three to be not applicable. EPA has found six to be High, one to be Moderate, and one to be not applicable.

Table 2. Summary of ABR and EPA functional rankings for the saturated graminoid shrub wetland type.

Function	ABR ranking	EPA ranking
Flood Flow Regulation	Moderate	High
Sediment, Nutrient, & Toxicant Removal	Moderate	High
Erosion Control and Shoreline Stabilization	N/A	High
Organic Matter Production & Export	N/A	High
General Habitat Suitability	Moderate	High
Fish Habitat	N/A	N/A
Subsistence, Recreational, Educational Value	Moderate	High
Uniqueness & Special Status	Low	Moderate

Based on our analysis, we recommend an overall HIGH functional ranking for the saturated graminoid shrub wetland type.

References

ABR, Inc. – Environmental Research & Services. 2013. Wetland Functional Assessment for the Greater Mooses Tooth Unit Development Project – 2013, Final Report. Prepared for ConocoPhillips Alaska, Inc. Anchorage, Alaska. 16 pp. + Appendix.

Adamus, P. R., Stockwell, L. T., Clairain, E. J., Jr., Morrow, M. E., Rozas, L. P., and Smith, D. R. 1991. Wetland evaluation technique (WET); Volume I: Literature review and evaluation rationale. Technical Report WRP-DE-2, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS., NTIS No. AD A251 739, Vol I.

Bureau of Land Management, U.S. Department of the Interior. February 2014. Alpine Satellite Development Plan GMT1 Development Project, Draft Supplemental Environmental Impact Statement. Anchorage, Alaska. 499 pp. + Appendices.

Jorgenson, M.T., J.E. Roth, M. Emers, S.F. Schlentner, D.K. Swanson, E.R. Pullman, J.S. Mitchell, and A.A. Stickney. 2003. An ecological land survey in the Northeast Planning Area of the National Petroleum Reserve-Alaska, 2002. Final report for ConocoPhillips Alaska, Inc. and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 124 pp.

Michael Baker Jr., Inc. 2013. *2013 Fish Creek Basin Spring Breakup Monitoring and Hydrologic Assessment*. Anchorage, Alaska. 75 pp. + Appendix.

Enclosure 3
U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements Definitions and Follow-Up Action*

Environmental Impact of the Action

LO – Lack of Objections

The U.S. Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC – Environmental Concerns

EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO – Environmental Objections

EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU – Environmentally Unsatisfactory

EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 – Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 – Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 – Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

[05-001]
Comment is noted.

[05-002]
The comment is noted.

[05-003]
Alternative D2 which does not include a CD5-GMT1 road and is seasonal has been included in Final SEIS.

[05-004]
BLM is working with both the Corps and EPA so that its NEPA process can align with the Corps' LEDPA permitting process.

[05-005]
The comment is noted.

[05-006]
With the exception of the temperature data presented in the first paragraph of Section 3.2.3.1 of the Draft SEIS, references are provided documenting the source of the data (i.e., operator and station name) and the period of record. The temperature data discussed in the first paragraph is referenced as coming from the CPAI Nuiqsut monitoring station from 2008 through 2012. Since this data was provided digitally as spreadsheets, with no associated report, no reference is provided nor warranted.

Since the CPAI-operated station and the FAA ASOS station are located less than 1.5 kilometers apart, data from these sites will produce the same climatology. Therefore, there is no value to adding the CPAI station data to Table 3.2-5.

[05-007]
While 12 climate and active-layer data monitoring stations collected data in the NPR-A from 1998–2011, only the following two stations were located close enough to the project area to be considered representative: Fish Creek (23 km WNW of GMT1), and Inigok (67 km WSW of GMT1). The remaining stations were either located too far away, too close to the coast, or too close to the foothills. By comparison, the Nuiqsut station is located 19 km ESE of GMT1 and is located closest to GMT1 and the associated activities which will occur within a triangle running from GMT1 to Alpine and Nuiqsut. Based on distance alone, the Nuiqsut monitoring station is the most representative of GMT1 and associated activities making it the best data set for characterizing project area climatology.

Another reason for relying more heavily on the Nuiqsut data for climate information is that the same data set was used to drive the dispersion modeling conducted to describe project ambient air quality impacts. None of the data collected in the NPR-A is suitable for this task.

While the Nuiqsut data is the best candidate for describing local climatology, this Section does rely on data collected at other regional stations (Kuparuk, Umiat, and Barrow). Though these stations are located much further from the project area than Nuiqsut or Fish Creek, they do represent a much more statistically significant period of record (i.e., 26 to 60 years) making them valuable to the analysis. Regardless, BLM concurs that the analysis would benefit from including the data collected at the Fish Creek monitoring station as an independent check on the data collected at Nuiqsut.

Since the dispersion potential of the atmosphere is relevant to understanding project ambient air quality impacts and because the data collected at Nuiqsut is suitable for providing this description, we concur that this section would benefit from a brief discussion of atmospheric conditions affecting pollutant transport.

[05-008]
Section 3.2.3.2 of the Draft SEIS discusses existing air quality and not meteorology, therefore, it is assumed that this comment is referencing Section 3.2.3.1 which is titled "Climate and Meteorology". It is not the purpose of this section of the Draft SEIS to include information justifying the acceptability of the meteorology for use in dispersion modeling and it is not appropriate to include this information in this section. However, the information is discussed in Section 3.2 (Meteorological Input Data and Processing) of the Alternative D Air Quality Impact Analysis (AECOM 2013b) and Section 3.2 (Meteorological Input Data and Processing) of the Alternative A Air Quality Impact Analysis (AECOM 2013a). Both of these documents are included in Appendix K of the Draft SEIS. The data used for modeling was fully discussed and justified in Section 3.2 (Meteorological Data) of the Final Protocol for the Greater Mooses Tooth Ambient Air Quality Impact Assessment (AECOM 2013e).

[05-009]
The 2012 NPR-A IAP/EIS Section 3.2.2.3 discusses the existing emissions sources in the project area. Emission sources in the area consist mainly of diesel-fired generators in small villages, residential heating, snow machines, all-terrain vehicles, occasional small aircraft, limited local vehicle traffic, and occasional open burning. Regional sources of emissions consist of oil and gas production facilities east of the NPR-A, including Kuparuk, Milne Point, Prudhoe Bay, North Star, Endicott, and Alpine Fields. Emissions sources at the Alpine field production and drilling areas just to the east of the planning area in the Colville River delta include gas-fired turbines and heaters, incinerators and flaring, diesel-fired power generators, storage tanks, fugitive hydrocarbon emissions, and mobile sources (vehicle traffic and aircraft).

[05-010]
Extending the project construction schedule due to road length will not change the model predicted impacts or the conclusions. The modeling focused on predicting construction impacts, which produce the highest impacts. The scenario selected was the period in time representing concurrent construction of the well site pad, and the segment of the road adjacent to the pad. Regardless of project alternative, the length of time this construction scenario will occur will not change. Therefore, impacts predicted from this scenario will not change. In other words, the overall construction schedule may be extended because more road will need to be built, but building roads across the tundra will always produce lower impacts than the construction scenario that was modeled regardless of duration.

The nearest Class I area is Denali National Park, located approximately 750 kilometers south of the project area. In addition to the great distance involved, trajectories that might transport emissions from the project area toward Denali would most likely be altered by the Brooks Range, which lies between the North Slope and Denali; consequently, it is highly unlikely that sources located at the North Slope could reasonably affect ambient air quality at Denali.

[05-011]
Please refer to Appendix K of the Draft SEIS for a comprehensive list of equipment and emission rates for both Alternatives A and D1/D2. Appendix K contains the Alternative A and

D1/D2 Air Quality Impact Analysis (AECOM 2013a and 2013b). Chapter 2 and the associated spreadsheets of these reports document the equipment inventory and emissions.

Other regulated pollutants include:

- 6 Criteria Pollutants (ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead).
- Greenhouse Gases.
- PSD Pollutants (carbon monoxide, nitrogen oxides, sulfur dioxide, particulate matter (PM10 and PM2.5), ozone (Volatile Organic Compounds are regulated as a surrogate for ozone), lead, fluorides, sulfuric acid mist, hydrogen sulfide (H2S), total reduced sulfur (including H2S), and reduced sulfur compounds (including H2S).
- 187 Hazardous Air Pollutants (see http://www.epa.gov/ttn/atw/pollsour.html).

As discussed on page 202, paragraph 3 of the Draft SEIS, an analysis of particulate matter (PM), including both PM2.5 and PM10 were considered, not just PM10.

A comprehensive qualitative discussion of secondary PM formation was included in the Alternative A and D1/D2 Air Quality Impact Analysis (AECOM 2013a and 2013b) included as Appendix K of the Draft SEIS. That discussion is included in sections titled ""Secondary PM2.5 Formation"" [Section 5.1.4 (Alt. A) and Section 5.1.6 (Alt. D)] of these documents.

[05-012]
The "construction seasons" referenced in Section 4.2.3 of the Draft SEIS are used in the same context that "construction seasons" are used throughout the Draft SEIS. The construction season is considered to be the period of time typically in winter months during which seasonal ice bridges and roads can be utilized for construction activities. Please reference Section 2.4 of the Draft SEIS and Draft SEIS.

[05-013]
It is not necessary to compare all activities and alternatives to applicable standards, only those that produce the highest impacts. These worst-case activities are conservative surrogates for all other alternatives and activities. Because the worst-case activities for Alternatives A, B, and C will be the same, model predicted impacts for all three scenarios will be the same. Therefore, impacts from all activities and alternatives have been compared with Class II increments and NAAQS as a result of the analysis conducted for Alternative A (i.e., impacts predicted for Alternative A activities are conservative surrogates for all other alternatives and activities). The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C; the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). By predicting ambient air quality impacts for these parts of Alternative A, impacts for Alternatives B and C have been predicted.

Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub.

[05-014]
We assume this comment refers to the sources used to develop the emissions inventory. Therefore, references for the following will be provided in the Draft SEIS:

- USEPA National Mobile Inventory Model (NMIM)
- FAA Emissions and Dispersion Modeling System (EDMS)
- Gas Research Institute emission factors/emission model."

[05-015]
Impacts were predicted using a continuous 5-year meteorological data set. Emission source types which emit Hazardous Air Pollutants are described in Paragraph 1 on page 204 of the Draft SEIS. This discussion would seem to make consideration of a table unnecessary.

[05-016]
Impacts were predicted using a continuous 5-year meteorological data set. Emission source types which emit Hazardous Air Pollutants are described in Paragraph 1 on page 204 of the Draft SEIS. This discussion would seem to make consideration of a table unnecessary.

[05-017]
The ambient air quality impact analysis described in paragraph 2 on page 205 of the Draft SEIS is a cumulative analysis conducted in accordance with 40 CFR 51 Appendix W (Guideline on Air Quality Models). There will be concurrent operations of the Pad Construction, gravel mining, and Nuiqsut Camps scenarios. While concurrent, since the impacts from these activities are highest in the immediate near-field and these activities are located a considerable distance from each other, they will not produce a significant ambient air pollutant concentration gradient in the impact area of each other. Therefore, it is not necessary to explicitly model these activities in the same model run.

All five scenarios listed on page 205 of the Draft SEIS and specific details of the 5 scenarios are documented in Chapter 2 of the Alternative A and D1/D2 Air Quality Impact Analysis (AECOM 2013a and 2013b) included in Appendix K of the Draft SEIS.

[05-018]
The calculation methodology is fully documented in CPAI GMT1 Air Quality Impact Analysis – Final - Response to Comments on the Emissions Inventory (EI): From: Zach Hedgpeth, P.E. (USEPA Region 10). This document was included as Attachment L to a letter from Tom Damiana (AECOM) to Bridget Psarianos (BLM); Subject: Response to Comments Received on the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A - Supplemental. Dated January 13, 2014.

[05-019]
PM monitoring is not necessary to verify the adequacy of watering based on an analysis submitted to the BLM on January 13, 2014 (CPAI GMT1 Air Quality Impact Analysis – Final - Response to Comments on the Emissions Inventory (EI): From: Zach Hedgpeth, P.E. (USEPA Region 10). This document was included as Attachment L to a letter from Tom Damiana (AECOM) to Bridget Psarianos (BLM); Subject: Response to Comments Received on the Air Quality Impact Analysis for GMT1 Alternative A - Supplemental). This document indicated that a simple watering plan (i.e., once per day watering) is all that is needed to obtain a high level of

fugitive dust control. Since controls are easily achieved, the result of the control does not need to be verified, therefore, a performance based approach is not necessary to achieve assumed controls.

[05-020]
An increment analysis was not conducted for activities that are considered temporary, such as construction at a particular location lasting less than 2 years. Of the remaining scenarios, only Well Intervention and Infill Drilling contained emissions from permanent on long-term sources. Of these two, infill drilling will produce the highest impacts since it was assumed to occur over a longer period of time. Because it produces the highest impacts of all scenarios containing permanent sources, it was considered a worst-case surrogate for all other scenarios and used for the comparison to the Class II PSD Increments.

The air quality analysis performed for the SEIS is not, and should not be considered a regulatory PSD Increment Consumption Analysis. Any comparison of modeled results to applicable PSD Increments are for informational purposes only.

[05-021]
The ADEC, Division of Air Quality is the agency responsible for tracking increment consumption.

[05-022]
The results of the ambient air quality impact analysis documented in Table 4.2-13 of the Draft SEIS is a project-only analysis. However, a cumulative impact analysis was conducted and is documented in the Alternative A and D1/D2 Air Quality Impact Analysis (AECOM 2013a and 2013b) documented in Appendix K of the Draft SEIS.

[05-023]
As discussed in the first and second paragraph, the statements made are a summary of details given in both the Alternative A and Alternative D1/D2 Ambient Air Impact Analyses supplied in Appendix K of the Draft SEIS. All references reviewed are properly cited in that Appendix. Please refer to those documents, Section 5.1.3 (Alternative A) and 5.1.5 (Alternative D1/D2).

Regarding Deadhorse speciation measurements, given the infrequent sampling at Deadhorse and Wainwright and that: 1) Deadhorse measurements are being made in the middle of an industrial area different from the project area, and 2) Wainwright measurements are collected in a maritime environment primarily impacted by transport from Asia and not regional oil and gas development, a discussion of the data collected at these sites is not likely to add value to the comprehensive discussion included in Section 5.1.8. Therefore, we do not recommend including these measurements. Note that the secondary particulate formation discussion included in Section 5.1.8 relies on evidence compiled by USEPA Region 10 which suggests that secondary PM2.5 formed from precursor emissions on the Alaskan North Slope is low even in light of large precursor emissions.

[05-024]
The comparison of impacts from GMT1 to PSD increments is irrelevant to the near-field analysis conclusions in this paragraph. No PSD increment analysis was conducted as part of the NEPA air quality analysis for the SEIS. The PSD increment comparisons are made for informational purposes only in the Draft SEIS and the Draft SEIS, and the analyses should not be interpreted as a regulatory increment consumption analysis.

[05-025]
Extending the project construction schedule due to road length will not change the model predicted impacts or the conclusions. The modeling focused on predicting construction impacts, which produce the highest impacts. The scenario selected was the period in time representing concurrent construction of the wellsite pad, and the segment of the road adjacent to the pad. Regardless of project alternative, the length of time this construction scenario will occur will not change. Therefore, impacts predicted from this scenario will not change. In other words, the overall construction schedule may be extended because more road will need to be built, but building roads across the tundra will always produce lower impacts than the construction scenario that was modeled regardless of duration.

The nearest Class I area is Denali National Park, located approximately 750 kilometers south of the project area. In addition to the great distance involved, trajectories that might transport emissions from the project area toward Denali would most likely be altered by the Brooks Range, which lies between the North Slope and Denali; consequently, it is highly unlikely that sources located at the North Slope could reasonably affect ambient air quality at Denali.

[05-026]
"Slightly higher" is defined as small amount above Alternative A, such that the additional impacts would be negligible.

[05-027]
The emissions estimates for Alternative C are presented in Tables 4.2-27 and 4.2-28 of the Draft SEIS. Because air quality modeling was not performed for Alternative C, no further detail for the emissions from Alternative C are available.

[05-028]
The emissions estimates for Alternative C are presented in Tables 4.2-27 and 4.2-28 of the Draft SEIS. Because air quality modeling was not performed for Alternative C, no further detail for the emissions from Alternative C are available.

[05-029]
The ADEC, Division of Air Quality is the agency responsible for tracking increment consumption.

[05-030]
Secondary PM formation is addressed in the Draft SEIS on page 209, immediately following Table 4.2-16.

[05-031]
Though the emissions may be higher, this does not indicate that model predicted impacts will be higher; therefore, higher emissions does not justify conducting a separate modeling analysis for Alternative C. The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C; the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., pad construction, gravel mining, infill drilling, and well intervention). Therefore, ambient air quality impacts for these parts of Alternative A, B, and C will be the same and it is not necessary to predict impacts from each of these alternatives separately.

[05-032]
CPAI GMT1 Alternative D Air Quality Impact Analysis, Final that is included as Appendix K of the Draft SEIS, does present a comparison of concentrations to Class II increments at the point of maximum impact as recommended. That comparison can be found in Table 5-6 on page 5-13 of the Draft SEIS.

Impacts predicted for the ambient air quality impact analysis are representative of a typical 33 well program in which the first 9 wells are drilled during a continuous developmental drilling program and the remaining wells are drilled in future years during several 14 month developmental drilling programs.

[05-033]
New emissions were included in modeling.

[05-034]
U.S. Fish and Wildlife Service, has reviewed and accepted the emissions inventory.

[05-035]
It is not necessary to provide a comparison of emissions in Table 2-15 of the Alternative D Air Quality Impact analysis. The purpose of the Alternative D Air Quality Impact Analysis included in Appendix K of the Draft SEIS was to document the Alternative D emissions, not provide a comparison to other alternatives. Comparing emissions between alternatives is a primary objective of the Draft SEIS and was done in the body of the Draft SEIS.

[05-036]
There is no reference for the technique discussed. However, the technique used to develop seasonally varying background concentration data used as input to the NO2 modeling is fully documented in Section 3.5.2. The technique documented in Section 3.5.1 was used in the compliance demonstration.

While using seasonally varying background concentrations is not the most conservative approach recommended by USEPA, it is still conservative for the project area considering the lack of near-field sources (which would be responsible for any highly variable and elevated background concentrations) and the fact that the background data used were measurements collected in the community of Nuiqsut. The background concentrations measured at Nuiqsut are known to be impacted by near-field source activity resulting in a measured background that has more variability and higher impacts than what would be expected in the project area. The use of the 98th percentile value in this case simply serves to decrease the effect of sources, such as residential heating and power generation, which impact the Nuiqsut measurements, but will not exist in the project area.

[05-037]
There is no reference for the technique discussed in the comment. However, the technique used to develop an hourly ambient ozone file used as input to the NO2 modeling is fully documented in Section 3.6. Substituting the 95th percentile value ensures that the substituted value is conservatively representative of the actual measurement, resulting in conservative predicted NO2 concentrations. There is no EPA reference for using the 95 percentile value.

[05-038]
As described in Section 3.6, the reference for the technique used can be found in Appendix A of the GMT1 Alternative A Air Quality Impact Analysis (AECOM 2014a) included in Appendix K of the Draft SEIS. As discussed, that technique relied on estimates of in-stack ratios were developed for each source group based on a review of available literature. When literature could not be found, the USEPA-approved screening value of 0.5 was used.

[05-039]
Ambient air is defined in 40 CFR 50.1(e) as that portion of the atmosphere, external to buildings, to which the general public has access. While this definition does not indicate that barriers are necessary, several guidance documents provide further interpretation which suggest that a physical barrier is important to restrict public access. The physical barrier could be man-made, such as a fence, or natural, such as a river. Regardless, the key is to restrict public access with or without a barrier since it is not always possible to construct a barrier. Such is the case on the Alaskan North Slope; therefore, as discussed below, barriers will not be used to restrict public access, but the general public will not have access to the areas modeled.

Justification for the project ambient boundaries were provided for the dispersion modeling conducted for Alternative A in the following: CPAI GMT1 Air Quality Impact Analysis – Final - Response to Comments on the Emissions Inventory (EI): From: Herman Wong, P.E. (USEPA Region 10) (Reference Comment 28) This document was included as Attachment C to a letter from Tom Damiana (AECOM) to Bridget Psarianos (BLM); Subject: Response to Comments Received on the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative A - Supplemental. Dated January 13, 2014.

While the boundaries were justified relative to Alternative A, the same boundaries were used in the modeling conducted for Alternative D. In the response previously given, Region 10 indicated that they would accept the edge of the well pad as ambient air boundary because its surface is above ground level. For the remaining ambient boundaries, AECOM provided the following which is relevant to Alternative D: access road and pad construction, infill drilling, and well intervention scenarios. The ambient boundary was defined at the perimeter of the well site gravel pad and the edges of the gravel access road. CPAI will take the steps necessary to control access to the area.

For the Clover Material Source scenario the ambient boundary was defined as the extent of the material source itself and a small buffer around the source that will be frequented by non-road equipment and unsafe for the public. It is reasonable to assume that the public will not have access to the area due to the nature of the activities taking place, most notably blasting and heavy equipment traffic. Regardless, CPAI will take the steps necessary to control access to the area primarily to keep the public safe from construction activities.

The ASRC Mine site is currently proposed as the potential gravel source. CPAI alerted BLM of its intent to use the ASRC Mine site shortly after the publication of the Draft SEIS.

[05-040]
Section of the Draft SEIS describes how offsite sources were treated in the cumulative impact analysis and does not imply that a cumulative analysis was not conducted. Never-the-less, a cumulative impact analysis has been conducted as part of the analyses documented in Appendix K of the Draft SEIS. The cumulative impact analysis and the handling of offsite sources follow procedures documented in 40 CFR 51 Appendix W Section 8. Section 8 indicates that impacts from 3 types of sources should be included in a cumulative impact

analysis; 1) the proposed project, 2) nearby sources, and 3) other sources. As justified in Section 3.10, there are no sources that are considered nearby sources, and the background concentrations selected represent ""other sources." Therefore, in this case (i.e., no nearby sources), cumulative impacts are determined by simply adding project impacts to the background concentration as was done.

[05-041]
Tables in the Draft SEIS shows that 24-hour PM10 and PM2.5 violations are predicted. Elevated impacts are primarily the result of fugitive dust associated with windblown and vehicular/aircraft disturbance of dirt on the pad, hangar, and runway located at the airstrip. Reducing the amount of traffic is a potential mitigation measure; however, this is not a realistic approach given that a fixed amount of materials need to be transported to support the drilling program. Note that Alternative D material transport leads to significantly higher localized impacts than Alternative A since much of the materials have be trucked to the storage pad and then from the storage pad to the well site rather than directly to the well site.

Assuming that the amount of traffic cannot be decreased, fugitive dust could be mitigated by adding additional controls to reduce dust from roadways by applying chemical stabilizers, or paving the roadways. Similarly, routine watering of all disturbed areas including the runway could be conducted to reduce emissions. Both situations would require an aggressive dust control plan potentially including performance based control measures. In either case, the application of chemical stabilizers would have to be examined for secondary impacts from common stabilizers such as magnesium chloride.

Mitigating the impacts as discussed will also positively impact the results (i.e., decrease impacts) shown in Table 5-6. However, Table 5-6 presents a comparison of total impacts to the PSD increments and is presented for informational purposes; therefore, these results are not a driver for mitigation measures.

[05-042]
The analysis included in section 5.1.3 of the Draft SEIS is a quantitative analysis and relies on monitoring results as opposed to modeling results. Given modeling uncertainties and the conservative assumptions built into the section 5.1.3 analysis, it would seem that in this case, the quantitative approach based on actual measurements will produce the more reliable analysis removing the need to conduct modeling.

[05-043]
BLM agrees that it is likely that installing a new turbine at the Alpine CPF would result in a project that would be subject to PSD review as the commenter suggests. However, the comment is related to a technical support document to the SEIS that has already been finalized and will not be revised as part of the Draft SEIS. Therefore, while accurate, the suggested revision will not be made.

[05-044]
The Draft SEIS has been updated to reflect the suggested edit. The sentence included in the Draft SEIS contained a typographical error and was edited to read: "The CCP PTE for criteria pollutants are presented in Table 5-8. NOX emissions comprise the majority of the facility's allowable emissions.

[05-045]
The Draft SEIS has been updated to reflect the suggested edit.

[05-046]
Given the infrequent sampling at Deadhorse and Wainwright and that: 1) Deadhorse measurements are being made in the middle of an industrial area different from the project area, and 2) Wainwright measurements are collected in a maritime environment primarily impacted by transport from Asia and not regional oil and gas development, a discussion of the data collected at these sites is not likely to add value to the comprehensive discussion included in Final SEIS. Therefore, we do not recommend including these measurements. Note that the secondary particulate formation discussion relies on evidence compiled by USEPA Region 10 which suggests that secondary PM2.5 formed from precursor emissions on the Alaskan North Slope is low even in light of large precursor emissions.

[05-047]
It is not be necessary to provide a comparison of impacts in section 5.1.8 of the Alternative D Air Quality Impact analysis. The purpose of the Alternative D Air Quality Impact Analysis included in Appendix K of the Draft SEIS was to document the Alternative D air quality impacts, not provide a comparison to other alternatives. Comparing impacts between alternatives is a primary objective of the Draft SEIS and was done in the body of the Draft SEIS.

[05-048]
The Draft SEIS has been updated to reflect the suggested edit.

[05-049]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[05-050]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[05-051]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[05-052]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[05-053]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

A revised ASA is being performed by ABR which incorporates ELS maps and associated data for the Alpine development to create a wetlands map at a scale of 1:10,000 to use as the basis for the ASA. These maps present ecotypes, surface form and vegetation in the study area which can derive wetlands, terrain sensitivity and wildlife habitat maps. The ELS ecotypes and

derived vegetation types are then cross-walked to Cowardin wetland types using standard NWI annotation.

[05-054]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[05-055]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[05-056]
The Draft SEIS is using vegetation and wetlands criteria developed based on CEQ NEPA regulations as described in Section 4.1, Impact Determination Methodology. These criteria are similar to those included in the Point Thomson Project EIS.

[05-057]
Medium impacts in intensity were assessed based on impacts from 5-25% of a vegetation type. The Impact Criteria used in Table 4.3-1 are similar to those used in the Point Thomson EIS and are appropriate for determining the magnitude of impacts. In this case the greatest impacts were determined to occur based on vegetation types, and in particular, Cassiope Dwarf Scrub Tundra.

[05-058]
The Impact Criteria used in Table 4.3-1 are similar to those used in the Point Thomson EIS and are appropriate for determining the magnitude of impacts. Table 4.3-2 outlines the acres and % of impacted vegetation types and can give the reader a quick assessment of the impacts across all Alternatives.

[05-059]
Table 4.3-4 as presented does allow a good comparison between Alternatives.

[05-060]
The BLM recognizes that the configuration of gravel placement plays a large role in potential impacts and section 4.2.2.6 was modified in the Draft SEIS to reflect this.

[05-061]
The text in Alternatives D1 and D2 was modified to incorporate the differences gravel configuration can make in overall impacts to hydrology. The impacts from placement of gravel fill perpendicular to drainage areas was discussed throughout the water resources sections and it is recognized that impacts vary with how gravel is placed.

[05-062]
Comment is noted. BLM understands the importance of monitoring and particular mitigation measures are included in the Draft SEIS.

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
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Regulatory Division
POA-2013-461

GMT1 SEIS Comments
Attention: Bridget Psarianos
222 West 7th Avenue, #13
Anchorage, AK 99513-7504

Dear Ms. Psarianos:

We are pleased to provide you with the U.S. Army Corps of Engineers comments in response the U.S. Bureau of Land Management's (BLM) publication of the Greater Mooses Tooth 1 (GMT1) Draft Supplemental Environmental impact Statement (Draft SEIS) for a hydrocarbon production proposal by ConocoPhillips Alaska, Inc. (CPAI) in the National Petroleum Reserve-Alaska (NPR-A). We are thankful for the invitation to participate in this National Environmental Policy Act (NEPA) process as a Cooperating Agency (CA) and assist BLM's efforts as the Lead Federal Agency in completing the Final SEIS. We look forward to working closely with BLM throughout our evaluation processes.

We received a draft Department of the Army (DA) permit application from CPAI on July 25, 2013, for their proposed project, Alternative A in your Draft SEIS. We have regulatory jurisdiction over CPAI's proposed project under Section 404 of the Clean Water Act (CWA) for their proposed discharge of dredged and fill material into waters of the U.S., including wetlands. Our authorization is required prior to CPAI commencing work which would cause a regulable discharge.

We intend to publish a Public Notice following receipt of a complete permit application from CPAI, for a 45-day comment period, concurrent with your publication of the Final SEIS. We will need approximately 120-days to complete our public interest review and Record of Decision (ROD). We would greatly appreciate continued coordination with BLM leading up to completion of your ROD. Should our agency decisions be to authorize CPAI's proposal or another project design, a decision which would meet each of our agency requirements, while not causing conflicting authorizations in the design and location of the project components would be advantageous. We would like to incorporate BLM's Final SEIS into our ROD, as appropriate, to help meet some of our NEPA, related Federal laws, and Regulatory Program requirements.

[06-001] We are concerned that a comprehensive oil and gas infrastructure development plan for the NPR-A is unavailable. We recommend BLM, CPAI, and other oil and gas producers, in association with the NPR-A Working Group begin to address this. We are concerned with the immediate action for GMT1, potential development of GMT2, the Greater Mooses Tooth Unit, and the Bear Tooth Unit. BLM recently provided us with a current oil and gas industry exploration area map showing several very large acreages. Without a coordinated development plan, the individual development proposals could lead to unnecessary adverse impacts to the aquatic resources of the NPR-A. A continuum of road access across the NPR-A, with its impacts to the aquatic environment, combined with secondary and cumulative impacts, needs further evaluation. Of particular concern is the long range decision on a main access road, pipelines, utilities extending the length of the NPR-A, with spur roads to resources, and to a coastal location with offshore infrastructure connections.

[06-002] We are also concerned that a there is no BLM specific management plan for compensating for the unavoidable impacts to aquatic resources which could be caused by future NPR-A development. We recommend the BLM coordinate with us and the NPR-A Working Group to identify appropriate mitigation opportunities within the NPR-A or adjacent lands.

The items suggested below would enable us to more fully evaluate the GMT1 development alternatives:

a. **[06-003]** Aquatic Site Assessments, including field surveys, for Draft SEIS action Alternatives B, C, D-1, and D-2 would be helpful for us to determine compliance with the CWA Section 404(b)(1) Guidelines (Guidelines), identify the Least Environmentally Damaging Practicable Alternative, and any appropriate compensatory mitigation. **[06-004]** Should the landowner under the Alternative C, Alternative Access, deny right- of-way access to CPAI by written notification to you, Alternative C could be eliminated from further evaluation. **[06-005]** Alternative A and the Clover material site aquatic resources have been evaluated but would benefit from field verifications. These efforts would enable a debit-credit analysis using wetland category (value) determinations per alternative or component and combined with appropriate ratios, determine the level of compensatory mitigation. This request is supported in BLM's 2013 NPR-A ROD for Baseline Studies.

b. **[06-006]** A site visit during the growing season by BLM and the CAs to all viable alternatives and the Clover material site to assess, by observation, the aquatic resources and other environmental conditions to facilitate accurate and timely decision making. A brief field assessment of a potential access route and drill site for GMT2 would also be helpful for the Final SEIS cumulative impact assessment.

c. **[06-007]** An evaluation of the aquatic resources based on the local watershed perspective. The Draft SEIS comparison based on the entire Project Study Area dilutes the importance of the aquatic resources and potential adverse impacts which would occur within localized area.

d. **[06-008]** An evaluation of surface waters within an appropriate vicinity of the action alternatives to identify appropriate buffer distances based on adjacent aquatic resources, floodplains, fish and wildlife habitat, and other environmental conditions.

e. Sufficient information and figures to depict the sub-Alternative D-2, Seasonal Drilling.

f. **[06-009]** Information regarding transport of oil rigs over the CD-5 Access Road and proposed GMT1 Access Road with respect to consistent bridge and road widths and ice road construction.

g. **[06-010]** Evaluate whether the use of a larger airstrip at GMT1, under Alternatives D-1 and D-2, would cause less overall adverse impacts to aquatic resources, subsistence species populations, and other environmental factors than would occur from a road and pipeline design. Include whether a smaller airstrip could be utilized at the GMT1 drillsite and potentially expanded later if further developments in the NPR-A occur.

h. **[06-011]** For all alternatives, evaluate the best location(s) for the pipelines in consideration of the higher value waters and wetlands and for effective spill response actions in the event of a flowline leak.

i. **[06-012]** Evaluate whether vertical loops could be used to protect creek crossings rather than manual valve which require wetland fill material placements.

j. **[06-013]** A detailed Mine Development, Rehabilitation, and Revegetation Plan for the Clover material site.

We are required by the Guidelines to authorize discharges into waters of the U.S., only after avoidance and minimization of adverse impacts have been demonstrated by DA permit applicants. Therefore, we are concerned that all practicable methods and techniques be utilized to avoid and minimize alternatives to discharges. This includes: all fill areas; gravel fill generated dusts; discharges from snow removal operations; equipment disturbances in waters/wetlands; prevention of siltation from fill material; altering natural drainage patterns; and changes to hydrophytic plant communities.

We look forward to continued coordination with BLM in regards to consider what, if any, compensatory mitigation BLM may require for aquatic resource losses. Potential compensatory mitigation which may be required of a DA permittee could include: 1) purchasing credits from an approved mitigation bank in the project's service area; 2) payment of an in-lieu fee from an approved in-lieu fee program in the project's service area; 3) permittee responsible mitigation; or 4) a combination of these. We would determine the environmentally preferred type(s) of compensatory mitigation in our ROD.

Attached is a more detailed list of USACE staff comments using the comment table you provided. Please contact Mr. Harry a. Baij Jr. by e-mail at harry.a.baij@usace.army.mil, by phone at (907) 753-2784, toll free within Alaska at (800) 478-2712, or by mail at the address above, for clarification or discussion of the comments provided. Thank you for your work in developing the Draft SEIS and range of alternatives presented for evaluation. For additional information about of Regulatory Program, please visit our website at www.poa.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Mike Holley
Chief, North Section

Enclosure

ASDP Supplemental EIS for GMT1: Cooperating Agency Comments

Agency	Commenter Name	Document Section or Figure Number	Comment
USACE		Introduction	Page 4. Section 1.4, paragraph 3, last sentence, change Section 2.2 to 2.3
USACE		Introduction	Page 6, 4th bullet down, second sentence beginning with "Pursuant to . . . ". Although not incorrect, it is difficult to understand.
USACE		Introduction	**[T06-001]** Page 11, Section 1.4.3, first paragraph under the bullets, last sentence. Explain why CD-7 (GMT-2) is not being considered in this SEIS.
USACE		Introduction	Page 14, Table 1.4-2, under Facility, first cell. Drill pad size would also increase
USACE		Introduction	**[T06-002]** Page 14, first paragraph, 2nd sentence. Recent climate data may change some projected outcomes.
USACE		Introduction	Page 15, Table 1.4-3, Threatened and Endangered species. Looking at this table, I'd want to know whether the polar bear and ice seals were listed as threatened or endangered.
USACE		Chapter 2	**[T06-003]** Page 19, second paragraph. Still no explanation of why CD-7 has been dropped from inclusion in SEIS.
USACE		Chapter 2	**[T06-004]** Page 24, Section 2.4.1, Location. Should you include ASRC mine site too?
USACE		Chapter 2	**[T06-005]** Page 26, 3rd paragraph, 2nd sentence. I am personally ignorant as to why pipelines 500' separate from roads would minimize caribou disturbance. Seems like it would be MORE disturbance. Explain here?
USACE		Chapter 2	Page 28, Section 2.4.5.1, first paragraph, second sentence. BP Mean Sea Level is not explained, even in the Acronym section.
USACE		Chapter 2	**[T06-006]** Page 30, paragraph 3, 2nd sentence. This Corps permit information is outdated.
USACE		Chapter 2	**[T06-007]** Page 30, paragraph 4, near the end. GMT2 is identified as a "reasonably-foreseeable" development causing the reviewer to again wonder why it is not part of this SEIS action; eliminating the repetition of evaluating it again in the near future.
USACE		Chapter 2	**[T06-008]** Page 33, 2.4.7.4. Would thickened ice present flooding issues at break up? This reviewer unsure of chemical components of "nut plug".

USACE		Chapter 2	Page 34, pargraph 2. This is a discussion about Alternative D impacts, but this chapter is about Alternative A.
USACE		Chapter 2	Page 39. ULSD is not defined here nor is it listed in the Acronyms.
USACE		Chapter 2	**[T06-009]** Page 40, 2.4.8.3, sentence 5. Erosion control should be designed to eliminate erosion and sedimentation, not just provide protection from flood events!
USACE		Chapter 2	**[T06-010]** Page 40, 2.4.8.4, 4th sentence. State whether CPAI intends to adopt the cited BMPs of which ones.
USACE		Chapter 2	Page 41, paragraph 6. Incomplete sentence or thought.
USACE		Chapter 2	Page 42, 2.4.8.5. "Fuel and Chemical Storage"?
USACE		Chapter 2	Page 42, 2.4.8.6, 2nd paragraph. Is a brief explanation of "annular" appropriate here?
USACE		Chapter 2	Page 43. Move paragraph 4 to the head of this section. It succinctly describes Alternative B, leaving the remaining paragraphs to explain how B evolved.
USACE		Chapter 2	**[T06-011]** Page 43, paragraph 7, 2nd sentence. This information is super important because it may be the deciding factor between Alts A and B. I hope a lot more information is provided on soils and thaw stability.
USACE		Chapter 2	**[T06-012]** Page 43, 2.6. What is the point of Alternative C? I understand all the upgrades to existing facilities, but why? What is accomplished or avoided with Alt. C? That should be in an introductory paragraph.
USACE		Chapter 2	**[T06-013]** Page 45, Alternative D. Which map depicts the "seasonal Alpine ice road" which is the starting point for this alternative's ice road.
USACE		Chapter 2	Page 46. "List of On-Site Facilities": at least 4 duplicate listings.
USACE		Chapter 2	Page 47. This sentence describes the need for "On-Site Facilities" and should precede the list for clarity: "Limited access requires that certain services, equipment and supplies otherwise provided at the APF be duplicated at the drill site."
USACE		Chapter 2	Page 49, to be consistent with Alternative A description, this section should be titled "**Spill Prevention and Response**"
USACE		Chapter 2	Page 49. Weather closures at APF were said to be from a previous citation, but I don't remember seeing it.
Chapter 3.4 Social Systems			

USACE		Chapter 3.4	P. 120, second paragraph, second to last sentence. Appropriate to add "oil development" here?
USACE		Chapter 3.4	**[T06-014]** P. 121, first sentence. Maybe define "bilateral family unit"?
USACE		Chapter 3.4	**[T06-015]** P. 122, first paragraph. Discussion on pounds of subsistence harvest should explain what this is; berries, fish, meat, all?
USACE		Chapter 3.4	**[T06-016]** P. 122, 2nd paragraph. Percentage used for oil industry; add percentage for NSB for comparison.
USACE		Chapter 3.4	P. 122, 4th paragraph. Airstrip should be "foot".
USACE		Chapter 3.4	P. 122, 4th paragraph, last sentence. Call the cited gravel road "Nuiqsut Spur Road".
USACE		Chapter 3.4	**[T06-017]** P. 122, 5th paragraph. Is the AC the only store?
USACE		Chapter 3.4	**[T06-018]** P. 122, 6th paragraph. Explain why the Helmrick's property is described in the Economic Organizations section.
USACE		Chapter 3.4	P. 122, Section 3.4.1.4. Consider adding "Government" to the title of this section. Typo in next sentence; change "with" to "within".
USACE		Chapter 3.4	**[T06-019]** P. 125, 3rd paragraph at head of bullet list. Is the "community health status evaluation" the "Health Analysis Report"?
USACE		Chapter 3.4	Page 126, first sentence. Reference document is in italics. This is great and all other cited document titles should be considered for italicization too.
USACE		Chapter 3.4	**[T06-020]** P. 126, second paragraph (after bullets), first sentence. Does "local" mean local Nuiqsut development or the larger picture oil field development?
USACE		Chapter 3.4	**[T06-021]** P. 126, second set of bullets, 4th bullet. I have no idea what this trauma is and perhaps other readers will not know either.
USACE		Chapter 3.4	P. 127, 3rd paragraph. "Result from" might be easier to understand than "incorporated into".
USACE		Chapter 3.4	Page 127, mid-page, paragraph starting with "New information". Last sentence states "A summary of the new data obtained is provided below". This summary occurs in first paragraph on page 128. The information in between isn't a summary and is confusing and overly detailed.

USACE		Chapter 3.4	**[T06-022]** Page 131, first paragraph. Maybe state that the SEIS will use NSB-contracted data, when available, because it is better than U.S. Census.
USACE		Chapter 3.4	**[T06-023]** Page 123, 3.4.1.5, first paragraph, last sentence. If drinking water quality is the only parameter in which Nuiqsut is compared to the Alpine field, leave this last sentence out.
USACE		Chapter 3.4	**[T06-024]** P. 131, 3.4.2, first paragraph. I notice the word "induces" is used in 3 or 4 places and I am uncertain of its use in economic discussion. Perhaps a quick explanation?
USACE		Chapter 3.4	P. 132, first full paragraph. The last sentence repeats what the previous sentence states, and much more succinctly.
USACE		Chapter 3.4	**[T06-025]** P. 133, first paragraph, second sentence. Seems to be contrary to info. on P. 132, first full paragraph, last sentence. If I'm wrong, others may be confused too and BLM should clarify.
USACE		Chapter 3.4	**[T06-026]** P. 135. Add a sentence describing "impact mitigation".
USACE		Chapter 3.4	**[T06-027]** P. 138, Table 3.4-5. Asterisks at "Source" not explained.
USACE		Chapter 3.4	**[T06-028]** P. 143, second sentence. I think the "other resources" identified in the footnote are important enough to be listed above in the text. Especially since project area-specific information is not available for these resources.
USACE		Chapter 3.4	P.144, second sentence. Would "encompassed" better than "crossed" to describe the impact to the study area?
USACE		Chapter 3.4	**[T06-029]** P. 144, 3rd sentence. Shift from what?
USACE		Chapter 3.4	**[T06-030]** P. 148, Figure 3.4-9. Where the trucks used on existing roads, ice roads, frozen river?
USACE		Chapter 3.4	**[T06-031]** P. 149, Figure 3.4-10 is out of order and doesn't depict "travel routes".
USACE		Chapter 3.4	**[T06-032]** P. 149, Resource Availability, last sentence. Add a quick note as to why these species were selected as indicator species?
USACE		Chapter 3.4	**[T06-033]** P. 149, last paragraph. Any idea what "substantial portion" would be?
USACE		Chapter 3.4	**[T06-034]** P. 164, 3.4.6, bullet list, second bullet. A few words describing what this relates to?
USACE		Chapter 3.4	**[T06-035]** P. 165, 3.4.7, middle of first paragraph. Does the NPR-A designation affect recreational opportunities or access?

USACE		Chapter 3.4	**[T06-036]** P. 167, 3.4.7.2, bullet list. Maybe add bullet that BLM is not considering the NPR-A or project study area for wilderness designation.
USACE		Chapter 3.4	**[T06-037]** P. 175, first paragraph. What kind of spills; gravel, petroleum?
USACE		Chapter 4.4	P. 293, 3rd paragraph from bottom. Forgot to identify this verbiage is about Alt. D.
USACE		Chapter 4.4	**[T06-038]** P. 293. No mention of impacts to villagers from lowered subsistence activities and resulting increased dietary dependence on processed store-bought foods. Maybe too difficult to quantify.
USACE		Chapter 4.4	**[T06-039]** P. 295, Comparison of Alternatives", first paragraph contradicts paragraph above bullet list on previous page.
USACE		Chapter 4.4	**[T06-040]** P. 295, same section, 2nd paragraph sentence: "because a more heavily used subsistence area would be preserved". I don't believe it is stated in "Affected Environment" that the Fish Creek setback is a more heavily-used subsistence area, and I think it is important enough to have been discussed earlier.
USACE		Chapter 4.4	**[T06-041]** P. 295, Economy, first paragraph. If the SEIS doesn't address "abandonment" impacts in all other resources evaluations, the document is inconsistent.
USACE		Chapter 4.4	P. 300, Comparison of Alternatives, first sentence. Should be "alternatives" – plural. Also in subsequent paragraphs, identify which alternative is being discussed.
USACE		Chapter 4.4	**[T06-042]** P. 301, second paragraph, 3rd & 4th sentences. Is there no reporting requirement for spills not contained on a road?
USACE		Chapter 4.4	**[T06-043]** P. 301, Impacts under Alternative A, sentences 1 and 2. The use of the term "overlap areas" instead of "project impact areas" is confusing. It isn't the overlap of the areas that potentially impacts subsistence, it is the impact from the proposed activity. Seems a euphemistic way to describe potential impacts.
USACE		Chapter 4.4	**[T06-044]** P. 302, User Access, mid-paragraph. Access for persons walking? What percentage of Nuiqsut residents have a truck but no 4-wheeler or sno-go? This seems like impact "fluff".
USACE		Chapter 4.4	**[T06-045]** P. 303, end of 2nd paragraph. Can you add information on how common this contamination concern (real or perceived) is among previous study participants?
USACE		Chapter 4.4	**[T06-046]** P. 304, first paragraph, last few sentences. Again, what about diet changes, diabetes, dental caries, etc. as the result of consuming fewer wild meat, fish and berries?
USACE		Chapter 4.4	**[T06-047]** P. 306, 2nd paragraph, first sentence. I think you have made a case in the previous discussion of Alternative D, that the increase in helicopter and fixed-wing traffic IS a substantial variation from other Alternatives as it relates to subsistence and its importance to Nuiqsut villagers.

USACE		Chapter 4.4	**[T06-048]** P. 307, Construction, 2nd paragraph. Bisecting communities or access between communities is not what you have identified as a potential for disproportionate EJ affect (disrupting subsistence resources, i.e. the bullet list above). And "community isolation".
USACE		Chapter 4.4	**[T06-049]** P. 307, same paragraph as above. Const. crew housing at any of the 3 locations cited, would minimize disturbance compared to what? No camp at all? Camps at all 3 places?
USACE		Chapter 4.4	**[T06-050]** P. 308. A general comment about Subsistence opportunities. The proposed road would provide vehicle access to the Ublutuoch River. A boat launch here would shorten access to the rich hunting and fishing areas downstream. Was this considered?
USACE		Chapter 4.4	**[T06-051]** P. 310, Conclusions, 2nd paragraph. The text: "the effects fall above the level of significantly restricting subsistence" mean MORE significant, or LESS significant restrictions? Maybe change the word "above" to "increase".
USACE		Chapter 4.4	**[T06-052]** P. 315, Land Use and Ownership, 2nd paragraph, last sentence. Confusing.
USACE		Chapter 4.4	**[T06-053]** P. 316, Table 4.4-4, Impact Criteria. This good information. It would be good to provide for every resource evaluated in Environmental Consequences section.
USACE		Chapter 4.4	**[T06-054]** P. 318, Recreation. It is perhaps irrelevant to the project decision outcome, but there has been no discussion of recreation undertaken by Nuiqsut residents. I believe that not all snow-go, 4-wheeler or boat trips are exclusively for subsistence gathering.
USACE		Chapter 4.4	**[T06-055]** General comment about the Resources sections in Environmental Consequences: the organization as described in the first paragraph (P.169) e.g. methodology, definitions, direct impacts, indirect impacts, alternatives comparison, mitigation, conclusion, climate change; was not followed in many of the Resource sections.

Agency	Commenter Name	Section	Page	Paragraph	Sentence	Comment
USACE		Essential Fish Habitat	87	4		The EFH Assessment for the project study area is only referred to in Appendix F. This paragraph should include a brief description of the results of the EFH Assessment.

USACE		Birds 3.3.3	87	5	4	**[T06-056]** This sentence states that data to support avian occurrence within the project study area is not available at this time. This statement is confusing. 1) What does this statement mean and why isn't this data available? 2) Also, the statement that avian occurrence data is not available conflicts with figures such as 3.3-7 which shows 2012 Avian Survey in Relation to Project Study Area and information on Page 90 that specifies bird studies have been conducted in the project area. Recommend that you delete or clarify this sentence. The introduction to this chapter should discuss when and what type of bird surveys were conducted within the Development Subarea. For example, on Page 96, paragraph 5, bird surveys conducted in 2005 and 2009 within the Project Study area are discussed. These bird surveys and any other bird surveys conducted in the Development Subarea should be discussed in the introductory bird section on page 87.
USACE		Birds 3.3.3	90	1 and 2		**[T06-057]** Recommend that these paragraphs be inserted as the beginning paragraphs under Birds 3.3.3 on Page 87
USACE		Birds 3.3.3	476	Figure 3.3-7		**[T06-058]** The color of the stars for king eider occurrence, glaucous gull nest, and pacific loon nest are very similar and hard to differentiate on the map. Recommend changing color or shapes.
USACE		Table 3.3-4.	90			**[T06-059]** Were bird surveys conducted within the 2011-2012 Development Subarea? This is unclear in the SEIS and should be better clarified.
USACE		Gulls 3.3.3.1	92	4	1 and 2	**[T06-060]** The first two sentences are confusing since Figure 3.3-7 documents loon and gull nests occurrence within the study area. If surveys for gulls were conducted in the Development Subarea, then this should be clearly specified in this paragraph.
USACE		Waterfowl 3.3.3.4	94	5	2	**[T06-061]** Information should be included to state why these particular waterfowl species were selected.
USACE		Brant and Snow Goose	96	5		**[T06-062]** This paragraph should be moved to page 87 under the Introduction to Birds section to provide the reader with information on surveys that were conducted within the Development Subarea.

USACE		Snow Goose	97			**[T06-063]** Information in this section should specify whether or not snow goose nests were observed in the GMT1 survey location.
USACE		Threatened and Endangered Species	111	4	General Comments	**[T06-064]** Recommended adding the following paragraph to this section: "The action area is defined in the ESA regulations (50 CFR 402.02) as the area within which all direct and indirect effects of the project will occur. The action area is distinct from and larger than the project footprint because some elements of the project may affect listed species some distance from the project footprint. The action area, therefore, extends out to a point where no measurable effects from the project are expected to occur." The action area should than be clearly defined for all alternatives and T&E species. This section should also mention if formal or informal consultation has occurred for the proposed action and for what species. Documentation of information and formal consultation including Biological assessments and Biological opinions (if they were required) should be referenced and included in the appendices.
USACE		Steller's Eider 3.3.5.2	115	1	1	Should be corrected to state: locations within and adjacent…
USACE		Bowhead Whale 3.3.5.5	118			**[T06-065]** Should state why bowhead whales are not expected to occur in study area, (i.e., lack of marine waters)
USACE		Beringia DPS Bearded Seal 3.3.5.6	118			Should state why bearded seal are not expected to occur in study area. Unless there is a measurable effect on bearded seal, recommend shortening this section to one paragraph.
USACE		Arctic Subspecies of Ringed Seal 3.3.57	119	4		Should state why bearded seal are not expected to occur in study area.

USACE		4.3.3 Birds	260	Table 4.3-7 Impact Criteria Intensity		**[T06-066]** How is the percentage of a bird habitat or bird population defined? What are the side boards? For example does 25 percent or more of a high value habitat mean the bird's habitat worldwide, within the ACP, within the subarea? Is 25% of the bird population worldwide, in Alaska, in the ACP, or the subarea. More explanation is needed to better define how this Impact Criteria Intensity is applied.
USACE		4.3.3.1 Construction Disturbance& Displacement	263	3		**[T06-067]** What are the current aircraft conditions (i.e., how many planes take off and land per day). Will the proposed action increase aircraft traffic? This information is important to understand how much of an impact aircraft has on noise and visual cues to birds as a result of the proposal.
USACE		4.3.3.1 Mortality	264	1		**[T06-068]** This paragraph should specify approximately how many structures would be built that would potentially cause bird collisions.
USACE		4.3.3.3 Comparison of Alternatives	265	7	1	Although it is included in Table 4.3-9, defining the total acreage in the project study area would be helpful to include in this paragraph.
USACE		4.3.3.3 Comparison of Alternatives	266	6		**[T06-069]** The airport improvements in Nuiqsut should also be mentioned in Section 4.3.3.1 disturbance and displacement under the aircraft noise levels section.
USACE		4.3.3.3 Comparison of Alternatives	267	2		**[T06-070]** The estimation of additional new flights should also be included in Section 4.3.3.1 disturbance and displacement under the aircraft noise levels section.
USACE		4.3.3.5 Conclusion	271			**[T06-071]** A conclusion on impacts to the "focal" group of birds should also be included since it was specifically mentioned in Chapter 3.
USACE		4.3.4.1 Terrestrial Mammals Construction	275	1	1	**[T06-072]** Medium-term is used throughout this sentence and should be defined. What is the difference between medium-term and long-term?
USACE		4.3.4.1 Terrestrial Mammals Construction Forage	275	2	2	The sentence is confusing. Recommend changing it to: The project may result in loss of forage habitat for caribou and other terrestrial mammals.

USACE		4.3.4.1 Terrestrial Mammals Construction Altered Survival or Productivity	278	6	1	**[T06-073]** Please clarify what is meant by food waste? Is that human food waste/garbage? Aren't there measures that would be implemented to prevent access to garbage?
USACE		4.3.4.1 Comparison of Alternatives	281	3	1	**[T06-074]** To reflect results in Table 4.3-18, this sentence should be re-written to state: Alternative D is expected to result in overall moderate impacts to caribou and low impacts to other terrestrial mammals.
USACE		4.3.4.1 Mitigation	283	2	1	**[T06-075]** Recommend listing these protective mitigation measures in a table.
USACE		4.3.5 Spectacle Eider Disturbance and Displacement	288	1	1	**[T06-076]** Since multi-year surveys indicate spectacled eider nest in the study area and loss of habitat would result, stating that it is unlikely that spectacled eiders would be affected by any of the GMT1 Project Alternatives should be revised to state minor impacts could occur.
USACE		2.4.6.2 ASRC Mine Site	30	3		**[T06-077]** The ASRC mine site holds sufficient gravel resources for additional cells in future years.

Agency	Commenter Name	Document Section or Figure Number	Comment
USACE		**Draft SEIS Vol. 1. Figures. pdf.** Figure 2.6-1 Alternative C Nuiqsut Alternative Access (pg. 7)	**[T06-078]** This figure is associated to the following draft SEIS Vol. 1. Section 1-7 (pg. 51), 'Kuukpik Corporation, the Nuiqsut Village Corporation, has applied for permits to construct an approximately 5.8-mile-long gravel road connecting to the CPAI CD5 access road (Figure 2.6-1), which would include a new 10-acre gravel storage pad near the juncture.' Show in this drawing the location of the 10-acre gravel storage pad **or** indicate in the text as follows: which would include a new 10-acre gravel storage pad near the juncture (Nuiqsut Laydown Pad).

USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment/Alpine Spill History (pg. 52)	**[T06-079]** The most prevalent geomorphic units present within the project study area include ice-rich margin thaw basin (17 percent), fresh water (17 percent), delta inactive overbank deposit (15 percent), alluvial-marine deposit (14 percent). Descriptions of these units are provided in Jorgenson et al. (2003, p. 13). Please add: .... overbank deposit (15 percent), alluvial-marine deposit (14 percent) (Figure 3.2-1).
USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment	**[T06-080]** The geomorphic classification of the project study area is shown in Figure 3.2.1.1-1. The areal extent of each geomorphic unit occurring with the project study area is listed in Table 3.2.1.1-1.[No clear if the 90,058.90 acres shown on table 3.2.1.1-1 is referring to the project study area please add in Figure 3.2.1.1- 1 the boundaries of the project study area]. Done [pg. 55 and Figure 3.2-1]
USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment	**[T06-081]** 3.2.1.2. Geology and Minerals: [please identify in this section what bedrock geology is found in the study area of the project. On the Final IAP/EIS Map 3.2.5-1 the bedrock geology is identified for the whole North Slope. Suggestion: show in the map where the study area is, so the reviewer can see the bedrock at this particular area]. Done: Applicant's answer: 3.2.1.2..... Supplemental site-specific information relevant to the evaluation of geology and mineral resources within the project study area was not identified. (pg. 55).
USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment (pg. 55)	**[T06-082]** Based on data from industry exploration, the USGS estimated that 120 to 200 MMbbl of discovered oil (oil and condensate) may also be technically recoverable in the NPR-A (USGS Fact Sheet 2010-3102). [Indicate where is this Fact Sheet]. Done: Information can be accessed using links. Applicant's answer: Based on data from industry exploration, the USGS estimated that 120 to 200 MMbbl of discovered oil (oil and condensate) may also be technically recoverable in the NPR-A (USGS 2010). Other information on geology is provided in BLM (2004, § 3.2.1.2) and BLM (2012, § 3.2.5). (pg. 55)
USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment (pg. 58)	The Colville River is the longest river (370 miles) and has the largest drainage basin (20,920 mi2) on the North Slope of Alaska, extending from the Brooks Range to the Arctic Ocean (Jorgenson et al. 1997). Information missing: There is not a Jorgenson et al. 1997 reference , please add it.

USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment. Fish Creek Basin Streams (pg. 59)	**[T06-083]** The proposed access road crosses Crea Creek approximately 0.75 mile west of Barely Creek. At this location, Crea Creek flows between two smaller lakes and has a firm channel bed with underlying sedge and banks dominated by willows (MBJ 2009). Information missing: MBJ, 2009a or MBJ, 2009b?
USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment. Fish Creek Basin Streams (pg. 65)	**[T06-084]** Water quality data specific to the lakes in the vicinity of GMT1, CD1, and CD4 were collected in 2002, 2004, and 2006-2012 as described in MJM Research (2004), MJM Research (2006), Information missing: MJM Research (**2004**) are MJM Research (**2006**) are not in the References (Chapter 6).
USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 3: Affected Environment. Surface Water Quality. (pg. 65)	**[T06-085]** In one study, lakes M9924 and M9925 (**see Figure 3.2-3**), located north and south of the proposed project area, respectively, were sampled four times in August 2002. Change for clarity: FROM: (see Figure 3.2-3) TO: (see Figure 3.2-3 and Figure 3.3-4) Figure 3.3.-4 has labeled both lakes.

USACE		**Draft SEIS Vol. 1, 1-7 Sections.** Chapter 4: Environmental Consequences. 4.3.1.Vegetation and Wetlands (pg. 241) and Appendix E-GMT1 Wetland Functional Assessment Table 3	**[T06-086]** Table 4.3-2. Direct Impacts of construction on vegetation and wetlands (acres), shows that the total impacts from Alternative A is 72.5 acres; the Wetlands Functional Assessment (WFA) appears to indicate in table 3 that the total area of impact is 91.22 acres. There is no connection between the information presented in the environmental consequences table and the acreage of wetlands associated to the functions of wetlands for the project footprint in table 3 (see attachment A and Attachment B). Information analysis sequence: Please streamline the wetland classification used in the different sections of the document so that the analysis of wetland impacts presented in Chapter 4 is clearly reflected in the WFA. There is a need to marry the classifications used in both analyses, Chapter 4 and WFA. Generally the first entry on both tables should be the wetland (Cowardin) classification. But because you did not separate the vegetation section from the wetland section, it is difficult to evaluate the acreage of wetland types impacted by each alternative. Then it is difficult to make the linkage between Chapter 4 and the WFA. Your analysis makes difficult to set a clear picture of impacts as the analysis is carried over the various sections (starting with the affected environment). Streamlining this sequence by standardizing the wetlands types will make easier to evaluate the proposed mitigation, including the project compensatory mitigation component.

USACE		**Appendix E**-GMT1 Wetland Functional Assessment Table 3	**[T06-087]** The proposed analysis results in all wetlands to be at the most of Moderate Value despite the fact that the area has close to zero oil development and that it is preferred habitat for threatened species, specifically eiders, when compared to other wetlands in the ACP where more development has occurred. There are surveys that corroborate the presence of eiders in the area (See Figure 3.3-7). Although most of the proposed project is in wetlands, there are some wetland areas that appear to be preferred for nesting and breeding. As per 2012 avian survey data collected in 2012, threatened species seems to prefer nesting and breeding closer to large ponds or where there are complex of ponds/tussock tundra features. Similar areas in the ACP have been classified as of moderate value based on their proximity to roads and oil development facilities. In this particular case, there is not extensive oil development within the proposed project study area (in comparison to other oil development fields in the North Slope). Information analysis: Based on the 2012 avian survey, see attached a preliminary map that identify wetland areas within the project area that show similar characteristics to nesting and breeding areas as per the 2012 Avian Survey map. This preliminary map also identifies wetland areas abutting (immediate adjacent) to fish-bearing streams. Both wetland areas are of higher value than other adjacent wetlands because in the case of eiders support an impaired species. Both eider habitat and abutting wetlands to fish bearing streams and fish-bearing lakes are certainly Category I. Please modify the functional analysis to include high function wetlands into your assessment. You may use the attached map to refine your analysis (see Attachment C and Attachment D).

Table 4.3-2. Direct Impacts of Construction on Vegetation and Wetlands (acre)

Vegetation Type	Wetland Type[1] (Cowardin Code / Functional Category)	Mapped Project Study Area[2]		Alternative A		Alternative B		Alternative C		Alternative D	
		Acres	(%)	Acres	(%)	Acres	(%)	Acres	(%)	Acres	(%)
Cassiope Dwarf Shrub Tundra	PSS3B / NA	86	0.1%								
Fresh Grass Marsh	PEM1H, R2AB3H / II	438	0.5%	<0.1		<0.1		<0.1		<0.1	
Fresh Sedge Marsh	PEM1H / II	970	1.1%	0.8	0.1%	1.2	0.1%	0.9	0.1%	<0.1	
Moist Sedge–Shrub Tundra	PEM/SS1B / III	15,187	17%	19.2	0.1%	26.5	0.2%	26.1	0.2%	24.8	0.2%
Old Basin Wetland Complex	PEM1F, PUBH, PEM1B / II	5,508	6.1%	5.5	0.1%	8.6	0.2%	5.7	0.1%	2.0	<0.1%
Open Low Willow	PSS1B / II	2,685	3.0%	0.1	<0.1%	0.1	<0.1%	0.1	<0.1%	<0.1	
Open Tall Willow	PSS1B / II	67	0.07%	0.3	0.5%	0.3	0.4%	0.3	0.4%	<0.1	
Riverine Complex	R2UBH, R2AB3H / II	162	0.2%	0.2	0.1%	<0.1		0.3	0.2%	<0.1	
Tussock Tundra	PEM/SS1B / III	15,973	18%	41.1	0.3%	29.5	0.2%	56.0	0.4%	50.2	0.3%
Water	PUBH, R2UBH / II	18,100	20%	0.1	<0.1%	1.5	<0.1%	0.1	<0.1%	0.8	<0.1%
Wet Sedge Meadow Tundra	PEM1E, PEM1F, PEM1F / II	23,814	26%	5.2	0.0%	11.6	<0.1%	6.8	0.0%	9.6	<0.1%
Total Potential Wetlands		**82,989**	**92%**	**72.5**	**0.1%**	**79.3**	**0.1%**	**96.3**	**0.1%**	**87.3**	**0.1%**
Barren	Us (upland)	3,019	3%					1.2	<0.1%		
Total Project Study Area	**102,487**			**72.5**	**0.07%**	**79.3**	**0.08%**	**97.5**	**0.10%**	**87.3**	**0.09%**

[1] Wetland types are from the Cowardin classification system used by the National Wetland Inventory (http://www.fws.gov/wetlands/). Functional Category ratings were interpreted from Table 4 of the Wetland Functional Assessment for the Greater Mooses Tooth Unit Development Project – 2013. Prepared for ConocoPhillips Alaska, Inc. by Wendy Davis, ABR, Inc., Anchorage, AK. December 2013. The Functional Category ratings reflect the particular functions and their magnitude (e.g., Low, Moderate, High) assigned by the author, resulting in Functional Categories of I (high), II (moderate), or III (low). The wetland functions these ratings represent are discussed in Section 3.3 Vegetation and Wetlands. "NA" indicates no functional ratings available for this wetland type.

[2] Percent of vegetation type acreage within the mapped vegetation portion of the project study area. Note that 12,428 acre (12%) of the project study area extends outside of the vegetation map coverage. All the project facilities under all the alternatives are within areas of mapped vegetation.

Attachment B

Table 3. Acreages (acres) for Wetland Functional Classes occurring in the Greater Mooses Tooth development project footprint, North Slope, AK.

Wetland Functional Class	CD1 to CD4 Pipeline VSM	CD5 to GMT1 Pipeline VSM	Clover Material Source	GMT1 Drill Site	GMT1 Road	Valve Pad
Waters						
Lower Perennial Stream		< 0.01			0.37	
Permanently Flooded Pond		< 0.01				
Waters subtotal		< 0.01			0.37	
Wetlands						
Permanently Flooded Sedge or Grass Marsh	< 0.01	0.00			0.79	
Semi-permanently Flooded Sedge Meadow	0.01	0.01	2.07		4.99	
Tidal Seasonally Flooded Barrens	< 0.01					
Tidal Semi-permanently Flooded Graminoid Meadow	< 0.01					
Saturated Graminoid Shrub	0.01	0.06	16.60	11.74	53.49	0.70
Saturated Low and Tall Willow Shrub	< 0.01	< 0.01			0.36	
Wetlands subtotal	0.02	0.07	18.70	11.74	59.62	0.70
Wetlands and Waters Total	**0.02** +	**0.07** +	**18.70** +	**11.74** +	**59.99** +	**0.70** = 91.22 ac.
Uplands						
Upland	<.01					
Total	0.03	0.07	18.70	11.80	60.00	0.70

10% buffer added proportionally to Clover material site to correspond with acreages presented in the EED, total rounded to nearest 0.1 acre.

Corps of Engineers comments

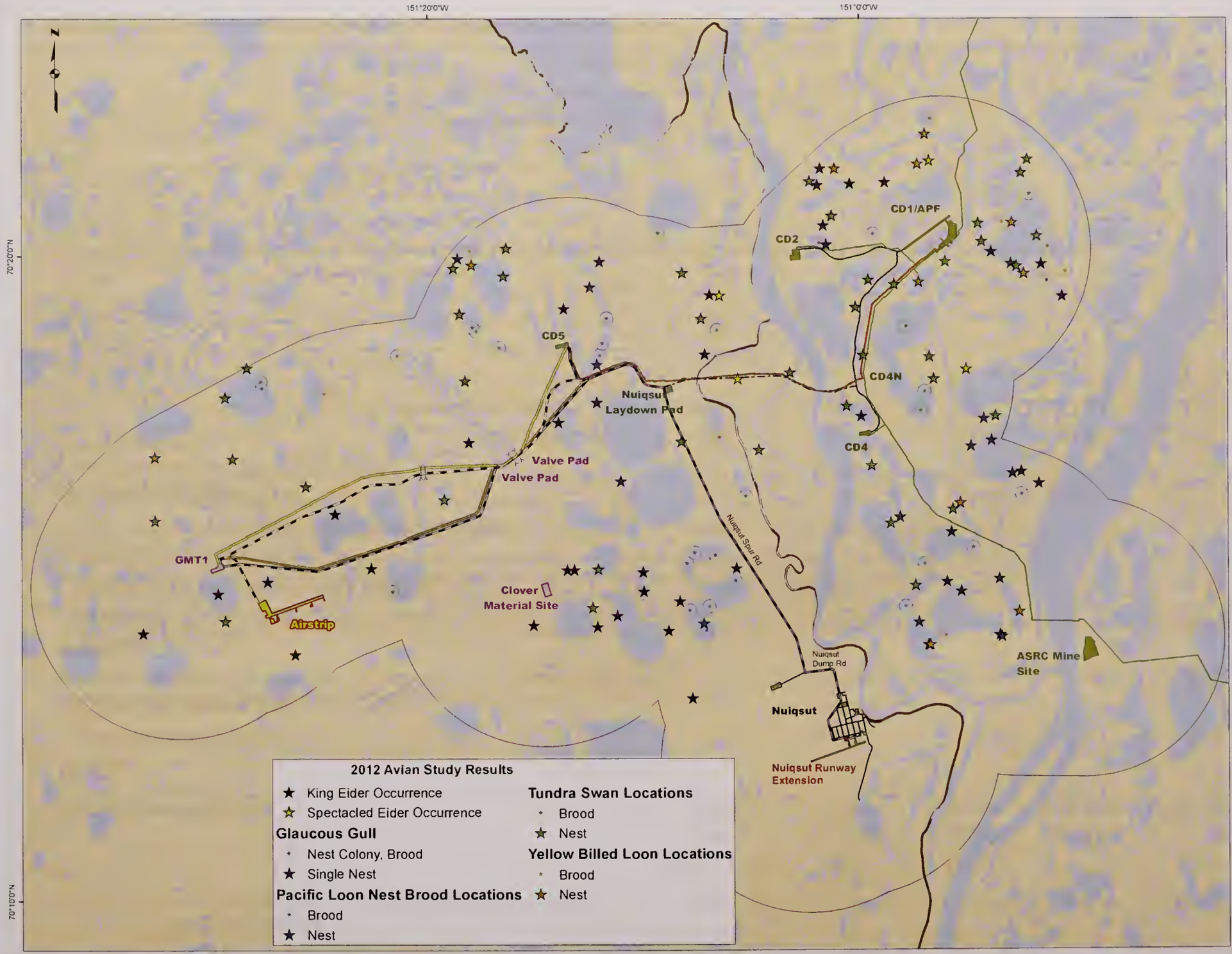


Figure 3.3-7

2012 Avian Survey in Relation to Project Study Area

Alternative A Infrastructure
- Pipeline
- Road
- 14 inch Water[2] Injection Line
- Bridge
- Facility

Alternative B Infrastructure
- Pipeline
- Road
- 14 inch Water[2] Injection Line
- Bridge
- Facility

Alternative C Infrastructure
- Pipeline
- GMT1 to CD5 Road
- Nuiqsut Spur Road and Airport Access Road
- 14 inch Water[2] Injection Line
- Bridge
- Facility
- Nuiqsut Runway Extension

Alternative D Infrastructure
- Pipeline
- Access Road
- 14 inch Water[1,2] Injection Line
- Bridge
- Facility
- Airstrip

Proposed or Permitted (not part of GMT1)
- Pipeline
- Road
- Facility

Existing
- Pipeline
- Road
- Facility

Boundary
- Project Study Area
- NPR-A

Footnote
1 Pipeline includes a 2 inch diesel line & 2 inch waterline from CD1 to GMT1
2 14 inch Water Injection line from CD1/APF to CD4N will be constructed on a new pipe rack From CD4N to CD5 the14-inch Water Injection line will be placed on the already proposed or permitted pipe rack (not part of GMT1)

DRAFT SEIS

Draft Date 1/23/2014

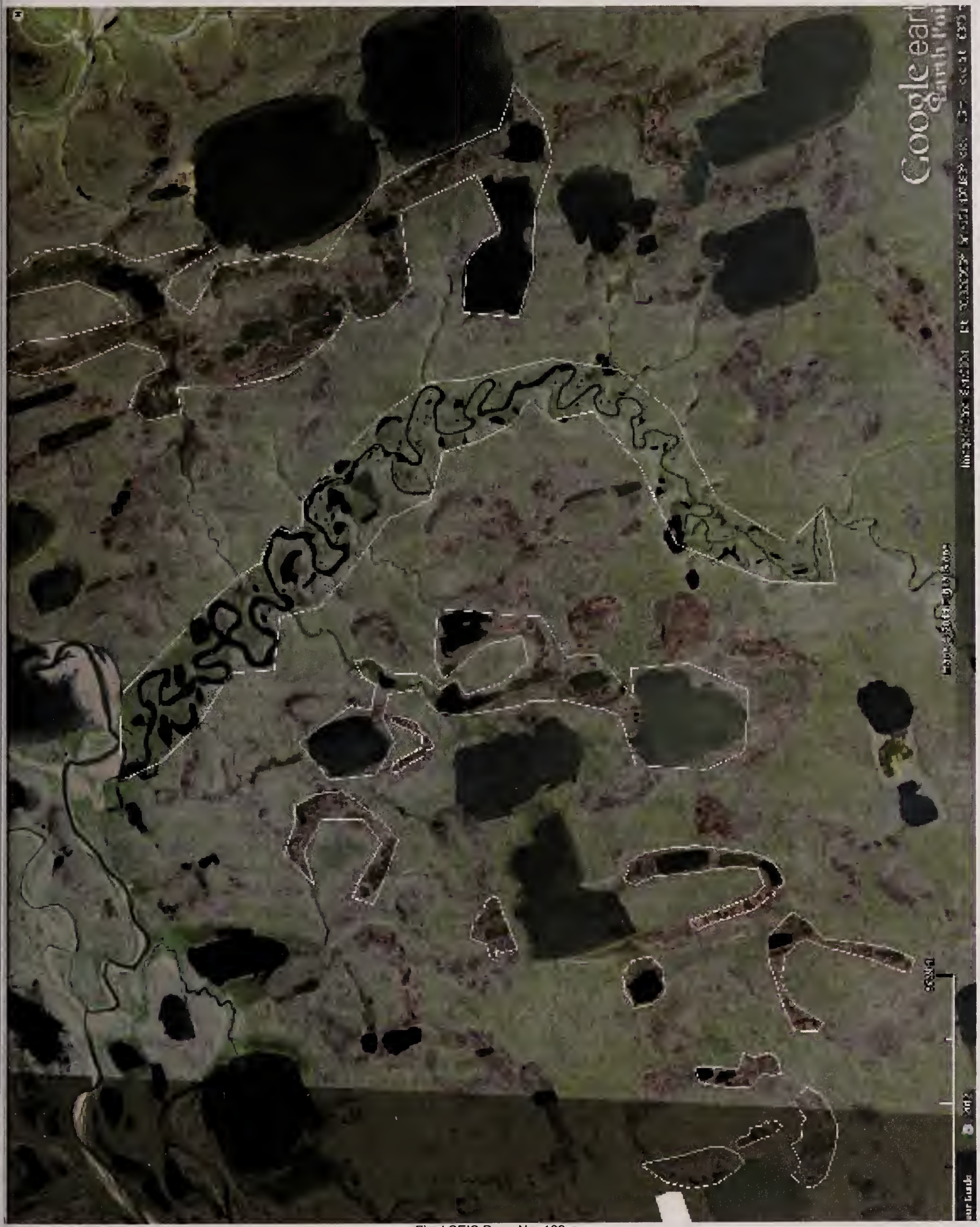
0 0.5 1 2 3 Miles

No warranty is made by the Bureau of Land Management as to the accuracy reliability, or completeness of these data for individual use or aggregate usa with other data, or for purposes not intended by BLM Spatial information may not meet National Map Accuracy Standards This information may be updated without notification for offical land status information refer to Cadastral Survay plats, Master Title Plats and land status case-files

NAD 1983 StatePlana Alaska 4 FIPS 5004 Faet

Bureau of Land Management - Alaska
National Petroleum Reserva - Alaska

GMT1 Development Project Supplamantal Environmantal Impact Statement 2014


Google earth

[06-001]
A comprehensive oil and gas infrastructure development plan for the entire NPR-A is beyond the scope of the SEIS. The NPR-A IAP/EIS (2012) provides extensive analyses for oil and gas development in the NPR-A (Sections 4.2.1.2 and 4.8.3) and for NPR-wide activities the SEIS tiers to those analyses.

[06-002]
The Corps is the federal agency with jurisdictional authority to require compensatory mitigation for unavoidable impacts to aquatic resources. Because the Corps is a cooperating agency on the GMT1 SEIS, the BLM will continue to work closely with the Corps to ensure that the information necessary to evaluate the impacts to aquatic resources in incorporated in the Final GMT1 SEIS. Additionally, the BLM will continue to work with the NPR-A Working Group and other North Slope Stakeholders to identify other mitigation opportunities in the Arctic.

[06-003]
The ASA (WFA) is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[06-004]
It is unknown whether the landowner will deny ROW access; therefore, Alternative C is considered in the Final SEIS.

[06-005]
Analysis of direct and indirect impacts, including that for wetlands and water resources, includes infrastructure and the area within 300 ft of gravel roads and pads, respectively. This analysis describes potential adverse impacts that are expected to occur within a localized area. Watershed impacts were also evaluated by an "Inundation Analysis" as shown in Figures 4.2-2 and 4.2-3.

[06-006]
The 2013 NPR-A IAP ROD has determined setback distances for streams and lakes within the NPR-A which will be utilized for the GMT1 development project.

[06-007]
The CD5 and GMT1 gravel access roads are 32 ft across, crown width. They are capable of handling all loads including traditional North Slope drill rigs. To reduce gravel footprint in the Colville River Delta, the section of the CD5 access road from the east abutment of the Nigliq Channel Bridge to the west abutment of the Nigliagvik Bridge is reduced to 30 ft shoulder to shoulder with 22 ft wide bridges. This section is limited to 400,000 pound loads. Rig transport in and out of the Colville River Delta will occur via ice road. Rig transport between CD5 and GMT1 will be via the gravel access road.

[06-008]
If a gravel access road connecting GMT1 to the Alpine field road system and the APF is not permitted, then a gravel airstrip of at least 5,000 ft in length is required to provide the necessary transportation system for effective and reliable spill response support by means of C-130 aircraft. See also October 19, 2012 Corps ROD for the Point Thomson Project Final EIS (ref. page 59) for justification for a 5,600 ft airstrip at a remote drill site operation.

[06-009]
Faculty siting priorities are given to the GMT1 drill site and airstrip (if applicable in each alternative). Once the drill site and airstrip are sited, pipeline routes are determined with significant consideration for water bodies and wetlands while also balancing consideration that minimizing line length reduces risk for line failure. Pipelines and spill contingency plans are designed with utmost care for effective spill detection and response. All alternatives were developed and amended as necessary to ensure best possible pipeline siting.

[06-010]
Vertical loops were adapted for the purpose of eliminating these remote valve locations on Alaska's North Slope and may have potential in this application. Instead of an additional set of remotely located valves to reduce spilled volume, the vertical loops would complement the valves located both at the GMT1 drill site and ACF to cut off flow in the event of a pipeline failure at river/creek crossings. This method is used on other North Slope pipelines but should not be considered as universally applicable to all area projects since there are unique technical limitations to be considered. A major technical limitation to this method would be the difficulty in adapting this system for varying terrain. Existing North Slope development mostly occurs in relatively flat terrain, where these loops are proven. However, terrain in NPR-A varies in elevation more drastically than to the east. In order for these loops to be used effectively on river crossings with varying elevations, many loops may be needed instead of just one to overcome the height differences. Depending on specific application requirements, these loops could add undesired effects on visual resources and raise other concerns in these sensitive areas. CPAI should investigate the technical feasibility of this method as its advantages are worthy of discussion.

[06-011]
The need for a detailed mine and reclamation plan has been noted in previous reviews. This is a requirement of the regulations governing the use of mineral material disposals on public land. When the material site is selected, if it is located on public land, a complete mine and reclamation plan will be submitted to the BLM for review by the NEPA staff for determination of the need for additional NEPA prior to a contract for the sale of the mineral materials being issued.

[T06-001]
At this time, there are no project proposals to develop the mineral accumulations that are anticipated to be developed from a GMT2 drill site, either in fact or by agency assertion that a proposal exists. The BLM has addressed this development as reasonably foreseeable based on results from past exploration activity and long term Continuing Development Obligation plans so that its impacts may be discussed in general terms until additional project economics and reservoir analysis data are derived. GMT2 project economics are expected to be heavily dependent on the presence of an active GMT1 drill site and may also depend on the presence of North Slope natural gas infrastructure. CPAI is unable to formally commit to a development timeline for these accumulations until more data is evaluated. An appropriate NEPA document will be prepared for GMT2 development if necessary.

[T06-002]
The Final SEIS has been updated to reflect the suggested edit.

[T06-003]
At this time, there are no project proposals to develop the mineral accumulations that are anticipated to be developed from a GMT2 drill site, either in fact or by agency assertion that a

proposal exists. The BLM has addressed this development as reasonably foreseeable based on results from past exploration activity and long term Continuing Development Obligation plans so that its impacts may be discussed in general terms until additional project economics and reservoir analysis data are derived. GMT2 project economics are expected to be heavily dependent on the presence of an active GMT1 drill site and may also depend on the presence of North Slope natural gas infrastructure. CPAI is unable to formally commit to a development timeline for these accumulations until more data is evaluated. An appropriate NEPA document will be prepared for GMT2 development if necessary.

[T06-004]
The Final SEIS has been updated to reflect the suggested edit.

[T06-005]
The benefits of separating roads from pipelines to reduce synergistic effects on caribou movement have been well known for over 25 years. More detailed discussion can be found in the EISs to which the Final SEIS is tiered, and the scientific papers incorporated by reference in those EISs.

[T06-006]
The Final SEIS has been updated to reflect suggested edit.

[T06-007]
At this time, there are no project proposals to develop the mineral accumulations that are anticipated to be developed from a GMT2 drill site, either in fact or by agency assertion that a proposal exists. The BLM has addressed this development as reasonably foreseeable based on results from past exploration activity and long term Continuing Development Obligation plans so that its impacts may be discussed in general terms until additional project economics and reservoir analysis data are derived. GMT2 project economics are expected to be heavily dependent on the presence of an active GMT1 drill site and may also depend on the presence of North Slope natural gas infrastructure. CPAI is unable to formally commit to a development timeline for these accumulations until more data is evaluated. An appropriate NEPA document will be prepared for GMT2 development if necessary.

[T06-008]
The thickened ice required for placement of the bridge structure will be slotted or removed prior to breakup. Nut plug consists of sand and cellulose and has superior traction over sand and is an inert material. Most of it will be removed as the ice is scraped at the end of the winter construction season.

[T06-009]
The Alpine Facilities Erosion Control Plan outlines procedures for operation, monitoring, and maintenance of various erosion control methods. These procedures will be assessed and modified if necessary to enhance their ability to prevent future erosion and sedimentation.

[T06-010]
During development of its ROD, BLM will determine whether and which of these potential new mitigation measures will be adopted as part of BLM's authorization for the project.

[T06-011]
The BLM has only limited information at the present time regarding soils conditions. The effects of climate change on the changes in permafrost are not well documented and the resulting

conditions are not addressed in the current soil survey documents. This information is limited to that contained in the Exploratory Soil Survey of Alaska. BLM may include a request for more detailed soils and permafrost information (1/2-mile radius) in the monitoring plan as requirement for the proponent.

[T06-012]
Alternative C is intended to evaluate impacts to Nuiqsut in the event that it's used as a hub of industrial activity. Given Nuiqsut's proximity to oil development, BLM felt that it was worthwhile to analyze impacts that may affect the village, as a result of both GMT1 and future development in the area. Additionally, the Native Village of Nuiqsut, a cooperating agency on the SEIS, encouraged BLM to carry this alternative forward from the 2004 EIS. Native Village of Nuiqsut expressed interest in the economic benefits which could potentially arise as the result of using Nuiqsut as a "hub" of industrial operations. Aside from analyzing social impacts, Alternative C may provide an environmental benefit by keeping some air and vehicle traffic out of the Colville River Delta, where Alpine CPF is located. Kuukpik Corporation, the land owner of the Nuiqsut Spur Road, stressed in its public comments that it would not allow widening of the Spur Road to make adoption of this Alternative feasible.

[T06-013]
The Final SEIS has been updated to reflect the suggested edit.

[T06-014]
The Final SEIS has been updated to reflect the suggested edit.

[T06-015]
The Final SEIS has been updated to reflect the suggested edit.

[T06-016]
The Final SEIS has been updated to reflect the suggested edit.

[T06-017]
The AC Value Center is the only store in Nuiqsut.

[T06-018]
Helmerick's property does not play a role in economics impacts, thus, it will be removed from the Chapter 3 economic discussion in the Final SEIS.

[T06-019]
The Final SEIS has been updated to reflect the suggested edit.

[T06-020]
"Local" in this particular context refers to development that could occur with a community's subsistence harvest area. Text will be revised for clarification.

[T06-021]
Text has been revised to better explain the "trauma" being referred to here as reported in NSB 2012 Final Baseline Community Health Analysis Report.

[T06-022]
The Final SEIS has been updated to reflect the suggested edit.

[T06-023]
The Final SEIS has been updated to reflect the suggested edit.

[T06-024]
Text was added as a footnote in the Final SEIS to define direct, indirect, and induced jobs.

[T06-025]
Relevant test was expressed as a footnote in the Final SEIS which describes the difference in the two estimates.

[T06-026]
The Final SEIS has been updated to reflect the suggested edit.

[T06-027]
The Final SEIS has been updated to reflect the suggested edit.

[T06-028]
The text has been added in Table 3.4-11 noting the types of resources not addressed.

[T06-029]
The Final SEIS has been updated to reflect the suggested edit.

[T06-030]
Generally trucks are used on ice roads and local roads, although some people use trucks to access fishing spots along the Nigliq Channel when frozen.

[T06-031]
Figure 3.4-10 was included in the DRAFT SEIS, but it is not clear from the text that reader should refer to maps/figures in back. The figure is included in the Final SEIS with better language to indicate where it can be found.

[T06-032]
The Final SEIS has been updated to reflect the suggested edit.

[T06-033]
Text has been added noting the maximum percentage of the harvest Arctic cisco has represented during available study years.

[T06-034]
The Final SEIS has been updated to reflect the suggested edit.

[T06-035]
The Final SEIS has been updated to reflect the suggested edit.

[T06-036]
The Final SEIS has been updated to reflect the suggested edit.

[T06-037]
Spills from petroleum or diesel during construction would have the potential to impact terrestrial resources. The Final SEIS has been updated to reflect the suggested edit.

[T06-038]
Nutritional importance of subsistence is important, and is mentioned as being one of the key elements of subsistence under "Subsistence Definition and Relevant Legislation." Potential impacts to nutrition are discussed in more detail in the revised version of Public Health in the Final SEIS.

[T06-039]
The Final SEIS has been updated to reflect the suggested edit.

[T06-040]
The Final SEIS has been updated to reflect the suggested edit.

[T06-041]
The Final SEIS has been updated to reflect the suggested edit.

[T06-042]
Spill reporting will follow and comply with all applicable sections of the Alaska Oil & Hazardous Substances Pollution Control Statues and Regulations, 18 AAC 75.300 Discharge or release notification; reporting requirements. This includes contained spills and spills not contained on a road. A new potential mitigation measure on spill response has been included in Section 4.5.5 Final SEIS. Updates to the Alpine ODPCP would include adding BLM's role in a response scenario, and would include their participation in spill exercises.

[T06-043]
While the impacts of the proposed activity are, indeed, one source of impacts on subsistence, the physical presence of the project (i.e., the project footprint) is an impact in and of itself, as it physically removes certain areas from the traditional use area of local residents.

[T06-044]
It is not uncommon for residents to not have access to a four-wheeler, boat, and/or snow machine during a given year (often due to malfunctioning equipment and the difficulties of ordering and receiving replacement parts in Nuiqsut). This has been the case during the Nuiqsut Caribou Monitoring Project, where individuals reported difficulty hunting due to a lack of transportation. Often, these individuals do have vehicles for in-village travel.

[T06-045]
BLM has already established BMP A-11 that addresses these concerns by requiring a study of contaminants in subsistence food for new development. A potential mitigation measure in the Final SEIS would expand on that BMP and includes the following as background information: SRB&A 2009 (Impacts & Benefits of Oil and Gas Development to Barrow, Nuiqsut, Wainwright, and Atqasuk Harvesters) provides data on how common concerns about contamination are. For example, 59 percent of harvesters from these communities cited personal experiences with contamination, and 73 percent of Nuiqsut respondents volunteered contamination and extraction of materials as a concern.

[T06-046]
Nutritional importance of subsistence is important, and is mentioned as being one of the key elements of subsistence under "Subsistence Definition and Relevant Legislation." Impacts to nutrition are described in more detail in the revised section on Public Health in the Final SEIS.

[T06-047]
Agreed. The difference in impacts under the various alternatives are described in greater detail in the revised subsistence impacts section. However, the differences are still not substantial enough to result in different findings regarding the overall degree of impacts based on the impact criteria and metrics used in the SEIS.

[T06-048]
The Environmental Justice section is revised and expanded in the Final SEIS to address this and other concerns.

[T06-049]
Text has been added to the Final SEIS to explain that these practices have the effect of isolating the two populations from each other, which has traditionally been viewed by agencies and industry as a good policy, but that recent interviews with residents of Nuiqsut indicate that they are opposed to any policies that enforce segregation of the two populations.

[T06-050]
There is a potential mitigation measure for a boat launch. The potential mitigation measures were accidentally omitted from the printed version of the DRAFT SEIS.

[T06-051]
ANILCA uses very specific language, the revised Environmental Justice analysis included in the Final SEIS explains this finding in other terms.

[T06-052]
The Final SEIS has been updated to reflect the suggested edit.

[T06-053]
Impact criteria for all resources (Summary of Impacts for the Alternatives) were provided in the DRAFT SEIS on page 173 and will be provided in the Final SEIS in the same section.

[T06-054]
Travel and camping in the NPR-A by local residents is predominantly related to subsistence activities. A wide range of subsistence activities and impacts to them are described under Subsistence in Section 4.4.5 of the Final SEIS.

[T06-055]
The Final SEIS has been updated to reflect the suggested edit.

[T06-056]
The introduction to Section 3.3.3 in the Final SEIS has been revised to describe available data more effectively. A new appendix (Appendix M) which contains a summary of all available avian survey records pertinent to the GMT1 project has been included in the Final SEIS.

[T06-057]
The introduction to Section 3.3.3 in the Final SEIS has been rewritten to describe available data more effectively.

[T06-058]
The Final SEIS has been updated to reflect the suggested edit.

[T06-059]
The introduction to Section 3.3.3 in the Final SEIS has been revised to describe available data more effectively. A new appendix (Appendix M) which contains a summary of all available avian survey records pertinent to the GMT1 project has been included in the Final SEIS.

[T06-060]
A new appendix (Appendix M) which contains a summary of all available avian survey records pertinent to the GMT1 project has been included in the Final SEIS.

[T06-061]
Relevant text in introduction of Section 3.3.3 of the Final SEIS has been revised to better describe the selection of focal species.

[T06-062]
The introduction to Section 3.3.3 in the Final SEIS has been revised to describe available data more effectively. A new appendix (Appendix M) which contains a summary of all available avian survey records pertinent to the GMT1 project has been included in the Final SEIS.

[T06-063]
A new appendix (Appendix M) which contains a summary of all available avian survey records pertinent to the GMT1 project has been included in the Final SEIS. References to Appendix M have been added through relevant sections of Chapter 3 of the Final SEIS.

[T06-064]
The actions requested in this comment will be addresses in the BA and BO itself not in Chapter 3 of this Final SEIS. The Final SEIS will contain the documentation of the ESA consultation as the consultation has not yet been initiated and can not be begun until the preferred alternative has been selected.

[T06-065]
Marine waters could be affected by this project if a spill were to occur and flow down a tributary of Fish Creek into the waters of Harrison Bay. The previous EISs to which this Final SEIS is tiered explain that the bowheads tend to remain close to the pack ice edge during migration, keeping them far enough offshore to make any effects unlikely.

[T06-066]
The text "or bird population" has been removed from Table 4.3-7 of the Final SEIS, as quantitative impacts are based on impacted habitat only. The percentage calculations are shown in Tables 4.3-9 and 4.3-10 and are based on impacted value divided by the total habitat type available within the project study area.

[T06-067]
The Final SEIS discusses aircraft use for all alternatives in Chapter 2 and impacts in Chapter 4. Cumulative impacts including those from aircraft use are discussed in Section 4.6.

[T06-068]
A reference to GMT1 structures that may result in bird strikes has been included in Section 4.3.3 of the Final SEIS.

[T06-069]
Section 4.3.3.1 of the Final SEIS does not differentiate impacts among alternatives, it discusses the impacts in general. The paragraph under Section 4.3.3.1 does discuss disturbance and displacement of birds near "existing and planned airstrips". Section 4.3.3.3 discusses Alternative C airport improvement impacts to birds in detail. This subject is sufficiently discussed in the Final SEIS text.

[T06-070]
The text of the Final SEIS has been revised to discuss disturbance effects as a function of flight frequency.

[T06-071]
BLM does not agree that a conclusion on impacts to the "focal" group of birds is needed. The bird species in the focal group are represented in the impact conclusions.

[T06-072]
The Final SEIS has been updated to reflect the suggested edit.

[T06-073]
The Final SEIS has been updated to reflect the suggested edit.

[T06-074]
The Final SEIS has been updated to reflect the suggested edit.

[T06-075]
The Final SEIS has been updated to reflect the suggested edit.

[T06-076]
This statement has been revised in the Final SEIS to more accurately describe potential impact.

[T06-077]
The Final SEIS has been updated to reflect the suggested edit.

[T06-078]
The Final SEIS has been updated to reflect the suggested edit.

[T06-079]
The Final SEIS has been updated to reflect the suggested edit.

[T06-080]
This comment was made during the PDRAFT SEIS comment period and was addressed in DRAFT SEIS

[T06-081]
This comment was made during the PDRAFT SEIS comment period and was addressed in DRAFT SEIS

[T06-082]
The Final SEIS has been updated to reflect the suggested edit.

[T06-083]

The 40-foot-long Crea Creek Bridge will be constructed using two sets of pilings positioned approximately 40 feet apart with sheet pile abutments for erosion protection located at each end of the bridge. Stream flow collected at this site (S5) is present within this report: MBJ, 2009a which is listed in the bibliography.

[T06-084]
The Final SEIS has been updated to reference applicable documents: MJM Research (2006) has been removed from Section 3.2.2 of the Final SEIS.

[T06-085]
The Final SEIS has been updated to reflect the suggested edit.

[T06-086]
The 91.22 acres in the Draft SEIS includes the Clover mine site. Currently, the proposed gravel source is the ASRC mine site, a commercial gravel mine. Tables 4.3-2, 4.3-3, and 4.3-4 of the Final SEIS provide direct impacts by alternative and vegetation type/Cowardin Code.

The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

[T06-087]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project.

ASDP Draft Supplemental EIS for GMT1: Cooperating Agency Comments - 4/22/14

Agency	Commenter Name	Document Section or Figure Number	Comment
USFWS	LNSmith	2.4.7.2	**[T07-001]** Water Use – *During year two of construction, between 17 and 26 miles of ice road will be required depending upon completion of the Tinmiaqsigvik River Bridge and the Nuiqsut Spur Road.* Not sure why the Nuiqsut Spur Road is mentioned in Alternative A as it is not supposed to be used as an industrial road nor associated with this project under Alternative A.
		Table 2.4-2	**[T07-002]** Water use numbers do not agree with text for (MG) for Alternative A year 2.
		2.7	**[T07-003]** Under sub-Alternative D (seasonal drilling) the airstrip should be the same as at CD-3 (3,600 ft.) since an ice road will be available during active drilling to transport a relief rig if necessary.
		Table 2.7-1	**[T07-004]** Additional elements necessary for Alternative D. Not too sure all of this is necessary under the sub-Alternative D (seasonal drilling). Should check to see what was necessary at CD-3 during drilling. Similar elements should be applied to the sub- Alternative D.
		3.3.1	**[T07-005]** Not too sure why wetlands are cited as *potential* jurisdictional wetlands – is there some ruling that needs to occur to classify them as wetlands? Also, percentages of wetlands, water, and uplands do not agree from one paragraph to another in this section. Uplands are < 5% on page 79 and < 1% on page 80. Throughout the document, gravel fill should be classified as man-made fill or something similar; the term "uplands" should be used only to classify naturally-occurring uplands (sand dunes; tall pingos, etc.)
		3.3.1 (page 82)	**[T07-006]** General Habitat Suitability – this category differs for mammals vs birds; should really be mammals and/or birds. Uniqueness and special status – what denotes "high quality habitat" ? It is a rather vague term and without the presence of listed species would be left up to interpretation.
		3.3.2.1	**[T07-007]** Fish Habitat – It is important to note that overwintering fish habitat is *naturally* limiting on the Arctic Coastal Plain. Approximately 70% of the naturally occurring overwintering fish habitat on the ACP is located within the Colville River Delta and River. Within the oilfields, we have created overwintering fish habitat where none previously occurred through daylighting abandoned mine sites (deep water) to streams. While we should be careful to preserve the naturally occurring overwintering habitat and connectivity to those habitats, creating more as compensation for *wetland* losses
		3.3.3 Birds	**[T07-008]** Wildlife studies vs avian studies…should limit this to avian studies. Also, reference to a map depicting ASDP area would be helpful in the first paragraph on page 90. In addition, it should be noted that the Applicant limited studies to the Colville Delta in the 1990s. The first studies in NPR-A began in 2001.
		3.3.3.2 Passerines	**[T07-009]** Common ravens were counted on the Christmas Bird counts for several years…I believe the data show a marked increase in overwintering Ravens on the North Slope over the years.

		3.3.3.4 Waterfowl - Tundra Swan	**[T07-010]** What time of year were the density data for tundra swans collected? The outer Colville Delta and other coastal areas are known to have high numbers of fall staging swans. Were these densities contours based on pre-nesting, nesting, brood-rearing, or fall staging swans? It makes a difference as different habitats are used accordingly. Page 96 - Last Swan paragraph "Of these four preferred nesting habitats, *only* three occur in the project study area." Qualifying language such as *only* should be removed (actually, 3 out of 4 is 75% which could be interpreted as being quite high). Tundra swans are long-lived birds. Pairs that have established nest sites prior to the encroachment of industrial activity may return to those nest sites and continue to utilize them for many years, until one or both the adults die. It is unclear however, if the site would be re-occupied by another pair due to the disturbance.
		Brant	Brant utilize coastal salt marsh habitats during brood-rearing. The birds may or may not be found in specific areas along the coast on any given day as they are known to move back and forth along the coast sometimes travelling fairly great distances. The availability of habitat, and a successful hatch year, are the most important indicators of potential use.
		3.3.3.5 Shorebirds	**[T07-011]** 2nd paragraph – was this an aerial survey? 3rd paragraph – probably should remove reference to Lapland longspurs as this is a discussion about shorebirds…
		3.3.5.4 Polar Bear	Denning habitat within/adjacent to infrastructure can be created through drifting of snow. Polar bears also are attracted to infrastructure through smell of food/food waste. While the GMT-1 site is fairly far inland, as ice becomes scarce, bears may move inland in search of food…
		Environmental Consequences – 4.2.2 Water Resources	**[T07-012]** In general this section identifies potential impacts of the Alternatives – but only in a qualitative manner. In order to assess the impacts of the different Alternatives there needs to be some quantitative measure with which to make comparisons. For example for each Alternative the following data could be compiled: length of the road, number of culverts, the number of bridges, amount of inundation on upstream side of road, number of primary and secondary streams intersected by the road, length and duration (years) of ice roads, etc. Some impacts will be generic among Alternatives such as fugitive dust, development of mine sites, etc. Much of this information is in the text and some tables
			– but it is not presented in a compact manner that allows for direct comparison at a glance. Also, the conclusion that impacts to the drainage pattern with Alternative D would be greater than Alternatives A-C is counter intuitive. More gravel in a consolidated area does not necessarily mean more impacts to drainage patterns. If the data were presented in one table as outlined above, side to side comparisons among Alternatives would be easier to make.

		4.3 Biological Environment	**[T07-013]** Impact Criteria Table 4.3.1 Functional Categories are based on the Functional Assessment. Intensity – Impacts to Category III wetlands are not captured in Impact Criteria Duration – All gravel fill should be considered a Long Term impact (ASRC has asked that all roads be left in place; if rehabilitation occurs – it would take at least 25 to 30 years post gravel removal to yield functional habitat) Context – this category is somewhat confusing; Important resource is noted as having a distinctive ecosystem role within the region; all habitats fit this description in that they fulfill particular roles within the ecosystem (or they would not be there); seems like a comparison between abundance of a particular habitat vs the importance of its function
		Table 4.3-4; and other citations	**[T07-014]** Alternative C – It is unclear if the "existing" Nuiqsut spur road is subtracted from the Acres of impact for Alternative C. For all aspects of Alternative C the Spur Road footprint and indirect impacts should be subtracted from the "industrial road" footprint and indirect impacts.
		4.4.4 Birds - Table 4.3-8	**[T07-015]** Important shorebird habitat is listed. Some of these habitats (Moist sedge shrub; moist Tussock tundra) are reflected in Category III Functional Categories…
		Page 263- 2nd paragraph	**[T07-016]** Impacts to nesting birds from aircraft noise/disturbance. Should cite nesting/aircraft study at Alpine…
		4.3.3.3 Comparison of Alternatives	**[T07-017]** Last paragraph (page 267). Text indicates additional flights at Alpine (162-223) to support Alternative D during construction; flights would drop to no additional flights (at Alpine) after construction is completed. Yet flights would increase at GMT-1 to 540 new flights/month for May and June and 282 new flights for July and August for the life of the project. It is unclear where these flights will be originating from (Nuiqsut, Deadhorse?) Apparently they will not be coming from Alpine?
		Table 4.3-9 Table 4.3-10	**[T07-018]** Human modified habitat is listed in tables of Direct Impacts (and Indirect Impacts) to Potential High Value Bird Habitats…???
		4.3.3.4 Mitigation	**[T07-019]** Rehabilitation of gravel mine site to enhance habitat for waterfowl. In general mine site restoration on NS has not been successful; habitat gained would not be equivalent to habitat lost; Clover would be poor choice to rehab because of limited amount of overburden; rehab therefore would have to be successful after first season (not likely); advise would be to stabilize slopes to prevent thermocarsting of perimeter of mine site; and let fill with water over time. If daylighted into stream to create overwintering fish

			habitat should not get "credit" for wetland loss; may get credit for overwintering fish habitat if this type of habitat was lost in the creation of the mine and/or project related development. Last bullet (page 271) – placement of gravel during bird nesting (1 June – 31 July); indicates that this might be okay if nest search is done prior to gravel placement; Mentions mitigation of potential loss of active nest through USFWS advice. 1) Nest search not practical – not every nest (shorebird; passerine) will be found; negative data is not an indication of no nesting; 2) the Migratory Bird Treaty Act (MBTA) does not allow take of active nests (eggs/young) or birds so no mitigation for take is possible.
		Alternative C General Comments	**[T07-020]** Impacts associated with Alternative C regarding the Nuiqsut Spur road: All impacts need to be assessed only in terms of the expansion (widening) of the road. Cannot assess impacts as if the road does not exist.
		Cumulative Effects	**[T07-021]** 4.6.1.1 Assumptions: cumulative effects from GMT-1 including abandonment and restoration, would extend 30-50 years (more if GMT-2 were developed). Actually, given the life of GMT-1 20 to 30 years plus another 20 to 30 years for rehabilitation to occur the effects for GMT-1 over time would be 50 to 60 years at a minimum – more if additional projects (GMT-2, etc) came on line "down-stream" of GMT-1.
		4.6.2.1 Past, present, and future activities	**[T07-022]** Page 345 – reasonably foreseeable future actions: Why is the Clover mine site not included here? ASRC mine site expansion is but not Clover?
		4.6.4.2 Biological Resources – vegetation and wetlands	**[T07-023]** Page 365 paragraph 2: Removal of gravel fill and restoration of sites has occurred in the PBay/Kuparuk oil fields since 1990s. We have in excess of 20 years of data for some projects – there is nothing "preliminary" about the techniques or the results regarding gravel removal and restoration of pads/roads/airstrips. It is not really that expensive – just need time for restoration to occur. Having said this – we generally have not been successful with mine site restoration.
		Birds	**[T07-024]** Page 368: Question the conclusion that Alternative D would have the most impacts to birds of the 4 Alternatives. More acreage in a consolidated area vs a long linear road transecting many habitat types and subjecting more habitats to indirect impacts, such as dust and gravel as well as impounded water (removing available habitat during early staging and nesting).
		Table 4.7-1 Mitigation	**[T07-025]** Gravel hauling restricted during spring and summer to avoid interference with waterfowl nesting habitats…not too sure what this means. Gravel hauling on existing gravel roads during spring/summer or any time likely would have little or no impact on waterfowl nesting habitats. Gravel hauling on ice roads would happen only in winter when birds are not present. It is not gravel hauling, it is gravel *placement* that is the problem. *Gravel placement will take place outside the nesting window (1 June to 31 July) to avoid impacts to nesting birds.*
		Figure 3.3-2 Fish overwintering habitats	**[T07-026]** Figure should have proposed project overlaid on the map. All Alternatives would be best.

		Figure 4.2-6 Crea Creek and Barely Creek Drainage Basins	**[T07-027]** Needs pipeline depicted on map.
		Figure 4.6-1 Oil and Gas Infrastructure	**[T07-028]** GMT-2 not on map but should be; Oooguruk Island and recently permitted facilities in Kuparuk not on map; Should have additional map at closer scale so infrastructure is more visible.
		Appendix E Functional Assessment	**[T07-029]** Category III wetlands: The classification description indicates these wetlands will be "smaller" and less diverse on the landscape than Category II wetlands; also that they may have experience some form of degradation. Not sure what constitutes a small wetland? The wetlands categorized as Saturated Graminoid Shrub Wetlands were categorized as Category III wetlands because they are widespread and do not border waterbodies or watercourses. According to Appendix E, Figure 2 Saturated Graminoid Shrub habitat borders most of the waterbodies (lower perennial streams and permanently flooded ponds) along the proposed road route to GMT-1. Also, high value bird habitat for waterfowl, king eiders, and shorebirds (moist sedge-shrub meadow; grass marsh; sedge marsh), (Section 3.3.3.5; Figure 3.3-6; Table 4.3-8) are considered a Category III Functional Class wetland (saturated graminoid shrub; Appendix E; Figure 2). In fact, if Figure 3.3-6 is overlaid onto Figure 2 (Appendix E) the habitats through which the road runs includes high value bird habitat as indicated in Table 4.3-8 and are much more diverse than the Functional Assessment indicates in Appendix E; Figure 2. We suggest the habitats along the proposed road routes be used to assess impacts instead of Functional Categories. This would take into account their high-value to birds as indicated in Table 4.3-8.
		Appendix I Mine Site Restoration	**[T07-030]** To date, mine site restoration on the North Slope has not been very successful. Attempts to create shallow water habitat usually results in either overfilling (creating perched, steep-sided islands) or under-filling creating little or no littoral zone. Usually the restoration requires additional fill over several years to compensate for settling. At times, there is not enough overburden to create the required shallows. In addition, the pit needs to be monitored over many years – how long depends upon how long the pit takes to fill with water and how much settling occurs after the pit is full. For example, the first cells of the ASRC pit were rehabbed beginning in the late 1990s. Initially, the overburden failed to settle (requiring additional excavation work) and then settled too much (requiring additional fill). After about 10 years the site filled (due to flooding

			from the Colville River), additional overburden was then placed to maintain the littoral zone and islands. For about 3 years the site seemed stable, however recent aerial photos indicate additional settling has occurred and some of the islands have disappeared. It is unclear if a littoral zone has been maintained. The site is 16 years old. With the ASRC site, additional overburden was available for fine-tuning the site. With many mine sites however, additional overburden is not available. Because of the uncertainty surrounding mine site restoration and the long-term commitment to monitoring and maintenance of the site, the Service does not believe mine site restoration on the coastal plain of the North Slope to be a viable option. Instead, BMPs should be practiced when closing a site (3:1 side slopes to prevent erosion and berms surrounding the site to maintain thermal integrity and for safety) and the site left to fill.
		Road, pad, airstrip Rehabilitation	**[T07-031]** In contrast to mine site restoration, the removal of gravel from unused pads, roads, and airstrips within the Prudhoe Bay/ Kuparuk oilfields and subsequent rehab of the sites has been very successful. The gravel is removed to tundra grade (removal of as much gravel as possible is preferable) and the site is left for 1-2 years to settle. Rehabilitation may or may not include organic overburden, seeding, and fertilizer. Each site is unique however, eventually given enough time most sites see growth of some natural vegetation within 5 to 10 years. Complete rehabilitation may take in excess of 15-20 years, but maintenance is not usually necessary. The closer the site is to the coast, the longer rehab will take (colder, saline soils). It is important to note that the site may not reflect the type of habitat that originally was lost, (it may be wetter or dryer) but it usually is viable habitat (as opposed to a gravel pad). Removed gravel usually can be reused in new construction and/or for maintenance of in-field roads.
		Impacts/Cumulative Effects	**[T07-032]** In recent meetings, agencies have requested there be an attempt to quantify impacts and cumulative effects other that using number of acres filled. The impacts associated with Alternatives A-C are spread over a much larger area than those associated with Alternative D, yet if impacts were gauged only by the acreages involved, Alternative D would be identified as having the most impact. In an attempt to capture (and quantify) the impacts associated with a linear structure across the landscape we offer the following suggestions: Parameters • Length of road/structure (miles) • Number of river/stream xings (by type –including ephemeral/seasonal) • Number of fish-bearing (and seasonally connective) stream xings • Number of proposed bridges • Number of proposed culverts (or battery of culverts) • Amount (acreage) and duration of up-gradient flooding (estimated; then

			verified post-construction) • Number of habitats/wetland types crossed (into and out of) along the length of the road/structure (habitats/wetland types should be used, not functional categories) • Number of different previously-adjacent habitats/wetland types isolated from one another as a result of the road/structure • Existence of a road/structure up or down gradient from proposed structure • Existence of a road/structure perpendicular to proposed road/structure Other parameters could be included such as elevation difference (slope) of terrain; direction of sheet flow; position of road sections according to prevailing winds (dust shadow; snow drifting); distance to known wildlife concentrations (nesting, brood rearing, etc.), distance to know subsistence areas (fishing, hunting, berry picking) The parameters could have multipliers (mutually agreed upon and with some rational) applied to them (to minimize or increase) associated impacts Assessing the numbers associated with the parameters would indicate the impact of the road/structure to the environment. Cumulative effects could be quantified additively or as a multiplier, etc. for proposed infrastructure.

[T07-001]
The Final SEIS has been updated to reflect the suggested comment.

[T07-002]
Table 2.4-2 of the Final SEIS has been updated with new numbers from CPAI and the text modified to reflect changes made.

[T07-003]
In a D2 alternative, CPAI insists a 5000 foot gravel airstrip is necessary, for a relief rig to be hauled in via Hercules. Constructing an ice airstrip each year at GMT1 in place of a gravel airstrip would cut many weeks off the already short drilling season, resulting in fewer wells drilled each year and longer overall project length. It would also drastically limit site access during summer months and shoulder seasons when crews must remain present for well workovers and maintenance of production facilities.

[T07-004]
Comment is noted.

[T07-005]
The 2013 NPR-A IAP EIS, Section 3.3.2.1 (Wetland and Floodplain Definitions) describes the Corps authority over wetlands and how wetlands are defined. Uplands <5% includes Barren (3%) and Dune Complex (<1%) Vegetation types. The text in Section 3.3.1 of the Final SEIS has been modified to provide more clarity.

[T07-006]
The term “high quality habitat” is drafted from the Clean Water Act.

[T07-007]
Only "naturally" occurring overwintering fish habitat is being discussed in this section. There is no data or study cited to support that 70% of the naturally occurring overwintering fish habitat on the ACP is located within the Colville River delta and river. The actual distribution of overwintering habitat is only recently being identified (see Figure 3.3-2). There is no mention in this section (or other Fish section) of "daylighting" the Clover Mine for compensation to wetland losses.

The ASRC Mine site is currently proposed as the potential gravel source. CPAI alerted BLM of its intent to use the ASRC Mine site shortly after publication of the Draft SEIS.

[T07-008]
Most instances where the word "wildlife" are used in reference to specific titles of studies, such as ABR's Wildlife Survey series. In order to not inaccurately represent the available data, decline to alter the verbiage in these instances. One use of "wildlife" was edited to "avian" in Section 3.3.3 of the Final SEIS.

[T07-009]
Section 3.3.3.2 of the Final SEIS has been revised to include population status information for the common raven.

[T07-010]
Tundra swan data included in the Final SEIS were utilized from a long series of aerial surveys during two different periods: nesting aerials conducted during mid-late June and brood-rearing

aerials conducted during mid August. Fall staging swans may be present in high densities in the Outer Colville Delta and other coastal areas, but these locales are well out of the GMT1 Project Study area and thus do not need to be highlighted in detail.

[T07-011]
The referenced survey was aerial. The relevant sentence in the Final SEIS has been edited to provide context for inclusion of Lapland longspur.

[T07-012]
Table 2.3.2 (footprint and gravel requirements), Table 2.4.2 (water use), Table 4.1.1 (major project components number of bridges, miles of ice roads, acres of fill), Table 4.2.7 (inundation areas), and Table 4.2.8 (length of roads, number of bridges and culverts) are already available to make direct comparisons between alternatives.

[T07-013]
Section 4.3.1.5 states "The direct effects of construction and operation of the project alternatives include destruction of vegetation and wetlands during construction of gravel pads, roads and airstrips; from excavation of material sites and construction of VSMs; and the potential for colonization by non-native, invasive species. These impacts are characterized as long-term." These long term impacts will occur to all vegetation, regardless of Category. Impact criteria Table 4.3-1 has been revised so that intensity is calculated from the amount of each type of wetlands.

[T07-014]
The calculation is only the widening of the spur road for direct impacts. The "existing" proposed footprint was subtracted from the road width.

[T07-015]
Assignment of bird habitat value in the GMT1 Final SEIS analysis is based on habitat use from avian survey data (relevant survey citations listed within Final SEIS Tables 4.3-8 and 4.3-9). Value, or importance, may not be congruent with wetland functional categories. In addition to various ecological functions and habitat considerations, key factors used to classify wetland functions include hydrological functions (e.g., flood flow regulation) and water quality functions (e.g., nutrient and sediment retention) and will be considered as part of the 404 permitting process.

[T07-016]
Johnson et al 2003, which contains results of the Alpine Airstrip Study, is cited within Draft SEIS text, and remains in the Final SEIS text.

[T07-017]
Fixed-wing flights landing at Alpine under alternatives A, B, and C would generally originate from Deadhorse. An exception would be the C-130 which may come in from Kotzebue, Anchorage, or Kenai. Fixed-wing flights landing at GMT1 under Alternative D would originate from both Deadhorse and Alpine.

[T07-018]
Habitat impact Tables 4.3-8 and 4.3-9 of the Final SEIS have been revised and the habitat "Human Modified" is removed.

[T07-019]
The ASRC Mine site is currently proposed as the potential gravel source. CPAI alerted BLM of its intent to use the ASRC Mine site shortly after publication of the Draft SEIS. Information about A Reclamation Plan was developed for the ASRC Mine site as discussed in Section 2.4.4Information will be provided to CPAI for evaluation in developing the Mine Reclamation Plan for the Clover Material Source, if that is used as the preferred gravel source.

[T07-020]
The calculation is only the widening of the spur road for direct impacts. The "existing" proposed footprint was subtracted from the road width.

[T07-021]
The Final SEIS has been updated to reflect the suggested edit.

[T07-022]
The Final SEIS has been updated to reflect the suggested edit.

[T07-023]
The Final SEIS has been updated to reflect the suggested edit.

[T07-024]
Statement in question has been removed from the Final SEIS and the discussion of alternative impacts revised.

[T07-025]
The Final SEIS has been updated to reflect the suggested edit.

[T07-026]
The Final SEIS has been updated to reflect the suggested edit.

[T07-027]
The Final SEIS has been updated to reflect the suggested edit.

[T07-028]
The Final SEIS has been updated to reflect the suggested edit.

[T07-029]
The ASA (WFA) is being is being revised by ABR/CPAI in coordination with CORPS, USFWS, and EPA. The ASA will be available for use as supporting documentation in 404 permitting for the GMT1 project. Habitats along the proposed road routes are used in the impact assessment for birds in Chapter 4 of the Final SEIS.

[T07-030]
CPAI has indicated that it intends to use the ASRC mine site for GMT1, rather than the Clover material source. BLM will not have jurisdiction over the rehab and restoration plan for the ASRC site. However, the suggested BMPs may be incorporated in the future NEPA and permitting of Clover, should BLM receive an application to open that site.

[T07-031]
The ASRC Mine site is currently proposed as the potential gravel source. CPAI alerted BLM of its intent to use the ASRC Mine site shortly after publication of the Draft SEIS. Information about

A Reclamation Plan was developed for the ASRC Mine site as discussed in Section 2.4.4Information will be provided to CPAI for evaluation in developing the Mine Reclamation Plan for the Clover Material Source, if that is used as the preferred gravel source.

[T07-032]
Comment is noted. These parameters have been included in the analysis in the Final SEIS.

[redacted]

From: Collins, Catherine [catherine_collins@fws.gov]
Sent: April 22, 2014 4:01 PM
To: GMT1 Comments; Bridget Psarianos
Cc: Jill Webster; Meredith Bond; John Notar; Carol McCoy; Tim Allen
Subject: Comments to Correct Error in Greater Mooses Tooth Unit Proposed Development Project Draft Supplemental Environmental Impact Statement (SEIS) as published on February 21, 2014

Thank you for the opportunity to review the "SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One."

[01-001] In Section 4.2.3.2 Air Quality the term "Alaska" National Wildlife Refuge is used throughout the section and in many of the tables. The correct name for the National Wildlife Refuge is "**Arctic** National Wildlife Refuge." Please ensure that the Arctic National Wildlife Refuge is correctly referenced throughout the SEIS.

Should you have further questions or comments, please feel free to contact me.

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[08-001]
The Final SEIS has been updated to reflect the suggested edit.

COMMITTEE ON APPROPRIATIONS
COMMITTEE ON
HOMELAND SECURITY AND
GOVERNMENTAL AFFAIRS
CHAIRMAN SUBCOMMITTEE ON EMERGENCY
MANAGEMENT INTERGOVERNMENTAL
RELATIONS AND THE DISTRICT OF COLUMBIA

MARK BEGICH
ALASKA

COMMITTEE ON
COMMERCE SCIENCE AND TRANSPORTATION
CHAIRMAN SUBCOMMITTEE ON OCEANS
ATMOSPHERE FISHERIES AND COAST GUARD
COMMITTEE ON VETERANS AFFAIRS
JOINT COMMITTEE ON TAXATION AFFAIRS

United States Senate
WASHINGTON DC 20510

March 19, 2014

The Honorable Sally Jewell
Secretary of the Department of the Interior
1849 C Street, NW
Washington, DC 20240

Dear Secretary Jewell:

On the eve of the Anchorage public hearing for the draft Supplemental Environmental Impact Statement (SEIS) for the Alpine Satellite Development, now known as the Greater Moose's Tooth Unit (GMT), I write to continue to express my strong support for an alternative that allow roads and to request you do not extend the public comment period for the SEIS.

As we discussed while visiting the project area last August, the GMT development is a crucial step in developing the resources of the National Petroleum Reserve-Alaska and will help stem the decline of oil shipped through the Trans-Alaska Pipeline System (TAPS). Given the logistical and seasonal deadlines imposed by its location, the SEIS process must stay on schedule. While a few have suggested the need for an extension to the 60-day public comment period, already longer than required by law, this project has been sufficiently vetted by the public.

[09-001] As you know, this project has been studied multiple times before your time in office. The current GMT is only a slight variant of the Alpine satellite project approved through a similar 2004 plan and EIS. Earlier plans and studies have all approved development and infrastructure in the area. This includes the February 2013 Integrated Area Plan which specifically listed the GMT project area as open for leasing and development infrastructure.

Earlier plans in the area, such as the 1998 Northeast Area Plan, superseded by the Integrated Area Plan, also supported development in this area. The 2005, 2007 and 2008 updates to the Northeast Area Plan all did as well, and all provided the public with ample opportunity to comment. ConocoPhillips purchased the leases for these wells in a 1999 lease sale that followed the original 1998 plan, after a lengthy public process of its own.

[09-002] Turning to the substance of the SEIS, the A, B, and C alternatives all facilitate the roads necessary for safe and economic oil field development in the area, while some have higher costs. As I mentioned in my February 24 letter on the NPR-A, roads lower costs, promote safety and protect wetlands in the area. Of these three roaded options, I favor Alternative A, which would create less fill and have an even lower cost and impact on the environment than Alternatives B and C.

Using an unsupported airstrip creates a large and more damaging footprint as well as noise impacts on wildlife. As such, while I prefer Alternative A, I will support any of the three roaded alternatives that allow ConocoPhillips to responsibly and economically develop this significant oil and gas resource.

Finally, I direct your attention to the Introduction to the draft SEIS: "The currently proposed GMTI Project is essentially the same as that approved for permitting in the 2004 ASDP ROD, and evaluated in the 2012 NPR-A IAP/EIS, with changes which reduce the overall impact." Given the facts above, we cannot afford to suffer the years of delay experienced with the nearby CD-5 project, and I urge you to make all necessary resources available to BLM to permit this project as soon as possible.

I appreciate your personal interest in this project. It's time to move forward on this promising development to help fill Alaska's oil pipeline and meet America's energy needs.

Sincerely,

Mark Begich
United States Senator

cc: The Honorable Charlotte Brower, North Slope Borough
The Honorable Thomas Napageak, Jr., City of Nuiqsut
The Honorable Neil Komze, Bureau of Land Management
Mr. Bud Cribley, Alaska Bureau of Land Management

[09-001]
BLM recognizes that many important scientific studies have been conducted in the area, and incorporates them in its analysis. The SEIS tiers to earlier NEPA documents referenced in this letter.

[09-002]
Comment is noted. The importance of roads for health, safety, and spill response are addressed in the SEIS. The impacts of an additional airport from increased flights and increased gravel fill are also analyzed in the Final SEIS.

JOHN D. DINGELL
12TH DISTRICT, MICHIGAN
COMMITTEE ON
ENERGY AND COMMERCE
CO CHAIR HOUSE
GREAT LAKES
TASK FORCE
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MIGRATORY BIRD
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April 22, 2014

Mr. Neil Kornze
Principal Deputy Director
Bureau of Land Management
1849 C Street NW
Washington, DC 20240

Dear Mr. Kornze,

We are writing to provide input on your consideration of the Draft Supplemental Environmental Impact Statement (DSEIS) for the proposed Greater Mooses Tooth 1 (GMT-1) development in the National Petroleum Reserve in Alaska PR-A). As you know, GMT-1 would be located in a wildlife-rich area in close proximity to the Teshekpuk Lake and Colville River Special Areas, and within habitat that is critical for migratory birds, numerous aquatic species, and the Teshekpuk Lake caribou herd. Wildlife resources in the area are important in their own right, and also critical to fulfilling the subsistence and cultural needs of local residents.

GMT-1 would be the first commercial oil development on federal land within the NPR-A. As such, it promises to create a precedent for the development of future oil and gas resources throughout the region. Understanding and minimizing the potential environmental impacts from GMT-1 is important both for protecting the area's human and wildlife values and for establishing a sustainable model for future development within the NPR-A.

Given that, we were disappointed to see that **[10-001]** the DSEIS appears to fall short of the principles of Arctic management laid out in " Managing/or the Future in a Rapidly Changing Arctic," the report to the President from the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska, chaired by then-Deputy Secretary of the Interior David J. Hayes. That report espouses an Integrated Arctic Management (IAM) approach that involves region-wide planning, adaptive management, and better assessments of potential cumulative impacts, while warning against piecemeal proposal-by-proposal "compartmentalized management" that fails to look holistically at impacts and sensitivities.

The DSEIS appears to follow a traditional compartmentalized management approach, analyzing the potential cumulative impacts of GMT-1 and a conceptual G T-2, but not considering how the manner of development of those projects could impact future westward development in the NPR-A, such as of the Bear Tooth Unit and beyond. **[10-002]** We believe the analysis of the roadless alternative in the DSEIS would be much stronger if it took into account the potential long-term vision for development of the NPR-A and offshore oil and gas leases in the Chukchi and Beaufort Seas. While this additional development is included in the cumulative impacts section of the DSEIS, it does not appear that any thought was given

to how future development could allow for operational efficiencies that might obviate the need for continually building roads from one drill pad to the next, much as seasonal drilling and rig sharing allowed for roadless operation at CD-3. Simply acknowledging cumulative effects should not be enough under an IAM approach; the goal should be to minimize those effects through farsighted management decisions.

That being said, we are pleased that development in the NPR-A is being guided by the 2012 Integrated Activity Plan (IAP), which was based on a thorough review and planning-level analysis of the NPR-A's many values and how to manage them into the future. Under the IAP, management decisions should provide for meaningful partnerships among all stakeholders and should be focused on ensuring sustainable ecosystems and continuity of ecosystem functions. We believe that the IAP and IAM are essential in setting standards for development that can be used throughout the entire Reserve ecosystem and guarantee the level of protection needed for all development.

In addition to those general comments, we have the following specific input into the DSEIS:

- The IAP generally prohibits roads and permanent facilities within three miles of nearly all of Fish Creek, a waterway which supports plentiful fish and waterfowl. BLM should honor this important plan provision.

- **[10-003]** The DSEIS contains conclusions about the impacts of roadless development without a sufficiently robust analysis of the impact of roads and flights on the life stages and migrations of the important animals and subsistence resources in the area.

- We note that the DSEIS provides that "[u]nder all action alternatives, residents of the minority community of Nuiqsut could experience disproportionally high and adverse impacts as the result of disrupted access to traditional subsistence use areas." Addressing our comments above will help minimize those impacts. **[10-004]** However, the most important thing you can do to eliminate or minimize the environmental justice concerns of this proposed project is to work with the people who live closest to the project area, including through the tribes to which the United States has a trust responsibility. These local people have the most knowledge of the area, and the most at stake, and should be closely consulted and receive significant deference from the United States.

We ask that you consider all these potential effects of the GMT-1 project, and adhere to the principles on cumulative impacts and Integrated Arctic Management laid out by the Department of the Interior in determining the proper way forward with this precedential project.

Sincerely,

John D. Dingell
Member of Congress

Rush Holt
Member of Congress

[10-001]
The FEIS includes additional information on GMT2 and Beartooth Units, and the document tiers to the scenarios described in the 2012 IAP/EIS for NPR-A.

[10-002]
The FEIS includes additional information on GMT2 and Beartooth Units, and the document tiers to the scenarios described in the 2012 IAP/EIS for NPR-A.

[10-003]
Effects of road and air traffic are analyzed in more detail in the EISs to which this SEIS is tiered. The question of whether road traffic or air traffic has the greater effect on caribou movements is subject to debate. Western science, although with little data for aircraft effects, tends to lean toward roads having a greater effect, especially if heavy traffic is present. A proposed mitigation measure for effects of traffic may be included in the Final SEIS. Traditional Ecological Knowledge on the other hand suggests that aircraft are the greater disturbance factor.

[10-004]
BLM-AK has been conducting weekly government-to-government consultation calls with the Native Village of Nuiqsut. The Native Village of Nuiqsut is also a cooperating agency on the SEIS. BLM has made every effort to incorporate input from residents and the council and has described the sociocultural impacts of not adequately weighing their opinions. All mitigation measures were designed in collaboration with the Native Village of Nuiqsut tribal council.

Audubon ALASKA

April 22, 2014

GMT1 Draft SEIS Comments
Attn: Bridget Psarianos
222 West 7th Avenue, Stop #13
Anchorage, Alaska 99513

Dear Ms. Psarianos:

Thank you for the opportunity to comment on the draft Supplemental Environmental Impact Statement for the Alpine Development Plan for the Proposed Greater Mooses Tooth One Development Project. (DSEIS). Founded in 1977, Audubon Alaska has been involved in the conservation of Alaska's Arctic for over 30 years, working to promote the conservation of outstanding natural lands and wildlife habitat in the region. In 2002, Audubon Alaska published *Alaska's Western Arctic: A Resource Synthesis and Conservation Strategy* (Schoen and Senner, eds.)[1], documenting key areas of biological importance in the Arctic. Audubon Alaska published an updated *Habitat Conservation Strategy for the National Petroleum Reserve – Alaska* (Smith, et. al. 2011)[2] in 2011 and spent several years actively participating in the planning process for the 2013 Integrated Activity Plan for the NPRA (IAP).

Audubon appreciates the planning effort Bureau of Land Management (BLM) made to develop the IAP and agrees that careful development of GMT1, the first oil and gas production development to be permitted after the IAP, is appropriate within the context of the IAP. Nevertheless, the impacts of this project and those that are likely to follow it are significant. BLM has the opportunity and obligation to set an appropriate tone and precedent for further development in the NPRA by committing to authorizing development that minimizes impacts to the environment to the maximum extent possible.

One important way BLM can accomplish this is to commit to a careful analysis of road and aircraft impacts attached to oil and gas development in the NPRA. It is a complicated issue that deserves the agency's full attention. The analysis should be informed by the agency's understanding of likely future development in the region. **[11-001]** BLM should also, among other things, commit to adhering to the BMPs in the IAP, departing from those BMPS only with a full explanation of the environmental reasons for doing so.

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[1] Schoen, J. and S. Senner. 2003. Alaska's Western Arctic: A resource synthesis and conservation strategy. Audubon Alaska, Anchorage, Alaska.
[2] Smith, M. et. al. 2011. Habitat Conservation Strategy for the National Petroleum Reserve-Alaska. Audubon Alaska, Anchorage, Alaska.

Audubon's comments below: 1) highlight the importance of the habitat in the project analysis area and a larger cumulative effects area for a number of declining and vulnerable bird populations; and 2) recommend additional monitoring to help understand and mitigate the potentially significant impacts of GMT1 and future oil and gas development on bird populations in the NPRA.

Importance of the Habitat

[11-002] The IAP assumed the development of both the Greater Mooses Tooth and Bear Tooth units in each of its alternatives (IAP, Vol. 4, pp. 49, 51). The DSEIS, however, does not consider the Bear Tooth development at all. To capture potential cumulative effects and make most effective use of Audubon's GIS data, Audubon focuses its discussion of bird impacts on a cumulative effects area (CEA) that includes the Bear Tooth, Greater Mooses Tooth and Colville River units (NPRA portion only).

[11-003] The project area and larger CEA is within the Colville River Delta Important Bird Area (IBA). The Colville River Delta IBA was established for continentally significant breeding populations of Pacific Brant, Spectacled Eiders, and Yellow-billed Loons. More information is located at http://netapp.audubon.org/iba/Reports/2784.

[11-004] *Table 1. Waterbird values in the cumulative effects area (CEA) made up of the project analysis area plus the Bear Tooth, Greater Mooses Tooth, and Colville River units (NPRA portion only). Values generated by the NPRA Decision Support Tool (Audubon Alaska 2012).[3] Waterbird data used in the Decision Support Tool come from USFWS aerial surveys (e.g. Larned et al. 2010).[4] Species italicized and highlighted in red are on Audubon Alaska's 2010 WatchList (Kirchhoff and Padula 2010)[5] and represent populations that are either declining and/or vulnerable.*

Species	Percent of NPRA breeding population found in CEA	Waterbird density in CEA compared to NPRA Average	Estimated Number of Breeding Birds
King Eider	7.88%	3.19x	745
Tundra Swan	6.68%	2.7x	229
Scaup Spp.	5.44%	2.2x	429
Glaucous Gull	4.59%	1.86x	552
Greater White-fronted Goose	4.33%	1.75x	3,625
Red-breasted Merganser	4.23%	1.71x	26
White-winged Scoter	4.14%	1.68x	44
Pacific Brant	4.06%	1.64x	213
Jaeger Spp.	4.06%	1.64x	211
Yellow-billed Loon	4.01%	1.62x	68

[3] Walker, N. J. 2012. NPRA Decision Support Tool. Audubon Alaska, Anchorage, Alaska.
[4] Larned, W. W., R. A. Stehn, and R. M. Platte. 2010. Waterfowl Breeding Population Survey, Arctic Coastal Plain, Alaska, 2009. Unpubl. Rept., U. S. Fish and Wildlife Service.
[5] Kirchhoff, M. D. and V. Padula. 2010. Alaska WatchList: Highlighting Declining and Vulnerable Bird Species in Alaska. Anchorage, AK, Audubon Alaska.

Pacific Loon	3.76%	1.52x	866
Red-throated Loon	3.59%	1.45x	89
Sabine's Gull	3.52%	1.42x	310
Arctic Tern	3.32%	1.35x	495
Long-tailed Duck	3.04%	1.23x	783
Northern Pintail	2.84%	1.15x	963
Canada Goose	2.80%	1.13x	191
Snow Goose	1.96%	0.79x	106
Spectacled Eider	1.04%	0.42x	44
Snowy Owl	0.79%	0.32x	6
Steller's Eider	0.19%	0.08x	0
Shorebird Spp.	2.01%	0.81x	627
Watchlist Spp.	4.92%	1.99x	1164
Waterfowl Spp.	3.70%	1.5x	10,789

[11-005] As Table 1 demonstrates, the CEA supports above average NPRA breeding densities for 17 waterbird species. It contains above average NPRA habitat for four species on Audubon's Alaska Watchlist (Kirchhoff and Padula 2010)—Pacific Brant, King Eider, Red-throated Loon and Yellow-billed Loon.

[11-006] The CEA is particularly important for King Eiders, encompassing almost 8 % of the high-value King Eider habitat in the NPRA. On average, acres in the CEA are 3.2 times more valuable as King Eider habitat than an average acre in the NPRA. Additionally, an estimated 44 Spectacled Eiders, a federally-listed threatened species, as well as 68 Yellow-billed Loons, a candidate for federal listing, breed in the CEA (Table 1). Overall, WatchList species occur at almost twice the density within the CEA compared with the entire NPRA.

[11-007] Audubon has attached maps of the project area and CEA that highlight nesting use of the areas by Alaska WatchList species.[6] As expected, GMT1 infrastructure and other potential development in both the proposed development area and the CEA appear most likely to occur near identified King Eider nesting locations, but identified nesting locations for all five Watchlist species that occur in the area will be potentially impacted.

Within the project analysis area, 80 locations for five species of concern are mapped based on the Alaska WatchList of vulnerable and declining populations. The species and number of locations are: Spectacled Eider (16), Yellow-billed Loon (4), King Eider (30) , Pacific Brant (18), and Red-throated Loon (12). Within the larger cumulative effects area, 623 locations for the five WatchList species are: Spectacled Eider (47), Yellow-billed Loon (21), King Eider (349), Pacific Brant (142), and Red-throated

[6] The maps identify existing, planned and proposed infrastructure as well as the known location of breeding birds from aerial surveys by the US Fish and Wildlife Service from 2001-2010. Existing, planned, and proposed infrastructure data was compiled by UAF (with assistance from Audubon Alaska) for their forthcoming report on Arctic development. Together, these data show the current, expected, and potential future layout of roads, pipelines, and facilities that may impact nesting birds.

Loon (64). It is not known from this data whether these breeding sites were used multiple times over the ten-year period. **[11-008]** For planning purposes the location of used habitat in proximity to infrastructure should be considered during project implementation, and direct and indirect impacts should be avoided. The CEA map provides a more comprehensive look at the future potentially affected breeding bird habitats.

Recommended Monitoring

As detailed above, GMT1 and reasonably foreseeable future oil and gas development in the area will take place in important bird habitat. The DSEIS recognizes that the GMT1 project and future development in the NPRA "has the potential to affect birds, bird behavior, and their nesting, brood-rearing, foraging and molting habitats through habitat loss and alteration, disturbance from noise and visual activity, displacement from habitats, or attraction to habitats altered by thermokarst and early green-up adjacent to gravel infrastructure" (DSEIS p 260). The DSEIS also recognizes the potential impacts of increased predation and mortality from collisions with infrastructure (DSEIS p. 264).

[11-009] Several Best Management Practices (BMPs) have been designed to limit the population effects of development impacts and Audubon strongly support their continued inclusion in the plan. Among these BMPs is E-9 (limiting predators' use of infrastructure), E-11 (requiring surveys for eiders and yellow-billed loons before construction), E-18 (limiting ground-level disturbances), and F-1 (altitude requirements for aircraft flights).

In addition to the BMPs, 2004 Alpine Satellite Development Record of Decision requirements, Conoco Phillips Alaska Inc. design features and other agency permit requirements, Audubon believes that the avian resources at stake demand additional monitoring that will allow for a better assessment of the long-term impacts of oil and gas development on birds. This would be consistent with the intent expressed by the IAP (IAP, 1-1), which states that "[S]tudies and monitoring will be done to 1) ensure lessees and permittees comply with applicable requirements, 2) assess the effectiveness of protective measures to meet objectives, and 3) provide updated scientific, cultural, and technological data and knowledge needed to adapt management decisions to changing conditions and circumstances. Such information would be important to adapt management if protective measures, including but not limited to land allocations, stipulations, and best management practices, are not meeting their objectives."

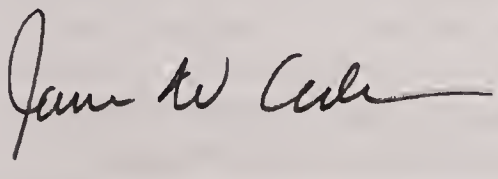
[11-010] First and most generally, the lack of infrastructure in the GMT1 area provides the opportunity for a long-term study to gauge the impacts of oil and gas infrastructure and activity on birds. Therefore, Audubon suggests that BLM require Conoco-Phillips to commit to a series of long-term, statistically accurate surveys that study the impacts of oil and gas infrastructure and activity on several key species of birds.

[11-011] Second, while the draft plan provides a number of measures designed to limit an increase in the population of predators in the area, it does not appear to address roadkill, which may provide an important supplementary food source for predators. As a result, Audubon suggests the BLM require Conoco-Phillips to establish a roadkill reporting/monitoring system to help determine whether additional steps on roadkill should ultimately be taken.

[11-012] Finally, F-1 provides a variety of standards for use of aircraft to avoid impacts to birds as well as other wildlife and subsistence users. More detailed reports on those flights, from their timing to the number of deviations from the standards, are important to assessing the impacts of air travel on wildlife and improving mitigation requirements. Audubon suggests that BLM require Conoco-Phillips to provide BLM with detailed flight records that indicate the timing and purpose of the flights as well as highlighting flights that deviate from BMP standards.

In conclusion, as the first oil and gas production development in the NPRA following the IAP, GMT1 is precedent-setting. We urge BLM to give this project the attention it deserves, and to recognize that the choices the agency makes are likely to become the standard for development in the NPRA. Thank you for your attention to these comments. Please contact Audubon Alaska with any questions or to access mapping data.

Sincerely,



Jim Adams
Policy Director
Audubon Alaska

[11-001]
GMT1 is not within any of the four discussed "Special Areas" of this reference.

[11-002]
Section 2.1 of the Final SEIS describes the three BMPs from which CPAI sought a waiver in 2004, two of which are still applicable to the proposed project. No other exceptions are sought by CPAI for GMT1. Any exceptions from BMPs will be explained and rationale provided.

[11-003]
The FEIS includes additional information on GMT2 and Beartooth Units.

[11-004]
Per consultation between BLM and Audubon society on 6/2/14, the requested level of consideration for the CEA/Audubon's avian resource analysis (decision tool and developed maps) to be included in the Final SEIS is recognition that the CEA is a high-value avian area. Language has been added to the cumulative impacts discussion in the Final SEIS and Audubon-provided resources are included within the administrative record.

[11-005]
Per consultation between BLM and Audubon society on 6/2/14, the requested level of consideration for the CEA/Audubon's avian resource analysis (decision tool and developed maps) to be included in the Final SEIS is recognition that the CEA is a high-value avian area. Language has been added to the cumulative impacts discussion in the Final SEIS and Audubon-provided resources are included within the administrative record.

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Per consultation between BLM and Audubon society on 6/2/14, the requested level of consideration for the CEA/Audubon's avian resource analysis (decision tool and developed maps) to be included in the Final SEIS is recognition that the CEA is a high-value avian area. Language has been added to the cumulative impacts discussion in the Final SEIS and Audubon-provided resources are included within the administrative record.

[11-009]
Per consultation between BLM and Audubon society on 6/2/14, the requested level of consideration for the CEA/Audubon's avian resource analysis (decision tool and developed maps) to be included in the Final SEIS is recognition that the CEA is a high-value avian area.

Language has been added to the cumulative impacts discussion in the Final SEIS and Audubon-provided resources are included within the administrative record.

[11-010]
It is BLMs intent to continue the inclusion of the BMPs highlighted by the comment in the GMT1 Final SEIS.

[11-011]
BLM feels that the stipulations and BMPs and requirement for effectiveness monitoring (NPR-A ROD 2013) provides for long-term impacts of oil and gas monitoring and that no other additional monitoring is necessary. Numerous stipulations and BMPs are in place to effectively protect birds and their habitats within the NPR-A. These include BMPs A-1 through A-7 and E-9, which ensure that solid, liquid, and hazardous wastes (including fuels) do not impact birds or their habitats, and to reduce the potential for garbage and shelters that attract predators. The protection of bird habitats and food sources are addressed by BMPs B-1, C-3, C-4, and Stipulations E-2 and L-1, among others. In addition, there are BMPs and stipulations that regulate the types of activities that can occur near waterbodies, including rivers and streams, types of equipment that can be used in the planning area, will serve to protect birds and their habitats. Effectiveness monitoring is required by the 2013 NPR-A ROD: Monitoring to evaluate the effectiveness of project designs and mitigation measures and thereby guide adaptive management. Project proponents shall be responsible for funding monitoring, by private or government parties, to assess the effectiveness of project designs and required mitigations in protecting resources. Project proponents may also be required to develop a plan, approved by BLM, for adaptive management programs associated with their project. As with baseline monitoring, the type and scale of such studies will be determined based on the characteristics of the proposed project and location, and the BLM will work with project proponents to coordinate any necessary surveys to ensure that consistent methods are used and that surveys are not unnecessarily duplicative.

[11-012]
BLM will evaluate if a new monitoring requirement will be included in the Final SEIS.

[11-013]
The Final SEIS includes data that ABR collected on birds from the aircraft (noise monitoring) monitoring during the Alpine development construction phase and production. However, there are so many other factors influencing the actions of birds in the GMT1 development than in the Alpine development (much larger issue with humans presence in the area). BLM will evaluate an aircraft monitoring plan, designed to primarily monitor the effects to subsistence and other wildlife in the Final SEIS.

[redacted]

From: Rebecca Noblin [rnoblin@biologicaldiversity.org]
Sent: April 22, 2014 3:56 PM
To: GMT1 Comments
Subject: GMT1 comments
Attachments: CBD GMT1 DSEIS comments with attachments 4-22-14.pdf

Please see the attached comments regarding BLM's Draft Supplemental Environmental Impact Statement for Greater Mooses Tooth One.

Attachment B lists 8 references that we would like included in the record. I will send these via separate email(s).

Belshe, E. F., Schuur, E. A. G., & Bolker, B. M. (2013). Tundra ecosystems observed to be CO2 sources due to differential amplification of the carbon cycle. *Ecology letters*, *16*(10), 1307-1315.

Jones, B. M., Arp, C. D., Jorgenson, M. T., Hinkel, K. M., Schmutz, J. A., & Flint, P. L. (2009). Increase in the rate and uniformity of coastline erosion in Arctic Alaska. *Geophysical Research Letters*, *36*(3).

Jones, B. M., Stoker, J. M., Gibbs, A. E., Grosse, G., Romanovsky, V. E., Douglas, T. A., ... & Richmond, B. M (2013). Quantifying landscape change in an arctic coastal lowland using repeat airborne LiDAR. *Environmental Research Letters*, *8*(4), 045025.

Raynolds, M. K., Walker, D. A., Ambrosius, K. J., Brown, J., Everett, K. R., Kanevskiy, M., ... & Webber, P. J. (2013). Cumulative geoecological effects of 62 years of infrastructure and climate change in ice-rich permafrost landscapes, Prudhoe Bay Oilfield, Alaska. *Global change biology*.

Saalfeld, S. T., Lanctot, R. B., Brown, S. C., Saalfeld, D. T., Johnson, J. A., Andres, B. A., & Bart, J. R. (2013). Predicting breeding shorebird distributions on the Arctic Coastal Plain of Alaska. *Ecosphere*, *4*(1), art16.

Shiklomanov, N. I., Streletskiy, D. A., Little, J. D., & Nelson, F. E. (2013). Isotropic thaw subsidence in undisturbed permafrost landscapes. *Geophysical Research Letters*, *40*(24), 6356-6361.

Slater, A. G., & Lawrence, D. M. (2013). Diagnosing Present and Future Permafrost from Climate Models. *Journal of Climate*, *26*(15).

Wobus, C., Anderson, R., Overeem, I., Matell, N., Clow, G., & Urban, F. (2011). Thermal erosion of a permafrost coastline: Improving process-based models using time-lapse photography. *Arctic, Antarctic, and Alpine Research*, *43*(3), 474-484.

Please let me know if you have trouble opening these comments or fail to receive any of the 8 references.

Thank you,

Rebecca Noblin
Alaska Director
Center for Biological Diversity
PO Box 100599
Anchorage, AK 99510-0599
907-274-1110
www.biologicaldiversity.org

April 22, 2014

VIA ELECTRONIC MAIL

Bridget Psarianos
Bureau of Land Management
GMT1 Draft SEIS Comments
222 West 7th Avenue, Stop #13
Anchorage, AK 99513
Email: gmt1comments@slrconsulting.com

Ms. Psarianos:

Thank you for the opportunity to submit comments on the Bureau of Land Management's (BLM) Draft Supplemental Environmental Impact Statement (DSEIS) for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One (GMT-1) Development Project. These comments are submitted on behalf of the Center for Biological Diversity and our more than 675,000 members and activists in Alaska and throughout the United States.

The Center supports Alternative E, the No Action Alternative, because the other alternatives currently included in the DSEIS would have significant negative effects on the National Petroleum Reserve-Alaska (Reserve). The Reserve is the largest roadless area in America and provides important habitat for caribou, bears, birds and a vast array of other wildlife. Any development in the Reserve threatens to destroy the wilderness and roadless characteristics of this vast and ecologically critical area.

[12-001] Moreover, oil and gas development will add to the greenhouse gas emissions that are already imperiling Arctic lands and waters. Documented impacts and science-based predictions of climate change in the Arctic region include sea level rise, temperature increase and fluctuation, loss of sea ice, changes in ocean circulation patterns, ocean acidification, increased tundra fires, changes in vegetation type and cover and coastal erosion, among others. These changes, combined with oil and gas development, threaten to destroy the unique and special ecological communities of the Reserve.[1] **[12-002]** Oil and gas infrastructure and climate change together are already

[1] For a detailed description of the impacts to the Reserve from oil and gas development and climate change, please see the Center's June 15, 2012, Comment Letter on the National Petroleum Reserve-Alaska Integrated Activity Plan and Environmental Impact Statement, and references cited therein, which is attached here as Attachment B and incorporated by reference. In addition to the references cited in the June 2012 letter, the Center submits for the record, as Attachment A, a list of recent papers relevant to climate change impacts in the Reserve that the BLM must consider.

having significant unforeseen effects on the North Slope of Alaska,[2] and these impacts will only intensify as the climate warms.

Because none of the current action alternatives in the DSEIS adequately protects the wilderness and roadless values of the Reserve or accounts for the destructive impacts of a rapidly changing climate, the BLM should choose Alternative E, or No Action. To the extent that BLM rejects the No Action alternative the Center incorporates by reference the April 22 comments submitted by the Wilderness Society (TWS), et al. BLM must make substantial improvements to its analysis of Alternative D, the roadless alternative. As it currently exists, Alternative D presents a skewed picture and does not accurately reflect the mitigating effects of avoiding roaded development in the Reserve. The Center supports the recommendations of TWS, et al., including that BLM analyze seasonal-only drilling in Alternative D.

Additionally, BLM must supplement and improve its analysis of the significant reasonably foreseeable impacts beyond GMT-1, including GMT-2 and other future roaded development in the Reserve. A road between CD-5 and GMT-1 is a gateway for oil and gas development in the Reserve, and it must be analyzed as such. BLM must also take a closer look at the cumulative impacts from past, present, and future onshore and offshore oil and gas operations in the context of a rapidly changing climate. Should the BLM choose to move forward with GMT-1, the Center requests the agency address the many concerns set forth by TWS, et al., and publish a new DSEIS for public review.

Thank you for your consideration.

Sincerely,

Alaska Director

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[2] *See, e.g.,* Raynolds, M. K., Walker, D. A., Ambrosius, K. J., Brown, J., Everett, K. R., Kanevskiy, M., ... & Webber, P. J. (2013). Cumulative geoecological effects of 62 years of infrastructure and climate change in ice-rich permafrost landscapes, Prudhoe Bay Oilfield, Alaska. *Global change biology.*

Attachment A:

Relevant Climate Change References

[12-003] Belshe, E. F., Schuur, E. A. G., & Bolker, B. M. (2013). Tundra ecosystems observed to be CO2 sources due to differential amplification of the carbon cycle. *Ecology letters*, *16*(10), 1307-1315.

[12-004] Jones, B. M., Arp, C. D., Jorgenson, M. T., Hinkel, K. M., Schmutz, J. A., & Flint, P. L. (2009). Increase in the rate and uniformity of coastline erosion in Arctic Alaska. *Geophysical Research Letters*, *36*(3).

[12-005] Jones, B. M., Stoker, J. M., Gibbs, A. E., Grosse, G., Romanovsky, V. E., Douglas, T. A., ... & Richmond, B. M. (2013). Quantifying landscape change in an arctic coastal lowland using repeat airborne LiDAR. *Environmental Research Letters*, *8*(4), 045025.

[12-006] Raynolds, M. K., Walker, D. A., Ambrosius, K. J., Brown, J., Everett, K. R., Kanevskiy, M., ... & Webber, P. J. (2013). Cumulative geoecological effects of 62 years of infrastructure and climate change in ice-rich permafrost landscapes, Prudhoe Bay Oilfield, Alaska. *Global change biology*.

[12-007] Saalfeld, S. T., Lanctot, R. B., Brown, S. C., Saalfeld, D. T., Johnson, J. A., Andres, B. A., & Bart, J. R. (2013). Predicting breeding shorebird distributions on the Arctic Coastal Plain of Alaska. *Ecosphere*, *4*(1), art16.

[12-008] Shiklomanov, N. I., Streletskiy, D. A., Little, J. D., & Nelson, F. E. (2013). Isotropic thaw subsidence in undisturbed permafrost landscapes. *Geophysical Research Letters*, *40*(24), 6356-6361.

[12-009] Slater, A. G., & Lawrence, D. M. (2013). Diagnosing Present and Future Permafrost from Climate Models. *Journal of Climate*, *26*(15).

[12-010] Wobus, C., Anderson, R., Overeem, I., Matell, N., Clow, G., & Urban, F. (2011). Thermal erosion of a permafrost coastline: Improving process-based models using time-lapse photography. *Arctic, Antarctic, and Alpine Research*, *43*(3), 474-484.

[12-001]
Environmental and economic impacts of greenhouse gas emissions from oil and gas consumption are not effects of the BLM's GMT1 decision, as defined by the CEQ, and thus are not required to be analyzed under NEPA. Greenhouse gas emissions from consumption of NPR-A oil and gas are not direct effects under NEPA because they do not occur at the same time and place as the action. They are also not indirect effects because NPR-A oil and gas leasing and production would not be a proximate cause of greenhouse gas emissions resulting from consumption. Also, because the impacts of consumption are not direct or indirect effects of the proposed action, a cumulative impact analysis would not reveal an incremental effect attributable to the decision.

[12-002]
Cumulative impacts from oil and gas infrastructure are discussed in Raynolds, et al. (2013) which has been incorporated in the Final SEIS.

[12-003]
Researchers compiled 40 years of carbon dioxide (CO2) flux observations from 54 studies at 32 sites in northern high latitudes, focusing on how seasonal and annual CO2 fluxes have changed over time. Although growing season CO2 uptake has increased since the 1990s, wintertime CO2 emissions have also increased. The results indicated that CO2 emissions from tundra sites exceed CO2 uptake across the range of temperatures in the tundra ecosystems.

[12-004]
This study is included in the 2012 NPR-A IAP/EIS analysis of climate change, which is incorporated by reference in this Final SEIS.

[12-005]
Researchers used airborne light detection and ranging (LiDAR) data from 2006 – 2010 to study landscape changes in a 100 km2 area on the Beaufort Sea coastal plain. They found statistically significant change including vertical change, permafrost degradation, and erosion. These impacts are discussed in the Final SEIS. This reference has been included in administrative record as a resource reviewed.

[12-006]
This study will be incorporated in the Final SEIS.

[12-007]
The provided resource has been included in administrative record as a resource reviewed.

[12-008]
This study has been referenced in the Section 3.2.4, Climate Change of the Final SEIS.

[12-009]
Researchers used output from the Coupled Model Intercomparison Project (CMIP5) to simulate present and future permafrost extent. The relationship between warming air temperature and a decrease in permafrost area is approximately linear for all models. Although a broad range of future permafrost states were predicted due to differences in future greenhouse gas emission and climate scenarios, permafrost extent is predicted to decrease significantly by 2100. This will be incorporated into the Final SEIS.

[12-010]
This Final SEIS does not include any coastal areas so the reference to coastal erosion by Wobus et al is not relevant to this analysis.

April 22, 2014

Bridget Psarianos, Project Manager
GMT1 Draft SEIS Comments
Bureau of Land Management (BLM)
222 West 7th Avenue, Stop #13
Anchorage, AK 99513

Re: Greater Mooses Tooth-1 Draft Supplemental Environmental Impact Statement Comments

Dear Ms. Psarianos:

Thank you for the opportunity to submit comments on the Draft Supplemental Environmental Impact Statement ("DEIS") for the Proposed Greater Mooses Tooth One Development Project ("GMT-1"). The Conservation Lands Foundation ("CLF") and Alaska Wilderness League ("AWL") submitted comments and engaged in the scoping of GMT-1 and planning for the National Petroleum Reserve-Alaska ("Reserve") Record of Decision ("IAP ROD"). We believe the Reserve is an extraordinary and delicate ecosystem, essential to the subsistence livelihood of Alaska Natives and a treasured part of our nation's public lands.

Though we are pleased that the BLM included a "roadless development" option in the DEIS, **[13-001]** the agency failed to consider a winter-only drilling operation that relies primarily on ice roads. A winter-only drilling operation is proven, viable, and reduces impacts on wildlife and subsistence activities as compared to the Alternatives A-C as proposed. This approach would also therefore be appropriate to the dual mandate for management of the NPR-A to both produce oil and gas and to protect the environment and wildlife. None of the current alternatives meet that mandate.

Our comments below outline an additional proposed alternative focused on a winter-only drilling operation. We strongly urge BLM to include and fully analyze this alternative, as it is needed to satisfy the requirements of the National Environmental Policy Act;[1] indeed it is the only alternative which can meet the dual mandates for the NPR-A.

We thank you for your time and consideration.

The GMT-1 is the first proposed development of oil and gas infrastructure (following the IAP ROD) and will be the first commercial oil and gas development on Federal land within the Reserve. The GMT-1 has the potential to establish a standard for future

[1] The Bureau of Land Management must "rigorously explore and objectively evaluate all reasonable alternatives" to meet the requirements of the National Environmental Policy Act standard for an Environmental Impact Statement. 40 C.F.R. Sec. 1502 14(a).

development within the Reserve and represents a further incursion on lands and waters that have been important habitat and hunting, foraging, and fishing areas for the people of Nuiqsit. We understand that there are concerns in the community with the way that they have been engaged in the process of making decisions that will have direct impact on both health and traditional values. While one site for drilling and oil production is currently under consideration, it represents just one piece of the significant and growing cumulative impacts associated with petroleum development in the region.

As noted above, the DEIS fails to consider a significant, practicable option for pursuing economically viable development of oil and gas resources while ensuring environmental protection. **[13-002]** The DEIS process should consider and recommend a winter-only drilling operation that relies primarily on ice roads. While Alternative D presents a "roadless" option, it assumes that drilling operations will take place year-round, with aircraft access of up to 70 flights/month just related to drilling during May – December of 2017[2] and significant permanent on-scene infrastructure to support year-round drilling with limited access. A viable alternative approach is to limit drilling activity to winter-months only, when ice roads can be used to transport personnel, equipment, and wastes, thereby reducing the construction of gravel roads across tundra and limiting the number of overflights during the summer months.

This recommendation is based on information provided by the project proponent and BLM through the 2004 Final Environmental Impact Statement for the Alpine Satellite Development Program (2004 Final EIS) and the DEIS. **[13-003]** In analyzing this proposed additional alternative (and indeed, in analyzing all alternatives in the DEIS), the actual activities and impacts at CD-3 should be considered rather than those predicted prior to construction.

Additionally, **[13-004]** any future development should include explicit plans for restoration of the area, an **[13-005]** assessment of health impacts considering both current projects and the proposed and potential future projects, and an **[13-006]** assessment of what will be re-injected during operations and any associated environmental impact.

Outline of the Winter-Only Drilling Alternative

With only a 30-day comment period, it is unreasonable for anyone to be able to fully design oil development infrastructure. **[13-007]** However, we can point to the CD-3 production pad as an example of how GMT-1 could be developed. The wells, pipeline, and associated facilities could remain there as described, with the following modifications.

- No gravel roads would be constructed to the site. (The gravel pad, gravel airstrip, and shorter roads within the site would remain.)

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[2] Table 2.4-3 Flight Requirements for Project Alternatives, 2017 Flights Required per Month by Alternative (p. 36, Draft SEIS)

- **[13-008]** The lack of year-round gravel road access would require limited additional equipment if drilling is limited to the ice-road season only.

  Alternative D includes significant on-site infrastructure that would be needed to sustain year-round drilling activity when ice roads are not available. As described in Section 2.7 of the DEIS, this would include a full-time work force and all associated facilities for their accommodation and food; a tank farm to store drilling and operating fluid and supplies; a new mud plant and bulk cement facility; and a new disposal well with injection facilities because drilling wastes would not be transported out.

  By contrast, based on the 2004 Final EIS, the additional infrastructure required at CD-3 as compared to the sites with gravel road access was limited to: an emergency generator; additional temporary storage tanks during drilling operations (Section 2.3.3.1); three trucks (pick-up, hot oil, and supersucker or vacuum trucks); a front end loader; two or three Tioga heaters, upright work tanks, a portable air compressor, and a bleed tank (Section 2.3.3.4). These additional resources are significantly less than those described in Alternative D (Section 2.7 of the Draft SEIS) which presents a footprint both in the size of the gravel pad and significantly larger power demand inflated by year-round drilling.

- **[13-009]** The drilling rig would be removed and remobilized to the site when not in use for winter-only drilling (as described in the 2004 Final EIS, page. 39).

- **[13-010]** A seasonal camp would be present only during winter drilling, and therefore during a time when ice roads can be used to bring personnel and resources in, and wastes out.

- **[13-011]** In addition to reducing the need for support facilities for housing, storage, and waste, fewer people on-site year-round reduces travel to and from the site. As described in the 2004 Final EIS, production operations require significantly fewer personnel than drilling, offsetting the slight increase in personnel required on-site (15) at CD-3 compared to the other sites being developed at the time. The same document describes operators visiting the production pad approximately 3 times per week; as with other aspects of this alternative, this element should be verified with the actual frequency of access undertaken at CD-3.

- **[13-012]** Additional spill prevention and detection methods should be applied, including those described for CD-3: "Roadless sites would have remote freeze protection of surface piping and well bores, remote monitoring of well annuli, and more extensive use of visual, infrared, gas detection, or camera surveillance than roaded sites." (Final EIS, page 41) As conditions permit, aerial inspections of pipelines should be conducted in conjunction with the limited transport of personnel and resources during the months when ice road access is unavailable. A forward looking infrared (FLIR) camera on a fixed-wing aircraft could be used from fixed wing aircraft to detect spills when conditions limit direct visual observation.

Why a Proposed Additional Alternative Should be Considered and Selected

With CD-3 as an example, the proposed additional alternative clearly meets the test of being both practical and feasible, and follows the approach touted by project proponents in the past as having "brought together the lessons learned over 30 years of oil development in the arctic."[3] NEPA requires the BLM to consider "reasonable" alternatives through the EIS process, "including those that are practical or feasible from the technical and economic standpoint, and using common sense, rather than simply desirable from the standpoint of the applicant."[4] The proposed additional alternative clearly fits within the range of options that should be considered; similar operations were considered in the 2004 Final EIS for the Alpine Satellite Development Program even though all pads were not eventually finalized as limited access.

Not only are winter-only drilling operations proven in the region, but season-specific operations are an increasingly important approach that will need to be taken as oil and gas operations expand into more and more marginal or extreme environments. Offshore development in the Arctic Ocean is another example.

Environmental Protection

While any oil and gas operations have the potential to impact the environment significantly, the following reductions in impacts would be expected from the proposed additional alternative, and should be stipulated by BLM:

- **Fewer roads mean less gravel extraction, less widespread construction activities and traffic, and less habitat fragmentation.**

[13-013] BLM has long recognized the impacts of constructing and operating on permanent roads in the tundra environment. The 2004 Final EIS (Section 2.6 and Section 4.2.1.1, which describes construction impacts on surface resources) cites impacts associated with gravel extraction, construction, and traffic. Inevitably, a road created for oil and gas development, becomes a network of roads, promoting other forms of incompatible development and degrading the natural area. The construction and use of permanent roads can be the most damaging result of oil and gas development, and the fact that their ultimate fate upon abandonment at the end of oil and gas operations is left as uncertain makes their impacts similarly unpredictable. Habitat fragmentation from roads can impede caribou migratory patterns, foraging options, access to calving grounds, and ultimately lead to herd decline.[5] **[13-014]** Roads can also have a long-term impact on bird habitat.

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[3] Quote from Kevin Meyers, President of Phillips Alaska. "Phillips now sprinting to the payoff of Alpine oil field," Alexander's Gas & Oil Connections. September 26, 2000. Retrieved from: http://www.gasandoil.com/news/n_america/14032e8b35b9be94798903b44eec6dff

[4] CEQ, 1981 as amended – Question 2a, CEQ, Forty Most Asked Questions Concerning CEQ's NEPA Regulations

[5] Cameron, R.D., W.T. Smith, R.G. White, and B. Griffith. 1995. Can petroleum development depress the productivity of Arctic caribou? Proceedings of the 2nd International Arctic Caribou Conference 36. University of Alaska Fairbanks, Alaska. ALSO Whitten, K., G. Garner, F. Mauer, and R. Harris. 1992.

Several studies have concluded that populations of bird species decrease along roads due to noise disrupting the communications key to mating and warning as well as general disturbance.[6]

Additionally, less road construction means less disruption of permafrost throughout the area.

- **Air traffic would be reduced by limiting drilling to the season when ice road access is in place.**

Air traffic is of particular concern because of its impacts on caribou herd behavior and waterfowl. Alternative D's year-round drilling would require significant flights during months of the year important to calving and nesting. **[13-016]** The number of flights needed for a winter-only drilling operation should be considered, including for both the drilling phase and during production. The overall number of flights should be significantly reduced by the seasonal limitation of the most intensive drilling activity. Access needs would instead be concentrated in the months when ice roads can be used.

[13-017] Further, a large number of flights for "special studies" are apparently expected to take place during the summer months. We understand that the BLM is reviewing new information that significantly reduces the estimated number of flights for these studies. This new information will be critical and requires rigorous evaluation and consideration of whether they can be reduced further given that they are slated for the summer months which are critical to both wildlife and subsistence activity.

- **Air emissions would be reduced from the estimated levels in Alternative D of the Draft SEIS.**

While the airstrip would require a larger site footprint for the proposed additional alternative than for Alternatives A and B, which do not have gravel airstrips but depend on road travel, the reality is that power generation and incineration of waste – both sources of air pollution – would occur whether on location or not. The estimates of air emissions at Alternative D in Section 4.2.3.2 of the Draft SEIS could be expected to be reduced if a CD-3-type approach was taken that did not involve year-round operations, on-site power generation of significant facilities, or waste incineration.

Impact on Subsistence Uses

The draft SEIS documents the wide-ranging subsistence uses in the area of the GMT Unit. **[13-018]** Hunting and foraging activities can be impacted by oil and gas activities, including road construction and traffic, aircraft traffic, air quality, and noise. Subsistence activities require safe access and accurate information about the places where harvests and hunts

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Productivity and early calf survival in the Porcupine caribou herd. Journal of Wildlife Management 56:201-212.

[6] **[13-015]** Seiler, A. 2001. Ecological effects of roads: A review. Swedish University of Agricultural Sciences. Retrieved from: http://www.coalicionventanasverraco.org/files/ASeiler.pdf

will be successful. If these places change, either over time as migration patterns adjust to new infrastructure, or very suddenly in the event of a helicopter or truck scaring animals during a hunt, then subsistence is compromised.[7]

[13-020] In addition to significantly reducing road development, the proposed additional alternative will focus the most disruptive drilling activity on the limited range of months that are relatively less active for subsistence uses by focusing on the February-April timeframe when ice roads can be constructed for the movement of equipment and personnel in and out of the area. While there will still be impacts to activities associated with some species, the impacts should be significantly less than year-round drilling activities would have. Table 3.4-6 of the Draft SEIS summarizes the annual cycle of subsistence activities, including describing hunting for all but furbearers as – although no doubt important – low-to-medium activity during February – April except for some more limited hunting and ice fishing for one species. Harvesting activities do not take place during winter snow cover.

Feasibility of Emergency Response

[13-021] While emergency response operations are facilitated by the presence of road access year round, planning for remote sites is possible with a tailored approach. This aspect of the potential impacts overall is not thoroughly addressed in the Draft SEIS, as it primarily references the state-approved contingency plan for the Alpine Satellite Development Program without appending it. The details of mounting an emergency response, including oil spill response, should be described as the potential for oil spills from facilities and pipeline related to the GMT-1 are considered, or the state-approved plan made available with environmental impact reviews. Again, this could mirror the planning for CD-3 and should include pre-staging equipment, developing site-specific tactics and response scenarios for different weather conditions, and identifying immediate response activities possible on-site with pre-staged resources and trained personnel to mitigate impacts if something goes wrong.

[13-022] Emergency operations would depend on special permission for over-tundra travel, which, as of the 2004 Final EIS, would be expected in an emergency situation (page 45). (A significant spill response would require a corresponding increase in road travel in the other alternatives.)

[13-023] While CD-3 does have limited boat access, which GMT-1 would not, the primary purpose of a floating dock described in the 2004 Final EIS appears to be the deployment of on-water containment and recovery equipment in the event of a spill near the

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[7] **[13-019]** Conservation Lands Foundation, 2013 comments on the 2012 Amended Draft EIS (p. 3-86), subsistence hunters from Nuiqsut no longer hunt in traditional areas where oil and gas development infrastructure now exists, even though subsistence resources continue to be available. In order to avoid oil and gas development, Nuiqsut hunters must travel farther and at an increased cost in order to harvest caribou. Studies reveal that in 1999 and 2000, Nuiqsut residents harvested 0% of their caribou within industrialized areas, 22% of their caribou within 5 miles of industrialized areas, and 78% 5 miles or more distant from developed areas.

production area (page 45). While GMT-1 development has the potential to spill oil to water, this would impact stream crossings along the pipeline route so the inability to access the drilling/production area via boat would not detract from spill response operations.

Importance of Protecting Surface Resources in the NPR-A

[13-024] Despite its name, the National Petroleum Reserve-Alaska exists not only for the extraction of petroleum resources, but for the protection of wildlife, fish, and other environmental and cultural resources as well. This is clearly noted in the Draft SEIS (p. 5) when referencing the Naval Petroleum Reserves Production Act, which "requires oil and gas leasing in the NRP-A while also requiring protection of important surface resources and uses." The SEIS goes on to note that this Act also "provides the Secretary of the Interior with the authority to: protect 'environmental, fish and wildlife, and historical or scenic values" in the Reserve (42 USC Sec. 6503(b)).

Protecting these resources – especially in an area changing as fast as the arctic environment is today, which is acknowledged in Section 3.2.4.3 of the Draft SEIS – requires the highest possible level of protection even in the face of extractive industrial activity. A patchwork or piecemeal approach to protecting these resources is inadequate, and a network of gravel roads does not align with the mandate of protecting the area. Thus, the roads proposed in Alternatives A-C of the Draft SEIS must be considered not only as described for GMT-1, but as precedent-setting development models which would form the cornerstone of a patchwork of industrial activity that would be unnecessarily damaging to wildlife and environmental quality.

[13-025] The Draft SEIS refers to "economic and production goals" (page 45) as the reason why drilling would continue year-round in the proposed Alternative D. This conclusion is not supported in the EIS. Far more detailed analysis of precedent and this project is required before BLM can reasonably conclude that a winter only drilling is not economically viable.

We submit that these goals should be better balanced with environmental protection goals that should, in this area, be considered at least as important.

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[13-001]
A seasonal drilling alternative, with no road between GMT1 and CD5, is discussed in detail as Alternative D2.

[13-002]
A seasonal drilling alternative, with no road between GMT1 and CD5, is discussed in detail as Alternative D2.

[13-003]
BLM has considered CD3 in fleshing out its analysis of seasonal drilling, however, certain differences exist between the two sites based on location and emergency response capabilities.

[13-004]
A reclamation plan is a required part of the mine and reclamation plan for the mineral material source, in the event the Clover Mine site is eventually developed. For all infrastructure, Lease Stipulation G-1, Draft SEIS Appendix H, requires that land used for oil and gas infrastructure be reclaimed to ensure eventual restoration of ecosystem function.

[13-005]
The BLM intends to continue our practice of analyzing the effects of proposed actions in the NPR-A on Public Health , as has been done in all EISs since 2008 (e.g., BLM 2008; BLM 2012; BLM 2014). All future development EISs will include a cumulative impacts analysis as required by NEPA whereby potential reasonably-foreseeable developments will be identified and included within the analysis.

[13-006]
This comment can be interpreted as referencing two different types of 're-injected material' so a response is provided for both. A major part of the enhanced oil recovery strategy incorporates injection of an alternating stream of injectant water and miscible injectant chemicals as well as re-injection of processed dry natural gas from the Alpine Central Processing Facility. These volumes can be reasonably estimated but known volumes cannot be determined without drilled and tested wells. This MWAG enhanced recovery process is discussed sufficiently in this SEIS.

The other materials to be re-injected are related to the well drilling and completions phases. Drilling mud, produced fluids and other oilfield wastes are to be hauled to ACPF for disposal in existing permitted facilities. ACPF's disposal facilities were designed to handle waste from the Alpine Satellites and impacts resulting from this activity lie within these design limits.

Variations from this plan, such as the Alternative D Class I disposal well should be analyzed for environmental impacts.

[13-007]
BLM has considered CD3 in fleshing out its analysis of seasonal drilling, however, certain differences exist between the two sites based on location and emergency response capabilities.

[13-008]
BLM has considered CD3 in fleshing out its analysis of seasonal drilling, however, certain differences exist between the two sites based on location and emergency response capabilities.

[13-009]
BLM has considered CD3 in fleshing out its analysis of seasonal drilling, however, certain differences exist between the two sites based on location and emergency response capabilities.

[13-010]
Alternative D2 would use an incremental drilling support rig camp to support drilling activities.

[13-011]
BLM has considered CD3 in fleshing out its analysis of seasonal drilling, however, certain differences exist between the two sites based on location and emergency response capabilities.

[13-012]
BLM and CPAI would take appropriate measures to ensure that any site without road access has appropriate and feasible spill detection and response capabilities. Under all alternatives, GMT1 will have similar remote freeze protection and monitoring capability as at CD-3. The production system will be plumbed so that surface piping and well bores can be freeze protected with diesel from various remote control stations. All wells will be configured for remote monitoring of wellbore annular conditions as noted. Aerial inspections will be necessary, which is included in the Draft SEIS analysis of Alternative D.

[13-013]
Impacts of roads, both direct, indirect and cumulative, are addressed in the 2004 EIS and this Final SEIS. BMP G-1 from the 2012 IAP/EIS requires that land used for oil and gas infrastructure be reclaimed to ensure eventual restoration of ecosystem function.

[13-014]
The recommended resource has been reviewed; the locale/environment habitat fragmentation included in reference is not applicable to the GMT1 project.

[13-015]
The recommended resource has been reviewed; the locale/environment habitat fragmentation included in reference is not applicable to the GMT1 project.

[13-016]
The Final SEIS includes additional information on aircraft activity.

[13-017]
The Final SEIS includes additional information on aircraft activity.

[13-018]
BLM agrees that hunting and foraging can be impacted by oil and gas activities and these impacts are described in the Section 4.4.5, Subsistence of the Final SEIS. BLM also agrees that access for subsistence activities should not be impeded by infrastructure. BLM does not believe that it would be possible to provide nor do hunters require accurate information about where hunts will be successful. The impacts discussed in the comment are described in detail in the section.

[13-019]
Adequate data on the avoidance effect is provided in the revised 4.4.5, Subsistence of the Final SEIS.

[13-020]
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft. BLM analysis of different impacts from the various alternatives is expanded in Final SEIS. However, local subsistence hunters do not support drilling without a CD5-GMT1 road due to impacts from annual ice road construction, longer period of construction and operation, increased aircraft traffic, and lack of road into affected area.

[13-021]
The BLM has analyzed a seasonal drilling sub-alternative without a CD5-GMT1 road (Alternative D2) which is included in the Final SEIS. This analysis includes the planning of remote sites containing pre-staged equipment for oil spill response capabilities.

[13-022]
Multiple forms of transportation will be analyzed and should be included for emergency response in the ODPCP. Certain circumstances such as a catastrophic oil spill could warrant the use of certain permits for additional response vehicles. CPAI has stated that it does not intend to use Rolligons for spill response, due to technical limitations and tundra damage. The Final SEIS will include an analysis of where response equipment would be positioned and how it would be accessed under alternatives that have/do not have a CD5-GMT1 road. This discussion will account for how a relief rig would be transported over the Nigliq Channel, as that bridge is not being rig-capable.

[13-023]
CD-3 and GMT1 have many differences, including boat access. Spill response operations unique to GMT1 should be described in the ODPCP.

[13-024]
BLM is obliged to permit development on leases it has sold in the NPR-A and to protect environmental and cultural resources. BLM recognizes that impacts from development do occur and works continuously to mitigate those impacts.

[13-025]
Comment is noted.

Northern
Alaska Environmental
Center

Conservation's Northern Voice

April 22, 2014

Bridget Psarianos, Project Manager
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Re: Public Comments on Draft Supplemental EIS for GMT1 in NPRA

Dear Ms. Psarianos:

We provide these comments on behalf of the Northern Alaska Environmental Center ("Northern Center") and our members regarding the Draft Supplemental Environmental Impact Statement ("DSEIS") for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project ("GMT1") in response to BLM's public notice (79 FR 9920-9921, Feb. 21, 2014). In addition to these general comments, we also have provided technical comments in a separate letter submitted today by The Wilderness Society et al.

Our Fairbanks-based non-profit organization, established in 1971, has long advocated for the special areas of the National Petroleum Reserve- Alaska so important to fish and wildlife, subsistence and cultural values, from the Colville River, Teshekpuk Lake and Utukok River Uplands to Peard Bay and Kasegaluk Lagoon.

About a year ago, BLM completed the final Area-wide plan for the NPR-A. Teshekpuk Lake wetlands -- internationally important to nesting and molting birds and providing vital caribou habitat -- finally received protection this area deserves. The Teshekpuk Lake and Utukok River Uplands Special Areas were expanded and vital areas allocated as no leasing with critical habitats also designated as unavailable for oil and gas infrastructure.

The GMT1 project is located near Fish Creek in the easternmost region of the Reserve and within the approximately 11.8 million acres of the Reserve available for oil and gas leasing under the new plan.

[14-001] This project will be the first commercial oil production site and permanent road on the Federal lands of the NPR-A and therefore sets the stage for future development in NPR-A. With this in mind, it is critical to evaluate a full range of alternatives capable of protecting NPRA's world-class wildlife habitat and subsistence opportunities. The EIS must focus on the impacts not just of GMT1, but of the reasonably foreseeable projects that GMT1 will help make possible.

The proposed GMT1 oil development will be the first considered under the management standards and lease stipulations of the 2012 Integrated Activity Plan (IAP) and 2013 record of Decision (ROD).[1] While the 2012 IAP provided for five Special Areas critical for wildlife habitat and subsistence, it also allocated roughly 11.8 million acres to oil and gas leasing.

During the scoping phase, we noted the close proximity of the proposed GMT1 oil development project to the Teshekpuk Lake Special Area (TLSA). It is vital that all EIS alternatives and assumptions of full-field development and cumulative impacts clearly respect the requirement in the IAP that no exploration drilling or development facilities shall be located in the TLSA lands allocated as unavailable for leasing or non-subsistence infrastructure. In addition, BLM should comprehensively consider mitigation measures and alternatives that minimize impacts from proximate development to this special area and the Colville River Special Area.

As active participants in the development of the 2012 IAP that led to the ROD, we have a great interest in the implementation of this plan through GMT1 and future oil and gas developments. The Northern Center wishes to see that impacts at this new development project be reduced to the greatest extent possible; preliminary analysis of the EIS shows that greater steps to reduce impacts should be considered and incorporated into the alternatives.

During EIS scoping, we had requested that BLM fully re-evaluate the proposed project in light of the new information and circumstances since the 2004 Alpine Satellites EIS, and ensure that all applicable science and traditional and local knowledge is taken into consideration. BLM's current analysis does not fully analyze all the information available. Nor does it adequately consider the least environmentally damaging alternative as detailed in our letter submitted by The Wilderness Society et al. In light of the magnitude of the errors and their serious repercussions for the analysis in the DSEIS, NEPA requires the agency to issue a supplement for public comment.

We are concerned that the development plan for this project along Fish Creek as laid out in Alternative A is business as usual for the North Slope. **[14-002]** The plan represents incremental development that does not set a significantly higher bar to protect the environment or subsistence resources than the status quo despite the BLM having additional management authorities for this area. In fact, ConocoPhillips plan does not represent a meaningful improvement over past proposals considered by BLM, nor has BLM yet addressed an adequate range of alternatives to assess whether impacts are avoided or minimized to the full extent possible. As we look forward with cumulative impacts of

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[1] BLM, National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement (Dec. 2012), *available at* https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=14702

BLM, Record of Decision for the National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement (Feb. 2013), *available at* https://www.blm.gov/epl-front-office/projects/nepa/5251/42462/45213/NPR-A_FINAL_ROD_2-21-13.pdf

similar development, **[14-003]** a piecemeal road development seems to be unfolding as did Prudhoe Bay and Kuparuk, contrary to goals set out by BLM since the 1998 IAP/ROD.

[14-004] We are most concerned that a sensible roadless alternative is not evaluated, seasonal production drilling is not addressed by any of the alternatives, and the analysis of aircraft traffic and ground traffic is insufficient to evaluate the impacts of each alternative. Because of concerns about aircraft vs road traffic, a winter-only drilling and construction alternative should be evaluated for Alt. A, and the other alternatives, as well as a new road-less alternative.

[14-005] We are concerned that no consideration was given to seasonal production drilling in any of the alternatives, even though this was done at Alpine's CD-3 site, not connected by a road, and at the Northstar field. This could reduce risks from blowouts to Fish Creek and also continue the practice seen during exploratory drilling of access from ice roads. Furthermore, the increases of manpower, supplies, and other shipments during the summer season when birds are nesting and caribou are calving may not be required and conflicts could be reduced. That **[14-006]** the crew flights, supply flights, research flights, etc. would happen at the existing oil field airport does not reduce the impacts to the high quality wetlands in that river delta. The SEIS's Alt. C does evaluate an option that could require less reliance on the Delta for flight access, but that Alt. still does not discuss season production drilling restrictions. We support continued inclusion of Alt. C in the final SEIS.

The **[14-007]** lack of specific charts of estimated ground travel requirements nor timing (i.e. number of gravel hauling trips per day and locations, ice road routes by year, drill drig transport crew travel, etc., drilling waste hauling, etc).

[14-008] The proposed project (Alt. A), as well as Alt. B&C involves more than double the number of aircraft flights in the summer (May June and July) than during winter – even though that alternative has connecting roads in a way that confounds logic. We are concerned about increasing levels of aircraft within the Colville Delta as well as in the Fish Creek area, as a result of this project, as well as additional summer vehicle travel in both locations that could be reduced with seasonal (winter only) drilling and construction activities. There was not sufficient rational provided why this factor was not included in any of the alternatives.

[14-009] We are concerned because the proposed project involves 3688 flights in 2016,[2] including the "baseline" that appears to be existing Alpine operations. Flight estimates are provided for 2017 (3811) and 2018 (2995), but not for 2019 (except for Alt D. (4759) and there are no charts showing flights association with production operations beyond that.[3] Flight information from the initial development of the Alpine field to the present should also be provided in order to evaluate trends, additive and synergistic effects of this stressor to people (e.g. subsistence resource availability and subsistence hunting, fishing, berry picking, and other activity experience and recreational opportunities) and fish and wildlife.

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[2] DSEIS Vol. 1, p. 35, Table 2.4-3

[3] DEIS Vol. 1, pp. 36-38, Table 2.4-3

[14-010] The analysis for Alt. D which does not have a connecting road to CD-5, unlike the others, seems biased. Why would there be twice as many helicopter flights needed for special studies (hydrology and biological studies) for Alt. D than the other alternatives – with all of these being in the summer months (May – Aug)? **[14-011]** Why weren't any flights show to be necessary for 2019 and beyond for the proposed project (Alt. A)? If this involves stick pickers, water quality or other monitoring or surveillance, could this be done via walking with backpack kits as is done in many places? How many of these flights are for spill monitoring? Could Alpine "baseline" flights be reduced?

[14-012] These numbers then make it appear that there would be significantly more flights for Alt. D, yet it is unclear how many of these would be for crew or other operational access. We have reviewed the information provided by ConocoPhillips to BLM subsequent to the public hearings but that data on flights remains insufficient in terms of types of aircraft, flight routes and repeated take-offs and landings, seasonal timing, purpose of industry flights, industry research or monitoring flights, as well as other agency, scientific, and other flights, nor present it clearly to understand GMT1 flights in relationship to existing Alpine oil field related flights. **[14-013]** Furthermore, cumulative information related to other exploration whether for seismic or drilling by ConocoPhillips or others, offshore seismic or drilling, baseline studies by Shell and others for potential offshore OCS oil pipelines across NPR-A, etc. was not provided but is essential for understanding the full risks to animals and people.

[14-014] ConocoPhillips' draft GMT1 Aircraft Transportation Plan in Appendix J, a short 3-pages, does not have specific numbers of ground vehicle trips, aircraft and helicopter trips by month, and for the duration of the project, and a more complete plan should be provided. **[14-015]** It also only addresses this first development, GMT1, not the construction and operation of additional fields in the future and how operations may overlap. We are concerned because an analysis of cumulative effects from all sources of flights in the affected region (with clear GMT-1 necessary flights clearly shown) was not done in the draft SEIS.

[14-016] We note that recent studies on aircraft flights in the NPR-A, presented at the Subsistence Advisory Committee meeting, showed major impacts in the number of flights across the Reserve, from 410 in 2008 to 3069 in 2013, with an average of 1800 per year (both industry and research flights were recorded). While there may now be predictive improvements for estimation of flight numbers, the fact is an upward trend for flights as an increasing stressor. **[14-017]** The DSEIS does not analyze information on geographic area affected (i.e. lots of flights in one place or broad geographic coverage), nor the combination of flights for exploratory drilling operations underway in the Reserve, further studies for offshore pipeline baseline studies, and other scientific research which is extensively being done across the Reserve. **[14-018]** How does aircraft, road vehicle traffic, blasting noise for gravel extraction, and pile-driving noises for bridges, VSM, etc. combine during various time periods, for geographic areas, as well as cumulatively within key fish, wildlife, subsistence, and other areas?

This example shows the potential concern, albeit an old example. When the original Alpine oil field was first constructed, the oil company said that aircraft operations would be minimized during the summer season to reduce effects during the sensitive bird nesting time (June 1-July 15), and while 13

monthly RT flights were predicted, in reality there were 1980 airplane and helicopter take offs in that 45 day period in 2000. **[14-019]** What efforts have been made to mitigate through relevant avoidance of activities during bird nesting, molting, and staging periods, caribou calving, fish spawning, known fish overwintering habitats and other activities?

We are concerned about the cumulative impacts of this and other projects yet to be analyzed in a site specific way and across the NPR-A. **[14-020]** Although the GMT-2 project is now considered "conceptual development" even though it was formally proposed as early as 2003 and general future development of the Beartooth Units is vaguely addressed in the cumulative impacts section 4.6, there are no maps portraying such future development infrastructure (roads, pipelines, pads, processing facilities, etc). The Fiord project also proposed as early as 2002, is not addressed at all).

[14-021] This is perplexing and unacceptable piecemealing of these projects in this expedited draft SEIS. The GMT-2 and other projects were first proposed in 2003 in the plan subject to the 2004 Alpine Satellites EIS which included five satellites, although with different configurations: Fiord/CD3, Nanuq/CD4, Alpine West/CD5, Lookout/CD6 [now GMT1], Spark/CD7 [now GMT2].[4] Furthermore, "preliminary" locations and descriptions for GMT2 were provided by CPAI in 2009.[5] Due to this lack of comprehensive analysis, if not rectified, this SEIS will not provide an adequate basis for evaluating future projects beyond GMT-1.

A bit of history is in order. Back when ConocoPhillips originally proposed a series of Alpine Satellites, this project GMT-1, (then named CD-6 or Lookout), and another one now called GMT2 (then called CD-7 or Spark) were proposed for the road and drilling pads to be located in the Fish Creek buffer zone, established as a no-surface occupancy buffer zone to protect the clean water, fish, wildlife, and subsistence values of Fish Creek. So instead of living up to the plan's provisions, ConocoPhillips had requested lease stipulation exemptions so that it could place its roads and pads in the Fish Creek buffer zone as well as build a connecting road outside of NPRA to Alpine. Furthermore, in the earlier plan, CP had proposed the road that connects outside the NPRA plan area to Alpine (i.e. CD-5 road and bridge project). BLM did not uphold the original stipulations from its 1998 IAP just a few years afterwards when it approved the final Alpine Satellites EIS ROD in 2004. It said:

> This ROD grants exceptions to three stipulations included in the *Northeast National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement Record of Decision* (IAP/EIS ROD) signed in October 1998.
> Consistent with the exception clause in the IAP/EIS ROD, BLM will grant exceptions to:
> - Stipulation 39(d): to allow permanent oil and gas facilities within a 3-mile setback from Fish Creek, based on technical, economic, and environmental factors.

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[4] Alpine FEIS at p. 1-1. However, we recognize locations of each project have been modified since the 2004 application, and the need for this GMT1 SEIS is a recognition of many changed conditions and new information since 2004.

[5] 2009, May 12, US Army Corps of Engineers, Public Notice of Application for Permit, POA-2005-1576, Colville River. See Attachment A: Foreseeable future developments for NPRA, GMT1, GMT2, and Fiord West, and map: PAO-2005-1576, Sheet 30 of 30, April 2009.

- Stipulation 41: to allow some permanent oil and gas facilities within 500 feet of some waterbodies, based on technical factors.
- Stipulation 48: to allow gravel roads between "separate oil fields," based on environmental factors.

ConocoPhillips still has not proposed a project that fully complies with the current IAP plan requirements. It is our understanding that the Greater Mooses Tooth One and Two projects will be producing from a different oil field reservoir than Colville Delta 5 or the other Alpine satellites.

Another major impact that needs greater attention is air quality cumulative impacts from existing North Slope operations and this new development. **[14-022]** The EIS does not address air emissions from flaring, nor quantify instances during production startup as well as ongoing production operations which of concern given the proximity to Nuiqsut. **[14-023]** BLM should implement stronger standards to reduce the incidence of flaring at startup of production, as well as routine flaring of waste products.

- **[14-024]** Gas flaring episodes at the Alpine oil field lasting longer than one hour exceeded quantities released in such upsets at all the other North Slope oil fields combined in 2000.[6]
- Flares are designed to burn waste gases from hydrocarbon production, and as a safety relief during plant emergencies. **[14-025]** Over 100-150 chemicals can be produced during flaring including soot, nitrogen oxides, sulfur dioxide, hydrogen sulfide, propylene, benzene, toluene, methane, carbon dioxide and ammonia.[7]
- **[14-027]** Adverse human health effects from chronic exposure to repeated flaring discharges have been observed for people living or working near flaring in Canada and from offshore development near Los Angeles.[8] According to a Canadian study, adverse impacts may occur at distances ranging from 0.2 – 35 km from the flaring.

The Northern Center is happy to discuss and of these concerns, as well as those detailed technical comments provided contained in the letter submitted today by The Wilderness Society et al.

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[6] Bodron, D. 2003. Information on 2000 flaring (Gas2000 North Slope.xls; Re 2000 flaring.rtf) from Wendy Mahan, Alaska Department of Natural Resources, April 6, 2001.

[7] **[14-026]** Argo, J. 2001. *Unhealthy effects of upstream oil and gas flaring*. A report prepared for Save Our Seas and Shores, for presentation before the Public Review Commission into effects of potential oil and gas exploration, drilling activities within Licences 2364, 2365, 2368. Sydney, Nova Scotia, January 18, 2002. IntrAmericans Centre for Environment and Health, Wolfe Island, ON, Canada.

[8] Argo, J. 2001. Unhealthy effects of upstream oil and gas flaring. A report prepared for Save Our Seas and Shores, for presentation before the Public Review Commission into effects of potential oil and gas exploration, drilling activities within Licences 2364, 2365, 2368. Sydney, Nova Scotia, January 18, 2002. IntrAmericans Centre for Environment and Health, Wolfe Island, ON, Canada.

Thank you for this opportunity to comment.

Sincerely,

Pamela A. Miller

Pamela A. Miller
Arctic Program Director

[14-001]
Development beyond GMT is speculative. The NPR-A IAP EIS analyzed scenarios that include long-term development beyond GMT. If the Bear Tooth Unit is developed, additional analysis will be conducted during the planning phase.

[14-002]
Comment is noted.

[14-003]
Development beyond GMT is speculative. The NPR-A IAP EIS analyzed scenarios that include long-term development beyond GMT. If the Bear Tooth Unit is developed, additional analysis will be conducted during the planning phase.

[14-004]
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft.

[14-005]
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft.

[14-006]
Comment is noted.

[14-007]
The Final SEIS includes additional information on vehicle traffic.

[14-008]
The Final SEIS includes additional information on aircraft and vehicle traffic, as well as analysis of a seasonal (winter only) alternative that does not include the CD5-GMT1 road (Alternative D2).

[14-009]
The Final SEIS includes revised information on aircraft flights. The respective sections of the Final SEIS (subsistence, wildlife, recreation) consider direct, indirect, and cumulative impacts from aircraft and noise.

[14-010]
The Final SEIS has been updated to reflect the suggested edit.

[14-011]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources.

[14-012]
The Final SEIS includes additional information on aircraft activity.

[14-013]
The Draft SEIS and Final SEIS consider the following information relating to oil and gas activity. Past – Legacy wells; existing oil and gas infrastructure; winter access. Proposed and Current – CD5 development; Nuiqsut Spur Road; Colville River Access Road; Umiat Road and Pipeline; winter oil and gas exploration; offshore oil and gas exploration; and GMT2. Please see Table 4.6.2 and Section 4.6.2 of the Final SEIS.

[14-014]
The Final SEIS includes additional information on aircraft and vehicle traffic, as well as analysis of a seasonal (winter only) alternative that does not include the CD5-GMT1 road (Alternative D2).

[14-015]
Development beyond GMT is speculative. The NPR-A IAP EIS analyzed scenarios that include long-term development beyond GMT. If other fields are developed, additional analysis will be conducted during the planning phase.

[14-016]
Comment is noted.

[14-017]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources.

[14-018]
The cumulative impacts from noise would be moderate and long term. The cumulative impacts to noise are discussed in BLM 2004 (Section 4G.5.9).

[14-019]
Applicable potential mitigation measures are found in section 4.7 of the Draft SEIS and Final SEIS.

[14-020]
The Final SEIS includes additional information on GMT2 and Beartooth Units, including additional maps.

[14-021]
The Final SEIS includes additional information on GMT2 and Beartooth Units, and the analysis tiers to the scenarios described in the 2012 IAP/EIS for NPR-A.

[14-022]
Flaring is not part of the GMT1 project design, nor will there be an increase in flaring at the Alpine CPF as a result of GMT1; therefore, emissions from flaring were not documented and mitigation measures do not need to be considered.

[14-023]
Flaring is primarily done in emergency situations when production equipment fails or for other abnormal causes usually equipment or well related. But there are some cases where scheduled well or facility maintenance requires temporary flaring. Any additional flared volume of gas at ACF associated with GMT1 would be negligible compared to existing flaring events.

[14-024]
Flaring is primarily done in emergency situations when production equipment fails or for other abnormal causes usually equipment or well related. But there are some cases where scheduled well or facility maintenance requires temporary flaring. Any additional flared volume of gas at ACF associated with GMT1 would be negligible compared to existing flaring events.

[14-025]
There is no current regulation that prevents CPAI from flaring in non-emergency cases without approval, however, the BLM has the discretion to limit these events to those determined to be absolutely necessary for safe production handling.

[14-026]
A discussion regarding flaring has been added to Section 4.4.6 Public Health of the Final SEIS.

[14-027]
A discussion regarding flaring has been added to Section 4.4.6, Public Health of the Final SEIS.

ALASKA WILDERNESS LEAGUE ◆ CONSERVATION LANDS FOUNDATION ◆ NATURAL RESOURCES DEFENSE COUNCIL ◆ NORTHERN ALASKA ENVIRONMENTAL CENTER ◆ PACIFIC ENVIRONMENT ◆ SIERRA CLUB ◆ THE WILDERNESS SOCIETY[1]

April 22, 2014

Bridget Psarianos, Project Manager
GMT1 Draft SEIS Comments
Bureau of Land Management (BLM)
222 West 7th Avenue, Stop #13
Anchorage, AK 99513
gmt1comments@slrconsulting.com
bpsarianos@blm.gov

Re: Comments on the Draft Supplemental Environmental Impact Statement for Greater Mooses Tooth-1

Dear Ms. Psarianos:

Please accept these comments on the Draft Supplemental Environmental Impact Statement ("DSEIS") for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project ("GMT1") in response to BLM's public notice (79 FR 9920-9921, Feb. 21, 2014). We appreciate the magnitude of this job. We also appreciate your incorporation of several mitigation measures suggested in The Wilderness Society's additional scoping comments dated September 20, 2013.

Our comments address public involvement, scope, the range of alternatives, cumulative impacts, roads and gravel, aircraft, wetlands, floodplains, habitat and wildlife impacts, hydrology, subsistence impacts, health, social issues, environmental justice, and other human impacts, air quality, pipelines and other oil and gas issues, mitigation measures and project specific stipulations, and economic issues.

A summary of our key requests is provided in Table 1 below.

As an initial matter, **[15-001]** we ask BLM to issue a supplement to the DSEIS for public review prior to the issuance of the final supplemental environmental impact statement (FSEIS). Significant omissions and errors exist in the current DSEIS that distort the analysis of impacts for Alternative D and undermine the comparison of alternatives that is at the heart of the National Environmental Policy Act (NEPA) process. A supplement would provide the public with the

[1] These comments were prepared with assistance from Trustees for Alaska.

correct data regarding the expected number of flights and water usage. The supplement would also allow the public to review components that are missing in the DSEIS, such as consideration of seasonal drilling and a modified layout for Alternative D. **[15-002]** Without such a supplement, BLM's NEPA documents would not contain a reasonable range of alternatives; a reasoned choice among alternatives would not be possible; and public participation and informed decision-making purposes would fundamentally be undercut. In light of the magnitude of the errors and their serious repercussions for the analysis in the DSEIS, NEPA requires the agency to issue a supplement for public comment.[2]

We offer these comments with the vision of preserving the National Petroleum Reserve-Alaska's (NPRA's) sensitive ecological places for the wildlife and people that depend on them, and for future generations of Americans that will be here after NPRA's oil and gas have been exhausted. NPRA is home to many of our nation's Arctic treasures, including two large caribou herds, globally significant migratory bird populations, polar bears, extraordinary lakes, ponds, rivers, floodplains, wetlands, and upland areas, and sensitive coastal resources. These values are central to the subsistence livelihood of Alaska Natives and our nation's conservation heritage.

As the first commercial oil and gas development on federal land in NPRA, GMT1 sets the stage for NPRA's future development. With this in mind, it is critical to evaluate a full range of alternatives capable of protecting NPRA's world-class wildlife habitat and subsistence opportunities. The EIS must focus on the impacts not just of GMT1, but of the reasonably foreseeable projects that GMT1 will help make possible. It must also consider all that has happened on the ground since the 2004 Alpine Satellites EIS, and ensure that all applicable science and traditional and local knowledge is considered.

BLM's current analysis does not fully analyze all the information available. Nor does it adequately consider the least environmentally damaging alternative. Development that sets the stage for unnecessary roads and infrastructure and avoidable disturbance and emissions will not be responsible.

In order to respect and protect the NPRA's world-class wildlife habitat and subsistence opportunities, we urge BLM to consider and adopt an alternative that most reduces the impacts from the proposed GMT1 project to wildlife and subsistence. While a revised analysis of alternatives will likely demonstrate that a roadless development is the environmentally preferred alternative, deficiencies in the current DSEIS preclude the public's or BLM's identification of such an alternative.

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[2] *See* 40 C.F.R. § 1502.9(a) ("If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion."). *See also Russell Country Sportsmen v. USFS*, 668 F.3d 1037, 1048 (9th Cir. 2011) (changes that reduce environmental impacts may nonetheless require supplementation).

Table 1: Summary of Requests

Topic	Request
Public involvement	• Allow for adequate public review of a supplement to the DSEIS and of the FSEIS. • Give interested stakeholders other than government entities a chance to review and comment on plans for reclamation, oil spill contingencies, and other issues.
Scope	• Describe the potential configurations and assess the potential impacts of GMT2 throughout the document. • Address the proposed CD5-GMT1 road's contribution to the likelihood of additional roads in the area and to a potential trans-NPRA road, and the impacts associated with such roads. • Analyze the overall GMT unit's footprint with and without the proposed road.
Alternatives	• Analyze each alternative using seasonal drilling (winter). • Analyze an environmentally preferred, roadless alternative with a more efficient configuration and smaller airstrip that would avoid setbacks and use seasonal drilling as well as best technology for pipelines. • Compare facilities at CD3 with those proposed for GMT1 under Alternative D and consider whether GMT1 infrastructure could be reduced.
Cumulative impacts	• Conduct a more in-depth assessment of cumulative impacts considering roads likely to be built in adjacent areas, gravel resources, and alternatives to roads in the context of emergency response and pipeline safety. • Provide a map showing GMT2 and other activities that will contribute to cumulative impacts, as well as a map showing drilling activities by company in NPRA since 2000. Provide an overlay showing caribou migration corridors. • Address whether and how the full-field scenario contained in the Alpine Satellites DEIS (BLM, 2004, Fig. 2.4.1.2-1) is used for cumulative effects assumptions and analysis.
Roads and gravel	• Include pullouts in the road design for all road-access alternatives where technically and socially appropriate and revise estimates of the footprints. • Provide specific estimates of vehicle trips on roads by purpose, type/ size and season and evaluate impacts associated with these vehicle trips. • Analyze fragmentation metrics and indirect impact area (acres) in tables for all alternatives alongside the footprint estimates. • Perform additional studies on the long-term impacts to subsistence and habitat associated with roads and aircraft.
Aircraft	• Summarize aircraft activity based on user group, time/season, purpose, and aircraft type; evaluate this separately for GMT1, existing Alpine and satellites operations, and other reasonably foreseeable developments; evaluate the cumulative effects of non-development aircraft use; evaluate impacts on animals and subsistence at different times of the year; evaluate the ecological sensitivity of take-off/landing locations; and consider alternatives to aircraft to reduce flights. • Provide the public with the correct data and analysis on flights; issue the revised data to the public in a supplement to the DSEIS prior to the FSEIS. • Examine whether flights and truck trips can be eliminated by injecting drilling wastes at the well pad rather than transporting the wastes to Alpine for injection. • Examine whether flights for Special Studies can be reduced by alternate transportation methods.
Habitat and wildlife	• Better analyze how roads and aircraft affect caribou at different life-cycle stages, especially migration. • Differentiate between impacts to subsistence and impacts to caribou habitat,

	movements, and population. • Require long-term monitoring of the effects of oil and gas infrastructure and activity on several key species of birds and assess the extent of birds killed by vehicles and structures.
Hydrology and fish	• Require sufficient data to be provided in a GIS format; maintain a database of this information; assess water quality and quantity and availability for fish, wildlife, and subsistence resources over the life of the development project, taking into account climate change effects (permafrost melt, lakes drying up, coastal and river erosion). • BLM should provide its own expertise and management to ensure its federally reserved water rights are upheld. • Reassess the accuracy of older fish and hydrology surveys; consider more recent surveys and the use of precautionary restrictions to ensure that appropriate decisions regarding water withdrawal and water use are made. • Assess long-term impacts of roads, pads, river crossings, culverts, and the Tinmiaqsigik bridge design on fish habitat. • Document sources of water for ice roads and the volumes to be extracted per month from each water source.
Subsistence	• Work with stakeholders and the Federal Aviation Administration to develop specific altitude and other flight restrictions around subsistence activities. • Strengthen BMP F-1 by mandating the requirement for operators to submit flight plans; limit takeoffs and landings; avoid allotments and subsistence areas; avoid low altitudes; and implement a flight communication system between operators and Nuiqsut representatives; and provide this data annually to BLM. • Restore areas previously important to subsistence.
Health and social issues	• Improve the environmental justice analysis by better evaluating recent studies, health impact assessments, and cumulative impacts to subsistence for the different alternatives; reconciling conflicting statements about environmental justice; and including communities beyond Nuiqsut. • Consider the social impacts associated with rapid development.
Air quality	• Include GMT2 and other developments in air quality modeling; analyze air quality for Alternatives B and C; consider emissions from flaring. • Implement mitigation measures to reduce flaring. • Require the use of natural gas for power and electric vehicles where feasible; when diesel fuels are used, require the use of ultra-low sulfur diesel.
Pipelines and oil and gas issues	• Analyze information showing that transmission pipelines do not require roads and that roads are not always necessary for leak detection and spill response. • Require highly-sensitive electronic pipeline leak detection, annual smart pigging, and automated, not manual, valves to protect key water bodies. • Correct the spill analysis to categorize spill causes; assess the worst-case scenario, toxic spills, and the Repsol blowout. • Require drilling to be paused during times when cleanup would be impossible due to extreme cold. • Consider requiring separation of oil, gas, and produced water at well pads. • Correct the apparent errors in Table 2.4-2 regarding water used for drilling; issue the revised data to the public in a supplement to the DSEIS prior to the FSEIS.
Mitigation	• Pursue the least environmentally damaging development scenarios by avoiding and minimizing impacts wherever possible. • Provide for enforcement and monitoring of mitigation measures. • For compensatory mitigation, consider some form of long-term protection for high

	value habitat as compensatory mitigation for the long-term likely permanent impacts of development at GMT1 and GMT2. Develop a formula for determining how much land to protect based on the need for a high compensation ratio; work with all affected stakeholders, agencies, and the public to determine which areas would be appropriate for protection; and select a form of protection (such as a conservation easement) that will be substantive and agreeable to stakeholders. • Require restorative mitigation and clean up legacy wells. • Clarify the applicability of lease stipulations and BMPs when land is conveyed out of federal ownership to Kuukpik/Arctic Slope Regional Corporation.

1. Public Involvement

[15-003] As an initial matter, as described above, we believe BLM must prepare and make available for public comment a revised or supplemental DSEIS because of serious flaws in flight and hydrology data in the DSEIS that centrally undermined BLM's presentation and comparison of alternatives. The supplement also would allow the public to review components that are missing in the DSEIS such as consideration of seasonal drilling, a modified layout for Alternative D, and an improved analysis if GMT2's likely impacts on GMT1's design.

We appreciate the level of public involvement to date for the DSEIS, particularly BLM's willingness to conduct government-to-government consultation and hold meetings in affected villages. We believe BLM has improved its level of public involvement since the GMT1 scoping comments. BLM allowed for a 60-day public comment period on the EIS. This was an improvement over the comment time period for the scoping comments.

That said, **[15-004]** we reiterate the need for an extended comment period, given the extensive nature of the proposed project's impacts on remote populations and economically disadvantaged communities, the voluminous technical information, and the multiple questions raised during the public hearing process. Instead of being rushed, the public process for this first commercial oil and gas development on federal lands in the NPRA under the 2012 Integrated Activity Plan (IAP) should be carefully implemented so that all public concerns are heard.

[15-005] Upon publication of the revised or supplemental DSEIS (if completed as we recommend) and the FSEIS for GMT1, BLM will allow for another period of public review. We encourage BLM to structure that comment period in a manner that maximizes the likelihood of receiving meaningful feedback. This means that BLM should time this comment period to align with a period in which North Slope residents are available to review and provide input. It should also provide a summary and/or newsletter document to communities and the public. Further, if warranted, BLM should consider holding hearings in the region on the supplemental DSEIS and FSEIS.

Several places in the DSEIS refer to CPAI's development of plans "in consultation [or in coordination] with," appropriate local, state, and federal entities.[3] We urge BLM to give interested stakeholders other than government entities a chance to review and comment on such plans where feasible. We are especially concerned that **[15-006]** CPAI did not provide its oil spill contingency plan for GMT1 with the project description. Nor is the plan included in the DSEIS, despite being an integral requirement for this development.

The concept of allowing the public to review such plans is consistent with the recently released strategy for improving the mitigation policies and practices of the Department of the Interior, which calls for collaboration as follows: "Collaboration: Coordinate with other federal and state agencies, tribes, and stakeholders in conducting assessments of existing and projected resource conditions, forming mitigation strategies, and developing compensatory mitigation programs…"[4]

2. Scope

Outside of the section on cumulative effects, the DSEIS focuses almost exclusively on GMT1.[5] BLM's justification is that GMT2 is a connected action, not ripe for decision, but appropriate for analysis in the cumulative effects section because it is reasonably foreseeable.[6] **[15-007]** While BLM states that GMT2 may not be ripe for decision, additional analysis of its impacts is needed to fully evaluate the alternatives for GMT1. The potential range of configurations for GMT2 should be fully described, based on the most updated information from ConocoPhillips Alaska, Inc. (CPAI). **[15-008]** Further, the location of GMT2 should be shown on a map—it is currently not shown in any of the DSEIS maps.

[15-009] BLM should obtain the most up-to-date information about GMT2 from CPAI or use information based on the preliminary 2009 mapping or other information provided to the agencies, and evaluate the impacts of both GMT1 and GMT2. To the extent possible, BLM should consider the impacts of GMT2 throughout the EIS, not only in the cumulative effects section. That said, unless BLM has sufficient information about the GMT2 project that CPAI will move forward with and expands the scope of this EIS to include a full analysis of GMT2,

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[3] *E.g.,* 2014 Alpine DSEIS, vol. 1, 258 (gravel mining and reclamation), vol. 2, p. 44 (waste plan), p. 46 (contingency plan).

[4] *See* A Strategy for Improving the Mitigation Policies and Practices of the Department of the Interior, A Report to The Secretary of the Interior from The Energy and Climate Change Task Force (April 2014), available at http://www.interior.gov/news/upload/Mitigation-Report-to-the-Secretary_FINAL_04_08_14.pdf, p. 1 [hereafter DOI Mitigation Strategy]. *See also id.* at 12: "The networks of Landscape Conservation Cooperatives, Climate Science Centers, and other partnerships should be engaged to provide essential information in the development of landscape-level mitigation strategies across sectors, scales, and levels of government."

[5] The DSEIS states that "GMT2 Project and the development of onshore infrastructure or activity (e.g., seismic exploration) associated with offshore oil and gas development are considered reasonably foreseeable future actions for purposes of cumulative impacts." 2014 Alpine DSEIS, vol. 1, p. 345. Although these actions are considered reasonably foreseeable, they are only considered in the cumulative impacts, and not in air modeling, the gravel footprint, or other analyses of the environmental impacts associated with each alternative.

[6] 2014 Alpine DSEIS, vol. 1, p. 388.

BLM may still be required to do an updated analysis of that project under the National Environmental Policy Act before the project moves forward.

[15-010] A project proposed and mapped years ago, Fiord West, is not addressed at all.[7] Impacts from exploration projects in the GMT unit are not discussed. The DSEIS currently lacks a discussion on state offshore leasing,[8] despite Nordaq Energy, Inc.'s planned activity in Smith Bay. A road between CD5 and GMT1 sets the groundwork for a trans-NPRA road that could ultimately lead to a larger footprint with greater environmental impacts than discrete developments. The DSEIS appears to recognize this by noting that "Alternative D, the roadless alternative, would be less likely to facilitate westward oil and gas development."[9] But the contribution of a CD5-GMT1 road to a larger NPRA footprint has not been analyzed.

[15-011] Nor does the DSEIS fully analyze the facilities that would be required for the conceptual GMT2 project and other developments in the GMT unit.[10] The DSEIS simply states that many additional (i.e., duplicative) facilities would be needed for GMT1 under Alternative D, since the lack of a gravel road would prevent access to facilities at CD1.[11] It is not clear whether GMT2 and other projects within the unit could all rely on the CD1 facilities, or whether such facilities would need to be built within the GMT unit regardless of the road status. If additional facilities must be located within the GMT unit to serve the various developments, then a roadless GMT1 may not significantly add to the overall GMT unit's footprint. BLM should analyze the overall GMT unit's footprint with and without a CD5-GMT1 road.

[15-012] Section 1.3 of the DSEIS refers to the Purpose and Need for the Project. We disagree that the purpose of the proposed GMT1 project is to "construct a drill site, access road, pipelines and ancillary facilities to support development." How does this project meet NPRA purposes, which include meeting the energy needs of the nation and protection of surface values?[12] As it

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[7] CPAI proposed the development of a drilling pad and access road in the Fiord West region of NPRA as part of the Alpine Satellite Development Plan. The Fiord West Pad was planned to be accessible via a gravel road extending north approximately 1.7 miles from an intersection with the proposed CD5 access road. *See* Michael Baker, Fiord West 2009 Hydrologic Assessment, http://www.arlis.org/docs/vol1/A/462208683.pdf.

[8] *See* 2014 Alpine DSEIS, vol. 1, p. 344. The discussion offshore leasing on p. 346 focuses on federal leasing. Further, page 344 refers to Figure 4.6-1 as showing winter oil and gas exploration activities, but that figure shows oil and gas infrastructure, not winter exploration.

[9] 2014 Alpine DSEIS, vol. 1, p. 388; *see also* p. 391.

[10] The justification is that GMT2 is a connected action (40 CFR 1508.25(a)(1)), not ripe for decision, but appropriate for analysis in the cumulative effects section because it is reasonably foreseeable (BLM 2008c, H-1790-1, p.45). 2014 Alpine DSEIS, vol. 1, p. 388. While GMT2 may not be ripe for decision, additional analysis of its impacts is needed to fully evaluate the alternatives for GMT1.

[11] *See, e.g.*, 2014 Alpine DSEIS, vol. 1, p. 216 "Stationary source emissions from ongoing GMT1 operations would include a waste incinerator and two backup generators in addition to those operational sources proposed under Alternative A."

[12] The need for development is more accurately described in the 2004 Alpine Satellite Development Plan FEIS, and we would add reference to the Naval Petroleum Reserves Production Act of 1976 (NPRPA), as amended. Thus, we

considers this question, the Purpose and Need for the DSEIS should be "to guide development of the GMT unit so that oil resources can be developed and important surface resources and uses are protected."

3. Range of Alternatives

The purpose of an EIS is to "rigorously explore and objectively evaluate all reasonable alternatives" to a proposed action.[13] The discussion of alternatives "is the heart of the [EIS],"[14] and it "guarantee[s] that agency decision-makers have before them and take into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance."[15]

NEPA requires that agencies explore alternatives that "will avoid or minimize adverse effects of these actions upon the quality of the human environment."[16] In assessing a development proposal, "an agency must consider the statutory context of the proposed action and any other congressional directives in addition to a private applicant's objectives."[17]

One of the most critical decisions to make in moving forward with NPRA development is whether it will be essentially roadless (i.e., a collection of discrete units within which there may be roads) or roaded, which could give rise to a landscape traversed by a spider web of roads similar to the industrial complex at Prudhoe Bay. A sprawling industrial complex across NPRA is both unnecessary and, most importantly, wholly inappropriate given the impact of such an approach on NPRA's other values.

[15-013] While BLM may be able to justify a conclusion that discrete roads connecting nearby pads may be environmentally preferable in some situations, it has not done so here. This is because the numbers of aircraft predicted for Alternative D are flawed and incomplete (see Section 6 of these comments); water use calculations are flawed (see section 12.3); the DSEIS assumes that drilling must be year-round (see Section 3.1);[18] there may be more infrastructure listed in the DSEIS for

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suggest the following: "The need for oil production from the perspective of CPAI is to generate financial return on its investment in oil and gas leases, while requiring protection of important surface resources and uses."

[13] 40 C.F.R. § 1502.14(a). *See also* 42 U.S.C. § 4332(2)(C)(iii).

[14] 40 C.F.R. § 1502.14

[15] *Alaska Wilderness Recreation & Tourism Ass'n v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995) (quoting *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988)); *see also Angoon v. Hodel*, 803 F.2d 1016, 1020 (9th Cir. 1986) ("[T]he touchstone for our inquiry is whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation.") (quoting *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982)).

[16] 40 C.F.R. § 1500.2(e).

[17] *Alaska Survival v. Surface Transp. Bd.*, 705 F.3d 1073, 1085 (9th Cir. 2013) (citations omitted).

[18] *See* 2014 Alpine DSEIS, vol. 1, p. 45 "Alternative D is depicted in Figure 2.7-1. Drilling would continue year-round to achieve economic and production goals, unlike the seasonal drilling activity at the roadless CD3 pad. "

Alternative D than would actually be needed; there is not a robust analysis of road versus aircraft impacts (see Sections 9.2, 5, and 6); and the DSEIS narrowly focuses on GMT1 impacts (see Section 2).[19]

The result is that BLM has failed to evaluate an alternative that is adequately protective of the natural and subsistence resources in NPRA. All action alternatives, for example, have major effects on subsistence, environmental justice, and socio-cultural resources.[20] They all have the same level of effects on fish, birds, and water resources, and similar effects on terrestrial species, air quality, and noise.[21] To remedy this failure, **[15-014]** BLM should fully examine a roadless winter-only (i.e., seasonal) drilling and construction alternative for GMT1. As described below, this alternative is viable and consistent with the basic policy objectives for NPRA management, and it potentially would minimize the adverse effects of the proposed project.[22]

3.1 Need for consideration of seasonal drilling

The alternatives assume that drilling must take place year-round, but the DSEIS does not justify this assumption.[23] Year-round drilling activity requires a great deal of infrastructure (i.e., a larger airstrip, man camps, storage areas, etc.) and additional flights, many of which would not be required if drilling were limited to the winter season when ice roads are available.

[15-015] We encourage BLM to analyze a roadless alternative that provides for seasonal drilling, similar to what takes place at the roadless CD3,[24] rather than the year-round drilling proposed by CPAI. A plan that avoids drilling during the snow-free months in summer and fall would mitigate disturbance impacts on nesting birds, caribou fall migration and summer and fall subsistence activities from disturbances by industrial activity during these critical times. It would also reduce the blowout risks to open water in wetlands, floodplains, and the Fish Creek watershed.

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[19] *See, e.g.*, 2014 Alpine DSEIS, vol. 1, p. 197: "In comparison to the other action alternatives during the operation period, Alternative D could result in higher spill risk due to increased activity with aircraft operations and year-round living accommodations."

[20] 2014 Alpine DSEIS, vol. 1, p.173.

[21] *Id.*

[22] *See Se. Alaska Conservation Council v. Fed. Highway Admin.*, 649 F.3d 1050, 1056 (9th Cir. 2011); *Citizens for a Better Henderson v. Hodel,* 768 F.2d 1051, 1057 (9th Cir.1985) ("The existence of a viable but unexamined alternative renders an environmental impact statement inadequate."); *Bob Marshall Alliance v. Hodel,* 852 F.2d 1223, 1228 (9th Cir. 1988) ("Informed and meaningful consideration of alternatives—including the no action alternative—is thus an integral part of the statutory scheme.").

[23] Year-round drilling appears to be contemplated under all alternatives. See 2014 Alpine DSEIS, vol. 1, p. 275: "Construction and use of ice roads, gravel roads, pipelines and other infrastructure will primarily occur during the winter, however some construction activities would occur in the summer months."; p. 276: "Most of the construction associated with the GMT1 Project would occur during winter, when caribou may be present in the project study area. The proposed developments would bring year-round facilities and activities within caribou summer range."

[24] CD3, the pad three miles north of the main Alpine facility, is a roadless drill site with an airstrip and has winter-only drilling via an ice road.

Seasonal drilling should be considered for an environmentally preferred alternative and analyzed as possibilities for all other alternatives.

If seasonal drilling occurred only during the ice road season, there would be no need for Alternative D to have a 5,000-foot airstrip and parking apron that is Hercules C-130 capable for transporting a relief well drilling rig.[25] Additionally, the size of the pad (which correlates with gravel use), the camp facilities, the power needs, and tank and storage volumes could be significantly reduced as it would be possible to transport most of the supplies needed for drilling via ice road. Solid waste and wastewater generation also would be reduced without a permanent camp at the well pad.

[15-016] Based on the 2004 Final EIS, the additional infrastructure required at CD3 as compared to the sites with gravel road access was limited to: an emergency generator; additional temporary storage tanks during drilling operations (Section 2.3.3.1); three trucks (pick-up, hot oil, and supersucker or vacuum trucks); a front end loader; two or three Tioga heaters, upright work tanks, a portable air compressor, and a bleed tank (Section 2.3.3.4). These additional resources are significantly less than those described in Alternative D (Section 2.7 of the DSEIS), which presents a footprint—both in the size of the gravel pad and significantly larger power demand—inflated by year-round drilling.

In the Administrative Record for the CD5 development project,[26] CPAI explained that winter-only drilling would not be practicable for CD5 because of economic reasons related to the estimated well production rate and the cost of drilling for multiple seasons. CPAI contrasted the economic viability of winter-only drilling at CD3 on grounds that the CD3 reservoir holds twice the amount of oil as CD5, with a higher estimated production rate per well at CD3 leading to higher investment results. CPAI said that, because of the lower reserves and production rates at CD5, winter-only drilling would stretch out the development time frame to the point that an adequate return on investment may not occur, and could result in an uneconomic project. Further, CPAI indicated that there was no other drill site scheduled to be drilled during the same time frame as CD5, so there was no cost benefit of drilling in the winter only and sharing a rig with another project, as with CD3 and CD4 (CD3 shares a drilling rig with CD4, decreasing costs).[27] The rig would need to be stored at CD5 on standby during the summer, or moved back across the Nigliq Channel at the beginning and end of each winter season until all of the wells are drilled, adding to capital costs.

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[25] *See* 2014 Alpine DSEIS, vol. 1, p. 45 (describing facilities needed for Alternative D).

[26] AR 3445.

[27] AR 3267–68.

The reasoning regarding oil reserves does not necessarily apply to GMT1, which will produce oil from a separate reservoir than CD5. The maximum projections of oil—20,000 barrels per day—are the same for GMT1 and CD3.[28] Further, there is the potential for sharing a rig for winter-only options at GMT1 and GMT2, or between GMT1 and CD5 if a road (ice or gravel) is built between the latter two sites. **[15-017]** BLM should provide an analysis of the economic viability of winter-only drilling or drilling that pauses during the summer season. Specifically, BLM should compare the projected oil reserves for GMT1 and CD3, which appear to have a similar number of wells (30+). Would this situation change if GMT2 were considered at the same time? Regardless, seasonal (winter) drilling and construction should be evaluated to have a full spectrum of alternatives in the DSEIS.

3.2 Flaws in the alternatives that were analyzed in the DSEIS

As discussed above, we request that BLM supplement the DSEIS with an alternative that examines a winter-only drilling roadless alternative. In addition, the DSEIS should remedy additional flaws in the alternatives it does analyze in the DSEIS as described below. Our request is consistent with "BLM policy to minimize the number of permanent facilities such as gravel roads and elevated pipeline systems to the maximum extent possible."[29] Areas of additional analysis include:

1. Vehicle impacts: **[15-018]** The impacts of vehicles associated with Alternatives A, B and C have been underestimated in terms of their direct effects on air quality, noise, soils and wildlife, notably caribou migrating through the project area. Vehicle contribution to spills should be clarified. **[15-019]** Additional impacts associated with accommodating non-industry travelers, including pull-outs, should be incorporated in the EIS. **[15-020]** We also question whether aircraft activity is underestimated for Alternatives A, B and C. If Alternative D requires a larger pad for storage of goods brought in by ice road in winter and more resupply flights, wouldn't the same be true for getting goods from CD1 under Alternatives A, B and C? Please explain.
2. Aircraft for Alternative D: **[15-021]** The information contained in the DSEIS on aircraft flights associated with Alternative D was inaccurate. An analysis needs to be done using the revised estimates provided to BLM by CPAI after the issuance of the DSEIS. **[15-022]** Additionally, BLM should outline ways in which air traffic by permitted users can be reduced, and BLM should develop a plan to work with agencies, researchers, and others to reduce impacts by non-permitted users.

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[28] Page 296 of the 2014 Alpine DSEIS says, "GMT1 is expected to peak at 20,000 barrels per day in 2018, declining to about 5,000 barrels per day in 2031, then goes to a steady decline of about 15 percent per year through 2041. This projection is the same assumption used in BLM (2004, § 4A.4.2.1, p. 620), which still provides BLM a reasonable estimate, although may overestimate the amount of recoverable oil from the reservoir." Page 621 from the 2004 Alpine EIS shows a maximum of 20,000 barrels per day for CD3, the same as for GMT1. It is not clear why winter-only drilling would be economical for CD3 but not GMT1.

[29] 2014 Alpine DSEIS, vol. 1, p. 336.

3. Footprint: **[15-023]** BLM should include fragmentation metrics and indirect impact area (acres) in tables for all alternatives alongside the footprint estimates. Can Alternative D be reconfigured to reduce its footprint? For example, could the airstrip be put northeast of the well pad and the pipeline routed as in Alternative B?
4. Alternate configurations for roadless development: The DSEIS suggests that Alternative D would have a larger footprint than Alternative A, which has a 7.8 mi road. We would like BLM to consider other possible configurations that could reduce the footprint for a roadless alternative, including seasonal drilling as mentioned above. This is consistent with DOI's policy of siting projects to avoid impacts, as outlined in the recent DOI guidance.[30] **[15-024]** A different location of the airstrip could reduce the distance from the well pad to the airstrip. For example, could the airstrip be placed NE of the well pad, where the road and pipeline under Alternative A are sited? This could be done with no or minimal incursion into the Fish Creek buffer. The pipeline could then be sited as proposed under Alternative B, as shown in Figure1. Also, the length of the runway could be minimized if seasonal drilling is used, since a relief well drill rig would not have to be flown in.
5. Avoidance of setbacks: **[15-025]** There is currently no consideration of a roadless alternative that would fully avoid the setback for Fish Creek. The map for the roadless Alternative D, Figure 2.7-1, shows the pipeline running through the buffer; while the map for the road Alternative B, Figure 2.5-1, shows the pipeline and road outside the buffer. BLM should consider a roadless alternative with infrastructure moved out of the buffer. As recognized in the DSEIS, avoiding setbacks may lessen impacts to subsistence as well.[31] Also, if pipelines are located outside of the setbacks, there would likely be less potential impacts to Fish Creek and the Ublutuoch River from oil spills.[32]
6. Reduction of facilities at GMT1: **[15-026]** We are concerned that the list of facilities needed at GMT1 in the DSEIS under Alternative D is unnecessarily high. We assume that if this alternative had been CPAI's proposed activity, it would have undergone greater analysis and consideration, including economic considerations that would have eliminated unnecessary facilities. We would like BLM to identify all of the facilities listed in Chapter 2.7 under "On-Site Facilities" that are present at CD3, to explain why any additional facilities (if any) are needed at GMT1that are not present at CD3, and to then re-evaluate how the project could be designed (including transportation, storage, operations (see also section 3.1 above) and footprint) to make Alternative D have minimal environmental and social impacts.

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[30] See DOI Mitigation Strategy at 2: "The [mitigation] hierarchy starts with avoidance. If a project can reasonably be sited so as to have no negative impacts to resources of concern then that is generally the most defensible approach."

[31] 2014 Alpine DSEIS, p. 295.

[32] 2014 Alpine DSEIS, p. 194.

7. **[15-027]** Reduction of flights: Alternatives to aircraft (e.g., walking, boats, and other low-impact travel on the pipeline right of way) should be used to access water bodies to the maximum extent possible for Special Studies during the summer.
8. Reduction of impacts associated with operations: Wells should be seasonally drilled when ice roads are usable. **[15-028]** BLM should examine oil, gas, and produced water separation on the well pad as it would result in less likelihood of spills from pipelines by largely eliminating water transport in the pipeline which results in corrosion (though also increasing the well pad footprint). Drilling muds, gas, and all fluids should be injected on the pad. Drilling should stop when extreme winter cold makes spill control and cleanup technically impossible.
9. Use of best technologies for pipelines: **[15-029]** The GMT1 to CD5 pipeline should be equipped with sensitive, electronic leak detection and subject to annual smart pigging of the line. Annual testing and reporting to BLM of the leak detection effectiveness should be required, including how quickly inspection was done when leaks were reported and false alarm locations and rates. Remote, automated closure valves (i.e., instead of manual valves, see Section 2.4.3.1) should be placed on the pipeline to minimize spill size into the Ublutuoch River and also to Fish Creek.
10. **[15-030]** Emergency response: Low-ground pressure vehicles could be used for emergency response during the summer, while helicopters or vehicles appropriate for off-road winter travel[33] could be used during the winter.

[33] *See* Alaska Department of Natural Resource, Off-Road Travel on the North Slope on State Land, http://dnr.alaska.gov/mlw/factsht/off-road_travel.pdf.

Figure 1. Proposed alternate location (top, gray) for the airstrip for a roadless alternative which reduces the overall footprint; pipeline (yellow/orange) as in Alternative B for separation. Original airstrip (bottom, pink) for Alternative D shown for comparison.

3.3 Alternative C

[15-031] BLM representatives stated at public meetings that Alternative C (the Nuiqsut hub alternative) is not viable, since Kuukpik Corporation will not grant permission to widen the Nuiqsut Spur Road for industrial use. This factor of non-viability for this alternative should be discussed in the FSEIS. It should also be noted that the U.S. Army Corps of Engineers has issued the Section 404 permit for Kuukpik Corporation to build the Nuiqsut Spur Road. We support continued inclusion of Alternative C in the FSEIS.

4. Cumulative Impacts

The Cumulative Impact Analysis (CIA) discussed in the cumulative effects section 4.6 provides BLM the opportunity, and is a Council of Environmental Quality mandate, for considering how

NPRA might look in the future, considering at least the next several decades. With the GMT1 FSEIS, BLM could have the opportunity to shape how development is likely to advance across NPRA in areas that are open to oil and gas leasing and development. **[15-032]** Considering that there are no permanent protections in place for the Special Areas that are administratively protected from leasing and non-subsistence infrastructure with the 2013 Integrated Activity Plan, we ask BLM to consider a more in-depth CIA in the FSEIS than is presented in the DSEIS. We recognize that the CIA is difficult due to uncertainty as to where energy development and other landscape changes will occur and because of ongoing climate change.

The primary questions we are interested in seeing greater discussion and analysis of in regards to the northeastern region of NPRA include:

1. **[15-033]** What would be the approximate extent of roads be if roads are constructed in connection with new pads in the Greater Mooses Tooth and Bear Tooth units, other leases in northeast NPRA, and to Smith and Harrison Bays (outside of NPRA)?
2. **[15-034]** Given that there is little available gravel for roads in much of NPRA, what is the likely extent of gravel resources, including known and unknown, available to facilitate development in NPRA?
3. **[15-035]** Will building roads to GMT1 and GMT2 deplete gravel resources sufficiently such that future development in northeast NPRA could not occur due to the lack of economically viable gravel resources? Where are gravel resources best committed?
4. **[15-036]** What alternative technologies and operating procedures can be implemented to make roads unnecessary?
5. **[15-037]** What does road and air traffic in northeast NPRA look like beyond the construction period for GMT1? Will the decline in both types of traffic after construction be offset by new development? How can BLM help guide development to have fewer impacts during all seasons?

[15-038] We appreciate the list of activities included in the CIA,[34] but it is difficult to place them in context without a map. Please provide a map in the FSEIS similar to that included in BLM 2004, Figure 2.4.1.2-1, showing all of the activities, including all Alpine satellites, GMT1 and GMT2, the Bear Tooth unit, and all proposed roads, while still respecting the IAP's Special Area protections (including areas allocated for no leasing and/or non-subsistence infrastructure). Not having such a map hinders our ability to assess cumulative effects. **[15-039]** We also ask BLM to include a map depicting the locations of all drilling activity by company in NPRA since 2000 so that the public can understand exploration activity levels and where future development may occur. It also would be helpful for BLM to maintain a website established for this purpose.[35]

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[34] 2014 Alpine DSEIS, vol. 1, Chapter 4.6.2.

[35] http://www.blm.gov/ak/st/en/prog/energy/oil_gas/npra/npra_oilandgasactivity.html.

[15-040] Although GMT2 is considered a reasonably foreseeable future action, the DSEIS does little to estimate its impacts. The EIS simply estimates that GMT2 would encompass approximately 7,100 acres, and a combined GMT1-GMT2 project study area would encompass approximately 109,600 acres. Impacts of GMT2 are assumed to be "similar"[36] to GMT1, but there is no quantification of the potential gravel footprint, flights, or facilities need for GMT2 under the alternatives with and without roads, or considering seasonal (winter only) drilling and construction.

The DSEIS states that, "As a result many of the cumulative effects of Alternative E would be similar to those of the action alternatives, although Alternative E would not add impacts incrementally."[37] **[15-041]** We question BLM's assumption that cumulative impacts for NPRA will be similar regardless of the alternative chosen. There would be no CD5-GMT1 road under Alternatives D and E, reducing the likelihood of NPRA being traversed with roads between all units. Furthermore, such similarity in effects for the DSEIS alternatives provides evidence that a full range of alternatives has not been provided.

We believe that **[15-042]** Table 4.6-4 needs to include the impacts for all alternatives, not just Alternative A. It is unclear from the text how this information was used in the Cumulative Impacts Analysis; so we request that BLM clarify that.

[14-043] The FSEIS should describe how future winter exploration and ice road construction in NPRA and in nearshore waters of the Beaufort Sea could combine with ice road construction needed under Alternative D.

[14-044] BLM should address whether and how the full-field scenario contained in the Alpine Satellites DEIS (BLM, 2004, Fig. 2.4.1.2-1) is used for cumulative effects assumptions and analysis.

Finally, **[15-045]** the FSEIS should provide a more comprehensive synthesis and maps of the cumulative impacts of past, present, and future oil and gas operations both onshore and offshore that also addresses climate change effects. **[15-046]** A new scientific study of 62-years of oil development on Alaska's North Slope plus climate change has revealed significant unanticipated impacts (Raynolds, et al., 2014).[38] In addition to consideration of the direct habitat loss from placement of roads and other infrastructure, other factors such as road dust and flooding and resultant thermokarst in adjacent habitats and shoreline erosion have intensified in the warming

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[36] 2014 Alpine DSEIS, vol. 1., p. 345 ("The project design elements are predicted to be generally similar to those described for GMT1"); p. 351("The reasonably foreseeable GMT2 Project would have similar, though potentially fewer impacts, than GMT1, which would be additive").

[37] 2014 Alpine DSEIS, vol. 1., p. 349

[38] Raynolds, M., et al. 2014. Cumulative geoecological effects of 62 years of infrastructure and climate change in ice-rich permafrost landscapes, Prudhoe Bay Oilfield, Alaska, Global Climate Change Biology 1211-1224, *available at* http://onlinelibrary.wiley.com/doi/10.1111/gcb.12500/suppinfo.

conditions. **[15-047]** This study also updated the North Slope infrastructure analysis from the 2003 National Research Council study[39] for areas covered by the wide range of oil field facilities and the areas covered by gravel fill and excavation. It also examined the indirect effects of infrastructure. This new information should be incorporated into the FSEIS analysis.

5. Roads and Gravel

5.1 Need for clarifications

[15-048] The DSEIS states that, "If Alternative D were to be constructed, the GMT2 pad would also be roadless."[40] BLM should clarify whether, for the purposes of the analyses in the DSEIS, it considers "roadless" to preclude a road between GMT1 and GMT2.

[15-049] The GMT1 DEIS says that the pad footprint for Alternative A would be 12.5 acres, while the Alternative D footprint would be 31 acres exclusive of the airstrip (Table 2.3-2 in GMT1 DEIS). In projecting Alternative D's footprint, BLM should consider CD3, the existing roadless drillsite in Alpine, as well as the estimates for a roadless pad provided in the 2004 Alpine FEIS. That FEIS indicated that roadless pads (outside the delta) would be 17.6 acres (from the Alpine FEIS section 2, page 26)—significantly less than the 2014 estimate.

[15-050] The DEIS states that the Alpine Erosion Control plan contains snow removal and dust control plans for roads and pads.[41] BLM should clarify what areas are likely to be designated as cleared snow deposition areas and consider if this contributes to an increase in the gravel footprint.
[15-051] Road/pad dust control watering should also be considered in the water use for all alternatives. As we detail in the next section, Raynolds, et al. 2014, National Research Council 2003, and other studies show that road dust, roadside flooding, thermokarsting and other indirect impacts also need to be taken into account. Furthermore, disturbance impacts take place well beyond the direct site of gravel fill, and these also should be addressed in the FSEIS.

[15-052] One of the stated benefits of a gravel road is increased subsistence access to resources. But roads proposed under Alternatives A, B and C do not include the pullouts that would be needed to facilitate subsistence access in either their design or footprint, so the analysis is distorted. Please include pullouts in the road design for all road-access alternatives where technically and socially appropriate and revise the estimates of the footprints.

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[39] National Research Council, 2003. Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope,*available at* http://www.nap.edu/openbook.php?isbn=0309087376.

[40] 2014 Alpine DSEIS, vol. 1, p. 358.

[41] 2014 Alpine DSEIS, vol. 1, p. 40.

[15-053] Finally, there are no specific charts of estimated ground travel requirements nor timing (i.e. number of gravel hauling trips per day, crew travel, etc., supply hauling, drill rig travel, drilling waste hauling, etc.). BLM should include these in the final EIS.

5.2 Impacts of permanent roads

BLM has long recognized the impacts of constructing and operating permanent roads in the tundra environment. The 2004 Final EIS (Section 2.6 and Section 4.2.1.1, which describes construction impacts on surface resources) cites impacts associated with gravel extraction, construction, and traffic. **[15-054]** The construction and use of permanent roads can be the most damaging result of oil and gas development (aside from a major spill), and the fact that their ultimate fate upon abandonment at the end of oil and gas operations is left uncertain makes their impacts unpredictable.

The long-term impacts of gravel roads are significantly greater than, as well as different from, those of seasonal ice roads. While the footprint of a road alternative may be less than that of a roadless alternative under some configurations, the indirect impacts of roads traversing the landscape will likely be greater, including the area affected by dust on vegetation (resulting in thermokarst), impacts to drainage and hydrology, permafrost disruption,[42] impacts of vehicles on prey species, permanent loss of habitat for native species, and more.[43]

The presence of roads has a significant impact on caribou, especially in combination with pipelines. Habitat fragmentation from roads can impede caribou migratory patterns, foraging options, access to calving grounds, and ultimately lead to herd decline.[44] Roads also can have a long-term impact on bird habitat. Several studies have concluded that populations of bird species decrease along roads due to noise disrupting the communications key to mating and warning as well as general disturbances.[45] Roads can provide access to potentially significant numbers of non-local people who can adversely affect fish and wildlife numbers. **[15-055]** BLM should analyze fragmentation metrics and indirect impact area (acres) in tables for all alternatives alongside the footprint estimates.

Ice roads may have comparable or greater short-term/seasonal traffic impacts. But when ice roads melt, the tundra remains in place. Airstrips result in disturbances as do roads, but the

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[42]Martha Raynolds et al., op. cit.

[43] 2014 Alpine DSEIS, vol. 1, p. 273.

[44] Cameron, R.D., W.T. Smith, R.G. White, and B. Griffith. 1995. Can petroleum development depress the productivity of Arctic caribou? Proceedings of the 2nd International Arctic Caribou Conference 36. University of Alaska Fairbanks, Alaska; Whitten, K., G. Garner, F. Mauer, and R. Harris. 1992. Productivity and early calf survival in the Porcupine caribou herd. Journal of Wildlife Management 56:201-212.

[45] Seiler, A. 2001. Ecological effects of roads: A review. Swedish University of Agricultural Sciences. Retrieved from: http://www.coalicionventanasverraco.org/files/ASeiler.pdf.

indirect impacts noted above may not affect as large an area as a longer road. Further, long-term fragmentation of the landscape is greater under the road alternatives.[46] More studies are needed to compare the impacts of permanent roads versus those of aircraft.

[15-056] In correspondence on the CD5 Alpine Satellite expansion project, the U.S. Fish and Wildlife Service expressed its concerns regarding road development in the Colville Delta.[47] The letter explained that the hydrology and geomorphology of the Colville Delta is driven by sediment deposition and erosion, and a road would back-up and subsequently decrease the flow rate of water moving downstream during flood events. This would result in the deposition of sediment upstream of the road, and, even with water moving though culverts. The habitats on the downstream side could subsequently become sediment starved.

5.3 Gravel mining

Road construction requires extensive gravel mining and transport of gravel to the roadbed. **[15-057]** The proposed CD5-GMT1 road would make up approximately 78% of the total gravel needed for the project,[48] requiring more than 9000 vehicle hauling trips during summer construction.[49] We estimate that this represents 102-156 round-trips each day to build the road or 4-6 trips per hour, clearly an intensive industrial operation with potentially significant wildlife impacts.

[15-058] The FSEIS needs to document road maintenance needs over the decades the road would exist.

Given that the Clover site is partially within the Tiŋmiaqsiġvik (Ublutuoch) River setback, there may be additional impacts to fish and wildlife that depend on this water body.[50]

Moreover, **[15-059]** BLM needs to address where gravel will be mined for future projects in the area.

5.4 Location of infrastructure

On page 43, the DSEIS describes Alternative B as being more technically challenging for road construction and maintenance due to poor soils and thaw stability due to the extent of thaw basins along the route, but the basis for this description is not clear.[51] **[15-060]** It is important to discuss

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[46] 2014 Alpine DSEIS, vol. 1, p. 377.

[47] Letter from Larry Bright, U.S. Fish and Wildlife Service, to Colonel Reinhard W. Koenig, U. S. Army Corps of Engineers, re POA-2005-1576, Colville River (Aug. 17, 2009).

[48] 2014 Alpine DSEIS, vol. 1, Table 2.4-1.

[49] Page 33 of the DSEIS says that there would be 12,000 vehicle round-trips hauling gravel over a 2-3 month period in the summer during construction, and 78% of that would result in 9,362 round-trips.

[50] 2014 Alpine DSEIS, vol. 1, p. 176.

[51] BLM may be relying on wetland classification in this determination. On pages 245-246, the DSEIS states that alternative A impacts a total of 434 acres of tussock tundra and moist-sedge shrub habitat (potentially drier and more stable) and 124 acres of wet sedge and old basin wetlands (potentially wetter and more susceptible to thermokarst).

the relative suitability of different soil and wetland types for supporting infrastructure so that final design plans for GMT1 would cause the least overall impacts and to establish guidelines for future development.

6. Aircraft

[15-061] Aircraft activity is a significant concern, particularly to North Slope communities, and this topic needs significantly greater analysis and discussion in the GMT1 FEIS. **[15-062]** A starting point would be to summarize aircraft activity collected by BLM (and required from all NPRA permittees reliant on aircraft) by: 1) user group (e.g. basic science research (non-industry), agency monitoring, industry ecological baseline/monitoring, pipeline inspection, exploration and development access (e.g. staking, stick-picking) site access, etc., agency administrative flights, permitted visitors and other significant users; 2) month and 3) aircraft type. This data should be evaluated for the periods of construction, drilling, and production operations. BLM then should use this information to evaluate the cumulative effects of all aircraft use (i.e., for development and non-development purposes). **[15-063]** Finally, BLM should use this information to develop an aircraft transportation plan for northeast NPRA that reduces aircraft activity and increases flight sharing among agencies, industry and others.

[15-064] We are extremely concerned by the incomplete and inaccurate information in the DSEIS regarding flights associated with "Special Studies." These data suggest that Alternative D would have significantly more flights in May-August than the other alternatives for Special Studies. According to the DSEIS, for Alternatives A-C, "[a]pproximately 70 percent of the hydrological studies would be conducted using boats launched from the road system."[52] After the issuance of the DSEIS, BLM received revised flight data from CPAI and provided it to TWS. Table 2 shows that the revised number of flights for Special Studies under Alternative D (which now includes September flights as well) is projected to be less than the flights needed under Alternatives A-C. This means that under "roadless" Alternative D, the impacts associated with Special Studies flights appear to be less than for Alternatives A-C.

For alternative B, the impacts are stated to be across 366 acres of tussock and moist sedge and 197 acres of wet sedge and old basin wetlands.

[52] 2014 Alpine DSEIS, vol. p. 39.

Table 2: Comparison of Special Studies Helicopter Flights for Alternatives A-C vs. D

Flights	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Alternatives A-C	2016	0	0	0	0	134	145	52	71	12	0	0	0	**414**
Alternative D	2016	0	0	0	0	68	86	18	37	8	0	0	0	**217**
Alternatives A-C	2017	0	0	0	0	134	145	52	71	12	0	0	0	**414**
Alternative D	2017	0	0	0	0	68	86	18	37	8	0	0	0	**217**
Alternatives A-C	2018	0	0	0	0	4	44	21	16	24	0	0	0	**109**
Alternative D	2018	0	0	0	0	66	104	21	34	24	0	0	0	**249**
Alternatives A-C	2019+	0	0	0	4	44	21	16	24	0	0	0	0	**109**
Alternative D	2019+	0	0	0	0	66	104	21	34	24	0	0	0	**249**
Total for Years 2016-2019+ for Alts. A-C														**1046**
Total for Years 2016-2019+ for Alt. D														**932**

Using the revised data provided by ConocoPhillips to BLM, April-December 2017 and January-April 2018 flights to GMT-1 under Alternative D would be substantially greater compared to Alternatives A-C, likely since drilling wastes would not be transported by road. The DSEIS estimates that during drilling activities for Alternatives A-C, 390-450 monthly vehicle round-trips between CD5, Alpine, and GMT-1 would occur (Section 2.4.8.1), or 13-15 roundtrips each day. Thus, the trade-off between Alternative D's greater flights during the approximately one year of drilling (April 2017-April 2018, revised data) would be a comparatively large number of daily truck trips along the newly-built road for Alternatives A-C during that relatively short time period.

[15-065] We request that BLM examine whether both the flights and the truck trips can essentially be eliminated by injecting drilling wastes at the well pad rather than transporting those wastes to Alpine for injection. This possibility is mentioned in the DSEIS[53] but not analyzed as part of any alternative. **[15-066]** Furthermore, the scenarios for flight levels by month need to be done for winter-only drilling and a construction plan should be provided.

In summary, what we can conclude using the revised flight data is:

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[53]2014 Alpine DSEIS, p. 42. "Drilling wastes (i.e., muds and cuttings) would be disposed of through annular disposal on-site and/or transported to an approved Class II disposal well such as the Alpine disposal well at CD1."

1. "Special Studies" flight numbers for Alternative D can be greatly reduced from those in the DSEIS, resulting in fewer Alternative D Special Studies flight numbers than Alternatives A-C.
2. Based on the data provided to date by CPAI, for a one-year period during 2017-2018, Alternative D would have more flights than Alternatives A-C due to drilling waste transport; however Alternatives A-C will have a very high number of daily truck trips during that period of time.

Importantly, our analysis of the revised data shows that BLM should not conclude – as it does in the Cumulative Effects section of the DSEIS – that "Alternative D would likely have the greatest impact to subsistence uses and activities of all the alternatives…"[54] We urge BLM to perform new analyses using the revised aircraft data, and also to examine the possibility of injecting drilling wastes on the well pad. These analyses likely will change the results and conclusions regarding GMT1's projected impacts on wildlife, subsistence, air quality, and the cumulative impacts of the various alternatives.

[15-067] The magnitude of the difference between the previous and revised data is significant enough to warrant the issuance of a supplement to the DSEIS.[55]

A revised analysis in a supplemental DSEIS should do more than just tally the number of flights associated with each alternative. **[15-068]** BLM should consider the flight routes, whether repeated take offs and landings occur in concentrated locations, and the time of year when they take place to evaluate the impact on subsistence as well as migration, calving, and other sensitive life phases. BLM also should consider the ecological sensitivity of the location of landings and takeoffs.

[15-069] The revised analysis also should justify the assumption on page 38 that the road options will require no flights above the background level after construction is completed.[56] Additional supplies and people will need to be transported into the region during production. The assumption is particularly questionable for Alternative C, as BLM states: "A reduction in air traffic at APF is not certain under this Alternative, since the Applicant has stated their intention

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[54] 2014 Alpine DSEIS, p. 386.

[55] A supplemental DEIS was done for the Eastern Interior Resource Management Plan in January 2013. See Hardrock Mineral Leasing in the White Mountains National Recreation Area: Supplement to the Eastern Interior Draft RMP/EIS (January 2013) https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=10151.

[56] 2014 Alpine DSEIS, vol. 1, p. 38: "Alternative A, B, and C drilling needs will be handled by flights that are already part of the ongoing operations. No additional flights are anticipated." *See also* p. 281: "Under Alternatives A, B, and C, an estimated 162 to 223 additional new flights each month would be required during construction and would reduce to no new flights after construction is completed; under Alternative D these would increase during drilling and operation to 540 new flights per month during May and June, and 282 new flights added for July and August for the life of the project."

to continue using APF as the primary location for air logistics for the GMT1 Project regardless of which Alternative is selected."[57]

Finally, the revised analysis should take a closer look at the transportation needs for Special Studies and other helicopter access needs. **[15-070]** BLM should consider whether all of the Special Studies require aircraft access, or if there are other practical (albeit less convenient) alternatives such as boat or foot access. Given that the distance between CD5 and GMT1 is only approximately eight miles, our organizations believe that not all the hydrological and biological Special Studies need to utilize helicopters under a "roadless" alternative. The distance is short enough that well-placed boats could be accessed by foot, snowmachine, or low-ground-pressure vehicles travelling largely along the pipeline right of way. We appreciate CPAI's submittal of new data to BLM during the comment period on this topic, but we request that BLM scrutinize these new data as well.

Similarly, well-placed, supplemental spill response equipment may be accessible through means other than helicopters.

7. Habitat and Wildlife Impacts

7.1 Caribou

As the EIS states, the GMT1 project area is not considered a high-use area for caribou during any season. But regardless of the number, caribou do use this area in winter, during fly season, and during late summer and fall migration. The late summer distribution of the Teshekpuk Caribou Herd is important to depict, since this time is the approximate starting point for fall migration, and late summer habitat will be affected by the projects and activities listed in the cumulative impacts analysis. Late summer and fall also are important times for caribou hunting in the region according to the DSEIS and references within.

Caribou are most likely to be affected by development during fall migration, and this should be reflected in the FSEIS. **[15-071]** A map showing migration corridors, as determined using Brownian Bridge or similar analysis, for the full set of collared caribou, would help clarify caribou use in the project area and compliment the current figures which trace collared caribou. By overlaying the alternatives on the map of migration in section 3.3.4 and all of the Cumulative Effects projects, including the proposed roads from the Dalton Highway to Umiat, the public can better visualize the factors affecting caribou fall migration. **[15-072]** Analysis of the response of the Teshekpuk Caribou Herd to the Dalton Highway also should be included in the FSEIS, as it appears that the Teshekpuk Caribou Herd shows some reluctance to road crossing despite the 40-year presence of that road.

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[57] 2014 Alpine DSEIS, vol. 1, p. 44.

Further, the caribou that are in the area are an important resource to the community of Nuiqsut. Changes in migration routes also could impact Anaktuvuk Pass. There is not a clear understanding or analysis of how either caribou or hunters will ultimately fare under each alternative. **[15-073]** The DSEIS states that caribou and hunters may avoid the road and states that the road may provide increased hunting opportunities.[58] Both may be true: a road may provide some increased access during summer, but infrastructure and roads could prevent some winter snowmachine access and travel. This should be discussed and analyzed. BLM will need to mitigate the impacts to caribou and hunters if a road alternative is selected.

In the Cumulative Impacts Analysis for caribou, starting on page 370, BLM states that, "The combined GMT1 and conceptual GMT2 project would have the greatest impact under Alternative C followed by Alternatives D, B and A." We disagree with BLM's conclusion based on the following:

1. Similar levels of traffic for Alternatives A-C: The DEIS goes on to state, "Impacts associated with vehicle traffic would be greatest under Alternative C, due to the increased distance vehicles would have to travel."[59] **[15-074]** While Alternative C may have more traffic in the project area due to increased use of the Spur road, we believe similar levels should be expected between CD1, GMT1, and GMT2 under Alternatives A and B as some industrial use, some commuter traffic, some hunting and some other road uses could occur once the Nuiqsut Spur road is constructed. Further, for all road alternatives, increased hunting access may be an additive deterrent for caribou to use habitat near the road.[60]
2. Caribou foraging areas impacted: Caribou are more inclined to forage and travel in drier habitat types than wetter habitats,[61] such that Alternatives A and C would have a greater impact on caribou than Alternatives B or D.
3. Lack of justification for aircraft impacts: We disagree with the statement that "Alternative D would have no road traffic, but the absence of impacts from roads are likely offset by the increase in impacts from air traffic at the Nuiqsut Airport, APF, at GMT1, and at the conceptual GMT2 site. The use of aircraft at four airports that are 11 to 19 miles apart under Alternative D is expected to have the greatest overall impact to caribou."[62] **[15-075]** There is no adequate discussion in the DSEIS of research suggesting that caribou would be more impacted by aircraft than roads; in fact, much of the discussion in Chapter 4.3.4.1 regarding caribou response to activity focuses on road traffic disturbances. As the DSEIS states, the project area is not within the high-value caribou

[58] 2014 Alpine DSEIS, vol. 1, p. 276.

[59] 2014 Alpine DSEIS, vol. 1, p. 370.

[60] 2014 Alpine DSEIS, vol. 1, p. 276.

[61] 2014 Alpine DSEIS, vol. 1, p. 105.

[62] 2014 Alpine DSEIS, vol. 1, p. 370.

calving area identified by Wilson, et al. 2012 and Person, et al. 2007. **[15-076]** Analysis should focus on caribou response to aircraft during late summer, fall migration and winter, though it also should consider long-term cumulative effects to the entire calving and post-calving habitat use. Further, much of the information gathered on caribou in the area is from overflight monitoring of herd distribution, thereby encompassing an observer effect.

[15-077] CPAI has stated that its caribou monitoring in Alpine and Kuparuk has indicated little significant caribou disturbance from aircraft. Data from this monitoring should be analyzed and included to provide the best available science to date on caribou responses to aircraft. This is in contrast to the road and/or road vehicle disturbances that are evident for the collared caribou in the Teshekpuk Caribou Herd approaching the Dalton Highway, which clearly show that this herd has not grown accustomed to the now 40-year-old road.

[15-078] To the best of our understanding of the literature and unpublished information on the Teshekpuk, Western and Central Arctic Herds regarding caribou habitat use, seasonal response to roads/traffic, and response to aircraft, we believe that Alternatives A and C will have the greatest impacts on caribou in the project area; Alternative B having slightly less due its location in wetter vegetation types; and Alternative D will have the least impact. We request that BLM address the issues raised here in the appropriate chapters on environmental impacts to caribou and other terrestrial mammals that are present largely where caribou occur (grizzly bears, wolves, wolverine).

7.2 Birds

7.2.1 Potentially affected bird species

The project analysis area and the larger Cumulative Effects Area (CEA)[63] are within the Colville River Delta Important Bird Area (IBA). The Colville River Delta IBA was established for continentally significant breeding populations of Pacific Brant, Spectacled Eiders, and Yellow-Billed Loons.[64]

[15-079] Table 3 shows waterbird values in the CEA made up of the project analysis area plus the Bear Tooth, Greater Mooses Tooth, and Colville River units (NPRA portion only). Values were

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[63] The 2012 IAP assumed the development of both the Greater Mooses Tooth and Bear Tooth Units in each of its alternatives (IAP, Vol. 4, pp. 49, 51) even though it did not incorporate site-specific impact infrastructure or activity information or provide a site-specific impact analysis. The DSEIS, however, does not consider the Bear Tooth development at all. To capture potential cumulative effects and make the most effective use of Audubon Alaska's GIS data, commenters focus their discussion of bird impacts on a cumulative effects area (CEA) that includes the Bear Tooth, Greater Mooses Tooth and Colville River Units (NPRA portion only).

[64] More information is located at http://netapp.audubon.org/iba/Reports/2784.

generated by the NPRA Decision Support Tool (Audubon Alaska 2012).[65] **[15-080]** Waterbird data used in the Decision Support Tool come from USFWS aerial surveys (e.g. Larned, et al. 2010).[66] **[15-081]** Species highlighted in red are on Audubon Alaska's 2010 WatchList (Kirchhoff and Padula 2010)[67] and represent populations that are either declining and/or vulnerable.

Table 3: Cumulative Effects Area Waterbird Values

Species	Percent of NPRA breeding population found in CEA	Waterbird density in CEA compared to NPRA Average	Estimated Number of Breeding Birds
King Eider	7.9%	3.2x	745
Tundra Swan	6.7%	2.7x	229
Scaup Spp.	5.4%	2.2x	429
Glaucous Gull	4.6%	1.9x	552
Greater White-fronted Goose	4.3%	1.8x	3,625
Red-breasted Merganser	4.2%	1.7x	26
White-winged Scoter	4.1%	1.7x	44
Pacific Brant	4.1%	1.6x	213
Jaeger Spp.	4.1%	1.6x	211
Yellow-billed Loon	4.0%	1.6x	68
Pacific Loon	3.8%	1.5x	866
Red-throated Loon	3.6%	1.5x	89
Sabine's Gull	3.5%	1.4x	310
Arctic Tern	3.3%	1.4x	495
Long-tailed Duck	3.0%	1.2x	783
Northern Pintail	2.8%	1.2x	963
Canada Goose	2.8%	1.1x	191
Snow Goose	2.0%	0.8x	106
Spectacled Eider	1.0%	0.4x	44
Snowy Owl	0.8%	0.3x	6
Steller's Eider	0.2%	0.1x	0
Shorebird Spp.	2.0%	0.8x	627
Watchlist Spp.	4.9%	2.0x	1164
Waterfowl Spp.	3.7%	1.5x	10,789

[65] Walker, N. J. 2012. NPRA Decision Support Tool. Audubon Alaska, Anchorage, Alaska.

[66] Larned, W. W., R. A. Stehn, and R. M. Platte. 2010. Waterfowl breeding population survey, Arctic Coastal Plain, Alaska, 2009. Unpubl. Rept., U. S. Fish and Wildlife Service.

[67] Kirchhoff, M. D. and V. Padula, 2010. Alaska WatchList: Highlighting Declining and Vulnerable Bird Species in Alaska. Anchorage, Alaska, Audubon Alaska.

[15-082] The CEA supports above-average NPRA breeding densities for 17 waterbird species, as shown in Table 3. It contains above average NPRA habitat for four species on Audubon's Alaska Watchlist[68]—Pacific Brant, King Eider, Red-throated Loon, and Yellow-billed Loon. The CEA is particularly important for King Eiders, encompassing almost 8% of the King Eiders estimated in the NPRA. On average, acres in the CEA support 3.2 times more King Eiders than an average acre in the NPRA. Additionally, as shown in Table 3, an estimated 44 Spectacled Eiders, a federally-listed threatened species, as well as 68 Yellow-billed Loons, a candidate for federal listing, breed in the CEA. Overall, WatchList species occur at almost twice the density within the CEA compared with the entire NPRA.

GMT1 infrastructure and other potential development in both the proposed development area and the CEA appears most likely to occur near identified King Eider nesting locations, but identified nesting locations for all five Watchlist species that appear in the area will be potentially impacted.

As shown in Figure 2, there are 80 locations within the project analysis area for five species of concern, mapped based on the Alaska WatchList of vulnerable and declining populations. The species and number of locations are: Spectacled Eider (16), Yellow-billed Loon (4), King Eider (30), Pacific Brant (18), and Red-throated Loon (12). Within the larger cumulative effects area, 623 locations for the five WatchList species are: Spectacled Eider (47), Yellow-billed Loon (21), King Eider (349), Pacific Brant (142), and Red-throated Loon (64). It is not known from these data whether the breeding sites were used multiple times over the ten-year period. For planning purposes, the location of used habitat in proximity to infrastructure should be considered during project implementation, and direct and indirect impacts should be avoided.

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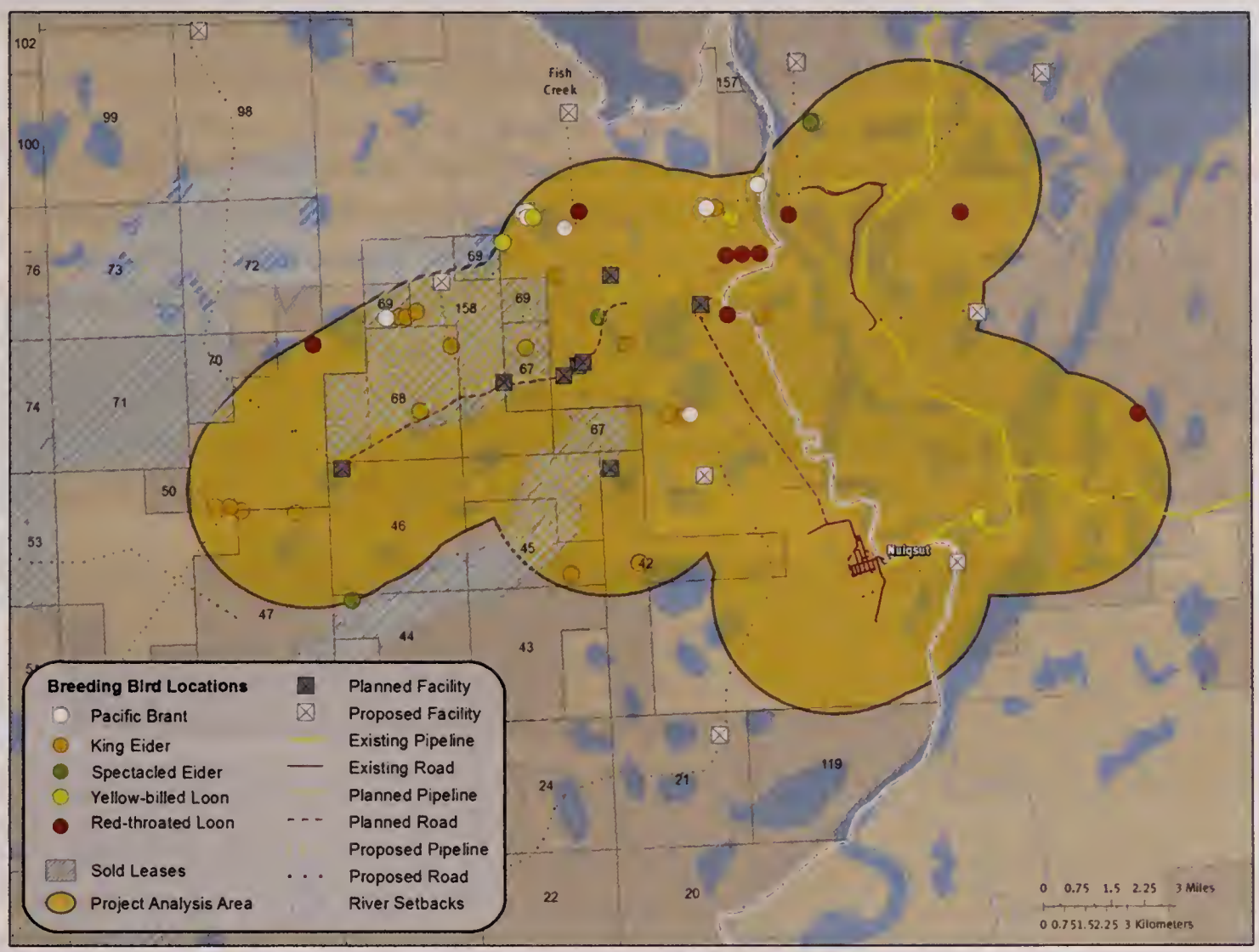
[68] *See* Kirchhoff, M., and V. Padula. 2010. The Audubon Alaska Watchlist 2010. Audubon Alaska, Anchorage, AK. 10 pp.

Figure 2: Species of concern within project area (Source: Audubon Alaska)



This map shows the location of bird species of concern during the breeding season over a ten year period, 2001 to 2010. Data is from USFWS aerial surveys.
Species of concern are from the Audubon Alaska WatchList (Kirchhoff and Padula 2010). Proposed infrastructure based on UAF's forthcoming report by Kevin Hilmer-Pegram.

7.2.2. Recommended monitoring

As detailed above, GMT1 and reasonably foreseeable future oil and gas developments in the area will take place in important bird habitat. The DSEIS recognizes that the GMT1 project and future development in the NPRA "has the potential to affect birds, bird behavior, and their nesting, brood-rearing, foraging and molting habitats through habitat loss and alteration, disturbance from noise and visual activity, displacement from habitats, or attraction to habitats altered by thermokarst and early green-up adjacent to gravel infrastructure."[69] The DSEIS also recognizes the potential impacts of increased predation and mortality from collisions with infrastructure.[70]

The 2012 IAP contained several Best Management Practices (BMPs) designed to limit the impacts of development on bird populations. Among these BMPs is E-9 (limiting predators' use

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[69] 2014 Alpine DSEIS, vol. 1, p. 260.

[70] 2014 Alpine DSEIS, vol. 1, p. 264.

of infrastructure), E-11 (requiring surveys for eiders and Yellow-billed Loons before construction), E-18 (limiting ground-level disturbances), and F-1 (altitude requirements for aircraft flights). Still, **[15-083]** the avian resources at stake demand additional monitoring that will allow for a better assessment of the long-term impacts of oil and gas development on birds.

Additional monitoring is justified for several reasons. First, it is consistent with the intent expressed by the 2012 IAP that "[S]tudies and monitoring will be done to: 1) ensure lessees and permittees comply with applicable requirements, 2) assess the effectiveness of protective measures to meet objectives, and 3) provide updated scientific, cultural, and technological data and knowledge needed to adapt management decisions to changing conditions and circumstances. Such information would be important to adapt management if protective measures, including but not limited to land allocations, stipulations, and best management practices, are not meeting their objectives."[71]

Second, **[15-084]** the lack of infrastructure in the GMT1 area provides the opportunity for a long-term study to gauge the impacts of oil and gas infrastructure and activities on birds. We recommend that BLM require CPAI to commit to a series of long-term, statistically accurate surveys that study the effects of oil and gas infrastructure and activities on several key species of birds as "mitigation" or part of a monitoring program.

Third, while the DSEIS provides a number of measures designed to limit an increase in the population of predators in the area, it does not appear to address roadkill, which may provide an important supplementary food source for predators. As a result, **[15-085]** we recommend that BLM require CPAI to establish a roadkill reporting/monitoring system to help determine whether additional steps on roadkill should ultimately be taken.

Finally, BMP F-1 provides a variety of standards for use of aircraft to avoid impacts to birds as well as other wildlife and subsistence users. More detailed reports on those flights, from their timing to the number of deviations from the standards, are important to assessing the impacts of air travel on wildlife and improving mitigation requirements. **[15-086]** We recommend that BLM require CPAI to provide BLM with detailed flight records that indicate the timing and purpose of the flights as well as highlighting flights that deviate from BMP standards.

8. Hydrology and Fish

The DSEIS states that all of the action alternatives have the potential for long-term impacts to local water resources resulting from the placement of new infrastructure and changes in the drainage pattern.[72] BLM states that no long-term impacts are associated with water withdrawals,

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[71] 2013 NPRA Integrated Activity Plan Record of Decision, p. 1.

[72] 2014 Alpine DSEIS, vol. 1, p. 199.

based on the 2004 FEIS.[73] But **[15-087]** the DSEIS lacks adequate scientific information needed to fully assess impacts on hydrology and consequently on aquatic species, nor does it take into account rapid climate change which was not as evident in the 2004 FEIS. We provide numerous examples and creditable scientific information that BLM should consider to assess the impacts on aquatic systems, plants and species. Further, we provide general recommendations on how BLM could minimize unintended impacts on aquatic systems by implementing conservative regulations until more information is collected.

[15-088] The additional data needed to adequately assess impacts on hydrology and fish should be provided in the form of GIS files that can be made available to the public. **[15-089]** BLM should ensure its federally-reserved water rights are upheld by establishing management and data systems for ensuring water quality and quantity analyses, compiling baseline data and monitoring information, and reviewing data deficiencies.

More specific recommendations are contained in Appendix A, Specific Comments on Hydrology..

8.1 Accuracy of fish presence surveys

[15-090] Much of the baseline hydrologic data considered in the DSEIS, including lake profiles, estimates of total water volume, and inventories of fish species present or not present are from surveys that were completed decades ago. Since then, the area has been affected profoundly by a rapidly changing environment, including sometimes altered patterns of precipitation, permafrost, and other features that affect local hydrology. BLM should consider more recent surveys to ensure that appropriate decisions regarding water withdraw and water use are made.

[15-091] Recent research has shown that fish detection probability is influenced by species, gear type and site specific variables (i.e. lake depth, day of sample, lake connection), suggesting that previous fish survey methods may have been inadequate to detect certain species.[74] While certain species such as least cisco and nine spine stickleback have high detection probability, other species that are considered sensitive to water withdrawal have low detection probabilities (e.g. Arctic grayling, slimy sculpin). Failing to account for false absences (i.e. not detecting a species when one is present) will lead to biased conclusions about fish species' presence in lakes.

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[73] 2014 Alpine DSEIS, vol. 1, p. 351: "The BLM (2004) analyzed the potential cumulative impacts of the project to water resources and water quality (BLM 2004, §§ 4G.5.6 - 4G.5.7). It predicted that no cumulative impact to North Slope water supplies from withdrawal of water for construction and operation would occur because the annual yield (runoff and refill of lakes) is many times greater than the amount withdrawn. Further, water use peaks during construction, which is a temporary, not-permanent activity and is generally not consumptive, so a continuous minimal increase in water use was not expected."

[74] Haynes, T.B., Rosenberger, A.E., Lindberg, M.S., Whitman, M. & Schmutz, J.A. 2013. Method-and species-specific detection probabilities of fish occupancy in Arctic Lakes: implications for design and management. Can J. Fish Aquat. Sci. **70**: 1055-1062.

Current regulations permit water withdrawal based upon the fish species present and therefore the methods used to survey lakes will influence water extraction permitting. This is important because if sensitive species are not detected, up to 30% of under-ice volume is available for extraction. If no species are detected, 20% of the total lake volume is available for withdrawal though more could be legally extracted. In late winter, after more than 7 feet of ice accumulation, the available liquid water could potentially be less than 20% of the total summer volume.

[15-092] We ask BLM to assess the accuracy of fish surveys used to understand the potential impacts of ice roads and development on overwintering fish habitat. In order to protect potentially sensitive species from impacts, we recommend that new fishery surveys be conducted using recommended sampling methods outlined in Haynes, et al. (2012) on lakes permitted within the proposed development area. If differences are found between previous and new sampling methods, the overall environmental impact on fish should be adjusted. **[15-093]** Alternatively, if it is not feasible for new surveys to be conducted, we recommend water withdrawal precautionary restrictions of 10% under-ice volume be followed in order to ensure that volume-weighted concentrations, oxygen concentrations profiles and overwintering habitat are not reduced[75] until more information is collected to assess fish species presence.

8.2 Timing of fish surveys

Fish use a variety of aquatic habitat within the region for feeding, spawning and overwintering. Lakes deeper than 1.6 m with seasonal connections to streams provide overwintering habitat for numerous fish species, but these locations are generally limited within the region. While there have been studies conducted that document summer fish presence in lakes,[76] there has been relatively little research that documents winter habitat use patterns.[77] The extraction of water for building ice roads potentially uses millions of gallons per lake which could decrease dissolved oxygen (DO) concentrations and increase lake temperatures and consequently impact sensitive fish species by increasing daily metabolic costs, reducing growth, and increasing the chance of weight loss or starvation.[78] Therefore, it is essential to conduct winter fish presence surveys in lakes prior to permitting and water extraction.

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[75] Cott, P.A., Sibley, P.K., Gordon, A.M., Bodaly, R.A., Mills, K.H., Somers, W.M., & Fillatre, G.A.. 2008. Effects of water withdrawal from ice-covered lakes on oxygen, temperature and fish. Journal of the American Water Resources Association **44**: 328–342.

[76] Moulton, L.L., Morris, W.A., & Bacon, J. 2007. Surveys of fish habitat in the Teshekpuk Lakes region, 2003-2005. Final Report December 2007. Available at: http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/tesh_fish_2003_2005.pdf.

[77] Morris, W.A. & Winters, J.F. 2008. A survey of stream crossing structures in the north slope oilfields. Technical Report No. 08-01. Available at: http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/08_01.pdf/

[78] Evans, D.O. 2007. Effect of hypoxia on scope-for-activity and power capacity of lake trout (Salvelinus namaycush). Can J. Fish Aquat. Sci. **64**: 345-361; Shuter, B.J., Finstad, A.G., Helland, I.P., Zweimuller, I. & Holker, F. 2012. The role of winter phenology in shaping the ecology of freshwater fish and their sensitivities to climate change. Aquatic Sciences. **74**:637-657.

[15-094] Since fish potentially migrate to overwintering locations in the fall right before freeze up, summer fish surveys used to assess overall impacts may not be representative of species present and of overwintering habitat used, and could under estimate development impacts on fish. If BLM will only be relying on summer fish distribution studies, BLM should provide evidence that these studies are representative and provide adequate information to assess the potential impacts of development on overwintering fish in locations where water extraction is planned. We recommend that fish surveys be conducted during the winter using newly available video and acoustic camera techniques[79] or environmental DNA methodology.[80] **[15-095]** If winter surveys are not possible we recommend – in order to protect sensitive overwintering fish species – that all habitat deeper than approximately 1.6 m be considered overwintering habitat with sensitive fish until winter fish surveys are conducted. Additionally, due to the reasons mentioned above, we also recommend that conservative water withdrawal restrictions of 10% under ice volume be followed until adequate winter fish surveys are complete.

8.3 Road development design and associated impacts

The proposed road development is planned within the Fish Creek setback area, which is essential fish habitat, and sensitive overwintering fish habitat. Roads, bridges and culverts have been shown to alter surface hydrology through channelization and redistributing of flow to stream crossings[81] which can destroy or create wetlands, reduce fish movement[82] and prevent access to seasonally important habitat.[83] Vehicle traffic has the potential to introduce heavy metals, ozone,

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[79] Brown, R.S., Duguay, C.R., Mueller, R.P., Moulton, L.L., Doucette, P.R. & Tagestad, J.D. 2010. Use of synthetic aperture radar (SAR) to identify and characterize overwintering area of fish in ice-covered arctic rivers: a demonstration with Broad Whitefish and their habitats in the Sagavanirktok River, Alaska. Transactions of the American Fisheries Society. 139:6,1711-1722; Mueller, R.P., Brown, R.S., Haakon, H., Moulton, L. 2006. Video and acoustic camera techniques for studying fish under ice: a review and comparison. Reviews in Fish Biology and Fisheries. **16:2**, 213-226

[80] Jerde, L.C., Mahon, A.R., Chadderton, L. & Lodge, D.M. 2011. "Sight-unseen" detection of rare aquatic species using environmental DNA. Conservation letters. **4**:150-157; Minamoto, T.,Yamanaka, H., Takahara, T., Honjo, M.N. & Kawabata, Z. 2012. Surveillance of fish species composition using environmental DNA. Limnology.**13**:193-197.

[81] Wemplc, B. C., Jones, J.A. & Grant, G.E. 1996. Channel network extension by logging roads in two basins, western Cascades, Oregon. Water Resources Bulletin. **32**:1195-1207.

[82] Furniss, M.J., Roeloffs, T.D., & Yee, C. S. 1991. Road construction and maintenance. Pages 297-323 in W. R. Meehan, editor. Influences of forest and rangeland management on salmonid fishes and their habitats. Special publication **19**. American Fisheries Society, Bethesda, Maryland; Warren, M. L., Pardew, M. G., 1998. Road crossings as barriers to small-stream fish movement. Transactions of the American Fisheries Society. **127**:637-644.

[83] Brown, T. G., and G. F. Hartman. 1988. Contribution of seasonally flooded lands and minor tributaries to coho (Oncorhynchus kisutch) salmon smolt production in Carnation Creek, a small coastal stream in British Columbia. Transactions of the American Fisheries Society. **117**:546-551.

and nutrients to roadside aquatic environments[84]where they can be transported throughout aquatic systems[85] to harm aquatic biota.

[15-096] Historically, restrictions have been placed on essential fish habitat areas in order to protect sensitive aquatic resources. But roads proposed in the DSEIS would cross sensitive anadromous streams within setback areas, and there is not a clear explanation as to why BLM has allowed exceptions to best management practices. Please provide scientific evidence and administrative justification for allowing development to occur within these areas.

[15-097] In addition, please provide evidence demonstrating adequate assessment of the long-term and large scale impacts of multiple phases of road development on the biological integrity of aquatic fish habitat in the proposed area. In order to more accurately assess the future impacts of a road, we recommend that the BLM follow a similar conceptual framework proposed by Angermeier, et al., 2004[86] where impacts of multiple stages of development on habitat structure, water chemistry, flow regime, energy sources, and biotic interactions are considered.

8.4 Fish passage

[15-098] The proposed road design to GMT1 plans for road culverts to be placed beneath the gravel road to "maintain natural surface drainage patterns" but does not state how the design, number and size of culverts were determined. Nor does the DSEIS show CPAI's proposed culvert locations for Alternative A. It appears that culvert locations will be selected at a later time.[87] This information should be provided for public review as part of the NEPA process. The public cannot meaningfully participate and assess mitigation measures without knowing information about the use of those measures. **[15-099]** It is also unclear how can BLM consider the cumulative impacts from Alternative A to hydrology and the effectiveness of culverts as a mitigation measure if BLM does not know the location of the culverts and the potential impacts to fish passage.

Culvert placement is an important consideration because poorly designed culverts have the potential to block fish passage at critical periods, which could add additional stress on populations during time periods when resources are limited.[88] Evidence for poor fish passage

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[84] Araratyan, L.A., & Zakharyan, S.A. 1988. On contamination of snow along main highways. Biologicheskii Zhurnal Armenii. **41**:514-519; Leharne, S., D., Charlesworth, & Chowdhry B. 1992. A survey of metal levels in street dusts in an inner London neighborhood. Environment International. **18:** 263-270.

[85] Gjessing, E., Lygren, E., Berglind, L., Gulbrandsen, T. & Skanne, R. 1984. Effect of highway runoff on lake water quality. Science of the total environment. **33:** 247-257

[86] Angermeier, P.L., Wheeler, A.P., & Rosenberger, A.E. 2004. A conceptual framework for assessing impacts of roads on aquatic biota. Fisheries. **29**:12, 19-29

[87] See, e.g., 2014 Alpine DSEIS, vol. 1, p. 27.

[88] Furniss, M.J., Roeloffs, T.D., & Yee, C. S. 1991. Road construction and maintenance. Pages 297-323 in W. R. Meehan, editor. Influences of forest and rangeland management on salmonid fishes and their habitats. Special

design can be seen in other locations on the North Slope.[89] Fish passage systems that will remain effective through time must be developed. **[15-100]** Typically fish passage design considers minimum flows, 100-year flood events, potential debris and age and type of species present at the location. The typical design shown in Appendix A of the DSEIS uses 60-inch diameter culverts at regularly spaced intervals, but it is unclear how this size culvert was determined to be suitable for the location or if additional bridges would be required across the proposed road to GMT1.

[15-101] We are requesting that BLM provide scientific evidence and design examples showing that the proposed design is suitable for the planned road and fish passage and does not require larger and more frequent culverts or additional bridges. We recommend that BLM consult additional experts and sources[90] to design an adequate fish passage system for the duration of the proposed road development.

8.5 Bridge design

[15-102] We recognize that significant time was spent designing the Tinmiaqsigik (Ublutuoch) bridge to minimize impacts on the instream habitat. However, it is unclear how details of the final bridge design and location were determined. We are requesting that BLM clarify and provide evidence on how the bridge design (bridge materials, bridge height and bridge pier span) and location for the proposed crossings were selected to have the least impact on aquatic species. We recommend that BLM explore other bridge locations outside of known overwintering fish habitat in order to minimize short and long term impacts on important fish habitat such as seasonal scour, ice jamming, sedimentation and alterations of the natural flow regime.

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publication **19**. American Fisheries Society, Bethesda, Maryland; Warren, M. L., Pardew, M. G., 1998. Road crossings as barriers to small-stream fish movement. Transactions of the American Fisheries Society. **127**:637-644.

[89] Morris, W.A. & Winters, J.F. 2008. A survey of stream crossing structures in the north slope oilfields. Technical Report No. 08-01. Available at: http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/08_01.pdf

[90] E.g., Behlke, C.H. & Kane, D.L. 1991. Fundamentals of culvert design for passage of weak- swimming fish. Final report No. FHWA-AK-RD-90-10. Available at: http://www.arlis.org/docs/vol1/F/FishPassage/Behlke-1991b.pdf ; Bates, K., Barnard, B., Heiner, B., Klavis, J.P. & Powers,P.D. 2003. Design of road culverts for fish passage. Washington Department of Fish and Wildlife, Olympia. Available at: http://wdfw.wa.gov/publications/00049/wdfw00049.pdf; Price, D.M., Quinn, T. & Barnard, R.J. 2010. Fish passage effectiveness of recently constructed road crossing culverts in the Puget sound region of Washington State. North American Journal of Fisheries Management. **30**: 1110-1125; Barnard, R. J., Johnson, J., Brooks, P., Bates, K.M., Heiner, B., Klavas, J.P., Ponder, D.C., Smith, P.D. & Powers, P.D. 2013. Water Crossings Design Guidelines, Washington Department of Fish and Wildlife, Olympia, Washington. Available at: http://wdfw.wa.gov/publications/01501/

8.6 Water extraction and associated impacts

We appreciate BLM's proposed new stipulation consistent with the recommendation in TWS's supplemental scoping comments aimed at reducing the impacts to fish associated with the physical process of water withdrawals.[91]

The proposed winter water extraction plan shows that a large amount of water (liquid and bedfast ice) will be extracted from a multitude of permitted lakes each year. While the amount of water that can be extracted is regulated by both the Alaska Department of Natural Resources (ADNR) and the Alaska Department of Fish and Game (ADFG), each agency's permit is associated with a different time period. ADNR has historically used the calendar year (January 1st to December 31st), while ADFG issues permits based on a water year (October 1st – September 30th). The annual timeframe allows for water to be extracted in large daily or monthly rates and has the potential to cause short term and long term effects to aquatic ecosystems.[92] Dissolved oxygen (DO) concentrations in Arctic lakes are influenced by numerous physical and biological attributes[93] and understanding the landscape controls on DO will be crucial to identifying lakes with naturally low DO concentrations to help minimize impacts on aquatic species. If total permitted water is extracted rapidly from lakes with naturally low DO concentrations during months where under-ice DO concentrations are lowest (February-April) it could cause significant sub-lethal and lethal impacts.[94]

The current regulations manage water extraction based upon lake volume, average ice thickness and summer fish presence which has the potential to cause unintended negative consequences for

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[91] *See* 2014 Alpine DSEIS, vol. 1, p. 59:

Requirement/Standard: Water intake pipes used to remove water from fish-bearing water bodies must be surrounded by a screened enclosure to prevent fish entrainment and impingement. Screen mesh size shall not exceed 0.04 inches unless another size has been approved by the authorizing officer. The maximum water velocity at the surface of the screen enclosure may be no greater than 0.1 foot per second. The authorizing officer may, based on a written determination, impose additional restrictions on industrial water withdrawals from water bodies when further reduction of the water level would result in immitigable adverse impacts to species depending on or inhabiting in the water bodies.

[92] Cott, P.A., Sibley, P.K.,Somers, M.W., Lilly, M.R., & Gordon, A.M. A review of water level fluctuations on aquatic biota with an emphasis on fishes in ice-covered lakes. Journal of the American Water Resources Association. **44:** 343-358; Cott, P.A., Sibley, P.K., Gordon, A.M., Bodaly, R.A., Mills, K.H., Somers, W.M., & Fillatre, G.A.. 2008. Effects of water withdrawal from ice-covered lakes on oxygen, temperature and fish. Journal of the American Water Resources Association **44**: 328–342.

[93] Mathias, J.A. & Barica, J. 1979. Factors controlling oxygen depletion in ice-covered lakes. Can J. Fish Aquat. Sci. **37**: 185-194; Babin, J., Prepas, E.E.1985. Modelling winter oxygen depletion rates in ice-covered temperate zone lakes in Canada. Can J. Fish Aquat. Sci. **42**:239-249; Baird, D.J., Gates, T.E., Davies, R.W. 1987. Oxygen conditions in two prairie pothole lakes during winter ice cover. Can J. Fish Aquat. Sci. **44**:1092-1095.

[94] Evans, D.O. 2007. Effect of hypoxia on scope-for-activity and power capacity of lake trout (Salvelinus namaycush). Can J. Fish Aquat. Sci. **64**: 345-361; Cott, P.A., Sibley, P.K.,Somers, M.W., Lilly, M.R., & Gordon, A.M. A review of water level fluctuations on aquatic biota with an emphasis on fishes in ice-covered lakes. Journal of the American Water Resources Association. **44:** 343-358.

certain species. **[15-103]** More research needs to be conducted on aquatic winter processes, fish overwintering movement, feeding, and bioenergetics in order to understand the potential sub-lethal effects of water withdrawals on fish populations. Additionally, current permits do not take into account natural DO stratifications, under ice depletion rates or natural fluctuations in lake volume[95] which, if completely utilized, have the potential to impact aquatic biota in some lakes.[96]

[15-104] In order to assess the cumulative impacts of water extraction to support development, we request that BLM identify lakes that will be used to build ice roads, bridges and drilling pads. In addition, we request that BLM document the needed water volumes per month for each water source, current estimate of winter lake volume, and current information on winter DO profiles, concentrations and depletion rates. **[15-105]** If this is not possible, we recommend that BLM consider the impacts of taking the maximum permitted water withdrawal volumes from lakes during the winter months when water levels and DO concentrations are lowest in order to calculate the worst-case scenario impacts. **[15-106]** We also recommend that BLM consider requiring permit users to monitor and report monthly physical and water quality data in order to track potential changes to aquatic systems and recharge rates.

9. Subsistence Impacts

9.1 Overall impacts

All alternatives other than no action are expected to have high intensity, long-term impacts on subsistence,[97] and to significantly restrict subsistence use for the community of Nuiqsut.[98] These impacts could extend well beyond the life of the project, since subsistence patterns will be disrupted for many years and there may be permanent changes to the landscape.

Hunting and foraging activities can be impacted by oil and gas activities, including road construction and traffic, aircraft traffic, air quality, and noise. Subsistence activities require safe access and accurate information about the places where harvests and hunts will be successful. If

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[95] Jones, B., Arp, C., and Hinkel, K. 2009. Arctic lake physical processes and regimes with implications for winter water availability and management in the National Petroleum Reserve Alaska. Environmental Management. **43**: 1071–84.

[96] Cott, P.A., Sibley, P.K., Gordon, A.M., Bodaly, R.A., Mills, K.H., Somers, W.M., & Fillatre, G.A.. 2008. Effects of water withdrawal from ice-covered lakes on oxygen, temperature and fish. Journal of the American Water Resources Association **44**: 328–342.

[97] 2014 Alpine DSEIS, vol. 1, p. 173; p. 306 ("the overall degree of impact to subsistence is expected to be major because it is a high intensity impact, will have effects of long-term duration, extend to regional extents, and is an important resource").

[98] See 2014 Alpine DSEIS, vol. 1, p. 389 ("The ANILCA § 810 analysis for the proposed project concluded that, under all action alternatives, the effects fall above the level of significantly restricting subsistence use for the community of Nuiqsut."); p. 144 ("100 percent of Nuiqsut active harvesters interviewed for the 1995-2006 time period reported overland use areas crossed by the project study area.")

these places change, either over time or as migration patterns adjust to new infrastructure, or very suddenly in the event of a helicopter or truck scaring animals during a hunt, then subsistence could be compromised.[99]

The DSEIS states that GMT1 alone will have major impacts on subsistence throughout the duration of the proposed project under Alternative A,[100] and the cumulative impacts on subsistence will be significantly greater, especially with a road to Umiat.[101] How can BLM minimize these impacts so that North Slope communities can continue to use the landscape and benefit economically from oil development where it is permitted to occur?

[15-107] The DSEIS excludes an analysis of subsistence use areas accessed by boat.[102] Fish Creek and other creeks are accessed by boat, and infrastructure could impede access. These areas should not be excluded from the DSEIS.

9.2 Impacts of roads vs. aircraft

[15-108] The EIS draws several conclusions about Alternative D without fully analyzing the impacts of roads and aircraft on animal migration and subsistence use, and without considering the possibility of seasonal drilling. For instance, the DSEIS states that, "While there may be less of a physical barrier to caribou movement due to less road traffic and fewer roads in general, it is unclear whether these impacts would be offset by increased air traffic and the continued presence of the pipeline."[103] These impacts should be studied before BLM concludes that, "In terms of overall subsistence impacts, Alternatives A and B would likely have the fewest impacts to subsistence because they require less air traffic close to the community and because development related ground traffic would be limited to the road between CD5 and GMT1."[104] **[15-109]** It is not clear that "Alternative D would likely have the greatest impact to subsistence uses and activities of all the alternatives, as it would result in increased air traffic in hunting areas west of the community

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[99] As the Conservation Lands Foundation noted in its 2013 comments on the 2012 Amended Draft EIS (p. 3-86), subsistence hunters from Nuiqsut no longer hunt in traditional areas where oil and gas development infrastructure now exists, even though subsistence resources continue to be available. In order to avoid oil and gas development, Nuiqsut hunters must travel farther and at an increased cost in order to harvest caribou. Studies reveal that in 1999 and 2000, Nuiqsut residents harvested 0% of their caribou within industrialized areas, 22% of their caribou within 5 miles of industrialized areas, and 78% 5 miles or more distant from developed areas.

[100] *See, e.g.*, 2014 Alpine DSEIS, vol. 1, Table 4.6-4.

[101] 2014 Alpine DSEIS, vol. 1, p. 388.

[102] 2014 Alpine DSEIS, vol. 1, p. 143: "[D]irect impacts (occurring at the same time and place) on subsistence use areas will be limited to inland areas that are not accessed during boating activities. Therefore, in order to focus on current subsistence uses within areas of new infrastructure associated with the proposed project and to most accurately represent the directly affected use areas by excluding boat based subsistence activities, the analysis of uses within the project study area for Months of Use and Method of Transportation excludes subsistence use areas that are accessed by boat."

[103] 2014 Alpine DSEIS, vol. 1, p. 304.

[104] 2014 Alpine DSEIS, vol. 1, p. 305.

and would create a new source of air traffic that did not exist before."[105] This possibility needs to be analyzed using the data recently made available by CPAI to BLM. BLM also needs to consider how methods to reduce flights would change the analysis, and view the flights in the context of the entire GMT unit and the Bear Tooth unit being developed.

[15-110] BLM should calculate the number of flights by season, and correlate flights with life stages (i.e., migration, molting, and calving) and subsistence activity periods to better understand the impacts of flights.

[15-111] BLM also should consider impacts to subsistence under a seasonal drilling alternative. While there will still be impacts to activities associated with some species, the impacts should be significantly less than year-round drilling activities would have. Table 3.4-6 of the DSEIS summarizes the annual cycle of subsistence activities, including describing hunting for all but furbearers as a low-to-medium activity during February – April except for some more limited hunting and ice fishing for one species. Harvesting activities do not take place during winter snow cover.

9.3 Recommended mitigation measures for aircraft

At the December 2013 Western Arctic Caribou Herd Working Group Meeting (as well as during many meetings of the NPRA Subsistence Advisory Panel), participants raised concerns regarding low-flying aircraft and the lack of enforcement of altitude restrictions. **[15-112]** One of the suggestions resulting from the December meeting concerned the development of Federal Aviation Administration (FAA) regulations with specific altitude restrictions around subsistence activities. We suggest that BLM work with FAA and tribes to develop such regulations. There is some precedent for developing altitude restrictions above FAA's general standards.[106] A FWS regulation prohibits the operation of aircraft at altitudes resulting in harassment of wildlife in national wildlife refuges.[107] There are specific altitude restrictions around places like the Grand Canyon[108] and Denali National Park. FAA also has worked with the Air Force to reduce activities during calving; and developed altitude restrictions around Cook Inlet where migratory

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[105] 2014 Alpine DSEIS, vol. 1, p. 386.

[106] FAA has general standards at 14 C.F.R. §91.119 for minimum safe altitudes: 1,000 feet over a town; and 500 feet above the surface, except over open water or sparsely populated areas, where the 500-foot limit applies only where there is a person, vessel, vehicle, or structure.

[107] 50 CFR § 27.34.

[108] *See, e.g.*, Special Federal Aviation Regulation No. 50-2—Special Flight Rules in the Vicinity of the Grand Canyon National Park, AZ

birds are.[109] FAA also has guidelines in place encouraging pilots to fly at least 2000 feet above ground level in areas where wildlife is noise-sensitive.[110]

Best Management Practice F-1 from the 2013 Record of Decision contains several aircraft requirements for lessees relevant to subsistence:

- Altitude must be 1,000 feet over caribou winter ranges from December 1 through May 1, and 2,000 feet over the Teshekpuk Lake Caribou Habitat Area and Utukok River Uplands Special Area from May 20 through August 20.
- Aircraft use (including fixed wing and helicopter) by oil and gas lessees in the Goose Molting Area should be minimized from May 20 through August 20.
- An aircraft use plan must be submitted listing the number of flights, type of aircraft, and flight altitudes and routes, and a plan to monitor flights (but there is no requirement to share this with villages or tribes).
- The number of takeoffs and landings to support oil and gas operations with necessary materials and supplies should be limited to the maximum extent possible.
- Use of aircraft, especially rotary wing aircraft, near known subsistence camps and cabins or during sensitive subsistence hunting periods (spring goose hunting and fall caribou and moose hunting) should be kept to a minimum.

BLM could implement the following additional measures to strengthen BMP F-1:

- **[15-113]** By April of each year, an operator shall submit and aircraft use plan listing the number of flights, type of aircraft, and flight altitudes and routes, and a plan to monitor flights to tribes, municipalities, and corporations within 30 miles of the expected flight paths. The aircraft use plan shall include a calendar of activity as well as a map showing where activity is expected to take place on the relevant dates. The plan shall include photographs of each plane used and identify each plane by number and color.
- **[15-114]** The number of takeoffs and landings to support oil and gas operations with necessary materials and supplies shall be limited to the maximum extent possible. Trips shall be combined when possible, and studies shall be conducted by boat and foot when possible.
- **[15-115]** Use of aircraft, especially rotary wing aircraft, near known subsistence camps, cabins, and allotments, or during sensitive subsistence hunting periods (spring goose hunting and fall caribou and moose hunting), shall be kept to a minimum. To the extent practical,

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[109] Dan Billman, FAA, FAAST Program Manager, Anchorage FSDO, Anchorage Service Area. Presentation at Western Arctic Caribou Herd Working Group Meeting, Anchorage, AK (December 5, 2013).

[110] *See* 91-36D - Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas (September 17, 2004) https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23156 ("Pilots operating noise producing aircraft … over noise-sensitive areas should make every effort to fly not less than 2,000 feet above ground level … The intent of the 2,000 feet AGL recommendation is to reduce potential inference with wildlife and complaints of noise disturbances caused by low flying aircraft over noise-sensitive areas.")

research shall be planned in stages or staggered in order to reduce contact with subsistence users and avoid bird, caribou, and fish migration.

- **[15-116]** Unless necessary to protect human health and safety, traffic (including that of vehicles, vessels, and aircraft) shall not take place at altitudes, distances, or volumes that disturb subsistence activities at times and in places when subsistence activities are taking place. Aircraft used in support of permit activities must maintain an altitude sufficient to avoid harassing concentrations of 25 or more caribou to avoid interfering with or disturbing them.
- **[15-117]** Operations shall not restrict the boating routes, mooring spots or safe harbor of any subsistence hunters or vessels.
- **[15-118]** A telephone system shall be established so that, on a weekly or daily basis (depending on season and village preference), an operator and/or its contractors can communicate with a village representative and BLM the schedule and routes of upcoming flights and any deviations from the aircraft use plan. In the event that the lead of a caribou herd is migrating within the vicinity of a flight path, the village representative may request a deviation or temporary suspension. The operator should honor such a request to the maximum extent practicable.

[15-119] To further mitigate for subsistence impacts, BLM should require the restoration and recovery of areas previously important to subsistence, including Oliktok to the east of the Nigliq channel.

10. Health, Social, Environmental Justice, and Other Human Impacts

BLM must consider that the Iñupiat people and other disadvantaged populations of the North Slope will bear the brunt of the environmental, health, and social impacts from development of GMT1 and all potential future developments such as GMT2. Specifically, Executive Order 13212 directs BLM to permit energy-related projects "while maintaining safety, public health, and environmental protections."[111] Additionally, Executive Order 12898 requires BLM to analyze disproportionately high and adverse human health and environmental effects of programs, policies, and activities on minority and disadvantaged populations.[112] Pursuant to Executive Order 12898, BLM is required to consider environmental justice issues within its NEPA analysis.

Development of GMT1 will increase water and air pollution, adversely affect subsistence resources, disturb cultural patterns, and harm physical health and well-being. To fully consider these issues, it is imperative that the DSEIS include an environmental justice analysis that meaningfully impacts the alternatives analysis and final decision-making process.

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[111] Exec. Order No. 13,212 (May 2011).

[112] Exec. Order No. 12,898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7,629, 7,632-33 (Feb. 11, 1994).

As BLM notes, all action alternatives would have high intensity, long-term impacts on environmental justice,[113] with many of these impacts relating to the disturbance of subsistence.[114] **[15-120]** To fully evaluate environmental justice and health impacts, and allow for decision-making informed by a realistic assessment of impacts, BLM must better evaluate the cumulative impacts on subsistence associated with each of the alternatives.

Overall, BLM must do more in the FSEIS to ensure compliance with environmental justice and NEPA alternative analysis requirements. **[15-121]** BLM must analyze the environmental justice impacts of GMT1 development on all North Slope communities, not just on the Nuiqsut community. Additionally, the development of GMT1 will set the course for future developments that will be located closer to all North Slope communities, thus posing additional environmental justice and public health impacts that BLM must consider in its NEPA analysis.

10.1 Requirements for BLM to analyze environmental justice, public health, and social impacts

Executive Order 12898, entitled "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations," states in relevant part that "each Federal agency shall make achieving Environmental Justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."[115]

In addition to this overarching requirement, EO 12898 contains specific requirements particularly applicable to BLM's GMT1 NEPA analysis. For instance, EO 12898 calls for an analysis of the effects of federal actions on minority populations with regard to subsistence and that such analysis by an agency will "reflect[] the latest scientific information available concerning methods for evaluating the human health risks associated with the consumption of pollutant-bearing fish or wildlife."[116] Moreover, pursuant to Executive Order 13175 entitled "Consultation and Coordination with Indian Tribal Governments," BLM is required to have an accountable process to assure meaningful and timely input by tribal officials in the development of regulatory policies on matters that have tribal implications.[117]

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[113] 2014 Alpine DSEIS, vol. 1, p. 173.

[114] See 2014 Alpine DSEIS, vol. 1, p. 308: "Under all action alternatives, residents of the minority community of Nuiqsut could experience disproportionally high and adverse impacts as the result of disrupted access to traditional subsistence use areas."

[115] Section 1-101 of Exec. Order 12898, 59 Fed. Reg. 7629, (Feb. 16, 1994).

[116] Section 4-4 of Exec. Order 12898, 59 Fed. Reg. 7629, (Feb. 16, 1994).

[117] Exec. Order 13175, 65 Fed. Reg. 67249 (Nov. 9, 2000).

BLM also must perform its environmental justice analysis in accordance with CEQ Environmental Justice Guidance,[118] DOI's Environmental Justice Strategic Plan 2012-2017,[119] and BLM's Land Use Planning Handbook Appendix D.[120] Indeed, in line with the BLM requirements for environmental justice, the purpose of the 2012 IAP was to provide greater certainty to industry developing in the NPRA while simultaneously "better protecting the environment, public use of the land, and public health."[121] And finally, in practice DOI agencies often utilize Health Impact Assessments (HIAs) to better address health impacts in NEPA documents, focusing specifically on impacts to traditional subsistence diets, social impacts, health risks from pollution exposure, and the use of oil and gas revenues to support and/or impact local services and culture.[122]

10.2 Best available information and latest scientific information for environmental justice, public health, and social impacts

The DSEIS tiers and incorporates by reference its description and analysis of sociocultural systems, community health and welfare, subsistence, environmental justice, and cultural resources to the detailed information provided in the 2004 FEIS and 2012 IAP.[123] The purpose of the DSEIS is to "re-analyze the proposed project" in accordance with NEPA requirements and in light of new information and the most up to date and best available information.[124]

[15-122] Despite the tiering of its analysis and the inclusion of some updated information, the DSEIS falls short of what is required to fully analyze environmental justice, public health, and social impacts under NEPA and environmental justice requirements. For example, the DSEIS does not contain best available information from HIAs previously conducted on the North Slope such as Wernham (2007) and fails to include the most up to date studies on industrial development on the North Slope such as Raynolds, et al. (2014) and the National Research Council (2003).[125]

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[118] Council on Environmental Quality, *Environmental Justice Guidance under the National Environmental Policy Act* (Dec. 1997), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/planning_images/planning_image_folder.Par.0787.File.dat/CEQ%20EJ%20Guidance.pdf

[119] U.S. DOI, *Environmental Justice Strategic Plan 2012-2017* (March 2012), *available at* http://www.doi.gov/pmb/oepc/environmental-justice.cfm

[120] http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/planning_images/planning_image_folder.Par.74871.File.dat/EJ%20section%20-%20h1601-1.pdf

[121] 2012 IAP at I (emphasis added).

[122] *See, e.g.*, HIA conducted for Chukchi Sea Planning Area – Oil and Gas Lease Sale 193, http://www.healthimpactproject.org/resources/chukchi-sea-planning-area-oil-and-gas-lease-sale-193-and-seismic-surveying-activities-in-the-chukchi-sea

[123] 2014 Alpine DSEIS, vol. 1 at 119

[124] 2014 Alpine DSEIS, vol. 1 at 1.

[125] Wernham, A. 2007. Inupiat Health and Proposed Alaskan Oil Development: Results of the First Integrated Health Impact Assessment/Environmental Impact Statement for the Proposed Development on Alaska's North

Other sources of the most recent best available information BLM should consider include studies and research conducted in Canadian Inuit communities.[126]

Studies and HIAs such as these would provide BLM with the best available information on the impacts of industrial expansion on health and culture (such as community tensions; rising rates of substance abuse, domestic violence, and suicide; increased injury rates; increases in diabetes rates; increased asthma frequency; and increased exposure to carcinogens and endocrine disruptors), and cumulative and long-term impacts from oil and gas development on the North Slope communities from ongoing threats such as climate change. BLM must utilize these sources and other best available information and science in order to provide for an environmental justice analysis with a more complete accounting of all potential impacts to communities.

10.3 BLM must do better to analyze environmental justice, public health, and social impacts in the FSEIS

Both routine activities and unexpected oil spills and accidents from the operation of GMT1 threaten to harm, disrupt, and destroy subsistence resources and lifestyles and negatively impact public health. Routine oil activities increase water and air pollution, adversely affect subsistence resources with disturbances, upset cultural and land use patterns, negatively impact human health and well-being, and disrupt sociocultural values. These impacts are multigenerational and will be felt throughout the life of GMT1 operations. In the event of a major oil spill or other incident, these impacts to the communities will be even greater. Additionally, communities along the North Slope are already facing increased problems associated with climate change, increasing the stressors already within these communities.

[15-123] While BLM recognizes that all proposed alternatives will have a high intensity, long-term, and major negative impact throughout the region,[127] this does not excuse an environmental justice analysis that falls short of presenting a true picture of the likely impacts of GMT1 on Native people and communities. BLM's analysis in Chapter 4 does not fully utilize the background information provided and acknowledged in Chapter 3 and elsewhere in the DSEIS, leading the DSEIS to draw arbitrary lines and skewing the final analysis of impacts. As described below, that analysis should be improved in a number of ways.

Slope, 4 EcoHealth 500-513, *available at* http://advance.captus.com/planning/hia2/pdf/Module2/Results%20of%20Alaska%20North%20Slope%20HIA.pdf; Martha Raynolds et al., op. cit.; National Research Council, op. cit.

[126] *See, e.g.,* A Report for the Canadian Women's Foundation, The Impact of Resource Extraction on Inuit Woman and Families in Qamani'tuaq, Nunavut Territory (Jan. 2014), *available at* http://pauktuutit.ca/wp-content/blogs.dir/1/assets/Final-mining-report-PDF-for-web.pdf.

[127] 2014 Alpine DSEIS, vol. 1 Table 4.1-2

[15-124] First, the DSEIS and its Appendices contain conflicting conclusions on the impacts to communities from development of GMT1. For example, while the subsistence analysis in the DSEIS suggests that Alternative D would have the greatest impact on subsistence,[128] the public health analysis four pages earlier states that, "Alternative D, which does not include the construction of a road, would have the least impact of any of the action alternatives by reducing potential impacts related to perception of food contamination, noise (from road traffic), and avoidance of infrastructure at subsistence sites."[129] These statements obviously are at odds.

As another example, **[15-125]** the conclusion of Appendix L states that, in compliance with EO 12898, "the subsistence analysis of all alternatives, located in Chapter 4 (Environmental Consequences) of the GMT1 SEIS, have been reviewed and found to comply with Environmental Justice." Nowhere does BLM explain what is meant by this statement. What does it mean to "comply with Environmental Justice"? If it is supposed to mean that the substantive concerns about impacts to Native communities are somehow alleviated, such a conclusion is not supported in the record. Indeed, Chapter 4 of the DSEIS notes that Alternatives A through D will have high intensity, long-term, and major negative impacts on environmental justice communities throughout the region.[130] If it means that BLM is following a sufficiently robust process to be confident that all environmental justice issues are fully vetted, our comments in this section belie that point. In short, the conclusion in Appendix L must be further explained.

Second, the environmental justice analysis and social and health impacts analysis is lacking consideration of information that is found elsewhere throughout the EIS and appendices. For example, the **[15-126]** subsistence impacts from the ANILCA § 810 analysis should be incorporated into the environmental justice impacts analysis. Likewise, the health and social baselines are discussed in background Chapter 3, but are not meaningfully used in the sections analyzing project impacts in Chapter 4; instead the DSEIS merely refers back to analysis in the 2004 FEIS without the inclusion of some of the updated information. The same disconnect is true with the environmental justice analysis in Chapter 4. **[15-127]** The environmental justice analysis merely incorporates by reference the 2004 FEIS and 2012 IAP; however, new community health and welfare information was published since that should be given extra consideration in the analysis. While some of this new information is included in the background Chapter 3 environmental justice subsection, it is not used by BLM to inform discussion of GMT1 impacts in Chapter 4. All of this combines to undercut the depth and integrity of the environmental justice analysis, and should be fixed for the FEIS.

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[128] 2014 Alpine DSEIS, vol. 1, p. 386 (finding that Alternative D would likely have the greatest impact to subsistence due to increased air traffic).

[129] 2014 Alpine DSEIS, vol. 1, p. 382-83.

[130] 2014 Alpine DSEIS, vol. 1 Table 4.1-2

Third, **[15-128]** with respect to the scope of the environmental justice analysis, the DSEIS environmental justice section only includes information about Nuiqsut, while elsewhere the DSEIS acknowledges negative environmental justice and public health impacts to all North Slope communities.[131] This poses two significant concerns with BLM's environmental justice analysis. First, it arbitrarily limits BLM's analysis to the impacts of GMT1 development on Nuiqsut only, while simultaneously acknowledging widespread environmental justice and subsistence impacts in other sections of the DSEIS. Second, the development of GMT1 will set the course for future developments that will be located closer to all North Slope communities; therefore posing additional environmental justice and public health impacts that BLM must consider in its NEPA analysis.

Fourth, **[15-129]** BLM must consider all public comments and hearing testimony concerning the potential health and social impacts to all North Slope communities resulting from the development of any GMT1 alternative and future cumulative development. At the Anchorage public hearing, BLM promised to include in the FEIS a list of ways to lessen and mitigate cumulative subsistence impacts to all six villages from all historic, future, and potential projects.[132] This list should have been included in the DSEIS so that the public could review and comment. This step is important to ensure that the list is inclusive and is informed from the scoping comments, public comments on the DSEIS, and public hearing testimony portraying the significant threat that GMT1 and future potential development poses to subsistence, cultural values and resources, and public health.

Fifth, **[15-130]** the social problems associated with rapid development merit greater consideration. In the cumulative effects section on Social Systems (4.6.4.3), the discussion should include the possibility of increased crime and traffic, higher housing and schooling costs, and related impacts in North Slope communities due to population increases associated with oil and gas development. These types of impacts currently are being experienced and studied in lower 48 communities with drilling booms, e.g., in Wyoming from coalbed methane drilling and in North Dakota from shale oil drilling.

Finally, BLM's final analysis and decision should clearly address environmental justice considerations. This means that BLM must clearly identify the likely costs that North Slope people and communities will be asked to bear for the benefit to the nation of developing GMT1.

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[131] For example, table 4.6-4 notes "minor" environmental justice impacts to Nuiqsut, Anaktuvuk Pass, Atqasuk, Barrow, and Wainwright through 2050 for Alternative A. Also, Table 4.1-2 shows the environmental justice impacts as "regional" for all alternatives. But the environmental justice sections only contain a discussion of Nuiqsut.

[132] Stacey Fritz, Anthropologist, BLM Anchorage Field Office, Statement at Anchorage Hearing (March 20, 2014).

11. Air Quality

GMT1 is a step toward an expanded footprint of oil and gas development west of CD5 in NPRA's Colville River Delta. Emissions from GMT1 will contribute to cumulative air pollution affecting an airshed associated with a plume of arctic haze,[133] industrially polluted air extending west from Prudhoe Bay including subsistence-use areas frequented by hunters from the village of Nuiqsut. The air quality monitoring required by BMP A-10 for all major oil and gas projects in NPRA will be essential. It must continue for the lifetime of each project, and cumulative effects to air quality must be assessed in future EISs.

[15-131] The DSEIS suggests that air quality impacts associated with Alternative D are much higher than those associated with the road alternatives.[134] This may be the case if GMT1 is considered in isolation from other activity at Alpine and within the Greater Mooses Tooth unit, but it is less reasonable when impacts are considered cumulatively. For example, the EIS states that for Alternative A, "Electric power from existing, off-site generation will be provided to the site after construction which will limit total project site emissions."[135] The source of this off-site generation is not clear. Presumably it comes from CD1, which will still result in emissions to the region. Furthermore, **[15-132]** the FSEIS should analyze the power needs that could be met by renewable energy, including solar (summer) and wind (year-round) for camp, emergency and other needs.

While the airstrip would require a larger site footprint for the Alternative D than for Alternatives A and B which do not have gravel airstrips but depend on road travel, the reality is that power generation and incineration of waste – both sources of air pollution – would occur whether on location or not. The estimates of air emissions at Alternative D in Section 4.2.3.2 of the DSEIS could be expected to be reduced if a CD3-type approach was taken that did not involve year-round operations, on-site power generation of significant facilities, or waste incineration.

[15-133] Air quality modeling does not appear to account for GMT2 and other developments; and this should be taken into account in the FSEIS.[136]

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[133] There are many reasonably foreseeable future projects that will contribute emissions to a common Nuiqsut-centered airshed (see, i.e. Figure 4-2, Appx-K, *Reasonably Foreseeable Development Source Locations*).

[134] See 2014 Alpine DSEIS, vol. 1, p. 173, Table 4.1-2. The air modeling report relied on for the EIS suggests that emissions from Alternative D related to extracting gravel from Clover Source would account for 97% of the allowable 1-hour NOx emissions within NAAQS for the area and would exceed NAAQS for PM2.5 and PM10 (both 24-hour and annual). *Id.* at p. 219. The increment for a PSD II area for Alternative D would be exceeded for NO2, PM10 (24-hour and annual), and PM2.5 (24-hour and annual). *Id.* Criteria pollutants for Alternative D would be in compliance for the community of Nuiqsut, but NO2 emissions from GMT1 alone would account for 75% of the one-hour standard for NO2.*Id.* Modeling suggests that Alternative A would exceed allowable increment above background levels in a PSD II area for NO2, PM10 (both annual and 24-hour), and PM2.5 (both annual and 24-hour). *Id.* at 207.

[135] 2014 Alpine DSEIS, vol. 1, p. 203.

[136] See 2014 Alpine DSEIS, vol. 1, p. 204 ("The ambient air quality impact analysis covered various activities related to the construction, and routine operation of a wellsite, access road, pipelines and ancillary facilities to support the development of GMT1.").

[15-134] There was no air quality analysis performed for Alternatives B and C. An analysis should be performed for these alternatives.

[15-135] The DSEIS does not appear to address air emissions from flaring, particularly those that are likely to occur during production. Were overall emissions from the ongoing "pilot" flaring, plus upset events, included in the total air emissions? Emissions associated with flaring are a significant concern given the project's proximity to Nuiqsut.

Flares are designed to burn waste gases from hydrocarbon production, and as a safety relief during plant emergencies. Over 100-150 chemicals can be produced during flaring, including soot, nitrogen oxides, sulfur dioxide, hydrogen sulfide, propylene, benzene, toluene, methane, carbon dioxide and ammonia. [137] Adverse human health effects from chronic exposure to repeated flaring discharges have been observed for people living or working near flaring in Canada and from offshore development near Los Angeles.[138]

Gas flaring episodes at the Alpine oil field lasting longer than one hour exceeded quantities released in such upsets at all the other North Slope oil fields combined in 2000.[139] **[15-136]** BLM should implement stronger standards to reduce the incidence of flaring at startup of production, as well as routine flaring of waste products. The need for a flaring mitigation measure is especially important in light of the state's weak standard, which does not attempt to cap flaring emissions at a certain level.[140] **[15-137]** BLM needs to ensure that there is no non-emergency flaring of gas from GMT1, i.e., the gas needs to be used as a fuel or disposed of in injection or enhanced recovery wells as a required BMP.

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[137] Argo, J. 2001. Unhealthy effects of upstream oil and gas flaring. A report prepared for Save Our Seas and Shores, for presentation before the Public Review Commission into effects of potential oil and gas exploration, drilling activities within Licences 2364, 2365, 2368. Sydney, Nova Scotia, January 18, 2002. IntrAmericans Centre for Environment and Health, Wolfe Island, ON, Canada.

[138] Argo, J. 2001. Unhealthy effects of upstream oil and gas flaring. A report prepared for Save Our Seas and Shores, for presentation before the Public Review Commission into effects of potential oil and gas exploration, drilling activities within Licences 2364, 2365, 2368. Sydney, Nova Scotia, January 18, 2002. IntrAmericans Centre for Environment and Health, Wolfe Island, ON, Canada. (adverse impacts may occur at distances ranging from 0.2 – 35 km from the flaring).

[139] Bodron, D. 2003. Information on 2000 flaring (Gas2000 North Slope.xls; Re 2000 flaring.rtf) from Wendy Mahan, Alaska Department of Natural Resources, April 6, 2001.

[140] The Alaska Oil and Gas Conservation Commission currently regulates gas disposition under 20 AAC 25.235. This section requires reporting as to whether gas is flared or vented, including the volume flared or vented and efforts to minimize the volume of gas vented, burned, or otherwise permitted to escape into the air. Flaring or venting is considered waste, unless it does not exceed one hour and is authorized for safety purposes. But Section 25.235 does not actually require flaring to be minimized or emissions to be reduced—operators simply have to track their waste and justify why it occurred.

We appreciate BLM's proposed partial adoption of the stipulation suggested in TWS's supplemental comments: "To the extent practicable, all oil and gas operations (vehicles and equipment) must be powered by natural gas or electric power rather than diesel fuel."[141] **[15-138]** We encourage BLM to adopt the second half of the suggested stipulation: "Any vehicles and equipment that require the use of diesel fuels must use 'ultra-low sulfur' diesel as defined by the Alaska Department of Environmental Conservation-Division of Air Quality." We also encourage BLM to develop some criteria as to how the stipulation would be implemented and enforced (i.e., provide an examples of when non-diesel would not be practicable and when it would).

[15-139] BLM should consider a more specific requirement for electric vehicles, given the relatively short distances involved and the need to reduce noise to mitigate impacts to wildlife. According to the journal Environmental Health Perspectives, there are numerous ways to reduce or eliminate the noise from vehicle/equipment backup safety systems while still maintaining safety.[142] Higher speed vehicles on roads produce enough sound from tire and wind noise to be audible to humans as well as wildlife.

Finally, please correct the DSEIS to utilize the term "Arctic National Wildlife Refuge" instead of "Alaska National Wildlife Refuge" throughout Chapter 4.6.4.1 in the section on Air Quality for Alternative A.

12. Pipelines and Other Oil and Gas Issues

12.1 Roadless pipelines

[15-140] BLM should consider the real-world data showing that transmission pipelines between oil fields do not require accompanying roads. Leak detection can occur electronically and, done properly, spill cleanup can occur without major tundra damage and without the use of gravel roads. The state of Alaska has both leak detection and leak shut-down requirements for crude oil transmission pipelines in its regulations.[143] **[15-141]** Because 18 AAC 75.055 (b) requires that the flow of

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[141] See 2014 Alpine DSEIS, vol. 1, p. 229 (Potential Mitigation Measure 1).

[142] David C. Holzman, Jan 2011. Vehicle Motion Alarms: Necessity, Noise Pollution, or Both? Environmental Health Perspectives 119(1): A30–A33 (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018517/).

[143] *See* 18 AAC 75.055. Leak detection, monitoring, and operating requirements for crude oil transmission pipelines

(a) A crude oil transmission pipeline must be equipped with a leak detection system capable of promptly detecting a leak, including

(1) if technically feasible, the continuous capability to detect a daily discharge equal to not more than one percent of daily throughput;

(2) flow verification through an accounting method, at least once every 24 hours; and

(3) for a remote pipeline not otherwise directly accessible, weekly aerial surveillance, unless precluded by safety or weather conditions.

(b) The owner or operator of a crude oil transmission pipeline shall ensure that the incoming flow of oil can be completely stopped within one hour after detection of a discharge.

oil must be stopped within one hour of discharge detection, shut-down for Arctic pipelines would be done by remotely-operated valves.

[15-142] External leak detection can be used for multi-phase pipelines. More sophisticated electronic leak detection systems than those currently required by the state are available commercially. Additionally, it is not necessary to have a road alongside a pipeline for spill response as helicopters and snowmachines could be used in the winter for access, and low-ground-pressure vehicles and Hovercraft could be used in the summer.[144]

There are two crude oil transmission pipelines in the Arctic without roads, the Alpine to Kuparuk pipeline (34 miles long, 95,000 bbl/day) and the Badami to Endicott pipeline (25 miles long, peak transmission was 7,450 bbl/day). The benefits of roadless pipelines include less impact to caribou migration, avoidance of gravel mining and transport; and avoidance of a decrease to wildlife caused by non-local users in the area.

12.2 Future pipeline plans

[15-143] Please clarify what the empty spaces for future pipelines on the VSMs are intended to hold.[145]

12.3 Spills

[15-144] The spill analysis described in the DSEIS[146] is both limited and insufficiently detailed. This analysis does not distinguish between the type of infrastructure causing the spills, the types of materials spilled, and the regulatory status of the infrastructure where spills occur.

[15-145] The DSEIS notes that, "Based on the 34 years of North Slope experience, both the 2004 and 2012 analyses found that the vast majority of spills have been less than 10 gallons or between 10 and 100 gallons, and were contained within secondary containment or on gravel pads and roads."[147] While this statistic may be accurate, it does not capture the magnitude of major North Slope spills.

12.3.1 Magnitude and types of spills

The Alaska Department of Environmental Conservation's analysis of North Slope spills from July 1, 1995 through December 31, 2009[148] showed that there were a total of 1153 oil spills

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[144] 2012 NPRA Draft Integrated Activity Plan, Vol. 2, Chap. 4, p. 46.

[145] *See* 2014 Alpine DSEIS, Appendix A, Sheets 20-21.

[146] 2014 Alpine DSEIS, Section 4.5, pp. 326-327.

[147] 2014 Alpine DSEIS, vol. 1, p. 327.

[148] North Slope Spills Analysis: Final Report on North Slope Spills Analysis and Expert Panel Recommendations on Mitigation Measures, Nuka Research & Planning Group, LLC for the Alaska Department of Environmental Conservation, 2010, see http://dec.alaska.gov/spar/ipp/ara/documents/101123NSSAReportvSCREEN.pdf.

covered in the report,[149] with a spill of at least 1000 gallons of oil nearly every other month on average. Additionally, these data show that there were

- 240 spills from facility oil piping at the well/drill site or associated with a processing or storage tank facility,
- 71 spills from flow lines which are three-phase lines that can be long-distance and are similar to the proposed pipeline from GMT1 to CD5, and
- 202 spills from process piping not regulated by the state and minimally by the federal government including seawater and natural gas pipelines.

In contrast to facility oil piping, flow lines, and process piping, transmission pipelines are federally-regulated. Oil transmission pipelines resulted in only 9 (1%) spills in the report.

For the 13 oil spills greater than 10,000 gallons during this period, three were from facility oil piping, four were from flow lines, and two were from process piping, representing a majority of the largest releases.[150] There was only one such oil spill from an oil transmission pipeline. Additionally, since 2009 there have been a number of key releases; including the Repsol February 15, 2012 blowout.

[15-146] In its Appendix G spill analyses, BLM did not analyze toxic chemical spills associated with oil and gas drilling. These data are available from the Alaska Department of Environmental Conservation. The North Slope commonly has small toxic chemical spills associated with oil and gas operations.

12.3.2 Worst-case scenario

A worst-case scenario blowout could require weeks or even months to bring under control, requiring mobilization of a large quantity of specialized equipment and personnel to a well site and potentially requiring multiple relief wells to be drilled—a very time-, labor- and support-services-intensive process. While these efforts are underway, the total area contaminated and heavily impacted would expand. **[15-147]** Although Section 4.5.3.1 (Spill Scenario Modeling) refers to the possibility of a blowout, the DSEIS does not consider the potential effects of a worse-case scenario blowout to the surrounding environment. This should be considered in the FSEIS.

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[149] North Slope Spills Analysis: Final Report on North Slope Spills Analysis and Expert Panel Recommendations on Mitigation Measures, Nuka Research & Planning Group, LLC for the Alaska Department of Environmental Conservation, 2010, see http://dec.alaska.gov/spar/ipp/ara/documents/101123NSSAReportvSCREEN.pdf.

[150] Our organizations are uncertain what the following statement in the DSEIS is based on given the state of Alaska's spill data we reviewed: "Four very large spills have occurred on the North Slope; three associated with the operation of TAPS and one at BP's Gathering Center 2." (2014 Alpine DSEIS, p. 400)

12.3.3 Repsol Blowout

[15-148] In its oil and gas spill analyses, BLM did not include the 2012 Repsol blowout on the North Slope.[151] Nearly 900,000 gallons of subsurface materials were released to the tundra including 42,000 gallons of drilling muds, and almost 24 acres in the Colville River delta were impacted.[152] The blowout was caused by a shallow gas pocket, which could increase the statistical likelihood of a blowout. While the Repsol blowout released drilling mud and not crude oil, this incident – which resulted in a significant quantity of toxic materials on the nearby tundra – should be included in Appendix G calculations for Large Crude Oil Spills,[153] as should any drilling mud released previously during other North Slope gas blowouts.

The location of the spill by the Colville River within a mile of the Beaufort Sea shows the special vulnerabilities of drilling exploratory or production wells in sensitive areas. The Repsol blowout demonstrated the state's and industry's inability to respond under extremely cold conditions. For over two weeks after the spill was reported on February 15, 2012, it was impossible to operate outdoor equipment at the site, including well control equipment, as the temperature and wind chill were too low (i.e., less than minus 35 degrees F. temperature).[154] It took over a month for mechanical well control to take place at the well. **[15-149]** The K-3b Lease Stipulation/BMP needs to include language specifying that drilling must stop when extreme winter cold will make spill control and cleanup impossible.

12.3.4 Potential for spill to reach marine waters

[15-150] We disagree with the conclusion in Section 4.5.6 that "Alternative D would have the greatest potential risk of a spill or leak reaching fish bearing or marine waters before detection or before response teams could be mobilized to the spill site, given its limited access." With proper electronic leak detection and use of automated pipeline closure valves, Alternative D could achieve comparable or better release and response capabilities compared to the other alternatives.

[15-151] The DSEIS states that, "If a large spill reached Harrison Bay, it would not likely affect bearded seals, walruses, beluga or gray whales because these species mostly occur offshore in Harrison Bay (BLM 2004)."[155] If these species are located in Harrison Bay, it is not clear how they could avoid being affected by a spill that reaches Harrison Bay.

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[151] See the Alaska Department of Environmental Conservation's final Situation Report, http://dec.alaska.gov/spar/perp/response/sum_fy12/120215301/120215301_sr_24.pdf.

[152] See http://dec.alaska.gov/spar/perp/response/sum_fy12/120215301/120215301_sr_24.pdf.

[153] Draft Plan, Vol. 4, Chap. 5, pp. 84 ff.

[154] When the temperature increased, Repsol plugged and abandoned the well.

[155] 2014 Alpine DSEIS, vol. 1, p. 329.

12.3.5 Cumulative effects

[15-152] Section 4.6.4.4 on Oil, Saltwater, and Hazardous Material Spills in the cumulative effects section makes several inaccurate statements. The DSEIS states that "Development of GMT1 and its associated infrastructure is not expected to increase the likelihood of a very large spill."[156] This appears inaccurate, since GMT1 will add to existing well infrastructure on the North Slope and thus increase the risk of a very large spill from a blowout. Additionally, it appears inaccurate that an alternative with a road necessarily "mitigates some of the potential for a major or undetected spill" since appropriately sensitive electronic leak detection technologies for the pipeline can be required to be used. Moreover, the example of the Repsol blowout demonstrates that there can be a large spill that would not be confined to the well pad,[157] as the discussion on p. 400 assumes.

12.3.6 Need to analyze phase separation

[15-153] Given the high rate of spillage from three-phase lines and produced water, BLM should analyze the possibility of requiring separation of oil, gas, and water at each well pad. This type of separation occurs at offshore platforms, so it is clearly achievable onshore as well, albeit at a potentially higher cost than a more centralized separation facility. Such an approach builds upon the E-4 BMP, however additional language to accomplish this goal is needed. Further, BLM should develop stringent BMPs for produced water pipelines that ensure injection of such water near the producing well.

Should BLM require separation of oil, gas, and produced water at well pads, the pad footprint would be enlarged but the likelihood of significant pipeline spills would be reduced. Multi-phase pipelines, or flow lines, are more prone to corrosion than crude oil transmission pipelines, electronic leak detection from single-phase pipelines is simpler and generally more accurate, and the state has more specific requirements for crude oil transmission pipelines than it does for multi-phase pipelines and thus such lines would have increased oversight.[158]

12.3.7 Consideration of spill response under a seasonal drilling scenario

[15-154] As discussed throughout this document, BLM should thoroughly analyze an alternative based on seasonal drilling. This includes analysis of emergency and spill response in the absence of gravel roads. While emergency response operations are facilitated by the presence of road access year round, planning for remote incident sites is possible. BLM should consider the plan for emergency response at CD3, including pre-staging equipment, developing site-specific tactics and response scenarios for different weather conditions, and identifying immediate response

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[156] 2014 Alpine DSEIS, vol. 1, p. 400.

[157] *See* http://dec.alaska.gov/spar/perp/response/sum_fy12/120215301/120215301_index.htm.

[158] 18 AAC 75.055, Leak detection, monitoring, and operating requirements for crude oil transmission pipelines.

activities possible on-site with pre-staged resources and trained personnel to mitigate impacts if something goes wrong.

Emergency operations would depend on special permission for over-tundra travel, which would be expected in an emergency situation.[159]

While CD3 does have limited boat access, which GMT1 would not, the primary purpose of a floating dock described in the 2004 FEIS appears to be the deployment of on-water containment and recovery equipment in the event of a spill near the production area.[160] While GMT1 development has the potential to spill oil to water, this would impact stream crossings along the pipeline route so the inability to access the drilling/production area via boat would not detract from spill response operations.

12.3.8 Fuel storage

We appreciate BLM's proposed adoption of a fuel storage mitigation measure suggested in TWS's supplemental comments, based on a North Slope Borough stipulation.[161] This should help contain fuel spills on the pad. We also appreciate the proposed adoption of two additional new stipulations calling for the use of arctic engineering practices and new standards for a spill prevention plan.[162]

12.3.9 Other oil and gas mitigation measures

[15-155] Require drilling to stop when extreme winter cold makes spill control and cleanup technically impossible. The 2012 Repsol blowout demonstrated industry's inability to respond under extremely cold conditions. There needs to be a clear requirement (i.e., a BMP) that disallows drilling when winter cold makes spill control and cleanup technically impossible.

[15-156] Ensure annual smart pigging of all pipelines that leave the well pad. Smart pigging of pipelines ensures that any pipeline wall thinning would be detected in a timely manner which will allow repairs to take place to prevent releases. When pipelines pass through areas which are important

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[159] *See* 2004 Alpine FEIS, p. 54.

[160] *See* 2004 Alpine FEIS, p. 45.

[161] See 2014 Alpine DSEIS, vol. 1, p. 332: "New Potential Mitigation Measure 1 – Fuel Storage (new subparagraph to BMP A-4) … Requirement/Standard: Fuel and hazardous material storage containers with a capacity greater than 660 gallons must use impermeable lining and diking capable of containing 110 percent of the containers' capacity. Vinyl liners, with foam dikes and a capacity of 25 gallons, must be placed under all valves or connections to fuel tanks when located outside of secondary containment. Fuel and hazardous material tanks and containers on ice or gravel pads must be 100 feet away from the edge of the pad, or if the pad is less than 200 feet long or wide, tanks must be centered."

[162] See 2014 Alpine DSEIS, vol. 1, p. 333.

ecologically and for subsistence – such as those in the Reserve – annual smart pigging of the pipelines should be a required BMP.

[15-157] Require highly-sensitive leak detection mechanisms. Pipelines which leave the well pad should be required to utilize highly-sensitive leak detection mechanisms. Such electronic leak detection systems should be able to rapidly (i.e., instantaneously with external leak detection system wiring or within a few minutes for internal leak detection systems) and accurately detect both large ruptures and small leaks. BLM should define "slow leak" detection sensitivity as part of its New Potential Mitigation Measure 4.[163]

[15-158] Require automated valves. Regardless of the alternative selected, it is essential for BLM to require that the operator use automated, not manual, valves to minimize spill impacts on the Ublutuoch River,[164] and the areas west and east of the river,[165] as part of the GMT-1 design. Remotely-controlled valves are the preferred means to rapidly shut-down pipelines experiencing a release. According to a report prepared for the U.S. Department of Transportation which regulates oil and gas transmission pipelines and gas distribution pipelines on remotely controlled and automatic pipeline shutoff valves, "adding automatic closure capability to block valves in newly constructed or fully replaced hazardous liquid pipelines can also be an effective strategy for mitigating…environmental damage resulting from a release that does not ignite" (emphasis added).[166]

12.3.10 Water usage

While reviewing the DSEIS, we noticed that **[15-159]** Table 2.4-2 shows that drilling water use for Alternative D is 16.0 million gallons in years 3-6 whereas for Alternatives A-C it is only 1.0 million gallons in years 3-6. Since the need for water used in drilling is likely to be similar among all alternatives, this figure for Alternative D appears inaccurate. BLM obtained revised data from CPAI showing several changes from the data in the DSEIS. The revised data needs to be reanalyzed to compare water usage for each alternative; and this information needs to be shared with the public prior to issuance of the FSEIS.

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[163] Draft SEIS, p. 333.

[164] Draft SEIS, p. 26.

[165] Draft SEIS, p. 331. "Another manual valve will be located on a gravel pad adjacent to the gravel road, approximately 1,700 feet west of the Tinmiaqsigvik (Ublutuoch) River bridge. A similar valve will be located approximately 700 feet east of the Tinmiaqsigvik (Ublutuoch) River bridge."

[166] Oak Ridge National Laboratory, Studies for the Requirements of Automatic and Remotely Controlled Shutoff Valves on Hazardous Liquids and Natural Gas Pipelines with Respect to Public and Environmental Safety, ORNL/TM-2012/411, October 31, 2012, p. xxviii.

13. Other Mitigation Measures and Project-Specific Stipulations

Mitigation measures, together with monitoring of impacts and environmental changes, play huge roles in implementing the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), and wetlands protection provisions of the Clean Water Act (CWA). **[15-160]** Page 402 of the DSEIS discusses BLM's authority and responsibility to require compensatory wetlands mitigation for unavoidable impacts resulting from BLM authorizations that are likely to occur, in addition to wetlands impacts that are compensated through U.S. Army Corps of Engineers Sec. 404 permits. The paragraph on page 402 serves as a placeholder for what should be a thorough discussion of this complex topic in the FSEIS.

Addressing large scale environmental mitigation in NPRA is timely since: (1) GMT1 is the first commercial development on federal land in NPRA and will set the stage for how impacts are addressed throughout NPRA; (2) BLM is finalizing nationwide policies and guidance through its draft Regional Mitigation Manual[167] for avoiding, minimizing, and compensating for impacts of development; and (3) the Department of the Interior has just released its Strategy for Improving the Mitigation Policies and Practices of the Department of the Interior report.[168] Our comments and suggestions regarding mitigation for GMT1 impacts are derived from and consistent with DOI's newly released strategy document.

13.1 Avoidance

Our organizations urge BLM to avoid impacts whenever possible with respect to future development in the NPRA and specifically to GMT1 by: 1) protecting important resources and values from development, and 2) guiding development to low-values conflict sites.

Avoidance is the best way to prevent impacts and should be the highest priority for BLM. With the finalization of BLM's 2012 IAP, BLM has undertaken landscape-scale planning that has identified and administratively protected many important resources and values for the entire NPRA. Specific to GMT1, important resources and values include Fish Creek, caribou, waterfowl, and the Colville River Special Area, among others. BLM designated a buffer for Fish Creek in the 2012 IAP, which should be recognized and adhered to in this, the first commercial development on federal land in the NPRA, in order to avoid unnecessary impacts to important resources. Avoiding compromising the Fish Creek buffer would direct development to a lower conflict area.

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[167] See Draft MS-1794 – Regional Mitigation Manual Section (P), http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-142.html

[168] http://www.interior.gov/news/upload/Mitigation-Report-to-the-Secretary_FINAL_04_08_14.pdf.

13.2 Take appropriate measures to minimize onsite impacts

BLM should take appropriate measures to minimize impacts onsite. Examples of how to minimize impacts are addressed in these comments. In general, best practices for construction, maintenance, and operations within a development site should be used to minimize unavoidable impacts.

13.3 Long-term and compensatory protection

[15-161] Because there is no permanent protection for Special Areas in the 2013 NPRA ROD, we would like to see BLM consider some form of long-term protection for high value habitat as mitigation for the long-term likely permanent impacts of development at GMT1 and GMT2.[169] BLM should develop a formula for determining how much land to protect, and work with all affected stakeholders, agencies, and the public to determine which areas would be appropriate for protection. Wetlands mitigation required by the U.S. Army Corps of Engineers for a Clean Water Act 404 permit could count toward the land required to be protected under BLM's formula, but monetary compensation should not substitute for the requirement.

As outlined below, BLM has a variety of tools for establishing an administrative form of protection, ranging from management prescriptions to conservation easements and deferrals:

- Management prescriptions: The 2012 IAP and 2013 ROD retained and expanded Special Areas established in previous plans, but it did not provide a particular management regime for these special areas. BLM should consider specific management prescriptions for the Teshekpuk Lake and Colville River Special Areas that protect the values of these areas from impacts associated with GMT1 and other projects.
- Area of Critical Environmental Concern (ACEC): If BLM decides not to apply management prescriptions to entire Special Areas, it could consider establishing ACECs, Research Natural Areas, or National Natural Landmarks within Special Areas where management prescriptions could apply.
- Deferral: BLM could defer ecologically sensitive areas from leasing and infrastructure for a long period, beyond the allocations provided in the IAP.
- Conservation easements: BLM could work with local land owners and managers within the vicinity of the project—namely the North Slope Borough (NSB) and Arctic Slope Regional Corporation (ASRC) to establish conservation easements. The placement of a conservation easement is consistent with state law regulating conservation easements (AS 34.17), the NSB's authority under AS 29.35.180(b), NSB Charter Section 8.020, the Borough Code (NSBMC) 2.38.150 regarding easements, and NSBMC Title 19 providing for planning and land use regulation. ASRC has previously worked with the U.S. Army Corps of Engineers toward establishing what could become a mitigation bank

[169] This is consistent with DOI's Mitigation Strategy at 3: "[M]itigation might take the form of acquiring and bringing under long-term protection an existing, fully functional wetland."

encompassing selected high-value lands in the Colville River Delta. Although we are not aware of the exact status of this potentiality at this time, we did review ASRC's June, 2012 "Umbrella Mitigation Bank" prospectus and can envision a "win-win" solution whereby permanent protection is ensured for meaningfully-sized parcels of relatively pristine land along the Colville River and Beaufort Sea coast in exchange for mitigation credits.

BLM also could work with the White House and members of Congress to establish more substantial or longer-lasting protections.

[15-162] To ensure the effectiveness of any protective measures, scientific monitoring must be funded, instigated and maintained.[170] Data gathered and conclusions drawn from monitoring should be used to develop new tools to manage these protected lands and continually improve the metrics between lands and resources slated for future development and accompanying lands and resources set aside though implementing future environmental mitigation.

[15-163] BLM should develop a formula for determining the acreage of land to be protected based on the amount of wetlands lost due to placement of gravel fill; the reasonably expected potential loss of ecosystem services; and a multiplication factor to account for uncertainty inherent to ecological systems undergoing rapid climatic change.

The national "no net loss" goal for wetlands means that the Army Corps will issue wetland development permits only if permit-seekers agree to mitigate lost wetland functions by undertaking wetland creation, restoration or enhancement projects, or by preserving at-risk wetlands. Since each acre of mitigation may not fully compensate for each acre of impacted wetland, a "mitigation ratio" is used to establish the number of acres of mitigation required per acre of impacted wetland, establishing an environmental quality/quantity tradeoff.

Problematically, review of compensatory wetland mitigation over the past twenty years has shown that overall wetland gains resulting from mitigation projects have <u>not</u> adequately offset overall wetland losses resulting from permitted wetland development.[171] We urge BLM to err on

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[170] There are many references to the need for both baseline and ongoing scientific studies in mitigation in A Strategy for Improving the Mitigation Policies and Practices of the Department of Interior. *See, e.g.,* p. 6: "[S]cientific requirements for effective mitigation include monitoring conditions and processes in a comprehensive and consistent manner across jurisdictional boundaries; quantifying resources in both the impacted and mitigated areas; developing a system of metrics for adequately analyzing the comparability of development impacts and compensatory mitigation actions; assessing habitat quality for specific species of interest and assigning ecological equivalence to different locations; identifying tipping points that may lead to major degradation of natural and cultural resources and ecosystem services; developing models that accurately simulate environmental conditions in order to assess future possible scenarios; and providing useful data and training to land managers."

[171] National Research Council (NRC). 2001. Compensating for Wetland Loss under the Clean Water Act. National Research Council, Committee on Mitigation Wetland Losses. National Academy Press, Washington, D.C., USA; Spieles, D. J. 2005. Vegetation Development in Created, Restored, and Enhanced Mitigation Wetland Banks of the

the side of precaution in both cataloging the inventory of ecosystem functions impacted by GMT1 development that merit mitigation, and in setting mitigation ratios that are scientifically and legally defensible based on achieving "full" replacement of lost and potentially lost wetland services. It may be efficient to take into account GMT2 affected lands and resources in determining the appropriate acreage.[172]

[15-164] We suggest that BLM comprehensively inventory critical environmental wetlands-related services extending beyond the project footprint that are likely to be adversely affected by GMT1 construction.[173] Then, taking this list of significantly affected services for which BLM must develop and enforce compensatory mitigation, BLM could assign acreage equivalency values for each impact, and design mitigations for the sum of acres affected. The uncertainty due to the rapidly changing arctic environment should appear as a multiplication factor to BLM's estimated total value.

The need for a multiplication factor is bolstered by Raynolds, et al, 2014, which chronicles the unprecedented and unpredicted rates of climate change evident for the North Slope oilfields: "When the [Prudhoe Bay Oilfield] studies began in the 1970s, none of the now-senior authors who were involved foresaw the possibility of the rapid transitions that are occurring now. For over 20 years, the areas that were not affected by oilfield infrastructure showed little change. Based on the mapped information and current air and permafrost temperature trends, starting in 1990 we are witnessing landscape changes that will have major implications for much of the Arctic Coastal Plain. The conceptual model of thermokarst formation presented here and the description of the characteristics of areas most vulnerable to thermokarst will help in the

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United States. Wetlands. 25:51-63; Kiesecker, Joseph M., Holly E. Copeland, Bruce A. McKenney, Amy Pocewicz, and Kevin E. Doherty. 2011.

Energy by Design: Making Mitigation Work for Conservation and Development. Chapter 9 in: David E. Naugle (Ed.), Energy Development and Wildlife Conservation in Western North America. pp. 159-181.

[172] A Strategy for Improving the Mitigation Policies and Practices of The Department of the Interior, p.3 ("there might be economic efficiencies as well as better environmental results if compensatory mitigation actions are carried out in advance of foreseeable future projects, or if a single large mitigation action could compensate for the impacts of multiple future development projects. This approach allows for 'banking' credits earned for early compensatory mitigation actions, and later drawing down against those banked credits as new development projects are undertaken").

[173] Support for our suggested approach to calculating a summation of impacts eligible for mitigation can be found on pg. 8 of DOI's recent guidance: "Mitigation becomes much more complicated when the goal is to address impacts to a variety of resources, including species, habitats, historic and cultural resources, water quantity and quality, air quality, scenic views, night skies, natural soundscapes and others. Conducting a comprehensive assessment and developing a mitigation plan for these different resources and associated ecological services at the landscape scale is a major challenge in light of current capabilities and the requirements of the various laws that apply. The fact that primary responsibility for these various resources may rest with several different state and federal agencies adds still more complexity. The coordination of mitigation decisions among several agencies must be a primary focus as the Department develops a landscape-level approach to mitigation."

development of predictive models of how thermokarst spreads in different climate-change and infrastructure scenarios."[174]

[15-165] The determination of acreage needed for compensatory mitigation for Alternative A (as an example) should take into consideration the following factors as well as additional information available on impacts:

- 72.5 acres will be directly lost by placement of gravel fill.[175]
- At least 72.5 acres will have diminished ecosystem functions due to "dust-shadow."[176] Assigning an acreage value equal to the number of acres filled is reasonable because, although the loss of ecosystem function due to dust is not complete, it is widely spread. Thus, if dust causes an average loss of ecosystem functionality of, say, 20% and is spread across an area five times the size of the gravel fill that is the source of dust, one can see the effective acreage subject to this loss is equal to the number of acres of gravel fill.
- At least 145.0 acres will have diminished ecosystem function due to altered hydrology and consequent alterations to permafrost.[177] This is an underestimation of the net losses in ecosystem functionality due to altered hydrology and contributions to permafrost redistribution impact an area twice the size of actual gravel fill for a given development.
- At least 217.5 acres (and likely a much greater number) will have diminished ecosystem function due to altered migration patterns, altered behaviors and/or success of nesting, breeding, rearing, growth, etc. for indigenous wildlife populations, including birds, fishes, and mammals.[178] A similar number will have diminished ecosystem function due to fugitive toxic air emissions.

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[174] Raynolds, M. et al., op. cit.

[175] DSEIS Table 2.3-2. Footprints and Gravel Requirements for Project Alternatives.

[176] *See* Raynolds, M, et al., op. cit.14. Studies such as this have documented profound changes to tundra mat densities and cushion-plant species composition in the vicinity of North Slope oilfield activities as well as complete disappearances of vegetation down-wind from oilfield activities

[177] Raynolds, M. et al., op. cit. covers topics of altered hydrology and permafrost in the vicinity of oilfield infrastructure extensively.

[178] The Corps assigned a mitigation ratio of 3:1 for direct impacts to loss of wetlands covered in the project footprint for CPAI's CD-5, and 10:1 for high value wetlands. From the paragraph on pg. 402 of the DSEIS, it seems that BLM assumes the Corps will rule similarly for GMT1. At issue here, is that BLM will also require compensatory mitigation for unavoidable impacts that occur beyond the project footprint that are likely to occur in addition to impacts compensated for through issuance of Corps' Sec. 404 permit. For purposes of calculating the acreage values of ecosystem services due to stresses to indigenous wildlife populations, including birds, fishes, and mammals that extend beyond the edge of the construction footprint, we used the Corps ratio of 3:1.[179] 2014 Alpine DSEIS, vol. 1, p. 249, New Potential Mitigation Measure 1 — Oil Field Abandonment (new subparagraph to BMP G-1): "Requirement/Standard: The plan shall provide that as wells or facilities are permanently abandoned; interim surface reclamation requirements will be incorporated whenever feasible."

BLM should, based on the latest and best available science, better approximate the number of acres likely to be impacted. The total acreage should then be multiplied by an uncertainty factor to calculate the number of acres needed for compensatory mitigation.

13.4 Reclamation

[15-166] We appreciate BLM's new proposed mitigation measure requiring interim reclamation.[179] We encourage BLM to provide more details as to how this measure will be implemented and enforced.

13.5 Visual impacts

[15-167] The DSEIS discusses a recommendation from the 2004 FEIS designed to reduce visual impacts, but does not clearly adopt the recommendation as a stipulation.[180] We encourage BLM to adopt the recommendation as a stipulation.

13.6 Cleanup of legacy wells

BLM should consider prioritizing the remediation of legacy wells near the project area and in areas important to local subsistence hunters who will be affected by the project.

13.7 Clarification of applicability of lease stipulations

The DSEIS states that, "For the GMT1 project, the 2013 BMPs will be in effect. but no changes to the current lease stipulations will occur without further evaluation and discussion with the BLM. Certain 2008 lease stipulations (D-1, D-2, E-2, E-3, G-1, K-1, and K-2) applicable to this project present essentially the same level of protection as the 2013 BMPs."[181] **[15-168]** Some of the 2013 lease stipulations are also BMPs, including K-1 regarding river setbacks. BLM should clarify whether the 2013 BMPs that are also lease stipulations will trump any existing lease stipulations.

[15-169] Further, BLM should clarify the applicability of BMPs and lease stipulations to land (both the surface and subsurface estates) that has been selected for transfer to Alaska Native Corporations, and land that has already been conveyed.

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[179] 2014 Alpine DSEIS, vol. 1, p. 249, New Potential Mitigation Measure 1 — Oil Field Abandonment (new subparagraph to BMP G-1): "Requirement/Standard: The plan shall provide that as wells or facilities are permanently abandoned; interim surface reclamation requirements will be incorporated whenever feasible."

[180] See 2014 Alpine DSEIS, vol. 1, p. 323: "All structures would be painted to blend with the natural environment. All colors would be pre-approved including emergency spill containers along river channels. BLM will use computer-generated colors to determine the color for structures that blend in best with the background colors of the natural landscape and may do a color test onsite. Self-weathering steel, or best management practice, will be used on all metal structures not otherwise painted, including but not limited to pipelines, communications towers and drill rigs, thus providing a more natural color of brown."

[181] 2014 Alpine DSEIS, vol. 1, p. 401.

13.8 Monitoring and enforcement

We are concerned that proposed mitigation measures will only be effective if BLM has the resources to monitor and enforce their implementation. While previous Records of Decision have provided useful mitigation measures in the form of stipulations, best management practices, and required operating procedures, many exceptions to these measures have been permitted, and the measures have not always been enforced. **[15-170]** Along with any mitigation measure adopted in the Record of Decision, BLM should have an implementable plan for monitoring and enforcement.

14. Economic issues

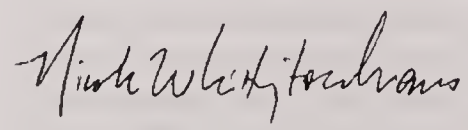
[15-171] The DSEIS finds that, "There will be no impacts to the state and local economy under [Alternative D]. The range of economic benefits associated with construction and operations as described under Alternative A would not be realized under this alternative."[182] It is not clear how BLM concluded that Alternative D would have no economic impacts. Alternative D is likely to result in the same amount of oil and gas production as the other action alternatives.

15. Conclusion

Thank you for considering our comments on this first commercial development on federal land in NPRA. We appreciate the work that was put into the DSEIS. We believe that the critical gaps that remain as identified above, however, preclude a reasoned choice among alternatives. Particularly glaring are the data inaccuracies for aircraft flight numbers and water usage. These inaccuracies, along with the failure to consider seasonal drilling and less facility-intense configurations, make the "roadless" alternative appear to have far more negative impacts than may be the case. We ask you to issue a supplement prior to completion of the FSEIS to correct these deficiencies. Regardless of which alternative is chosen, BLM must thoroughly analyze all of the information available and convey this analysis to the public. Finally, we ask BLM to implement additional mitigation measures, especially measures that would compensate for lost ecosystem services by establishing long-term, compensatory protection for ecologically important lands.

Please feel free to contact The Wilderness Society if you have any questions regarding these comments.

Sincerely,



Nicole Whittington-Evans

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[182] See 2014 Alpine DSEIS, vol. 1, p. 301.

Alaska Regional Director
The Wilderness Society

On behalf of:

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Executive Director
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Brian O'Donnell
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Appendix A: Specific Comments on Hydrology

1) Section 3.1.2, Existing and planned infrastructure

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The hydrologic conditions within the Fish Creek drainage basin were further studied in 2009, 2010, and 2011 to support the proposed GMT1 project (MBJ 2009, 2010, 2011). These findings are summarized below and peak discharge, stage, and date information obtained for the Tiŋmiaqsiġvik (Ublutuoch) River, location 6.8, from 2003 through 2011 is summarized on Table 3.2-3.

[15-172] The spring breaks up conditions were monitored for three years in the Fish Creek drainage. Are conditions during these years representative of the historical range of variations and anticipated future conditions for the area? We ask BLM to consider incorporating more information on the range of breakup magnitudes for the future of the planned infrastructure.

2) Section 3.2.2, Water resources

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While ponds and shallow lakes generally lack fish because they usually freeze to the bottom, they can provide important summer rearing fish habitat if they have a channel connecting them to a stream or deep lake that supports overwintering fish. They also provide important habitat to emergent vegetation, invertebrates, and migratory birds due to the earlier availability of ice-free areas.

[15-173] BLM states, "shallow ponds or lakes are important summer rearing habitat if they have a channel connecting them." We generally agree with the statement about shallow lakes and ponds, but it is important to note that additional habitat is important for summer rearing fish even if it is not connected by a perennial stream channel. Much of the area near streams flood in the spring and fish utilize this time period to access lakes and ponds not typically connected by streams.[183] We ask BLM to recognize within the GMT1 DSEIS that lakes or ponds seasonally connected by spring flood events are important summer rearing habitat.

3) Section 3.2.2, Water resources

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Deep lakes, along with river channels deeper than 5 to 7 feet, provide the most important fish habitats within the project study area.

[15-174] BLM states that "deep lakes are the most important fish habitats within the project study area." We ask BLM to provide evidence that deep lakes are the most important fish habitat. While we

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[183] Morris, W. 2003. Seasonal movement and habitat use of Arctic grayling (Thymallus arcticus), burbot (Lota Lota), and broad whitefish (Coregonus Nasus) within the fish creek drainage of the National Petroleum Reserve-Alaska, 2001-2002. Available at: http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/03_02.pdf;

Morris, W., Moulton, L., Bacon, J., Rose, J., Whitman, M. 2006. Seasonal movement and habitat use by Broad Whitefish (Coregonus nasus) in the Teshekpuk Lake region of the national petroleum reserve- Alaska. 2003-2005. Available at: http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/06_04.pdf

agree that deep lakes and channels are important for overwintering habitat this statement is largely opinion based and is not supported by evidence. Recent evidence for fish migration in the region[184] provides evidence that other habitats are also critically important for fish. To maintain healthy fish populations, fish in the Arctic coastal plain need 1) summer feeding/rearing habitat 2) spawning habitat and 3) overwintering habitat. These habitats may or may not be located in the same area and therefore it is highly likely that multiple habitats are important within the study area. Alternatively, if scientific evidence cannot be provided we suggest deleting or modifying the statement to acknowledge the value of a diverse portfolio of habitat.

4) Section 3.2.2, Water resources

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> exploration and construction of ice roads and pads (BLM 2006). Generally, water withdrawals during winter occur from lakes 7 feet deep or deeper and are limited to 15 percent of the estimated free-water volume remaining below the ice.

[15-175] BLM states that "water withdrawal during winter occur from lakes 7 feet deep or deeper and are limited to 15 percent of estimated free water volume." While this statement is true for a subset of lakes additional less conservative restrictions is allowed for lakes where fish species have not been detected. In order to understand the range of potential water withdrawal impacts, we ask BLM to describe in detail the range of water use restrictions and how this relates to ice pads and roads in the proposed development plan.

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[184] Morris, W. 2003. Seasonal movement and habitat use of Arctic grayling (Thymallus arcticus), burbot (Lota Lota), and broad whitefish (Coregonus Nasus) within the fish creek drainage of the National Petroleum Reserve-Alaska, 2001-2002. Available at: http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/03_02.pdf.

5) Section 3.2.2, Water resources

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Lake Studies

The BLM (2004, § 3.2.2.1) described several lake studies conducted between 2000 and 2003 that are located within the project study area. Key findings from these studies are summarized briefly below.

- Over a five-year study period, water withdrawals generally did not affect water chemistry, nor did they directly affect fish populations (MJM Research 2003). With respect to the lakes' water quality, pumping did not appear to affect temperature, pH, turbidity, sulfate, or nitrate levels (MBJ 2002).
- Lake water quality changed little as a result of pumping (for water withdrawal), water surface elevation changes in pumped lakes were within the range of changes seen in reference lakes, and changes in water surface elevations were correlated with changes in ice thickness (Oasis 2001).
- Water withdrawal rates were typically well below the maximum allowable. The water level decreases caused by pumping did not advance the freezing rate of the study lakes, and water levels depressed by pumping returned to pre-pump levels before freezeup (MBJ 2002).
- Water surface elevations in the majority of pumped lakes were lowered more than in reference lakes. The dominant mechanism for recharge of the lakes was melting winter snow accumulations. Data from 2001 and 2002 studies as well as anecdotal information at seven North Slope communities (including Nuiqsut) indicated that the magnitude of spring recharge has always been sufficient to compensate for withdrawals (MBJ 2002).

The lake studies statements above are not supported by conclusive evidence from studies designed to address the representative impacts of water withdrawal on water chemistry and fish populations across the proposed development area. The studies referenced in the above statements are from limited short term studies that do not take into account numerous other potential factors (i.e. differences between lakes, fish species and habitat detection probabilities, sampling methodology and design) that may impact the results. Recent research by Cott et al. 2008[185] has shown that 20% withdrawal of water can cause a reduction in a lakes oxygen profile, volume-weighted oxygen concentrations and the volume of overwintering habitat. In addition, other research has shown that lowering of lake levels can cause impacts to littoral zone benthic invertebrates,[186] plant communities,[187] and potentially freeze fish eggs deposited in littoral zones.[188] We are requesting the BLM to acknowledge that, while valuable, the current research

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[185] Cott, P.A., Sibley, P.K., Gordon, A.M., Bodaly, R.A., Mills, K.H., Somers, W.M., & Fillatre, G.A.. 2008. Effects of water withdrawal from ice-covered lakes on oxygen, temperature and fish. Journal of the American Water Resources Association 44: 328–342.

[186] Jansen, W. 2000. Experimental drawdown of lake 226 in the experimental lakes area, Ontario: Implications for fish habitat management in lake and reservoirs with fluctuating water levels. Department of Fisheries and Oceans, Central and Arctic region, Winnipeg, 29pp.

[187] Turner, M.A., Huebert, D.B., Finday, D.L.,Hendzel, L.L., Jansen, R.A., Bodaly, Armstrong, L.M., Kasian, S.E.M. 2005. Divergent impacts of experimental lake-level drawdown on planktonic and benthic plant communities in a boreal forest lake. Can J. Fish Aquat. Sci. 62:991-1003.

[188] Mills, K.H., Chalanchuk, S.M., Allan, D.J. & Bodaly, R.A. 2002. Abundance, survival, condition and recruitment of Lake Whitefish (Coregonus clupeaformis) in a lake subjected to winter drawdown. Archive fur Hydrobiologie. 57: 209-219.

does not provide conclusive evidence to support its statement and that other research suggests conflicting conclusions.

6) Section 3.2.2 Water resources

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> in all cases, was well below the levels that affect aquatic organisms. DO measured during the summer was typically near 100 percent saturation in the lakes sampled as discussed in MJM Research (2006), MBJ (2009b), and MBJ (2010). DO concentrations for lakes approximately 10 feet deep remained high during the March 2011 sampling event but were about half for lakes 6 feet deep as discussed in Derry et al. (2012).

[15-176] The statement above ("DO concentrations for lakes approximately 10 feet deep remained high during the March 2011 sampling event, but were half for lakes 6 feet deep") implies that relationships between depth and the lakes sampled during March of 2011 is consistent across time and space in the development area. This statement is inconsistent with other data[189] showing that in some lakes of equal depth, dissolved oxygen (DO) concentrations are reduced during the winter months. Winter DO concentrations are influenced by a multitude of chemical, physical and biological factors that affect oxygen budget of each lake.[190] We ask BLM to refine the statement to acknowledge that DO concentrations will vary spatially and temporally between lakes and that more than lake depth influences DO concentrations.

7) Section 3.3.2.1 Fish habitat

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> Spawning habitat requirements vary for different Arctic fish species and can occur in a wide range of flowing or still waters. Some species can spawn successfully in areas of silt or sand substrate, while many others require gravel of a particular size class and relatively clear water. Except for burbot, which spawn under ice in late winter, Arctic freshwater fish spawn between late May and October.

[15-177] The above statement does not provide enough information to assess the overall impacts on fish habitat. Understanding where anadromous fish spawn in the area will be crucial to assessing the impact on fish habitat. We ask BLM to identify spawning habitat and provide a description of the timing of spawning for each species in the proposed development area. If this information is not known, it should be stated that species-specific information is not available and the proposed development has the potential to negatively affect critical spawning habitat, which could cause decreased survival and productivity in Arctic fish populations.

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[189] Holland, K., Reichardt, D., Toniolo, H. & Lilly, M. 2009. Lake Chemistry and physical data for selected north slope Alaska, Lakes: March 2009. Geo-Watersheds Scientific, report GWS.TR.09.01, Fairbanks, Alaska, 18pp. Available at: http://www.arctic-transportation.org/doc/NS_Data%20Report_090323.pdf; Lilly, M.R., Derry, J.E., Murray, J.D., Whitman, M., Arp, C., Hilton, K.M., Kelly, K.A. & Toniolo H.A. 2010. Stream, lake and snow survey data, North slope, Alaska: March 2010. Geo-Watersheds Scientific, report GWS.TR.10.03, Fairbanks, Alaska, 19pp.

[190] Mathias, J.A. & Barica, J. 1979. Factors controlling oxygen depletion in ice-covered lakes. Can J. Fish Aquat. Sci. 37: 185-194.

8) Section 3.3.2.1 Fish habitat

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> Migration corridors are an additional habitat requirement for many Arctic fish since feeding, spawning, and overwintering habitat for an individual fish are not always proximate to each other, necessitating seasonal or annual movements. Annual water body connectivity and flow regimes play a major role in determining how much potential habitat is actually accessible. Many fish migrate locally or even extensively between major drainages in order to reach suitable habitat at various life history stages.

The above statement acknowledges the importance of migration corridors and seasonal connectivity of aquatic ecosystems, but does not identify pathways of importance. **[15-178]** We ask BLM to identify migration corridors and timing for fish species known to inhabit the proposed development area.

9) Section 3.3.2.1 Fish habitat

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> Alternative D is estimated to require more ice road construction than Alternative A (Table 2.4-2). There are more ice road miles during the construction phase, and also a need for annual ice roads during the operating period, which are not needed under Alternative A. Therefore, the impacts of ice roads under Alternative D will be greater and of longer duration compared to Alternative A. The ice roads could alter the drainage pattern, stream stage, and streamflow during spring breakup because the ice would melt more slowly than the surrounding tundra and streams. Blockage of streamflow and increased stream stage could occur due to ice roads that are not adequately slotted or breached.

BLM states that "ice roads could alter the drainage pattern, stream stage, and streamflow during spring break up." **[15-179]** We ask BLM to provide historical information on impacts from current exploratory ice road activities and ways that these impacts will be mitigated in the proposed development.

10) 4.3.2.1 Construction

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> channels. However, if placed above overwintering habitat out of necessity, the increased ice thickness associated with these crossings will result in a reduction of habitat where conditions may already be marginal. This can have a negative impact on fish, unless the under-ice water is substantially deep and expansive, as with the Colville River. Overwintering habitat is critical for fish in the Arctic, as it has been estimated that by late winter ice formation can decrease available habitat in rivers and streams by approximately 97 percent (BLM 2012, § 4.3.7.2, p. 147). A marked reduction in overwintering habitat at a given location would lead to increased fish densities, and overcrowding can increase stress, deplete oxygen supplies, and increase the concentration of metabolic byproducts to a point that may be fatal to the fish.

The above statement outlines some potential impacts of ice roads on overwintering fish habitat. **[15-180]** We ask BLM to outline the current protections that are in place to monitor ice roads and protect aquatic overwintering habitat where ice roads and bridges are proposed in the GMT1 and GMT2 development area.

11) 4.6.4.1 Physical Characteristics

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> The BLM (2004) analyzed the potential cumulative impacts of the project to water resources and water quality (BLM 2004, §§ 4G.5.6 - 4G.5.7). It predicted that no cumulative impact to North Slope water supplies from withdrawal of water for construction and operation would occur because the annual yield (runoff and refill of lakes) is many times greater than the amount withdrawn. Further, water use peaks during construction, which is a temporary, not-permanent activity and is generally not consumptive, so a continuous minimal increase in water use was not expected. The BLM (2004) found that localized and temporary impacts may occur at those lakes used for water supply, and that the project was not expected to contribute to cumulative impacts to marine and estuarine water quality.

[15-181] BLM states "that no cumulative impact to North Slope water supplies from withdrawal of water for construction and operation would occur because the annual yield is many times greater than the amount withdrawn." Due to the complex hydrology influenced by permafrost features, stream connection, and ground and surface flows that varies spatially, it seems unlikely that the assumption that every lake will recharge many time more than the maximum amount of permitted water would remain true across the development area. We ask BLM to provide more information about how it assessed the cumulative impacts of water withdrawal and lake recharge rates in the permitted lakes within the development area.

12) 4.6.4.1 Physical Characteristics

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> Inadequate design and placement of structures, culverts, or bridges and unbreached or slotted ice bridges could cause impoundments, streambank erosion, and scour and sedimentation at stream crossings, thereby altering natural sediment transport and deposition, and creating scour holes or channel bars. Through 2011, oil and gas activities have caused approximately

[15-182] BLM states that "Inadequate design and placement of structures, culverts or bridges and unbreached or slotted ice bridges could cause impoundments, streambank erosion, and scour and sedimentation at stream crossing." It is highly likely that these effects will occur if inadequate design and placement of structures is repeated in the proposed development area. We ask BLM to change the wording of this statement from "could" to "will likely" and provide evidence of negative impacts from nearby areas in the North Slope, AK.

13) 4.6.4.2 Biological Resources

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> The BLM (2004) found that the direct, indirect, and cumulative impacts to fish and fish habitats are expected to be localized, minor, additive, and are not expected to be synergistic. Although there is a potential for large impacts to fish from large oil spills, the risk of such spills is relatively small. The probability is higher for smaller spills, but the impacts from such spills, if they entered freshwater habitats, would likely be small, temporary, and additive and unlikely to severely affect fish populations, especially in light of control and cleanup activities implemented in response to spill events (BLM 2004, § 4G.6.2). Effects on fish from North Slope oil spills on land thus far have not accumulated because the spills have been small and cleanup and rehabilitation efforts have generally been successful (BLM 2012, § 4.8.7.7). A large spill reaching Crea Creek or the Tiŋmiaqsigvik (Ublutuoch) River could have long-term adverse

[15-183] BLM states that "the direct, indirect, and cumulative impacts to fish habitats are expected to be localized, minor, additive, and are not expected to be synergistic." But upon review of the 2004 Alpine FEIS, it is not clear how the BLM came to the conclusion that effects on fish and fish habitat will be additive and not synergistic throughout aquatic ecosystems in the development area. We ask BLM to provide information and or research in the DSEIS which outlines how this was determined in order to more accurately assess the cumulative impacts.

14) 4.6.4.2 Biological Resources

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> The 2012 IAP/EIS found that gravel infrastructure (roads, pads, airstrips) and gravel mining associated with North Slope oil and gas development and production have caused effects on fish that have accumulated by impeding fish movements and significantly altering the physical and chemical conditions of fish habitat. Oil and gas development and production in the Chukchi Sea,

[15-184] BLM states that there have been major effects on fish by impeding fish movement and significantly altering the physical and chemical conditions of fish habitat. We ask BLM to address how it plans to minimize similar effects on fish habitat in the proposed GMT1 and GMT2 development area.

15) 4.6.4.2 Biological Resources

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> effects on fish by allowing fish to reach habitats that were previously made inaccessible. Since many abandoned North Slope gravel mines have provided additional overwintering and spawning habitat for fish, it is assumed that future efforts would produce similar results and lead to cumulative effects that are positive for fish (BLM 2012, § 4.8.7.7). Thus there is countervailing potential that reclamation of the Clover site might be converted to a deep water lake providing overwinter fish habitat. Likewise, final cleanup at the Umiat landfill would be beneficial and important.

[15-185] BLM concludes that fish use abandoned gravel pits for spawning and overwintering, which gives a biased perception that gravel pits can replace naturally occurring spawning and overwintering habitat. We ask BLM to provide evidence that fish populations are using newly created gravel pits for spawning and overwintering. Alternatively, we suggest that BLM modify the statement.

[15-001]
Section 5.3 of the BLM NEPA Handbook and CEQ regulations describe the conditions under which supplementation must occur. The Handbook provides that supplementation to the current (draft or final) EIS is necessary only in the case of: (1) substantial changes to the proposed action that are relevant to environmental concerns; (2) addition of a new alternative beyond the scope of analyzed alternatives; or (3) significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its effects. Corrections to flight need estimates and water use data do not provide significant new information relevant to environmental concerns. The effects of these changes remain within the range of effects analyzed in the Draft SEIS. Erroneous data in the Draft SEIS has been corrected for the Final SEIS, thus a supplement to the Final SEIS will not be issued. A seasonal restriction on timing of drilling activity at the GMT1 pad is qualitatively within the range of alternatives analyzed in the Draft SEIS. A seasonal restriction is a variation of the timing of activity on the pad, however, the nature and context of the impacts of drilling at GMT1 remain the same.

[15-002]
See response to Comment 15-001.

[15-003]
See response to Comment 15-001.

[15-004]
See response to Comment 15-001.

[15-005]
See response to Comment 15-001.

[15-006]
Spill response plans are publicly noticed on the Alaska Online Public Notice System. Spill response plans are typically posted for a 30 day public comment period and the plans are available to the public. Spill response plans are typically hundreds of pages long documents, and most often someone would need to review them in an ADEC office or a local government office in the area where the operation is taking place. Hard copies are also available in Nuiqsut and Barrow. The only electronic documents currently available regarding spill response plans are the approval letters which can also include specific stipulations that are required for plan approval. It is not a regulatory requirement that plans be made available as an electronic document. However, BLM coordinated with ADEC, and DEIC will make the amended spill plan available on its website so that the public may more easily access it.

[15-007]
The Final SEIS includes additional information of GMT2 and the Bear Tooth Unit.

[15-008]
GMT2 will be shown on maps addressed in the Cumulative Impacts section. It was not considered in the GMT1 analysis and therefore will not be displayed on maps used in the Affected Environment section (Chapter 3) of the Final SEIS.

[15-009]
The Final SEIS includes additional information of GMT2 and the Bear Tooth Unit.

[15-010]
Fiord West has been on hold since 2010. It was analyzed in the 2004 ASDP EIS. Although the offshore oil and gas exploration and development will continue, there are no current development proposals within the geographic range described in the Cumulative Impacts section. The Final SEIS includes additional information of GMT2 and the Bear Tooth Unit, including road development to these sites.

[15-011]
The Final SEIS includes additional information of GMT2 and the Bear Tooth Unit. GMT2 and other pads in the GMT Unit are premised on using the facilities at Alpine CPF for processing

[15-012]
Additional language from the NPRPA has been incorporated into the Purpose and Need Statement to address DOI's responsibility to protect surface resources.

[15-013]
BLM has revised the impacts comparison throughout the Final SEIS for Alternative D (now Alternative D1) to provide a better distinction between alternatives, and differing impacts of linear fill as opposed to one large area of gravel fill. Updated numbers on flights are incorporated into the Final SEIS. BLM and the cooperating agencies have reviewed the necessary infrastructure required at the GMT1 pad for Alternatives D1 and D2.

[15-014]
BLM has analyzed seasonal drilling, with no road between GMT1 and CD5, in detail as Alternative D2. BLM has analyzed the differences in impacts to all resources in the Final SEIS.

[15-015]
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft as described in Alternatives D1 and D2.

[15-016]
The size of the seasonally drilled pad under Alternative D2 would be slightly reduced, compared to Alternative D1. However, required infrastructure on the GMT1 pad differs from that at CD3.

[15-017]
A full economic analysis was performed for seasonal drilling as described in Alternative D2. An independent economic third-party analysis was performed to determine whether such restriction would result in the project being economically infeasible.

[15-018]
Spill response plans are typically posted for a 30 day public comment period and the plans are available to the public. The actual spill response plans themselves are typically hundreds of pages long and found in thick binders and most often someone would need to review them in an ADEC office or a local government office in the area where the operation is taking place (BlueCrest's plan can be found at the Homer City Hall). If needed, confirmation on if the SPAR program would have the spill response plan available to North Slope communities could be obtained. The only electronic documents currently available regarding spill response plans are the approval letters which can also include specific stipulations that are required for plan approval. While it would be more convenient for public reviewers for the plans to be made

available as an electronic document, that is not a current regulatory requirement. A public record request could be filed to obtain the document, but if the spill response plan is over 200 pages, then there is a charge $0.25 per page for copies.

[15-019]
Pull outs will be incorporated as part of the final road design, after the road is walked and surveyed. Pull outs will be determined in consultation with the residents of Nuiqsut.

[15-020]
The Final SEIS includes revised information on aircraft flights. Under alternatives that include a gravel road between CD5 and GMT1, goods will be brought in year-round via gravel road, thus decreasing the amount of storage space needed on the GMT1 pad.

[15-021]
Updated flight information is incorporated in the Final SEIS and updates to the resource impacts have been made.

[15-022]
The BLM does consider alternatives to proposed access as part of the activity-level permitting process. This level of detail is considered when the applications for such studies are received by the BLM with sufficient detail to analyze the proposed activity's impacts, and applies mitigation in order to minimize the identified impacts.

[15-023]
TWS's suggested placement of the airstrip in its figure is infeasible due to FAA regulations. Moving the pad northeast would locate the "center line" of the airstrip within a required buffer zone surrounding the drilling rig. The FAA setback for a rig derrick with a height of 205 feet is 1,935 feet. See 14 CFR 77.19 (e).

[15-024]
TWS's suggested placement of the airstrip in its figure is infeasible due to FAA regulations. Moving the pad northeast would locate the "center line" of the airstrip within a required buffer zone surrounding the drilling rig. The FAA setback for a rig derrick with a height of 205 feet is 1,935 feet. See 14 CFR 77.19 (e).

[15-025]
BLM may select components of various alternatives in its Preferred Alternative. Because the pipeline routed outside of the Fish Creek setback was analyzed under Alternative B, BLM may select that route as the Preferred even if there is no road associated with it.

[15-026]
BLM reviewed the list of necessary equipment to be used under Alternative D1, and determined the necessity of equipment listed. BLM is also analyzing a seasonal drilling alternative as Alternative D2.

[15-027]
BLM is working with its permittees when giving out study permits to reduce impacts on subsistence users in study areas. BLM also uses its Subsistence Advisory Panel to consult with subsistence users to get feedback on ways to make studies and camps less impactful. These actions are performed separately from the SEIS analysis as part of the activity-level permitting process. This level of detail is considered when the applications for such studies are received by

the BLM with sufficient detail to analyze the proposed activity's impacts, and applies mitigation in order to minimize the identified impacts.

[15-028]
GMT1 is proposed as a satellite to the Alpine Central Processing Facility, where all production is designed to be processed into single phases, measured, then sold, reinjected, or used for fuel. Processing capacity at ACPF was designed around eventual production from western Alpine Satellites. Operational economics of these facilities and further exploration and development to the west relies on consistent production through this facility. Performing 3-phase separation on pad will require a facility comparable to ACPF at GMT1, drastically increasing pad size and adding risks for air quality and other environmental impacts. Although pipeline corrosion concerns would be notably reduced, single phase flow does not eliminate the need for pipeline monitoring. Pipeline designs and corrosion inspection and control measures shall be appropriate for pipelines under all anticipated ranges of 3-phase flow.

CPAI has filed applications with BLM for approval of commingling and allocation of GMT Unit production with other Alpine production as well as off-lease measurement and numerous metering variances such as multiphase metering. In accordance with IM 2013-152 and other applicable policy, the BLM is performing a technical review of these applications to determine whether the proposed production handling and measurement systems designs meet or exceed the intent of BLMs minimum standards. CPAI is engaged in the review process and is evaluating and responding to BLMs technical recommendations or additional requirements as they are discussed.

Under Alternatives D1 and D2, the impacts of injecting drilling muds and waste fluids on the pad are analyzed. Under Alternatives A, B, and C, CPAI proposes to haul this waste back for injection at CD1. There are indeed environmental, economic, and production accountability benefits to onsite processing and disposal of drilling wastes over offsite disposal. However, increased pad footprint and onsite heavy equipment activity create numerous risks which offset these benefits. The on-site waste disposal well results in much larger gravel footprint, as well as duplicative equipment on the GMT1 pad. ACPF already has a proven disposal well with capacity designed to handle these materials. No other disposal wells have been drilled in this area and due to varying rock conditions, there is technical uncertainty about establishing injectivity into the similar geologic formations as ACPF uses for disposal. CPAI would likely need to drill and test a well capable of sufficient injectivity rates long before drilling the first production well to justify relying on that as a disposal method.

'Extreme winter cold' occasionally but consistently effects Arctic winter drilling operations to the extent that drilling is shut in, sometimes days at a time. CPAI constantly observes temperature, wind chill, and blowing snow conditions and will shut down most or all rig operations for the protection of crew and equipment when combinations of these factors exceed what local experience proves to be safe working conditions. To clarify, spill control and cleanup measures become technically simpler as temperature drops since cold oil resists flow and cannot penetrate ice, and brine freezes; however, human personnel and response equipment would face the same challenges as what the rig crew and drilling rig face in extreme winter cold conditions. Either way, drilling will cease as a result of extreme winter cold, regardless whether for the purpose of safe drilling operations of spill control and cleanup. Spill control and cleanup equipment should still be designed to operate reliably in extreme cold conditions.

[15-029]
The BLM will consider the analysis of leak detection systems, corrosion and integrity programs using best practicable technology.

[15-030]
Multiple forms of transportation will be analyzed and should be included for emergency response. This should also be considered in the ODPCP. Certain circumstances such as a catastrophic oil spill could warrant the use of certain permits for additional response vehicles.

[15-031]
Kuukpik's opposition to Alternative C is discussed in the Final SEIS.

[15-032]
The Final SEIS includes additional analyses of cumulative activities. There are currently no plans on development in any NPR-A Special Areas.

[15-033]
The Final SEIS includes additional development as well as roadless development. The analysis will include development at GMT2 and Bear Tooth Units. Other development would be speculative. See the 2012 NPR-A IAP/EIS Chapter 4 for discussion of development scenarios in NPR-A.

[15-034]
The commenter is correct, materials for continued development may be difficult to locate. However, material sources reserve-wide do not need to be addressed in this SEIS. The SEIS specifically addresses the GMT1 project. In the Draft SEIS the Clover Material site was the preferred gravel source. However, CPAI alerted BLM of its intent to use the ASRC Mine site shortly after publication of the Draft SEIS. Opening of the Clover site will require a separate NEPA analysis and BLM authorization. Unknown gravel sources are not addressed in this SEIS. Applicants for continued development in NPR-A will need to determine where potential material resources are located and the feasibility of the resource extraction. Analysis of gravel mining, including cumulative impacts, were provided in the NPR-A EIS.

[15-035]
The ASRC Mine site is currently proposed as the potential gravel source. CPAI alerted BLM of its intent to use the ASRC Mine site shortly after publication of the Draft SEIS. Section 2.4.6 of the Draft SEIS states that the Clover material site contains the 626,000 cubic yards of material needed for this project. The ASRC material site contains over 1 million cubic yards of material in its current pit and a significant amount more in its Phase 3 pit. This Final SEIS is based on the GMT1 development. GMT2 has not been proposed at this time and it is unknown when it might be. The gravel material in the Clover mineral site and the ASRC mine site will likely provide the necessary material needed for the development of the GMT1.

[15-036]
This Final SEIS addresses the GMT1 development. Review of alternative technologies to make roads unnecessary is outside the scope of this SEIS.

[15-037]
The Final SEIS includes additional data on road and air traffic. Traffic levels at GMT2 during construction would likely be similar to GMT1, but Bear Tooth traffic levels have yet to be determined and any attempt to characterize this traffic would be speculative.

[15-038]
A figure that includes all of the existing infrastructure has been included in the Cumulative Impacts section for the Final SEIS.

[15-039]
BLM makes locations of drilling activity by company in NPR-A since 2000 available in a table on the following webpage: http://www.blm.gov/ak/st/en/prog/energy/oil_gas/NPR-A/NPR-A_oilandgasactivity.html. BLM cautions that exploration activity does not necessarily indicate where future development may occur. Areas of future development are explained in Section 4.8.3.2- Reasonably Foreseeable Future Exploration and Development of the 2012 NPR-A IAP/EIS.

[15-040]
The FEIS includes additional analysis of GMT2 development as well as roadless development.

[15-041]
The purpose of the analysis is to evaluate the incremental effect of each alternative on top of the past, present, and reasonably foreseeable future activities in a relatively broad geographic area. Given the relatively small size of the GMT1 pad in the context of oil and gas development on the North Slope, the incremental effect of one drill site in the Alpine Field is not vastly different among BLM's alternatives. To aid in the cumulative analysis, BLM assumes that if GMT1 is permitted without a road to CD5, there would not be a road to GMT2.

[15-042]
An impact summary table similar to Table 4.1-2 has been included in the Section 4.6, Cumulative Impacts, so that all alternatives can be viewed simultaneously.

[15-043]
Section 4.6 of the Final SEIS, Cumulative Impacts includes information on increased use of ice roads in the future, but BLM does not have specific information on ice roads near the Beaufort Sea. The Final SEIS includes additional analysis on roadless development.

[15-044]
In the immediate vicinity of the proposed project, Section 4.6, Cumulative Impacts includes Alpine, GMT1 and GMT2, and Bear Tooth Units.

[15-045]
The Final SEIS includes additional maps and analysis.

[15-046]
The Raynolds, 2014 study has been incorporated into the Final SEIS.

[15-047]
The Raynolds, 2014 study has been incorporated into the Final SEIS.

[15-048]
For purposes of the cumulative effects analysis, BLM assumes that for Alternatives D1 and D2, there would be no road connection between CD5, GMT1 and/or GMT2. GMT2 would be subject

to its own NEPA analysis in the future, at which point BLM would determine whether to authorize a road between GMT1 and GMT2.

[15-049]
Alternative D describes the use of an occupied structure pad, and a drill site pad. The drill pad for Alternative D is 15.7 acres. It is not clear whether the occupied structure pad was considered in the 2004 ASDP EIS. CPAI's CD6 permit applications submitted January 4, 2005 included a gravel pad size of only 9.1 acres for fewer wells (less than 33). In the permit application, the following detail was provided for GMT1 (CD6) in the Project Description:
Standard drill site features for each location:

- Up to 32 wells
- Emergency shutdown valve skid
- Test separator
- Electrical control module
- Pig launching/receiving facility
- Chemical injection module
- Production heaters
- New pipelines to transport water, MI, lean gas, and produced fluids
- Communication Towers
- Lighting as needed

Specific additional features for each location include:

- CD6 will include on site power generation and a backup generator
- A power line from CD6 to CD7 placed on poles. The poles will be located approximately 250 feet apart (as per email from Lynn DeGeorge to Bridget Psarianos 5/29/2014).

[15-050]
The Alpine Erosion Control Plan discusses snow removal in Section 3.1.2 on page D-17; and gravel deposition removal in Section 3.4 on page D-22. CPAI selects snow push areas annually avoiding areas of thermokarsting, proximity to water bodies, and evaluating how the area looks based on previous years activities. There will be some gravel on the tundra as it is not preventable. Due to annual changes, these areas cannot be identified in the Final SEIS.

[15-051]
Road water and dust control is accounted for in the Alpine Erosion Control Plan. Fugitive road dust, roadside flooding, thermokarsting and other indirect impacts are addressed within the SEIS for all alternatives.

[15-052]
BLM will work with CPAI and residents of Nuiqsut to determine the best placement for turn-outs based on safety and subsistence considerations. The text of this mitigation measure will be edited to require CPAI to consult with residents of Nuiqsut and BLM regarding placement of pullouts during the final road design.

[15-053]
Ground vehicle numbers have been incorporated into the Final SEIS.

[15-054]
BMP G-1 from the 2012 IAP/EIS requires that land used for oil and gas infrastructure be reclaimed to ensure eventual restoration of ecosystem function.

[15-055]
Habitat fragmentation has been addressed qualitatively in the Final SEIS, however, a quantification of habitat fragmentation metrics has not been completed for the project area.

[15-056]
The GMT1 DEIS addresses this concern. Additional culverts have been added and bridge widths were designed to span the entire low-water channel. BLM will evaluate if a new mitigation measure to monitor for sedimentation and impoundments along the road system and take corrective measures will be included in the Final SEIS.

[15-057]
Gravel mining, hauling and placement will occur during one season. The number of vehicle round-trips between the selected material site and GMT1 construction locations are discussed in Chapter 2 of the Final SEIS.

[15-058]
All road maintenance activities are described in the Alpine Facilities Erosion Control Plan, which was included as Appendix C Volume 2 of the Draft SEIS, and is included on the BLM web site: http://www.blm.gov/ak/st/en/prog/energy/oil_gas/npra/GMTU_proposed_dev_proj.html. Detail on what the agencies expect regarding gravel on tundra is also discussed. This would be gravel from snow push areas or any other activity.

[15-059]
The commenter is correct, materials for continued development may be difficult to locate. However, material sources reserve-wide do not need to be addressed in this SEIS. In the Draft SEIS the Clover Material site was the preferred gravel source. However, CPAI alerted BLM of its intent to use the ASRC Mine site shortly after publication of the Draft SEIS. Opening of the Clover site will require a separate NEPA analysis and BLM authorization. Unknown gravel sources are not addressed in this Final SEIS. Applicants for continued development in NPR-A will need to determine where potential material resources are located and the feasibility of the resource extraction. Analysis of gravel mining, including cumulative impacts, were provided in the NPR-A EIS.

[15-060]
Alternative A was designed by CPAI to avoid areas that are less wet to optimize road stability. CPAI stated that gravel roads in wetter areas sink over time and may require additional periodic gravel fill. As a result of moving the road and pipeline route away from the Fish Creek setback, the route traverses more semi-permanently flooded emergent meadow than Alternative A.

[15-061]
The Final SEIS includes additional information on air traffic. Analysis of impacts are provided in 4.3.3 Birds, 4.3.4 Mammals, 4.3.5 Threatened and Endangered Species, and 4.4.6 Subsistence.

[15-062]
BLM is considering adding mitigation to reduce aircraft impacts to subsistence use and resources. New aircraft data summarizes number of flights per month for the current project and types of activity.

[15-063]
While BLM requires aircraft plans from permittees, development of an aircraft transportation plan for the Northeast NPR-A is outside the scope of the SEIS.

[15-064]
The Final SEIS includes revised aircraft data, including for Alternatives D1 and D2. The revised numbers still require nearly the same or increased flights for special studies under Alternatives D1 and D2 than the "roaded" alternatives, with the exception of certain months during initial construction.

[15-065]
Injection of wastes at the GMT1 pad is a component of Alternatives D1 and D2 as discussed in Sections 2.8 and 2.9.

[15-066]
The Final SEIS includes Alternative D2, which considers winter drilling only.

[15-067]
Section 5.3 of the BLM NEPA Handbook and CEQ regulations describe the conditions under which supplementation must occur. The Handbook provides that supplementation to the current (draft or final) EIS is necessary only in the case of: (1) substantial changes to the proposed action that are relevant to environmental concerns; (2) addition of a new alternative beyond the scope of analyzed alternatives; or (3) significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its effects. Corrections to flight need estimates and water use data do not provide significant new information relevant to environmental concerns. The effects of these changes remain within the range of effects analyzed in the Final SEIS. Erroneous data in the Final SEIS has been corrected for the Final SEIS, thus a supplement to the Final SEIS will not be issued. A seasonal restriction on timing of drilling activity at the GMT1 pad is qualitatively within the range of alternatives analyzed in the Draft SEIS. A seasonal restriction is a variation of the timing of activity on the pad, however, the nature and context of the impacts of drilling at GMT1 remain the same.

[15-068]
The revised flight data includes the months during which flights are expected to occur, and are distinguished among alternatives. The Final SEIS also includes a map and a table in Alternative E showing the location and number of take offs and landings by year near the project area, and is intended as background so that the public gets a sense of the flights that are ongoing in NPR-A

[15-069]
The Final SEIS includes additional information on aircraft activity.

[15-070]
The BLM does consider alternatives to proposed access as part of the activity-level permitting process. This level of detail is considered when the applications for such studies are received by

the BLM with sufficient detail to analyze the proposed activity's impacts, and applies mitigation in order to minimize the identified impacts.

[15-071]
Two maps of fall migration that were included with the ADNR comments are included in the Final SEIS.

[15-072]
The Dalton Highway was not included in the scope of the cumulative effects analysis, except as a terminus for other potential future transportation routes. The response of the TCH to this highway has been discussed briefly in Person et al. (2007) which is cited in the 2012 EIS to which the Final SEIS is tiered. The road has been in place for 40 years but members of the TCH have encountered it in only some of the last 10 years.

[15-073]
Impacts of the road, both positive and negative, are discussed in greater detail in the Final SEIS in 4.4.6, Subsistence. It is clearly stated that subsistence hunters' preference for a roaded alternative does not indicate that the road would have minimal impacts, but that the relative intensity of those impacts compared to the impacts of increased aircraft traffic are behind that preference. The BLM has an established BMP (E-1) that requires all roads to be designed to protect subsistence use and access. BLM is working with the Applicant to ensure that road design would accommodate Nuiqsut residents.

[15-074]
BLM agrees that increased traffic from local residents may be expected in the area as a result of the Nuiqsut Spur Road, and this will be noted in the Final SEIS. Further, BLM agrees with the statement on caribou, which will be added to Chapter 4 impacts on caribou.

[15-075]
This question itself is subject to debate, without enough data on aircraft effects to resolve the debate in the Draft SEIS analysis. Western science, although with little data for aircraft effects, tends to lean toward roads having a greater effect, especially if heavy traffic is present. A proposed mitigation measure for effects of traffic may be included in the Final SEIS. Traditional Ecological Knowledge on the other hand suggests that aircraft are the greater disturbance factor.

[15-076]
Although some caribou distribution data are collected by aerial surveys, at best anecdotal evidence on caribou reactions to those flights are recorded, and these data do not lend themselves to quantitative analysis. Traditional Ecological Knowledge provides a similar type of data. Therefore no analysis in the Draft SEIS or Final SEIS focuses on this issue.

[15-077]
Although some caribou distribution data are collected by aerial surveys, at best anecdotal evidence on caribou reactions to those flights are recorded, and these data do not lend themselves to quantitative analysis. Traditional Ecological Knowledge provides a similar type of data. Therefore no analysis in the Draft SEIS or Final SEIS focuses on this issue.

[15-078]
These issues are addressed in the Final SEIS.

[15-079]
Per consultation between BLM and Audubon society on 6/2/14, requested level of consideration for the CEA/Audubon's avian resource analysis (decision tool and developed maps) to be included in the Final SEIS is recognition that the CEA is a high-value avian area. Language has been added to the cumulative impacts discussion in the Final SEIS and Audubon-provided resources are included within the administrative record.

[15-080]
Per consultation between BLM and Audubon society on 6/2/14, requested level of consideration for the CEA/Audubon's avian resource analysis (decision tool and developed maps) to be included in the Final SEIS is recognition that the CEA is a high-value avian area. Language has been added to the cumulative impacts discussion in the Final SEIS and Audubon-provided resources are included within the administrative record.

[15-081]
Although the Alaska WatchList (Kirchhoff and Padula, 2010) presents a concise summary of the apparent status of several birds found within the ASDP, use of this non-governmental evaluation to infer population status or focal species is unlikely to significantly improve the avian evaluation. For example, most of the birds within the ASDP identified as “declining” (Red List) in the Alaska WatchList also have a special status listing by the USFWS or BLM, or are currently used as a focal species in the evaluation. The only species on the Red List not listed as “threatened” or “birds of conservation concern” by the USFWS, or as “sensitive species” by the BLM, are the Canada goose, king eider, common eider, and American golden-plover. The Canada goose is listed as "sensitive" by the BLM, but this listing only applies to the dusky subspecies that breeds in the Copper River Delta. Similarly, the Red List refers specifically to the dusky subspecies. The king eider is a focal species discussed in the text. Common eider and American golden-plover are relatively common breeders in the ASDP. Historically, populations of common eider appear to have declined in portions of their Alaskan distributions, although more recently populations on the ACP appear to be stable or increasing (Stehn et al. 2013). Relative to other shorebirds in the ASDP, the overall population of American golden-plovers is large (Morrison et al, 2006).

[15-082]
Per consultation between BLM and Audubon society on 6/2/14, requested level of consideration for the CEA/Audubon's avian resource analysis (decision tool and developed maps) to be included in the Final SEIS is recognition that the CEA is a high-value avian area. Language has been added to the cumulative impacts discussion in the Final SEIS and Audubon-provided resources are included within the administrative record.

[15-083]
BLM feels that the stipulations and BMPs and requirement for effectiveness monitoring (NPR-A ROD 2013) provides for long-term impacts of oil and gas monitoring and that no other additional monitoring is necessary. Numerous stipulations and BMPs are in place to effectively protect birds and their habitats within the NPR-A. These include BMPs A-1 through A-7 and E-9, which ensure that solid, liquid, and hazardous wastes (including fuels) do not impact birds or their habitats, and to reduce the potential for garbage and shelters that attract predators. The protection of bird habitats and food sources are addressed by BMPs B-1, C-3, C-4, and Stipulations E-2 and L-1, among others. In addition, there are BMPs and stipulations that regulate the types of activities that can occur near waterbodies, including rivers and streams, types of equipment that can be used in the planning area, will serve to protect birds and their habitats. Effectiveness monitoring is required by the 2013 NPR-A ROD: Monitoring to evaluate

the effectiveness of project designs and mitigation measures and thereby guide adaptive management. Project proponents shall be responsible for funding monitoring, by private or government parties, to assess the effectiveness of project designs and required mitigations in protecting resources. Project proponents may also be required to develop a plan, approved by BLM, for adaptive management programs associated with their project. As with baseline monitoring, the type and scale of such studies will be determined based on the characteristics of the proposed project and location, and the BLM will work with project proponents to coordinate any necessary surveys to ensure that consistent methods are used and that surveys are not unnecessarily duplicative.

[15-084]
BLM feels that the stipulations and BMPs and requirement for effectiveness monitoring (NPR-A ROD 2013) provides for long-term impacts of oil and gas monitoring and that no other additional monitoring is necessary. Numerous stipulations and BMPs are in place to effectively protect birds and their habitats within the NPR-A. These include BMPs A-1 through A-7 and E-9, which ensure that solid, liquid, and hazardous wastes (including fuels) do not impact birds or their habitats, and to reduce the potential for garbage and shelters that attract predators. The protection of bird habitats and food sources are addressed by BMPs B-1, C-3, C-4, and Stipulations E-2 and L-1, among others. In addition, there are BMPs and stipulations that regulate the types of activities that can occur near waterbodies, including rivers and streams, types of equipment that can be used in the planning area, will serve to protect birds and their habitats. Effectiveness monitoring is required by the 2013 NPR-A ROD: Monitoring to evaluate the effectiveness of project designs and mitigation measures and thereby guide adaptive management.

[15-085]
BLM will evaluate if a new monitoring requirement will be included in the Final SEIS.

[15-086]
The Final SEIS includes additional information on aircraft activity.

[15-087]
The Final SEIS incorporates results from previous hydrologic studies related to water withdrawals, and will incorporate the best available practices in the placement of roads, pads, bridges and culverts related to oilfield development. Additional monitoring requirements after construction is completed will insure impacts with be addressed and minimized to the fullest extent.

[15-088]
The BLM can provide GIS files as they are available as requested by users.

[15-089]
The ADNR issues and manages permits for water withdrawals in the NPR-A. The BLM reviews these permits to insure water withdrawals are within the maximum allowable amounts for specific types of lakes and activities. The BLM has a water resource monitoring program which makes water quantity and quality results available as the data is completed. Presently it is in development at http://ine.uaf.edu/werc/projects/NPR-A-hydrology/Default.aspx. Other historical data is available at http://waterdata.usgs.gov/ak/nwis/si

[15-090]
The BLM acknowledges the changing environment and has a robust weather monitoring program which will insure atmospheric climatic impacts will be known within the NPR-A. Water resources will be accordingly affected by climatic changes and impacts will be incorporated into future research, monitoring and mitigation requirements within the NPR-A. If there are long-term water withdrawals projected to occur at specific lakes, then additional data such as detailed bathymetry would be required to verify the accuracy of the volume of water present.

[15-091]
Analysis of potential impacts to fish and fish habitat does not hinge greatly on the absence (i.e. non-detecting) of species. Proposed infrastructure routing under the different alternatives is evaluated by considering all fish-bearing lakes and streams as viable fish habitat.

[15-092]
The BLM's approach to analyzing actions in relation to overwintering habitat is not species-specific and also does not select one set depth as a breakpoint to designate overwinter habitat. Instead, it is habitat-based by considering all areas of liquid water in late winter to be potential overwinter fish habitat (as well as incorporating overwinter locations known from radio telemetry). This has been accomplished in the GMT1 area by using multiple approaches and technologies. This is a conservative approach by overestimating the extent and locations of overwinter habitat, since not all liquid water areas will have sufficient depth and dissolved oxygen to support fish species. See Figure 3.3-2 and the data sources utilized to generate the map.

[15-093]
There is no evidence to date suggesting that the current winter water use standards are negatively impacting lakes. See the 2012 NPR-A IAP/EIS (Vol. 2, Chapter 4, page 150, first paragraph) for a discussion and multiple references to support this.

[15-094]
The BLM's approach to analyzing actions in relation to overwintering habitat is not species-specific and also does not select one set depth as a breakpoint to designate overwinter habitat. Instead, it is habitat-based by considering all areas of liquid water in late winter to be potential overwinter fish habitat (as well as incorporating overwinter locations known from radio telemetry). This has been accomplished in the GMT1 area by using multiple approaches and technologies. This is a conservative approach by overestimating the extent and locations of overwinter habitat, since not all liquid water areas will have sufficient depth and dissolved oxygen to support fish species. See Figure 3.3-2 and the data sources utilized to generate the map.

[15-095]
There is no evidence to date suggesting that the current winter water use standards are negatively impacting lakes. See the 2012 NPR-A IAP/EIS (Vol. 2, Chapter 4, page 150, first paragraph) for a discussion and multiple references to support this.

[15-096]
Aside from fully protected areas that allow no oil and gas infrastructure, some BMPs allow for essential pipeline and road crossings through setback areas. This language is typically a part of the BMP and is not an exception. For example, BMP K-1: "On a case-by-case basis, and in consultation (with other agencies)...essential pipeline and road crossings to the main channel will be permitted through setback areas."

[15-097]
A full assessment of the potential impacts on fish and fish habitat from roads, as related to runoff patterns, runoff content, and stream crossings is described in the 2012 NPR-A IAP EIS (section 4.3.7.2). This knowledge is then applied to specific water bodies within the GMT1 area, regarding which of the alternatives presents the greatest risk to fish resources overall. This is done using the best, most recent information available. The detail of information required to conduct more complex ecological modeling is not available.

[15-098]
The state is required to permit the road (including culverts) and bridges (the ADFG Fish Habitat permitting authority); CPAI has not submitted a road permit application yet, as BLM had not determined its Preferred Alternative as of the Draft SEIS. Once the final road alignment is chosen it will need to be surveyed, and CPAI (or its contractor) will walk the road to note low areas where culverts should be based on on-the-ground data. ADF&G thinks that culverts will be closer than the 500 ft used in SEIS, because they are everywhere else on roads associated with oil and gas development on the North Slope

[15-099]
An average culvert spacing of 500 ft is designed to reduce impacts from impounding water upstream of the road system. The Alpine Facilities Erosion Control Plan will monitor for any adverse impacts and take corrective action to insure the effectiveness of culvert placement and the ability for fish passage to occur.

[15-100]
The BLM will not solely determine where and of what type culverts and bridges would be placed in the GMT1 area. Experts in other agencies that routinely address these issues will be providing input and approving structure placement and design, including the Corps and ADF&G Habitat Division.

[15-101]
The BLM will not solely determine where and of what type culverts and bridges would be placed in the GMT1 area. Experts in other agencies that routinely address these issues will be providing input and approving structure placement and design, including the Corps and ADF&G Habitat Division.

[15-102]
CPAI and ADF&G had extensive negotiation on the bridges based on data and studies, including modeling flood events. The bridge abutments are now located out of the Ublutuoch channel and up onto the banks-which is part of the current design. The location is the only feasible site in the vicinity and was selected based upon best engineering practice, ADF&G review and Kuukpikmuit Subsistence Oversight Panel, Inc. (KSOP) input. The current bridge length allows the abutments to be located above the high-water banks and outside of the normal floodplain (which far exceeds technical requirements for passing the stream flow). Sheet pile abutments are utilized in order to conform to the 2004 ROD stipulations. Span lengths were developed, again with input from KSOP, to balance the technical needs of a drill-rig capable structure while protecting the environment (aquatic species, willows, etc.) and to provide navigational clearance in the summer water channel. The bridge height was also set to provide 15 feet of clearance above the summer water level based upon vessel criteria provided by KSOP. Lastly, the bridge design itself is modeled after CD5 and is typical of North Slope Bridge design capable of supporting the weight of mobile drill rigs.

[15-103]
There is no evidence to date suggesting that the current winter water use standards are negatively impacting lakes. See the 2012 NPR-A IAP/EIS (Vol. 2, Chapter 4, page 150, first paragraph) for a discussion and multiple references to support this.

[15-104]
Until a final Alternative is chosen, it is unknown which lakes will be chosen for water withdrawals and the amounts needed. BMP B-2 will maintain the natural hydrologic regime and may require that withdrawals from these lakes occur only when waters have been replenished from the previous season's withdrawals. This will insure there will be no cumulative impact upon specific lakes. The BLM, as a condition of winter exploration permits, requires weekly water use reports. Additional water quality monitoring may be required for withdrawals from lakes of special concern. Table 2.4-2 lists water use quantities for all alternatives.

[15-105]
It is standard practice for industry to permit the maximum allowable water available for their winter permits from lakes along their route. Potential impacts from these projected withdrawals are assessed and mitigation developed as needed which could include monitoring water quality when DO and water levels are at their minimum. It is uncommon for lakes to be pumped to their maximum permitted allowance.

[15-106]
The BLM has required weekly and monthly water quality and quantity monitoring in the past as a condition for withdrawals from lakes of special concern. Presently the BLM requires weekly water withdrawal reports from all permittees.

[15-107]
The project study area is a 2.5 mile buffer from infrastructure. While it is true that subsistence users do access areas within that 2.5 mile buffer by boat (particularly Nigliq Channel and Fish Creek), areas affected by new infrastructure are most commonly accessed using overland methods of travel (i.e., snowmachine and four-wheeler). Thus, the original analysis focused on overland use of the area. The revised Subsistence sections (Sections 3.4.5 and 4.4.5) were expanded to also address the use of the area by boat.

[15-108]
The BLM is revising the impacts comparison throughout the document for Alternatives D1 and D2 to provide a better distinction between linear fill as opposed to one large area of gravel fill.

[15-109]
The Final SEIS includes additional information on aircraft activity including projections for GMT2 and Bear Tooth.

[15-110]
The number of flights by season are calculated, and considered in the respective sections.

[15-111]
BLM's analysis of seasonal drilling (Alternative D2) does not find that it would have fewer or less intense impacts in large part because local residents prefer to avoid the impacts associated with

ice roads, any potential for additional aircraft, and prefer the facilitated access that a road would provide for hunting and oil spills.

[15-112]
While BLM requires aircraft plans from permittees, development of an aircraft transportation plan for the Northeast NPR-A is outside the scope of the SEIS.

[15-113]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources.

[15-114]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources.

[15-115]
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources. The BLM does consider alternatives to proposed access as part of the activity-level permitting process. This level of detail is considered when the applications for such studies are received by the BLM with sufficient detail to analyze the proposed activity's impacts, and applies mitigation in order to minimize the identified impacts.

[15-116]
The BLM does consider alternatives to proposed access as part of the activity-level permitting process. This level of detail is considered when the applications for such studies are received by the BLM with sufficient detail to analyze the proposed activity's impacts, and applies mitigation in order to minimize the identified impacts.

[15-117]
The additional measure to BMP F-1 has been included for consideration in the Final SEIS, along with another proposed measure to strengthen F-1 as well as several other potential new mitigation measures that address aircraft. These are described in 4.4.6 Subsistence, Effectiveness of Stipulations and BMPs on Avoiding Conflict, Aircraft Traffic Mitigations.

[15-118]
The Applicant holds daily teleconferences on flight plans for the day and reports on flights from the previous day. The Applicant has also established a call in number so that residents can listen to a recording with a flight plan update. BLM has also proposed a potential new mitigation measure that would require the Applicant to conduct an ongoing aircraft monitoring plan that addresses these and other issues and would be used to increase efficiencies and reduce conflicts with subsistence hunters.

[15-119]
The BLM has analyzed the project proposed by the applicant to ensure that appropriate avoid and minimization efforts have been incorporated and has also developed appropriate stipulations to mitigate for unavoidable impacts. The BLM does not have jurisdiction pursuant to the Clean Water Act Section 404, which gives the Corps authority to require compensatory mitigation. BLM is reviewing its new draft manual on Regional Mitigation as part of its authorization for this project.

[15-120]
The analysis of cumulative impacts in the Subsistence section has been expanded in the Final SEIS.

[15-121]
BLM's analysis finds that GMT1 will likely have major impacts to subsistence and sociocultural systems for the community of Nuiqsut, but not for other communities. The cumulative effects analysis considers the impacts of GMT1 in conjunction with other past, current, and reasonably foreseeable future projects and concludes that Anaktuvuk Pass, Atqasuk, Wainwright, Barrow, Nuiqsut, and Point Lay could experience impacts to subsistence and thus Environmental Justice.

[15-122]
The Sociocultural Systems (Section 4.4.2), Public Health (Section 4.4.6) and Environmental Justice (Section 4.4.7) have been expanded for the Final SEIS. Given time restrictions, BLM cannot confirm at this time that all these sources have been or will be cited but will continue working to improve these sections for the Final SEIS.

[15-123]
In the Final SEIS, BLM more clearly describes the negative subsistence and sociocultural impacts that are likely to be experienced, and thus Environmental Justice issues, to the community of Nuiqsut. The discussion in the Affected Environment and Environmental Consequences sections focuses on Nuiqsut. The Cumulative Effects sections discusses potential impacts to all NPR-A communities.

[15-124]
The Social Systems sections (Sections 3.4 and 4.4) have been revised and updated to describe the differences in alternatives in greater detail. It is possible that the same alternative would have higher impacts for one resource and lower for another; these are not understood as conflicting. Many aspects of the proposed construction would likely involve a complex combination of positive and negative impacts.

[15-125]
The Environmental Justice section in the Final SEIS has been revised and expanded. In the revised ANILCA 810 analysis the language has been changed to better explain what is meant by this. In summary, this means that BLM has worked with the identified Environmental Justice population to review the alternatives, disclose and describe their input and concerns (potential Environmental Justice issues), and design mitigations to address those issues. These processes and proposed mitigations are described in the Social Systems sections.

[15-126]
The Sociocultural Systems (Section 4.4.2), Public Health (Section 4.4.6) and Environmental Justice sections (Section 4.4.7) in the GMT1 Final SEIS are revised and expanded. The Environmental Justice section considers new information and findings in the subsistence and sociocultural impacts sections. The findings of Environmental Justice issues in the GMT1 Final SEIS are based on the new findings of major impacts to subsistence and sociocultural systems.

[15-127]
The Environmental Justice section in the GMT1 Final SEIS considers new information and findings in the subsistence and sociocultural impacts sections. The findings of Environmental

Justice issues in the GMT1 Final SEIS are based on the new findings of major impacts to subsistence and sociocultural systems.

[15-128]
The Draft SEIS (Affected Environment and Environmental Consequences) focuses on the GMT1 projects impacts to Nuiqsut. The Cumulative Impacts section (Section 4.6) considers the impacts of all reasonably foreseeable future projects in conjunction with current and past projects. It is the Cumulative Effects section that considers impacts to other communities. Any problematic inconsistencies in findings are addressed in the Final SEIS.

[15-129]
The section on the Effectiveness of Lease Stipulations and BMPs, which includes several new potential mitigation measures, was accidentally omitted from the printed version of the Draft SEIS. This section has been revised and expanded and submitted to the Applicant and will be available for review in the Final SEIS.

[15-130]
These impacts are described in the Chapter 3 and Chapter 4: Sociocultural Systems sections regarding impacts from development around Nuiqsut. BLM is not willing to speculate on population and crime rates in the cumulative effects section.

[15-131]
The primary purpose of the NEPA Final SEIS air quality analysis is to determine the impacts of the proposed project only and alternatives. Cumulative impacts are also estimated; see Section 4.6.

[15-132]
Renewable energy sources could serve a purpose for supplemental base power supply for some camp and facility structures but benefits would be limited in application for drilling rig and large support equipment use where power consumption exceeds what can be economically provided by these renewable methods on a reliable basis. Addition of renewable energy generation equipment would not effectively replace or modify any power generation and transmission system currently proposed since they are currently operational components in ACF with designed capacity for GMT1 operations. Installation of either wind or solar power generation would add cost and risk without offsetting its own expense with cost savings. Wind and solar generation equipment are often rendered useless for extended periods during Arctic winters where cold temperatures and high wind speeds create significant operating and maintenance challenges that destroy equipment. These production processes and support operations depend heavily on the reliability of power generation and the risks of an unreliable power supply can be catastrophic to safety and process controls.

Also, ACF relies heavily on processing equipment and electricity generation fuel use as a disposition of gas which otherwise cannot be sold via pipeline at this time. Powering GMT1 with Alpine's existing electrical infrastructure creates a demand for natural gas that may otherwise be wasted. Significantly reducing the designed demand for electricity from ACF will have negative consequences on the gas processing system.

[15-133]
As discussed in Section 3.10 of the Alternative A Ambient Air Quality Impact Analysis (AECOM 2013a), when predicting near-field impacts using dispersion modeling, there are no reasonably foreseeable development sources, including GMT2, that would be large enough to create a

significant concentration gradient in the impact area. Therefore, it was not necessary to explicitly model GMT2 or any other offsite source in the near field dispersion modeling analysis. The same argument does not apply when predicting cumulative far-field ambient air quality impacts. That is why several existing and Reasonably Foreseeable Development (RFD) sources were explicitly included in the far-field modeling. A listing of these sources, which includes GMT2 can be found in Section 4.9 of the Alternative A Ambient Air Quality Impact Analysis (AECOM 2013a).

[15-134]
The detailed analysis performed for Alternative A is considered representative of the potential ambient air quality impacts which could result from Alternatives B and C because the scenarios selected for modeling of Alternative A would also occur under Alternatives B and C. Air quality modeling is focused on only those parts of a particular alternative which will produce the highest ambient air quality impacts, knowing that impacts from all other parts will be less. Because of the similarities between Alternatives A, B, and C, the particular part of each alternative that will produce the highest ambient air quality impacts will be the same for all three Alternatives (i.e., Pad Construction, Gravel Mining, Infill Drilling, and Well Intervention). Therefore, it is unnecessary to predict impacts from each of these alternatives separately because the worst-case activities for Alternatives A, B, and C are the same, making model-predicted impacts for all three scenarios the same as well.

Although vehicle traffic may travel a longer distance under Alt C, CPAI has stated that it would continue to use its facilities at Alpine as its industrial hub.

[15-135]
Flaring is not part of the GMT1 project design, nor will there be an increase in flaring at the ACF as a result of GMT1; therefore, emissions from flaring were not documented and mitigation measures do not need to be considered.

[15-136]
Flaring is primarily done in emergency situations when production equipment fails or for other abnormal causes usually equipment or well related. But there are some cases where scheduled well or facility maintenance requires temporary flaring.

[15-137]
Flaring is primarily done in emergency situations when production equipment fails or for other abnormal causes usually equipment or well related. But there are some cases where scheduled well or facility maintenance requires temporary flaring. There are no practical means for gas storage on the North Slope so capturing gas instead of flaring is not a possibility.

[15-138]
The 2013 BMP A-9 currently requires oil and gas operations that use diesel fuel to use ultra-low sulfur. Companies have been using this fuel since 2010 as it became available. Potential Mitigation Measure 1 - Air Quality requires to the extent practicable use of natural gas or electric power rather than diesel fuel. This allows for the authorized office to determine the appropriate level of use based on current technology.

[15-139]
See Potential Mitigation Measure 1 - Air Quality requires to the the extent practicable use of natural gas or electric power rather than diesel fuel

[15-140]
Leak detection methodologies generally fall into several categories, including visual leak detection, in-line, or instrumented leak detection, remote sensing, hydrocarbon vapor detection, and hydrocarbon contact sensors. While all are proven to work with varying sensitivities in controlled environments and with a defined range of products, each also has limitations in industrial use. Before any system, or combination of systems, can be deemed best for an application, certain parameters need to be examined.

The first consideration is the sensitivity of system, which may be defined in terms of a percentage of flow rate, a release rate, a release volume and the time to detect and to alarm. Another concern related to sensitivity is that a system that has too many false alarms is unacceptable, because any alarm may then be assumed to be false and not receive an appropriate response. In addition, an operator may become distracted by false alarms and fail to safely monitor other aspects of the line's operation.

The next consideration is a measure of robustness or reliability. Does it operate effectively during times of shut-down or startup, or when hydraulic conditions are outside of normal parameters? Does it function in all weather conditions? Optical systems and airborne systems can be more or less limited by meteorological conditions. Do component failures or system shutdowns enunciate themselves? In other words, what percentage of the time is the system available to detect a leak at the desired sensitivity, and does it self-report system failures? Other considerations relate to a system's infrastructure requirements for installation and operation. Instrumented in-line systems tend to benefit from multiple sensors along the pipeline to measure flow, pressure and possibly temperature, which will require a data system for data transmission. External sensors that detect hydrocarbons on contact or hydrocarbon vapors require power sources and data connections. These sensors must also be placed strategically so that spilled oil will come within their range of contact. Given the variety of paths and trajectories a leak can take from a pressurized pipeline, sensor placement may be difficult. Fixed optical systems also require power sources. Power requirements are significant because few remote pipelines include a power grid, and where they do, it must be designed so it is not a hazard itself in the event of a spill or during normal maintenance.

Experience along TAPS and the North Slope indicates that human inspection (visual and olfactory detection) have been the most robust and reliable method of detecting small spills. Pressure and flow deviation alarms are believed reliable for detection of major spills. Protection of specific sensitive or high consequence areas may justify the expense and design of site specific, continuous monitoring remote devices. Selecting an effective, practical technology, however, will depend on the specific performance requirements and the available infrastructure as well as the other considerations mentioned above. BLM will work with CPAI to determine the appropriate method of leak detection based upon the Preferred Alternative.

[15-141]
The timing for source control will be subject to ADEC and Federal Regulations. Remotely operated valves could be a component of source control but not the entire means of source control. Passive technology as well as automatic valves should be considered for effectiveness.

The procedures to stop the leak at the source should be effective and alternative means must be compared before selection. Passive technology as well as automatic valves should be evaluated for effectiveness.

Leak detection methodologies generally fall into several categories, including visual leak detection, in-line, or instrumented leak detection, remote sensing, hydrocarbon vapor detection, and hydrocarbon contact sensors. While all are proven to work with varying sensitivities in controlled environments and with a defined range of products, each also has limitations in industrial use. Before any system, or combination of systems, can be deemed best for an application, certain parameters need to be examined.

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The next consideration is a measure of robustness or reliability. Does it operate effectively during times of shut-down or startup, or when hydraulic conditions are outside of normal parameters? Does it function in all weather conditions? Optical systems and airborne systems can be more or less limited by meteorological conditions. Do component failures or system shutdowns enunciate themselves? In other words, what percentage of the time is the system available to detect a leak at the desired sensitivity, and does it self-report system failures? Other considerations relate to a system's infrastructure requirements for installation and operation. Instrumented in-line systems tend to benefit from multiple sensors along the pipeline to measure flow, pressure and possibly temperature, which will require a data system for data transmission. External sensors that detect hydrocarbons on contact or hydrocarbon vapors require power sources and data connections. These sensors must also be placed strategically so that spilled oil will come within their range of contact. Given the variety of paths and trajectories a leak can take from a pressurized pipeline, sensor placement may be difficult. Fixed optical systems also require power sources. Power requirements are significant because few remote pipelines include a power grid, and where they do, it must be designed so it is not a hazard itself in the event of a spill or during normal maintenance.

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[15-143]
Future space for a 24-inch line on the GMT1 to CD5 pipe rack would hold a produced crude or a gas pipeline from GMT2. The same 24-inch future line space is maintained on the CD5 pipe rack and the associated bridges. The 8-inch future line between CD4N to CD1 is for water transport.

[15-144]
There is more detailed information on the types of infrastructure causing the spills, the types of materials spilled and the regulatory status of the infrastructure where spills occur is located in Appendix G: Information, Models, and the Assumptions Used to Analyze the Effects of Oil Spills of the NPR-A Draft IAP/EIS dated March 2012. This document is incorporated by reference.

[15-145]
The following paragraphs in Section 4.5.1, Background, explains further that there is a decreasing trend in the volume of saltwater and oil spills occurring on the North Slope over the more than 30-year oilfield operating history. The following paragraph also describes the additional GC-2 spill of 200,00 gallons of crude oil. The ODPCP for facilities on the North Slope should contain history of all spills greater than 50 barrels.

[15-146]
Toxic chemical spills associated with oil and gas drilling are included in the analysis of the effects of hazardous materials.

[15-147]
The ADEC regulations governing the ODPCP (18 AAC 75) require modeling to show where dispersed oil would be most likely to fall within the environment (trajectory analysis). This involves consideration of prevailing wind direction (wind direction is taken from the nearest available wind monitoring station). However it is not labeled as the "worst-case" scenario blowout. Spill response planning is based on the varied requirements of multiple participating agencies, some of which do not use "worst-case scenarios".

[15-148]
The Repsol event was not an oil spill. However it was a spill of approximately 1,000 barrels of drilling mud and should be considered in the analysis of spills to the environment.

[15-149]
The BLM will consider potential restrictions to operations under extreme conditions when a response is not possible. Response capabilities under varying conditions will be considered as a requirement under the ODPCP.

[15-150]
Leak detection methodologies generally fall into several categories, including visual leak detection, in-line, or instrumented leak detection, remote sensing, hydrocarbon vapor detection, and hydrocarbon contact sensors. While all are proven to work with varying sensitivities in controlled environments and with a defined range of products, each also has limitations in industrial use. Before any system, or combination of systems, can be deemed best for an application, certain parameters need to be examined.

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few remote pipelines include a power grid, and where they do, it must be designed so it is not a hazard itself in the event of a spill or during normal maintenance.

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[15-151]
Additional information regarding impact of a large spill to marine mammals in Harrison Bay is included in the Final SEIS.

[15-152]
BLM agrees that a large spill will not necessarily be confined to the well pad.

[15-153]
The pipelines proposed for GMT1 are three-phase (oil-water-gas) flowlines. As detailed in the ADEC Pipeline Leak Detection Technology 2011 Conference Report, Section 5.1.2, "Flow verification for multi-phase flow lines is problematic with measurement errors up to plus or minus twenty percent (+/- 20%)." CPAI maintains flowlines in accordance with State of Alaska regulations at 18 AAC 75.047; proposed flowlines for GMT1 would be managed under a comprehensive integrity management program in accordance with 18 AAC 75.047(d)(2)(C). The maintenance program, along with routine visual inspection will provide appropriate leak detection capability and is consistent with current successful management programs for aboveground flowlines on the North Slope.

[15-154]
BLM is analyzing seasonal drilling, with no road between GMT1 and CD5, in detail as Alternative D2, which will include an analysis of spill response capabilities.

[15-155]
The BLM will consider potential restrictions to operations under extreme conditions when a response is not possible. Response capability operating limits under varying conditions are addressed in the Approved Alpine ODPCP.

[15-156]
BLM agrees that BAT should be applied and a corrosion prevention program should be submitted for approval to the appropriate agencies. BAT and corrosion prevention programs are covered in the Alpine ODPCP per ADEC regulations in 18 AAC 75.425. When the Alpine ODPCP is amended to include GMT1, these sections of the ODPCP will be reviewed and updated as necessary.

[15-157]
BLM agrees that leak detection should analyzed, approved by the appropriate agencies and that Best Available Technology should be applied. Leak detection is covered in the Alpine ODPCP

per ADEC regulations in 18 AAC 75.425. When the Alpine ODPCP is amended to include GMT1, this section of the ODPCP will be reviewed and updated as necessary.

[15-158]
The procedures to stop the leak at the source should be effective and alternative means must be compared before selection. Passive technology as well as automatic valves should be evaluated for effectiveness.

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[15-159]
Table 2.4-2 of the Final SEIS has been updated with revised CPAI figures and the data analyzed and additional edits made as needed.

[15-160]
Once the Corps completes their compensatory mitigation evaluation the BLM may determine whether additional compensatory mitigation is required.

[15-161]
Because the GMT1 project does not impact any of the special area identified in the 2013 NPR-A ROD, this comment is outside if the scope of the analysis for the GMT1 project and therefore is not considered substantive. The BLM has analyzed the project proposed by the applicant to ensure that appropriate avoid and minimization efforts have been incorporated and has also developed appropriate stipulations to mitigate for unavoidable impacts. The BLM does have jurisdiction pursuant to the Clean Water Act Section 404.

[15-162]
The 2013 IAP/EIS Record of Decision (pages 6-7) requires three categories of studies and monitoring by project proponents: Baseline studies, oversight monitoring, and effectiveness monitoring to guide adaptive management. CPAI's proposed project is governed by these requirements.

[15-163]
The Corps has the authority pursuant to the Clean Water Act Section 404 to require compensatory mitigation for impacts to waters of the U.S., including wetlands. Therefore this is not considered a substantive comment for the purposes of analysis by BLM

[15-164]
The BLM will evaluate and work with the Corps in their review of wetlands assessments and assist in developing mitigation measures. A 600 ft wide corridor route for each alternative was used to assess for indirect impacts from fugitive dust along the road routes and is appropriate. The ASAs take into consideration numerous functions related to flood flow, sediment and nutrient removal, erosion control, organic matter production, habitat suitability (for fish, avian and mammals) and scientific use. As climatic changes occur, the vegetation will likely change, or functions for vegetation types will change and will be captured in ASAs for adjacent developments. Vegetation monitoring will be conducted via the Alpine Facilities Erosion Control Plan which requires monitoring of the vegetation adjacent to the roads and facilities and corrective action taken if impacts are found to occur.

[15-165]
Once the Corps completes their compensatory mitigation evaluation the BLM may determine whether additional compensatory mitigation is required.

[15-166]
BLM has national guidelines and practices regarding interim reclamation of oil and gas fields. See http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/leasing_of_onshore/og_reclamation.html. This proposed new mitigation measure will allow for adaptive management based on the ground conditions and the approval of the Authorized Officer.

[15-167]
See Section 4.7 for additional information. Also note that the 2013 ROD is the first time that VRM specific stipulations (BMPs) were included for the NE NPR-A. They require the company

to consult with the Authorized Officer on ways to minimize visual impacts prior to submitting a plan to do so.

[15-168]
CPAI is subject to the BMPs in the 2013 IAP/EIS ROD, and 2008 NE NPR-A lease stipulations, which were in place when CPAI renewed its lease. To BLM's knowledge, these stipulations and BMPs are not inconsistent with each other. To the extent any are found to be inconsistent, the 2008 lease stipulations would control.

[15-169]
Pursuant to 43 CFR 3135.1-8(c), the lease terms and conditions continue to apply to the lessee; however, only ASRC (as the new lessor) may enforce the lease stipulations on the conveyed lands; BLM no longer has jurisdiction to do so. BMPs likewise apply on BLM-managed lands only, but may be enforced by ASRC.

[15-170]
The 2013 IAP/EIS ROD (pages 6-7) requires three categories of studies and monitoring by project proponents: Baseline studies, Oversight monitoring, and effectiveness monitoring to guide adaptive management. CPAI's proposed project is governed by these requirements.

[15-171]
The Final SEIS has been revised to provide more context as requested in the comment.

[15-172]
CPAI has collected at least seven years of flow data at the Tiŋmiaqsiġvik River (Ublutuoch River) crossing and this can be supplemented with flows from the BLM gaging station upstream at mile 13.7 for years with no data collection. The breakup flow discharge does not correlate well with stage due to ice in the channel (see Table 3.2-3) and backwater from downstream ice jams and blockages. To date, the highest observed flood elevation was 10.50 ft BPMSL at mile 6.8. CPAI calculated that a 50-yr flood would reach a height of 11.9 ft BPMSL, Since the lowest part of the bridge structure will be 17.0 ft there will be sufficient height to pass all flood flows.

[15-173]
The Final SEIS has been updated to reflect the suggested edit.

[15-174]
The Final SEIS has been updated to reflect the suggested edit.

[15-175]
The DEIS Section 3.2.2.2 describes lake studies (some over a five year period) designed to monitor water quality changes for pumped vs unpumped lakes. These studies were made close to the study area and would be representative of lakes along the road route. Winter dissolved oxygen is highly variable between individual lakes, stratified within the water column under ice and cannot be regionalized. The 2002 MBJ study found that pumped lakes had higher dissolved oxygen concentrations than in reference lakes, likely as a result of pumping methods used by the ice road subcontractor. The 15% restriction to free water removal in deep lakes does not conclusively guarantee that an impact cannot occur but from past studies, this has not been observed. Withdrawals exceeding 15% have additional monitoring requirements as a condition of their permit which could involve studies of dissolved oxygen or other water quality parameters. The Cott, et al., 2008 study indicated that a 10% withdrawal had no impacts to

dissolved oxygen and that the 20% withdrawal may have changed the oxygen profile by.7 mg/l but did not affect the abundance of northern pike. Their study stated that the effects of water withdrawal on water quality parameters reflected the characteristics of the lake and would be expected to vary from lake to lake.

[15-176]
Winter dissolved oxygen concentrations are highly variable between individual lakes, deep and shallow, stratified within the water column under ice and cannot be regionalized, which makes it extremely difficult to compare lakes across a region.

[15-177]
Text was added clearly denoting the lack of known spawning areas (Section 3.3.2.1). The elements of oil and gas exploration and development that could potentially degrade spawning areas due to increased sedimentation are discussed in the 2012 NPR-A IAP/EIS, tiered from this document. As such, the discussion of Alternatives for the GMT1 area acknowledges that the greater amount of roads and stream crossings, the greater and more likely impacts will occur on fish resources.

[15-178]
Studies of fish movements in the area to date (Morris 2003 and Heim 2014) are utilized in the Final SEIS.

[15-179]
Historical information on past impacts from ice roads is lacking. The BLM acknowledges that potential impacts from ice roads include altering the drainage pattern, stream stage, and stream flow. However, BMPs C-3 and C-4 are designed to mitigate or avoid those impacts.

[15-180]
The 2013 NPR-A IAP ROD outlines best management practices related to water withdrawals for winter ice road and ice pad construction and protection of the aquatic environment. Additional protections may be required for the GMT1 and GMT2 development areas depending on the final alternative chosen for these projects .

[15-181]
Water withdrawals related to the GMT1 project will be greatest during construction and not a permanent activity. The presence of a road will actually reduce some withdrawals needed at lakes such as L9817 which were needed for ice roads originating near Nuiqsut for past exploration wells. Long-term water withdrawals from specific water bodies related to GMT1 will be closely monitored but are still unknown until an alternative is chosen. Future withdrawals will be contingent on replenishment of water supplies as is currently required for winter drilling exploration operations in the NPR-A. Long-term monitoring studies (similar to those presently occurring at Lakes L9313, L9323, L9524, and L9525 near Alpine) will be required if there is a need for repeated withdrawals from lakes adjacent to GMT1. Section 4.6.5 describes how the water resources cumulative impacts were determined for water withdrawals.

[15-182]
The BLM requires that design of structures, bridges, and culverts to incorporate the latest design features which addresses past inadequacies in design. Impacts may still occur but are not certain to occur and future monitoring requirements will insure major impacts will be prevented before they become irreversible or substantial in nature.

[15-183]
The most current version of cumulative effects on fish states (in the conclusions subsection) that "The direct, indirect, and cumulative impact to fish and fish habitat associated with the proposed GMT1, conceptual GMT2, and other RFF projects would be additive and in some scenarios, could be synergistic."

[15-184]
The BLM plans to minimize similar effects in the NPR-A through its set of BMPs that have been crafted and updated based on the most recent information available. As the GMT development would be on federal lands, it would require following additional protective guidelines not necessarily being utilized on state lands.

[15-185]
In the cumulative impact analysis, statements made regarding the potentially positive benefit of "daylighting" mines to active stream channels have been removed.

Proposed methods for quantifying caribou response to infrastructure during migration and resulting changes in community harvest

Submitted by Dr. Wendy M. Loya, Ecologist, The Wilderness Society

The requirement for Conoco Phillips Alaska Incorporated (CPAI) to conduct 10 years of monitoring in the areas affected by the Alpine Satellite Development Plan (ADSP) and Greater Moose's Tooth Unit to understand the impact of infrastructure on caribou distribution and movement[1] provides the opportunity to conduct a comprehensive analysis of the potential impacts of the road on movement patterns for caribou in the Teshekpuk Caribou Herd (TCH) in the DSEIS. Further, because the TCH's fall migration and winter range overlaps with the Kuparuk and Prudhoe Bay development areas and the Dalton Highway, there is an opportunity to understand herd-specific response to development, especially during migration. Gaps in the knowledge base regarding caribou response to infrastructure and industrial activity can be tentatively filled based on information from research on other herds in Alaska and beyond, with the ultimate goal of identifying key drivers that should be monitored for the TCH in the future. An empirical modeling exercise of caribou response to development will help BLM and other stakeholders anticipate probable potential outcomes of different development scenarios for NPRA. There are at three major components that should be addressed: caribou migration behavior, caribou response to roads and human activities and impacts to subsistence hunting.

1. Seasonal use, including spring and fall migration

The research presented in the DSEIS and related documents indicate that the area around the GMT unit is not a high density calving area (Lawhead et al. 2013). During most years, TCH winter in the region, and high densities have been recorded in the NPRA survey area during late winter. Caribou densities average 1 caribou/km^2 in late June, 0.5 or less in July and August and increase to nearly 2 in some years during September and October (Lawhead et al. 2013, Figure 6; BLM GMT1 DSEIS, Figure 3.3-9). **[16-001]** Caribou also use the area, especially along the creeks, as insect relief habitat and migrate through the area to reach coastal insect relief habitat. Lawhead et al. (2013) state that "Although radio-collared TH caribou have crossed the proposed ASDP road alignment in the NPR-A occasionally (primarily during fall migration), the data collected thus far indicate that the proposed road and pipeline corridor is in an area of low-density use by caribou." While this indicates that low numbers of caribou in relation to the entire herd would potentially be impacted by the road, those few caribou are a significant resource for the village of Nuiqsut according to research by Braund & Associates (2013) and Braem et al. (2011).

[16-002] Critical to present in a revised analysis of development of GMT 1 and GMT 2 are the fall migration corridors of the TCH since fall is one of the primary seasons when caribou use the area and when they are hunted. Brownian bridge analysis (e.g., Sawyer et al. 2009) could show how the historical

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[1] The North Slope Borough development permit for CD4 stipulated a 10-yr study of the effects of development on caribou distribution and movements be conducted in the region which encompasses CD3, CD5, GMT1 & GMT2 (Lawhead et al. 2011 p. iii).

distribution of fall migration paths overlaps with the proposed road or airstrip. **[16-003]** Corridor analysis can also possibly highlight how the TCH moves in response to human activity in Nuiqsut, near Meltwater and to the Dalton Highway.

2. Caribou response to roads and human activity

Anticipating how the TCH will respond to roads is not only important in determining how to develop GMT 1 and GMT 2, but will also allow the BLM and other stakeholders to anticipate the cumulative effects of broader development in NPRA and offshore waters. **[16-004]** The assumptions for development in the NPRA IAP/EIS (BLM 2012) suggest that roads are likely to connect development within 8 or miles of each other. Thus, according to such assumptions it could be feasible that roads could be built to connect Alpine, GMT and the Bear Tooth Unit.

Caribou in the TCH have encountered roads during migration to and from wintering grounds if they have moved east from Teshekpuk Lake, across the Colville and encountered the Meltwater road and/or the Dalton Highway. TCH occasionally migrate west and appear to join the Western Arctic Herd (WAH) heading into the Northwestern Arctic and Seward Peninsula, and have encountered the Red Dog Mine road. Although the DSEIS references Corps (2012) to indicate that caribou may be reluctant to cross a road for several hours after encountering heavy traffic (DSEIS, p. 76), it is likely that the TCH could be delayed from crossing several days or be deflected based on preliminary observations of the TCH and WAH near Red Dog and TCH near the Dalton Highway. Further, it is important to look at responses beyond just the period when they are adjacent to the road. Caribou could be responding to the road at much further distances and direct observation of a 5 hr delay adjacent to the road might be severely underestimating the length of the delay. Panzacchi et al. (2013) found that caribou moved along a road for up to 5 days before crossing it during spring migration. Once they had crossed the road, the caribou then moved at considerably greater speeds than they had previously.

Observations of paths from collared caribou encountering roads suggest they can display at least 4 general behaviors: i) no response to the road; ii) hesitation to cross the road and potentially walking along it before eventually crossing; iii) avoidance of crossing the road by moving away from it for some time period before crossing; and iv) caribou deflecting from the road and never crossing it. Because both the Red Dog Road and Dalton Highway have been in place for approximately 25 and 40 years, respectively, it should be possible to anticipate how the TCH will respond to new roads in NPRA during migration.

The DSEIS states that hunter use roads could result in further displacement of caribou, which is also discussed in the literature (e.g. Bergerud et al. 1984). Local observations and collared caribou movement around the community of Nuiqsut, movement around other north slope communities and along the Dalton highway during hunting season may provide insight into how far caribou may be deflected if hunters are able to access the herd from the oil field roads. There may also be some deflection of caribou towards the road from hunters in Fish Creek or snow machining west of the development. **[16-005]** How hunters will use industrial roads, especially if there is a pipeline towards the

northeast of the road, as in Alternative A in the DSEIS, where most caribou would be coming from during fall migration is an important consideration.

In addition to the impacts of roads, impacts from aircraft need to be considered empirically. An important source of information regarding aircraft disturbance is from hunters on the ground who report caribou fleeing when low flying aircraft approach, although reports have decreased over time. Braund (2013) reported that the percentage of subsistence hunters that reported helicopter-related Alpine impacts decreased from 47% in 2010 to 22% in year 2011. Monitoring of caribou behavior in response to aircraft at CD1, CD3 and near other airstrips in the development areas east of NPRA can also be used to understand caribou response and tolerance to aircraft.

[16-006] There are few studies in the literature that quantify caribou response to overflights. Maier et al. (1998) found little response behavior in winter, moderate in the insect season and strongest right after calving. They concluded that the caribou response was mild, but that the aircraft activity resulted in a change of activity cycles and daily movements. Miller & Gunn (1979) reviewed a number of factors influencing Peary caribou response to helicopter overflights and found numerous responses, but concluded that the caribou calmed down rapidly after an over-flight, and a passing altitude of 200-400 m caused no measurable stress. In fact, aircraft are often used for direct observation of caribou or as an aid in telemetry or image capture for census work.

We believe it is critical to better quantify the impacts of Alternative D in the DSEIS. **[16-007]** The DSEIS states that the impacts of aircraft on caribou, and therefore on subsistence, under Alternative D would cause more significant impacts (moderate overall) than under the roaded alternatives (minor overall). We do agree that the level of disturbance, even if less significant on caribou as compared to a road, is likely to be often enough to spoil a hunt, but we are not certain that aircraft have an overall greater impact in the project area than roads.

3. Impacts to subsistence hunting: caribou abundance, access

Quantifying how human activity associated with development could alter caribou density and movement paths are important for cumulative effects analysis. Decreased harvest and increased travel times and costs will have a significant impact on the culture and economy of communities. **[16-008]** The qualitative result that development impacts will be long-term and significant makes it imperative that an attempt is made to quantify the impact so that the least-impactful alternative can be selected and effective mitigation measures can be implemented.

The project area and GMTU overlap with the highest caribou subsistence use areas for the village of Nuiqsut (DSEIS Figure 3.4-2). **[16-009]** ADFG surveys also show concentrated caribou hunting areas in the GMTU area (e.g. Braem et al. 2011, Figure 3). Further, while some harvest locations may be used infrequently, they can still be important to a subsistence user or a community if they are particularly productive areas or if they have cultural, historical, or familial significance to the user (DSEIS, Appendix G, p. 4). Nuiqsut residents have been traveling across a progressively larger area to harvest subsistence resources since Pederson's report in 1979. Over 90 percent of households used caribou during all "caribou only" study years, and between 47 percent and 90 percent of households attempted to harvest caribou during these

years (DSEIS, Appendix G, p.17 & Table G-2). The highest levels of caribou hunting activity occurs during April, May and June (Spring, Early Summer) and again in August, September and early October (Late Summer, Fall), although activity occurs throughout the year (SRB&A, Appendix G GMT DESIS, p.22 & Table G-3).

[16-010] According to Braem et al. (2011), Nuiqsut hunters harvest the most caribou in the hunt area surrounding that community (see Braem et al. 2011, figure 56). Most of the harvest in the hunt area closest to Nuiqsut occurred during the winter months (October to May; figures 57 & 58; Appendix O). Of the 307 caribou taken there between 2003 and 2007, 65% were taken between October and May. Harvest in the Fish Creek area, which comprised 12% of the 5-year total, was more evenly distributed between summer and winter.

[16-011] To determine how hunter access to caribou might be altered, an attempt should be made to understand how changes in caribou use of the area due to the road changes the distribution of caribou in subsistence hunting areas, such as those depicted by in studies (Braund et al. 2013; Braem et al. 2011; Figure 1). Comparison of no development (Alternative E) vs. development scenarios (Alternatives A-D and any modifications for FSEIS) will allow for a comparison of how each alternative might affect hunter cost and probability for success.

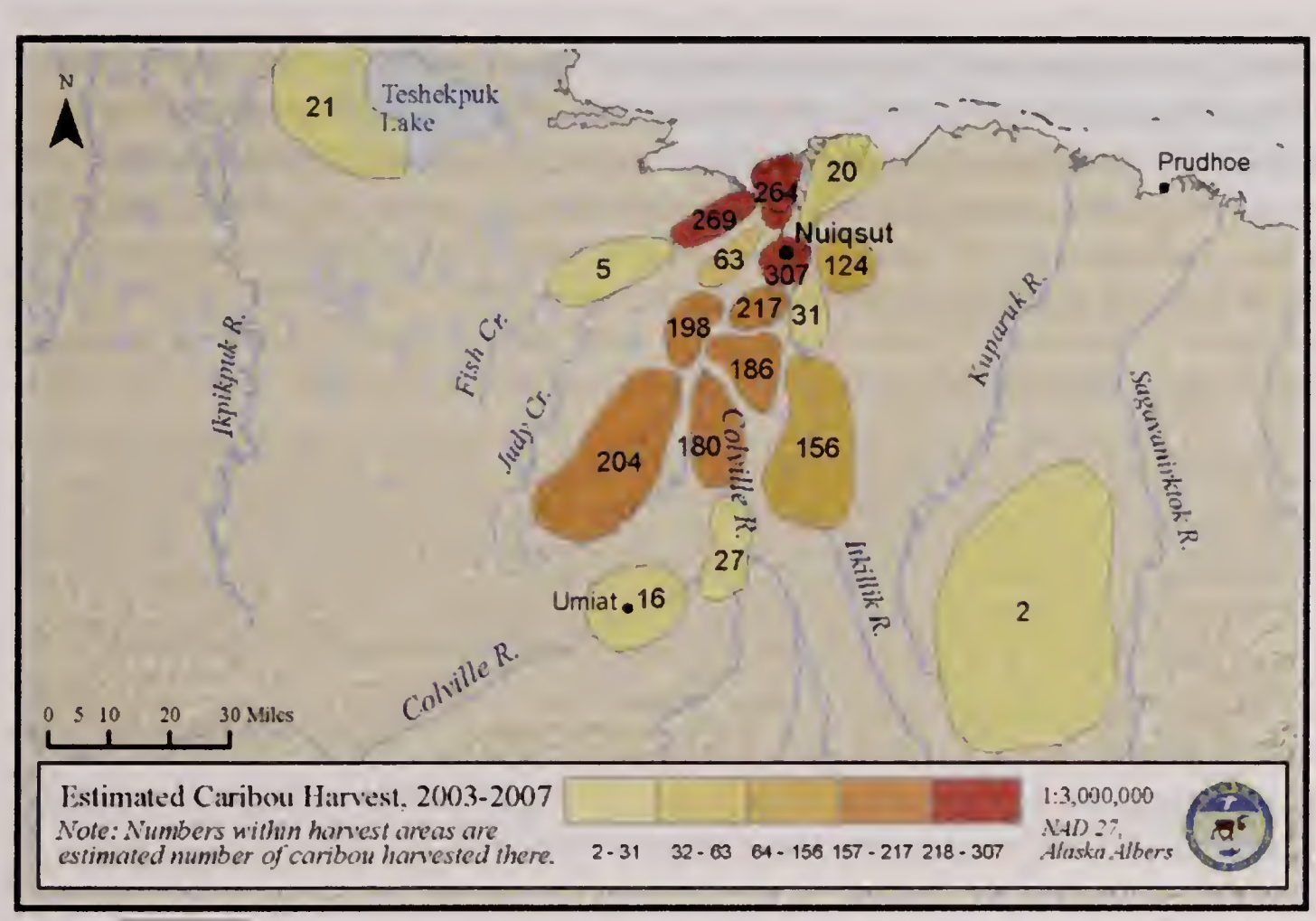

Figure 1. **[16-012]** Subsistence caribou harvest areas for Nuiqsut from Braem et al. 2011 that could be used to quantify changes in simulated caribou abundance and distribution.

Simulation Modeling

The Wilderness Society requested data from Alaska Department of Fish and Game (ADFG) that would allow us to begin development of the type of analysis we are suggesting. We were unable to gain access to those data. In lieu of data that would most accurately characterize TCH fall migration pathways, we relied on the literature and our best understanding of caribou response to roads based on public presentations by caribou biologists (e.g. Western Arctic Caribou Working Group meetings).

Methods overview

[16-013] To simulate autumn caribou migration we first built a general biased correlated random walk (BCRW) model similar to that described in Barton et al. (2009). Briefly, the model assumes that caribou exhibit some bias in their movement direction to their chosen wintering grounds, but that this bias increases the closer the caribou gets to its wintering grounds. This seemed reasonable given that caribou are motivated to move towards their winter grounds before the winter sets in, but that this motivation might be lower earlier during migration when animals are still attempting to forage on late summer vegetation. We simulated movements during migration at two-hour intervals for a period covering 2 months. This resulted in 720 individual steps for each simulation. We randomly selected migration start points from the area identified as having a high concentration of use during late summer in Person et al. (2007). Similarly, we randomly selected a migration end point from the region receiving moderate to high use in the southern and eastern portions of the Teshekpuk Caribou Herd's winter range identified in Person et al. (2007). At each time-step, an individual chose a random step length drawn from Weibull distribution with the shape parameter equal to 0.768 and the scale parameter equal to 717.513 (Fig. 1). This results in a mean step length of ~ 810 m. The expected direction of an animal's movement was also selected at each time step (d_t) using the following equation:

$$d_t = (1-\tanh(b*\delta^c))*d_{t-1} + \tanh(b*\delta^c)*\psi_t$$

where d_{t-1} is the expected direction at the previous time step, δ is the distance to the end point of autumn migration, ψ_t is the direction to the end point of autumn migration from the animal's current position, b is a scaler that indicates how fast the bias towards the end point increases, and c is related to shape of the relationship between bias and distance to the end of migration. We set c equal to 0.1 for each simulation, but allowed b to be randomly selected from a uniform distribution ranging between 0.5 and 0.75 at the beginning of each simulation. Finally, to determine the actual direction of movement at a given time step, we drew from a Wrapped Cauchy distribution with mean direction set to d_t and concentration parameter drawn from a Beta distribution with shape parameter 1 equal to 15 and shape parameter 2 equal to 10. From these random step lengths and directions, we simulated the migration path.

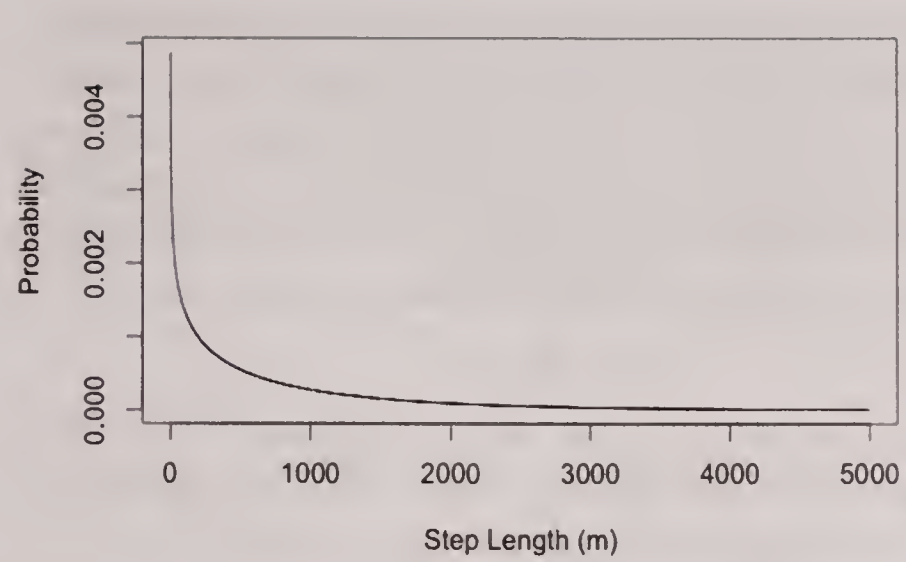

Figure 2. Weibull distribution used for selection of step lengths.

Because caribou movement during migration can be altered when encountering roads (Panchezzi et al. 2013), we allowed simulated caribou to respond to the road in one of four ways. First, they could exhibit no change in behavior and would thus exhibit movement defined by the above BCRW. We identified these individuals as 'normal'. Alternatively, caribou could have their migration delayed by the road, and concentrate movement adjacent to the road for a period of time before continuing their southward migration. We identified these individuals as 'roadies'. Conversely, caribou could respond by moving away from the road for some period of time before they continued their southward migration. We identified these individuals as 'avoiders'. Finally, caribou could respond to the road by having their movement deflected around the road, which we identified as 'deflected'.

Simulated paths only had the opportunity to become something other than a 'normal' migration if they came within a distance of the road they could reasonably be assumed to potentially be disturbed. Studies on caribou disturbance to infrastructure have described a number of distances that caribou are disturbed, ranging from ~ 5 km (Cameron et al. 2005) upwards to 15 km (Boulanger et al. 2012), thus we allowed the distance an individual could become disturbed to be a random variable drawn from a uniform distribution ranging between 5 and 15 km. Even if an individual came within that distance, it did not necessarily alter its movement from that of the 'normal' movement type. We modeled the 'normal' movement type as the predominant behavior, with individuals having a 60% chance of having their movement unaffected by the road if they came within the distance to the road they could be expected to exhibit a disturbance response. Of the 40% of caribou that exhibited a response to the road, 37.5% of the time it would exhibit movement depicted by 'roadies', 37.5% of the time it would exhibit movement depicted by 'avoiders', and 25% of the time it would exhibit movement depicted by the 'deflected' movement type.

If an individual was determined to have been 'disturbed' by the road and identified as a 'roadie' or 'avoider', it was assigned a random number of days its movement would differ from that of a 'normal' animal. This value was drawn from a uniform distribution ranging from 1 to 7 days. If the animal was classified as a 'roadie', during the period of altered movement, step lengths were still drawn from Weibull distribution described above, but movement direction was drawn from a uniform distribution

ranging from 0 to 2π (radians). If the combination of step length and direction resulted in a simulated step crossing the road before the period of altered movement was up, a new turn angle and step length were sampled. Movement was simulated like this until the period of affected movement was up, then movement resorted back to the normal movement type until the 2 month simulation was completed. 'Avoider' movements differed from 'roadies' in that instead of movement direction being drawn from a uniform distribution, it was drawn from a Wrapped Cauchy distribution with mean direction set to northwest, and concentration parameter set to 0.8.

Finally, if an individual was identified as having been disturbed by the road, and assigned the 'deflected' movement type, steps were generated by sampling from the Weibull distribution described above, and movement direction drawn from a Wrapped Cauchy distribution with mean direction set to approximately southwest (3.665 radians) and concentration parameter set to 0.95. This movement continued until the animal could move south to its desired migration end point without crossing the road.

Sample Results

Because we were unable to acquire permission to use data from the TCH to parameterize our model, we provide the following results *only as examples* of how a model might work and the types of analyses that could be performed on the model output. We believe that more accurate behavioral responses, including probable migration corridors, migration turn angles and step lengths, distance at which roads and activity affect the TCH and other disturbance coefficients can be derived from decades of collared caribou monitoring and spatially referenced observations and analyses.

Nevertheless, we were able to develop migration models that appeared to represent a possible migration paths and responses to infrastructure (Figures 3-6).

Figure 3. "Normal" caribou simulation, where caribou path is unaffected by the road.

Figure 4. "Roadie" caribou simulation, where caribou is affected by the road and avoids crossing the road for some time but stays relatively close to road.

Figure 5. "Avoider" caribou simulation, where path encounters road and deflects away for some period before returning to cross.

Figure 6. "Deflector" caribou simulation, where caribou path does not cross road.

It was possible to run 10,000 simulations within several days. Of the 10,000 simulations, 1686 or less than 20% simulated caribou came within 15 km of the road. While this result is artificial, it does reflect that not all caribou pass through the proposed GMT 1 and GMT 2 development areas during their fall migration. Of those simulated caribou that came within 15 km of the road, a smaller percentage went on to come within 15 km of Nuiqsut: 88% of "normal"; 81% of "roadies"; 88% of "avoiders"; and 70% of "deflectors." If our parameterization is in fact plausible responses of the TCH to the road, these results would suggest that deflection would cause a 30% reduction in caribou within 15 km of Nuiqsut whereas if caribou were not disturbed by a road or there was not a road, only 12% of caribou in the area would not end up within 15 km of Nuiqsut. Remembering that the total number of caribou responding in a certain way was pre-set based on the literature (see methods above), it is unknown whether our results are an underestimate or overestimate. We would expect cows with calves to be slightly more skittish than males based on previous research (see summary in Bergerud et al. 1984), but it is unknown why some caribou are affected and others aren't and why some caribou will eventually cross a road after some period of delay. These are important questions to find answers to for the TCH prior to expansion of infrastructure in NPRA towards Teshekpuk Lake.

Other analyses that can be conducted include the mean minimum distance to Nuiqsut for caribou by behavior response, again subset for those that came within 15k m of the road. In our simulation, we found that "normal" simulated caribou averaged 7.2 km (4.5 mi) minimum distance from Nuiqsut; "roadies" averaged 8.4 km (5.2 mi); "avoiders" averaged 6.6 km (4.1 mi); and "deflectors" averaged 12.0 km (7.5 mi) from Nuiqsut. This metric can be used as a "least cost" metric in quantifying the time, energy and cost of hunting under different alternatives and caribou behavioral responses. The average distance to Nuiqsut, as opposed to the minimum, was 14.4 km (8.9 mi), 16.1 km (10 mi), 14.2 km (8.8) and 18.3 km (11.4 mi) for the different behavioral responses of caribou, respectively.

We also calculated the number of steps caribou took while they were within 15 km of Nuiqsut. One step is equivalent to approximately 2hrs of time, and an accurate parameterization of TCH would provide estimates for comparison of caribou abundance within the vicinity of the village and time spent in migration for the caribou. In our example simulation, we found "deflectors" took the most steps within the vicinity of Nuiqsut, with ~72 steps or 144 hrs whereas the other responses were approximately half that amount. This result reflects the increased time and energy required to go around the road and resume a normal migration bearing.

While our results are artificial, we are encouraged that we were able to create a model that could incorporate multiple behavioral responses, create unique paths for each behavior and produce results that provided quantification of some of the changes development that subsistence hunters might encounter. It will be important to interpret results within the socio-economic context of the affected community, including willingness to travel and hunt in development areas, modes of transportation used, cost of fuel, time available for hunting, interactions between multiple types of hunting (e.g. harvesting of multiple species on one trip) and other factors.

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[16-001]
The Final SEIS agrees and states that caribou are among the top harvested species for Nuiqsut and that 85% of Nuiqsut harvesters use the project study area, among other areas, for caribou hunting.

[16-002]
The Draft SEIS does show in Figure 3.3-11 that the fall migration corridor for those TCH animals migrating to the southeast includes on its northern periphery the project study area. That migration corridor is presented in its entirety in the comment letter from ADNR. A summary of the modeling effort provided by The Wilderness Society and the two Browninan Bridge fall migration maps from ADNR are included in the Final SEIS.

[16-003]
The Draft SEIS does show in Figure 3.3-11 that the fall migration corridor for those TCH animals migrating to the southeast includes on its northern periphery the village of Nuiqsut and the Meltwater area. That migration corridor is presented in its entirety, including the Dalton Highway area, in the comment letter from ADNR. A summary of the modeling effort near Nuiqsut provided by The Wilderness Society and the two Browninan Bridge fall migration maps from ADNR are included in the Final SEIS.

[16-004]
Development beyond GMT is speculative. The NPR-A IAP EIS analyzed scenarios that include long-term development beyond GMT. If the Bear Tooth Unit is developed, additional analysis will be conducted during the planning phase.

[16-005]
The subsistence section of the Final SEIS has been rewritten.

[16-006]
In response to the larger question of whether roads with traffic, or aircraft, have a greater overall effect on caribou movement, which in turn is meant to question whether Alternatives D1 and D2 or one of the roaded alternatives would have less effect on caribou movement. The question itself is subject to debate. Western science, although with little data for aircraft effects, tends to lean toward roads having a greater effect, especially if heavy traffic is present. A proposed mitigation measure for effects of traffic may be included in the Final SEIS. Traditional Ecological Knowledge on the other hand suggests that aircraft are the greater disturbance factor.

[16-007]
The question of whether road or air traffic has the greater impact on caribou movements is subject to debate. Western science, although with little data for aircraft effects, tends to lean toward roads having a greater effect, especially if heavy traffic is present. A proposed mitigation measure for effects of traffic may be included in the Final SEIS. Traditional Ecological Knowledge on the other hand suggests that aircraft are the greater disturbance factor.

[16-008]
Efforts to quantify impacts are made wherever quantified data is available. Impacts are described in detail and estimated whenever quantified data is not available. In the revised Subsistence section in the Final SEIS, the impacts of each alternative are delineated more precisely.

[16-009]
ADF&G surveys, including Braem, et al., 2011, are incorporated into the revised subsistence section. These data support the conclusion that GMT1 is likely to have a major impact on subsistence.

[16-010]
Data on subsistence caribou harvest from Braem et al 2011 is incorporated into the revised Subsistence section of the Final SEIS.

[16-011]
Potential impacts to caribou distribution and movement through the immediate area are identified as likely potential impacts of the road. Actual changes cannot be studied unless and until a road is constructed. Observations on impacts from the new CD5 road have been incorporated into the subsistence section and, depending on the schedule of the Final SEIS, will continue to be incorporated.

[16-012]
Data on subsistence caribou harvest from Braem et al 2011 is incorporated into the revised Subsistence section of the Final SEIS.

[16-013]
A summary of the analysis provided will be included in the Final SEIS. A mitigation measure mitigation for traffic on roads will be evaluated for inclusion in the Final SEIS.

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arctic slope regional corporation

April 22, 2014

Via Email: gmt1comments@slrconsulting.com

GMT1 Draft SEIS Comments
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RE: Arctic Slope Regional Corporation Comments on the GMT1 Draft SEIS

Dear Ms. Psarianos;

Arctic Slope Regional Corporation (ASRC) appreciates the opportunity and hereby submits comment on the Greater Moose's Tooth #1 (GMT1) Draft Supplementary Environmental Impact Statement (SEIS).

GMT1 is the first development that would locate a development drill site on Bureau of Land Management (BLM) land in the National Petroleum Reserve – Alaska (NPRA) and is the subject of this SEIS. The currently proposed GMT1 project was reviewed and approved in the November 2004 Record of Decision for the Alpine Satellite Development Final EIS. At that time GMT1 was known as CD6. The main difference between the 2004 CD6 project and approval and the current GMT1 proposed project is that the Applicant, ConocoPhillips Alaska Inc. (CPAI), decided to move the drill site out of the Fish Creek buffer area to mitigate potential impacts to subsistence. Otherwise the project and size of the development is very similar to the original approved CD6 project.

The BLM's draft SEIS is of critical importance to ASRC and its Alaska Native shareholders. ASRC is committed both to increasing the economic and shareholder development opportunities within our region, and to preserving the Iñupiat culture and traditions that strengthen our shareholders. We also support responsible development of oil and gas resources in Alaska, and specifically on the North Slope (including in the NPRA), and believe that Alaska oil and gas must be an integral component of the nation's energy strategy.

The National Petroleum Reserve in Alaska (NPR-A) was created in 1923 as one of several national reserves established to ensure sufficient petroleum for the Navy and other military operations in times of war. In 1976, the Naval Petroleum Reserves Production Act of 1976 (NPRPA) transferred management of the NPR-A to the Department of the Interior.

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The NPRPA states that the NPR-A is to be managed "in a manner consistent with the total energy needs of the Nation" and, pursuant to Section 6505a of the NPRPA, BLM is required to conduct oil and gas leasing and development in the NPR-A. The protection of surface values is also required, to the extent consistent with exploration and development of oil and gas. In 1981, Congress directed BLM to undertake "an expeditious program of competitive leasing of oil and gas" in the NPR-A.

Any and all BLM decisions that impact the NPR-A, including decision on GMT1, are of critical importance to ASRC and its shareholders. ASRC is the Alaska Native Corporation formed under the Alaska Native Claims Settlement Act ("ANCSA") that encompasses the entire North Slope of Alaska. ASRC has a growing shareholder population of approximately 11,000, and represents eight villages on the North Slope: four that are within the boundaries of the NPR-A (Atqasuk, Barrow, Nuiqsut and Wainwright), and four that are not (Anaktuvuk Pass, Kaktovik, Point Hope and Point Lay).

ASRC owns approximately five million acres of land on Alaska's North Slope, including lands in the GMT1 area, conveyed to the corporation under ANCSA as a settlement of aboriginal land claims. Under the express terms of both ANCSA and ANILCA, the unique character of these lands, founded in federal Indian law and the most significant Native claims settlement in U.S. history, must be recognized by the Congress and the Federal government in making any land management decisions. In the unique framework created by ANCSA and ANILCA, Congress expected that regional corporations, including ASRC, would be responsible for developing the economic infrastructure, including management of the abundant natural resources on and under the lands conveyed to them, to provide for the economic well-being of Alaska Natives.

ASRC is committed both to increasing the economic and shareholder development opportunities within our region, and to preserving the Iñupiat culture and traditions that strengthen both our shareholders and ASRC. A founding principle of ASRC is respect for the Iñupiat heritage. A portion of our revenues is invested into supporting initiatives that aim to promote healthy communities and sustainable economies. By adhering to the traditional values of protecting the land, the environment and the culture of the Iñupiat, ASRC has successfully adapted and prospered in an ever-changing economic climate.

One of our concerns with the SEIS is it appears the BLM diminishes the benefits to our shareholders and residents of Nuiqsut, the North Slope and all Alaska Natives will receive through development of GMT1.

ASRC remains committed to fulfilling its obligations to Alaska Natives, including its shareholders, by developing these resources and bringing them to market in a manner that respects Iñupiat subsistence values while ensuring proper care of the environment, habitat, and wildlife.

ASRC owns the subsurface rights to 4.7 million acres across the North Slope, and the surface rights to 4.1 million acres. Of that total, approximately 320,000 acres is subsurface rights to land that lies within the NPR-A. Among the four villages that own land inside the NPR-A, Atqasuk Corporation, the village corporation of Atqasuk, owns 72,954 acres; Olgoonik Corporation, the village corporation of Wainwright, owns 170,870 acres; Ukpeaġvik Iñupiat Corporation, the village corporation of Barrow, owns 214,810 acres; and Kuukpik Corporation, the village corporation of Nuiqsut, owns 77,013 acres (note Kuukpik lands straddle the boundary of the NPR-A).

In order to fulfill our commitment to our Alaska Native shareholders, we not only need the ability to manage appropriate development of resources that are on lands owned by ASRC and the various Alaska Native organizations on the North Slope discussed above; we also need to ensure that appropriate development can occur on publicly owned land that is managed by the BLM, including the 22.6 million acres within the NPR-A that is managed by the BLM. This land, similar to other publicly-owned and federally managed land in other areas of Alaska, is increasingly subject to policies and decisions driven by the federal government that may impact the ability of ASRC to fulfill its mission, and it is critical that Alaska Native corporations have an opportunity to meaningfully participate in the development and implementation of polices that impact our ability to fulfill our mission to our shareholders.

[17-001] In addition to creating important jobs for economically disadvantaged Alaska Natives, responsible oil and gas development on the North Slope and offshore would play an integral role in providing a long term, secure supply of energy to the nation. It would also help ensure sufficient future flow of product through the Trans-Alaska Pipeline System, which is now operating at only one-third of its original capacity. Advances in technology lead us to believe that the abundant energy resources available, both onshore and offshore, in Alaska can be developed safely and responsibly, and in a manner that protects cultural and subsistence resources.

BACKGROUND

In 2007 ASRC along with Kuukpik Corporation (Kuukpik) utilized their ANCSA land entitlement to strategically select more than 15,000 acres of federal land in the northeastern area of the NPRA. ASRC acquired ownership of the subsurface estate to surface lands selected by Kuukpik, as is prescribed by ANCSA. With contractual commitments from CPAI in hand that assured that lands not selected would have the same enhanced environmental protections as lands that were selected, the two ANCSA corporations selected lands that had the highest potential for oil and gas development based on exploration results in the area. As a result ASRC and Kuukpik selected lands containing the ARCO Alaska Inc. Lookout #1 oil discovery well, drilled in 2001.

In 2008, CPAI, successor to ARCO Alaska Inc., applied for and received approval to form the Great Moose's Tooth Unit. Approval was received from both the BLM and ASRC as the subsurface managers of the leases.

In 2010 Lookout-area selections were conveyed to ASRC (subsurface) and Kuukpik (surface) by the BLM. By virtue of the land selection and conveyance, the ASRC subsurface estate within the GMT1 unit now contains approximately 90% of the hydrocarbon resources thought to be accessed through the GMT1 development.

Therefore, the development of GMT1 will be the development of Native-owned resources within NPR-A to a degree not seen before. This is a fact that is lost within the SEIS document and is the subject of further comments below. However, this fact and other shortcomings (identified below) within the SEIS do not condemn either the document or the proposed project.

ASRC, in this letter, will focus its comments along two broad themes:

1. That Alternative A of the SEIS is Least Environmentally Damaging Practicable Alternative (LEDPA). The project is good for its shareholders and all of Alaska's Native people, and for the North Slope Borough, the State of Alaska and the federal government; and

2. That the proposed GMT1 project has more benefits in terms of royalty, tax revenue, subsistence access, quality of life improvements and other areas than is described in the SEIS.

BRIEF PROJECT DESCRIPTION

GMT1 is a proposed drill site in the Greater Moose's Tooth Unit, and will be connected by road to the Alpine CD5 drill site. The proposed GMT1 project includes a new gravel pad, a 7.8-mile road, and pipelines. The GMT1 drill site is approximately 14 miles west of the Alpine Central Facility (CD1). Oil, gas and water produced from GMT1 would be transported via pipeline to CD5 and then on to the Alpine facility for processing. Sales quality crude would be transported from Alpine via pipeline to the trans-Alaska Pipeline. Estimated gross peak production is 30,000 BOPD. Construction is slated for the winters of 2016-2017, and first oil in late 2017. The purpose for the GMT1 drill site is to produce oil from ASRC subsurface leases.

The BLM developed the SEIS because it determined there was significant new data available since the 2004 Alpine Development Final EIS and the 2012 NPRA EIS/IAP. The SEIS evaluates 5 alternatives:

- Alternative A: CPAI's Proposed GMT1 Project - drill site out of the Fish Creek buffer with a section of road/pipeline inside the Fish Creek Buffer;
- Alternative B: Avoid Fish Creek Setback (moves section of road/pipeline out of Fish Creek buffer);
- Alternative C: Alternative Access (development of an industrial hub in Nuiqust);
- Alternative D: Roadless Access to GMT1 (access via aircraft and ice road only); and
- Alternative E: No Action

ASRC SUPPORTS ALTERNATIVE A

ASRC supports Alternative A as proposed by CPAI. We feel that Alternative A represents the LEDPA as required under the NEPA. We have also supported the efforts by Kuukpik Corporation to work with ConocoPhillips to design a project that meets the needs and concerns of the community of Nuiqsut. **[17-002]** GMT1 is a project that will produce oil from ASRC subsurface, a right given to us through ANCSA to support our shareholders and through the sharing provisions benefits Alaska Natives across the state. GMT1 is also an essential project to maintain North Slope production and the economic benefits that it brings to the North Slope Borough through its tax-base that supports the infrastructure of the North Slope communities.

ASRC believes Alternative A responds to the community of Nuiqsut's long-standing and well documented concerns over aircraft traffic in and around the village. The excessive amount of aircraft traffic has a negative effect on the community and subsistence through disturbances to the animals. Complaints of excessive amount of air traffic around Nuiqsut have been well documented

in numerous EIS's over the years and along with safety and spill response concerns are one of the primary reasons this project had a road in the 2004 Alpine Satellite Development Plan EIS.

ASRC agrees with the community that road access is better because it will reduce the number of flights in the area while at the same time allow broader access for subsistence to the west of the village in the Fish Creek area. Local Nuiqsut residents will have use of access to the road to improve access to subsistence hunting areas west of Nuiqsut in the northeastern NPRA.

Although ASRC supports a road we do not support any road. After having reviewed the SEIS and the functional assessment of wetlands of Alternative A versus Alternative B – we feel that Alternative A meets the 'Least Environmentally Damaging Practical Alternative' or LEDPA. It meets that standard because Alternative A is located in dryer more uplands tundra despite being located in the Fish Creek buffer versus Alternative B which has more drained lake basins as demonstrated on Figure 3.2-1.

Alternative A has less direct wetland impacts. The road of Alternative B impacts a total of 6.8 more acres of wetlands than does the road of Alternative A. Of the wetlands impacted, the road of Alternative B impacts 9.9 more acres of higher functional value wetlands (Category II) than does the road of Alternative A.

Alternative A has less indirect wetland impacts. Using the indirect impacts of construction on wetlands based on a 300-foot zone of impact (Table 4.3-4), the Alternative B indirectly impacts a total of 18.4 more acres of wetlands than does the Alternative A. Of the wetlands indirectly impacted, the Alternative B impacts 74 more acres of higher functional value wetlands (Category II) than does the Alternative A.

We have heard in Nuiqsut that the majority of the people would rather see Alternative A routing for this reason despite that it is in a small area of the Fish Creek set-back. Individuals in the community expressed that having a small portion of the Alternative A road in the drier set-back outweighed re-routing the road in the lower, moister Alternative B route.

[17-003] Alternative C, the Nuiqsut hub alternative, is not a viable option for consideration. CPAI has stated that it would not use the Nuiqsut airport to support its operations and Kuukpik has stated that it will not allow upgrading the privately-owned Nuiqsut Spur Road (Spur Road) to allow for industrial development. ASRC does not feel the need to provide more comment to this Alternative since it is not practical.

Like Alternative C, Alternative D is not a viable option because of the concerns expressed by the community over air traffic and noise from aircraft as stated above and reiterated here. It is ASRC's opinion that Alternative D should not be considered as an option and we find it surprising that the BLM would ignore the concerns expressed by Nuiqsut community members and organizations about air traffic that are well documented by the BLM in its own past EIS's for the NPRA, most recently in the 2012 NPRA IAP/EIS and in the 2004 Alpine Satellite Development EIS. In addition to the added aircraft and noise that the community would have to bear under Alternative D **[17-004]** the SEIS does not provide any information on the impacts to the community or subsistence or the costs associated with the need for CPAI to have an annual ice road to the GMT1 project. Alternative D would also have the most adverse effect on air quality of all the Alternatives, with the exception of Alternative E the no action alternative. The SEIS states for Alternative D that "[S]ignifcant air quality impacts will result from the construction and operation of Alternative D for

particulate matter". In its efforts to mitigate the concern that the road and pipeline are located in the Fish Creek buffer under Alternative A and that this may lead to adverse effects to subsistence the BLM is proposing more harmful effects to both the community through deceased air quality and adding more impacts to subsistence through increased air traffic and noise through proposal of this alternative.

ASRC COMMENTS ON THE SEIS

It is our opinion that the SEIS understate the importance of the project to Alaska Natives because the document does not clearly identify that the primary purpose of the project which is to primarily develop ASRC minerals. While we acknowledge that the surface location is on federal land and lease it is Alaska Native minerals that will be developed. **[17-005]** The only real depiction of our ownership is on Figure 1.1-1 of the SEIS, which depicts the Notional Participating Area included in the 2008 Greater Moose's Tooth Unit Agreement (GMTU). In fact, Figure 1.1-1 reflects that ASRC would own approximately 90% of the subsurface that will be developed through the GMT1 project. **[17-006]** ASRC feels that the BLM has not accurately described the ownership of the minerals to be developed and has been inconsistent throughout the document on land and resource ownership.

For instance, in **[17-007]** Chapter 1, Introduction, under section 1.3 Purpose and Need for the Project - the BLM states "The purpose of the BLM federal action is to provide CPAI with legal access across public land managed by the BLM and authority to construct, operate, and maintain drill sites, pipelines, an access road, and ancillary facilities to develop and produce petroleum resources on BLM-managed lands within the GMTU of the NPR-A, for which CPAI holds federal oil and gas leases issued by BLM." There is no mention of ASRC-managed lands and leases in this introductory statement which are clearly depicted on Figure 1.1-1 as stated above. The same section then goes on to say "Although this SEIS considers the reasonably expected impacts of the GMT1 development on Kuukpik, ASRC, and State owned surface and subsurface estates, these non-federal entities are responsible for land management decisions on their respective lands." **[17-008]** ASRC appreciates the statement however we are unsure how the SEIS considered the reasonably expected impacts to us since we were not consulted under the process even after we asked to be included. There is no readably identified location in the SEIS that presents how impacts to ASRC were considered. We would also like to make clear that significant negative impact to ASRC is non-development of our subsurface resources.

[17-009] Section 4.4.2 of the Economy chapter in the SEIS does not mention royalty revenue to ASRC as a primary economic effect while it does state that there will be increased revenues to the State, the NSB and the City of Nuiqsut resulting from shared royalties, state corporate income taxes, property taxes, bed taxes and other fees. This is a rather large oversight since royalty derived from the ASRC managed leases, along with taxes to the North Slope Borough, are the biggest economic gain to the people of the North Slope

[17-010] While the SEIS, on page 297, states that ASRC minerals will be developed through horizontal drilling there is no description of the economic and revenue impact to ASRC resulting from the project. In the next paragraph, however, the SEIS state estimated royalties from GMT1 would amount to over $2.9 million during of the life of the project but it does not state who those royalties would be paid to. **[17-011]** Our main issue with the total royalty derived is that it is wrong. On page 298, Table 4.4-1 the BLM uses the projected production for GMT1 that was in the 2004 Alpine Development Satellite EIS. The production numbers in Table 4.4-1 are average barrel of oil per day

(BOPD) annually production volumes. It appears that BLM simply totaled the average BOPD production numbers and did not convert those numbers to reflect daily production which is customary for determining the commercial viability of a project. By simply summing the annual volumes and using the oil price of $95.16 on page 297 the total royalty received is grossly underestimated. When the average BOPD is converted to total production assuming a 356-day production year (assuming 8-days of downtime per year) the actual royalty from the development is in excess of $1 billion (see attached worksheet).

[17-012] By miscalculating and grossly underestimating the potential royalty derived from the project and the inconsistencies in acknowledging the land ownership of the subsurface by ASRC the BLM has not accurately represented the enormous economic benefits to ASRC, its shareholders and all Alaska Native Corporations through ANCSA Section 7(i) revenue sharing. ASRC does not represent these numbers are correct, however, **[17-013]** we offer this as an example of incorrect information used by the BLM in assessing the impacts to the project and to point out that the BLM seems to have a preference and leaning toward the negative impacts and do not focus or highlight the positive outcomes from the project to form its conclusions in the SEIS.

[17-014] Other inconsistencies in the SEIS that have a direct impact on ASRC and the value of ASRC resources is incorrect information relating to gravel located at ASRC's gravel mine site.

Shown in Table 2.4-1, Gravel Use for Alternative A, on page 29 is a comparison of the expected footprint area that would result at the unopened potential Clover gravel site and the existing ASRC gravel mine site by the mining of 626,000 cubic yards of sand and gravel material for Alternative A. The Table 2.4-1 shows that the surface disturbance footprint at the ASRC Mine site would be 25.4 acres and the Clover site footprint would be 18.7 acres. **[17-015]** The 25.4 acre footprint for the ASRC Mine site is not correct and is too high. The correct footprint area for mining 626,000 cubic yards at the ASRC mine site is 18.3 acres. The 18.3 acre footprint area is based on the gravel mining activities at the Phase 1 area of the ASRC site done in 1998 and 1999. The mining in the Phase 2 area of the ASRC site done in 2005 in fact had a smaller footprint area for the equivalent volume of gravel mined. Based on the 2005 pit, the footprint area for mining 626,000 cubic yards at the ASRC mine site would be 17.8 acres (see backup information below).

The draft SEIS in the third paragraph of this section (bottom of page 29, top of page 30) states: "Access to the remaining 900,000 cubic yards within Phase 2 is practically unachievable. The 2005 existing cell contains more than 100 million gallons of water. To safely gain access to the gravel within 400 feet of an existing cell, any and all water must be removed prior to excavating the gravel." **[17-016]** The requirement for a 400 foot wide buffer as stated in the SEIS is not consistent with the permitted buffers shown in the U.S. Army Corps of Engineers permit. Corps permit POA-1996-869-M5 was issued on September 16, 2013 for gravel mining in the Phase 2 area of the ASRC mine site. This permit shows that a 300 foot buffer will be maintained between gravel mining and the 2005 gravel pit lake, but only a 200 foot wide buffer is to be maintained between gravel mining and the gravel pit lake in the Phase 1 area. The Corps of Engineers permit does not require the de-watering of the adjacent gravel pit lakes prior to gravel mining.

The draft SEIS in the third paragraph of this section (top of page 30) states: "Upon completing the excavation for the 2014 cell, supporting the CD5 Project and Nuiqsut Spur Road, it is estimated the 2014 cell will contain over 150 million gallons of water. Removing approximately 250 million gallons of water from the existing cells at the remotely located ASRC Mine Site is impractical and unachievable." **[17-017]** The SEIS does not state the basis for the estimate that "...the 2014

cell will contain over 150 million gallons of water. " If the permitted 1.2 million cubic yards of gravel is mined from the Phase 2 area it will create a pit capable of holding a volume of about 240 million gallons. The SEIS appears to conclude that the 2014 pit will fill in a season with a volume of water from drifting snow equal to about 60% of its capacity. Under normal circumstances and based on past experience, this rate of filling will not happen.

[17-018] Absent an ice-jam caused flood in 2014 on the Colville River during break-up, the 2014 pit will have minimal water in it from snowmelt during summer 2014. The 2014 pit will begin to fill with water from the drifted snow that blows into the pit in winter 2015 and melts in the summer of 2015. Based on the actual observations of the Phase 1 pit, the 2014 pit should fill with water slowly. It took 7 years (1998 - 2005) for the Phase 1 north pit to re-fill with water from the melting of drifted snow. Based on the rate of pit re-filling from drifted snow that was observed in the Phase 1 north pit, the 2014 pit would gain about 35 million gallons of water each year over a period of 7 years.

In addition, **[17-019]** the conclusions stated in the SEIS about pumping 250 million gallons from the Phase 2 area are not relevant to mining gravel from the immediately adjacent Phase 3 area of the ASRC mine site. Based on the exploration borings done in 1982-83, and using the volume of gravel actually mined between 1998 and 2007 in the Phase 1 and 2 areas, a preliminary estimate of the in-place gravel that may be in the 430 acres of the Phase 3 area is about 15 million cy.

[17-020] There are also corrections that ASRC will like to offer to Table 2.3-2 Footprints and Gravel Requirements for Project Alternatives. The Total Footprint in acres for Alternative D is stated to be 97.5 acres. This is not consistent with the 103.6 acres stated in Table 4.1-1. The Alternative D road length is stated to be 1.2 miles. This is not consistent with the 0.0 miles in Table 4.1-1.

The SEIS spends considerable effort trying to characterize negative impact to subsistence throughout the document however it does not seem to try to keep the size of the project in perspective. GMT1 is a satellite project to the Alpine field and has been a known discovery since 2001 and was in fact permitted in 2004. The SEIS characterizes the impacts of GMT1 to be greater than what the residents of Nuiqsut believe them to be. Who better to pay attention to than the local residents of the community adjacent to the development?

[17-021] Another area of the SEIS that is missing, other than ASRC's ownership interest, is the positive benefits to the community that the Nuiqsut Spur Road will have with regard to subsistence access. This road is a mitigating measure that Kuukpik and CPAI have agreed to that allows local access to the oil fields for not only jobs, where people can actually commute work and back (including to GMT1), but it also provides access to drive to new areas for subsistence use. Kuukpik has expended a great amount of effort and its own resources to permit and develop the Spur Road primarily to benefit the community by providing subsistence access. While the Spur Road does not tie directly into GMT1; it does connect Nuiqsut to CD5 which then through Alternative A will connect to GMT1. This is an important mitigating item that a locally-owned business has developed through an agreement with CPAI that does not get mentioned in the SEIS even though it was part of the public record while the SEIS was being prepared.

Conclusions

ASRC GMT1 SEIS Comment
April 22, 2014

While ASRC has reviewed in detail the SEIS we have found it difficult to respond to each and every area of deficiency, incorrect information and subjective conclusions in the document. We have tried to provide corrections and additions were we felt they were warranted particularly with respect to our interest in the GMT1 project and to support the community of Nuiqsut who have clearly stated their preference for which Alternative they support. It is for these reasons and based on the information available that ASRC strongly recommends that Secretary Jewell issue the Record of Decision for Alternative A. We feel that thorough analysis of the SEIS and the data within demonstrates that Alternative A is the Least Environmentally Damaging Practical Alternative presented in the SEIS.

Please contact Richard Glenn or Teresa Imm at ASRC if you have any questions or comment regarding our response to the SEIS.

ARCTIC SLOPE REGIONAL CORPORATION

Rex Allen Rock, Sr
President and CEO

Enclosure: Attachment 1

Cc: Mayor Charlotte Brower, North Slope Borough
Isaac Nukapigak, Kuukpik Corporation
Bud Cribley, BLM
Neil Kornze, BLM
Pat Pourchet, Department of Interior
Commissioner Balash, Alaska Department of Natural Resources
ConocoPhillips Alaska

[17-022] Attachment 1

Calculation of Potential Royalty Received by GMT1

Production Days	359
Ownership	100.00%
Royalty Interest	16.667%
Price (SEIS)	$95.16

Average BOPD*	Annual Production**	Royalty Barrels***	Royalty Revenue****
2,500	897,500	149,586	$ 14,234,635
20,000	7,180,000	1,196,691	$ 113,877,077
20,000	7,180,000	1,196,691	$ 113,877,077
20,000	7,180,000	1,196,691	$ 113,877,077
17,000	6,103,000	1,017,187	$ 96,795,516
14,450	5,187,550	864,609	$ 82,276,188
12,283	4,409,597	734,948	$ 69,937,607
10,563	3,792,117	632,032	$ 60,144,178
9,190	3,299,210	549,879	$ 52,326,517
8,087	2,903,233	483,882	$ 46,046,196
7,197	2,583,723	430,629	$ 40,978,666
6,478	2,325,602	387,608	$ 36,884,785
5,830	2,092,970	348,835	$ 33,195,168
5,247	1,883,673	313,952	$ 29,875,651
4,722	1,695,198	282,539	$ 26,886,378
4,014	1,441,026	240,176	$ 22,855,129
3,412	1,224,908	204,155	$ 19,427,429
2,900	1,041,100	173,520	$ 16,512,176
2,465	884,935	147,492	$ 14,035,350
2,095	752,105	125,353	$ 11,928,624
1,781	639,379	106,565	$ 10,140,754
1,514	543,526	90,589	$ 8,620,495
1,287	462,033	77,007	$ 7,327,990
1,094	392,746	65,459	$ 6,229,076
930	333,870	55,646	$ 5,295,284
185,039	**66,429,001**	**11,071,722**	**$ 1,053,585,027**

BLMs = total average BOPD x Royalty interest	30,840
BLMs = royalty barrels x price	$ 2,934,777

* from page 298, Vol 1
** Number of production days x average BOPD
*** Annual production x royalty interest
**** Royalty barrels x price

[17-001]
Comment is noted.

[17-002]
Comment is noted.

[17-003]
Kuukpik's opposition to Alternative C is discussed in the Final SEIS.

[17-004]
These impacts are discussed in Alternative D2

[17-005]
At this time, the exact areas that will be drilled have not been determined. Figure 1.1-1 of the Final SEIS only shows lease blocks. There is no designation shown or known as to what will actually be drilled.

[17-006]
Section 3.4.4 of the Final SEIS does include information about mineral ownership (subsurface lands). The oil and gas lease upon which GMT1 sits has not been selected and is public land. Until the exact areas that will be drilled have been decided a determination as to the owner of the minerals in question cannot be made.

[17-007]
Land ownership is covered in 3.4.4 and 4.4.4 of the Final SEIS. The oil and gas lease upon which GMT1 sits has not been selected and is public land. Until the exact areas that will be drilled have been determined a determination as to the owner of the minerals in question cannot be determined.

[17-008]
The Final SEIS sections on Sociocultural Systems and Economy have been substantially revised and expanded to describe the benefits to ASRC and the sociocultural and economic impacts of non-development. BLM formally alerted ASRC of the GMT1 project and invited ASRC to engage in tribal consultation, via certified mail on August 29, 2013, which was received by ASRC on September 4, 2013. BLM and ASRC met to discuss the GMT1 project September 26, 2013, and agreed that ASRC would continue to be included in discussions, although ASRC did not wish to set up a formal consultation schedule. Additionally, BLM appreciates ASRC's assistance in providing details and permit information associated with the ASRC gravel source being used for the GMT1 project. BLM has attempted to establish that it is glad to consult with any entity at any time. BLM is not aware of any specific requests for consultation that BLM did not respond to.

[17-009]
Text was revised in the Final SEIS to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

[17-010]
Text was revised in the Final SEIS to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

[17-011]
Text was revised in the Final SEIS to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

[17-012]
Text was revised in the Final SEIS to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

[17-013]
Text was revised in the Final SEIS to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

[17-014]
Comment is noted. BLM worked with ASRC to update the data and analysis on the ASRC mine site for the Final SEIS.

[17-015]
The Final SEIS has been updated to reflect the suggested edit.

[17-016]
The Final SEIS has been updated to reflect the suggested edit.

[17-017]
The Final SEIS has been updated to reflect the suggested edit.

[17-018]
The Final SEIS has been updated to reflect the suggested edit.
[17-019]
BLM has updated the data and analysis on the ASRC mine site for the Final SEIS.

[17-020]
The Final SEIS has been updated to reflect the suggested edit.

[17-021]
The revised Sociocultural Systems section (Section 4.4.2) describes in detail the benefits to Nuiqsut residents that would be likely from the ability to commute to work.

[17-022]
Text was revised in the Final SEIS to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

Lynn DeGeorge
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ConocoPhillips
Alaska, Inc

April 22, 2014

Hand Delivered to BLM Public Information Center

GMT1 SEIS Comments
Attn: Bridget Psarianos, Project Lead
222 West 7th Avenue, #13
Anchorage, AK 99513-7504

Re: ConocoPhillips Alaska Comments- Draft Supplemental EIS for GMT1

Dear Ms. Psarianos:

This letter is provided by the project applicant, ConocoPhillips Alaska, Inc. ("ConocoPhillips") to comment on the draft Supplemental Environmental Impact Statement ("DSEIS") prepared by the U.S. Bureau of Land Management ("BLM") for the proposed Greater Mooses Tooth One ("GMT1") development. GMT1 is a part of the Alpine Satellite Development Plan ("ASDP") that was approved by BLM in 2004. The supplemental EIS is being prepared primarily to identify any changes in the GMT1 project design since 2004, and to determine whether the effects of the project as currently proposed are still within the range of effects analyzed by BLM in the 2004 ASDP EIS.

BLM has provided a strong draft. ConocoPhillips submits the following comments in the spirit of constructive participation in the NEPA process to help ensure that the final document presents a full and fair supplemental analysis of the proposed GMT1 development. In this letter, ConocoPhillips draws your special attention to the following five comments:

1. The BLM is commended for the overall quality and sufficiency of the NEPA process and the DSEIS.

2. Incident response and safety are paramount issues that are important differentiating factors among the project alternatives for GMT1.

3. The draft subsistence and environmental justice impact analyses rely upon incomplete information and worst case assumptions, and the resulting findings overstate the adverse impacts from the GMT1 project alternatives.

4. The DSEIS contains errors and omissions on project costs and economic benefits, especially royalty payments to Alaska Native regional and village corporations, which are distributed throughout the state.

5. The Administrative Record as a whole demonstrates that Alternative A clearly should be selected as the preferred alternative, and that Alternative D (aircraft and ice road access) has substantially greater adverse environmental impacts.

These comments are addressed below and are further supported by additional and more detailed information provided in Appendices 1 through 8.[1] In addition, page-by-page comments on the entire DSEIS are provided in spreadsheet format in Appendix 6.

Thank you for considering our comments and for including this letter and its appendices in the administrative record.

I. OVERALL QUALITY AND SUFFICIENCY

ConocoPhillips commends BLM for the quality of the DSEIS. Of course, every draft NEPA document is subject to revision and improvement before it becomes final, and this DSEIS is no exception. Nevertheless, it is important to acknowledge that the draft is well-written, well-organized, and does a good job of referencing and relying upon pre-existing NEPA analyses in the foundational sections on the proposed project and the affected environment. Our review did not identify any analyses or alternatives that are missing, although BLM has discussed with ConocoPhillips the possibility of a potential seasonal drilling restriction, and that should be documented in subchapter 2.3.2 as an alternative that was considered but not carried forward.

The strong draft, in conjunction with multiple public meetings in villages across the North Slope and a 60-day comment period (instead of the standard 45-day comment period) all contribute to a robust NEPA process. BLM has kept this process moving forward despite difficulties, including the federal government shut-down in 2013. We appreciate the BLM's professional efforts to ensure both that the NEPA process proceeds correctly and that the proposed project does not suffer from avoidable delays.

II. OIL SPILL AND EMERGENCY RESPONSE

Oil spill and emergency response preparedness are critically important, especially for a remote, arctic location such as GMT1. The health, environmental, regulatory, economic and reputational consequences of inadequate safety and incident response are incalculable. Accordingly, as documented in the DSEIS, ConocoPhillips places a very high priority on safety and incident response.[2] ConocoPhillips has built in to the GMT1 project design numerous

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[1] Appendix 1 -Oil Spill and Emergency Response: Importance of Gravel Road Access to GMT1
Appendix 2- Social Systems (Particularly, Subsistence)
Appendix 3 - Subsistence Impact Mitigation
Appendix 4- Public Testimony Supportive of Alternative A
Appendix 5 - Seasonal Drilling is not a Practicable Alternative for GMT1
Appendix 6- DSEIS Comment Table
Appendix 7 - GMT1 Design Basis Criteria
Appendix 8 - GMT1 Project Impact Area Comparison Figure
Appendix 9 - Literature Cited

[2] *See, e.g.*, DSEIS at 335 ("CPAI places a high priority on spill prevention, which is integrated into their existing programs.... CPAI is continually evaluating their programs to optimize their defenses against oil spills and minimize the impacts should an oil spill occur.").

measures to be well prepared for oil spill and emergency response, and one of the key measures is year-round road access that allows the response resources maintained at the Alpine Processing Facility (APF) to be deployed reliably and rapidly to a spill or other emergency at the GMT1 drillsite, or anywhere along the pipeline route connecting the facilities.

[18-001] The DSEIS does not adequately reflect the importance of a road connection to GMT1 for oil spill and emergency response. It is not feasible to have complete incident response capability stationed at every drillsite, and a road provides a reliable way to mobilize response resources to the drillsite quickly when necessary. Without a road, roughly 15 miles of tundra, rivers, and lakes separate GMT1 from the resources at APF, although part of that distance will have a road upon completion of CD5. Project Alternatives A- C would include a road connection, but Alternative D would not. **[18-002]** Presently, the DSEIS does not adequately differentiate Alternative D from the other action alternatives on the basis that lack of year-round road access would seriously compromise oil spill and emergency response capabilities.

[18-003] Alternative D contemplates access to GMT1 supported by aircraft approximately 9 months of the year, and by ice road approximately 3 months of the year. Alternative D would involve some duplication of operational support facility infrastructure, such as materials storage, drilling equipment, a airstrip and a camp, but many of the resources that are necessary for full emergency response would remain only at APF. Alternative D would leave GMT1 inaccessible by road from APF for approximately three-quarters of the annual operational window, during which time oil spill and emergency response resources could be brought to GMT1 or the pipeline from APF only by air.

Locations to the west of the Nigliq Channel, including the proposed GMT1 drillsite, are frequently impacted by weather conditions that affect flight operations, presenting a significant logistical liability for human life safety and effective emergency response. **[18-004]** Due to weather related flight restrictions, air access to the proposed GMT1 drill site is likely to be restricted 13% to 22% of the year (based on historical flight restrictions observed since 2010). Access by air is not a sufficiently reliable way of bringing response resources to GMT1. Moreover, aircraft payload weight and size limitations could preclude delivery of the equipment necessary to address a significant event.

[18-005] For GMT1, there is no acceptable alternative to air transport outside the ice road season Locations west of the Colville Delta are not accessible by response watercraft originating from APF, which further restricts transportation options during an emergency. Heavy equipment necessary for fire, rescue, and spill response, as well as critical medical equipment such as the ambulance stationed at APF, would not be capable of traveling cross-tundra or across wet environments. Although tundra-travel vehicles (e.g., rolligon or tracked vehicle) may be permitted to travel cross-tundra to GMT1 during an emergency, they have serious limitations including lack of integrated medical life support equipment, slow travel speeds, and limited weight and volume capacities. Neither air transport nor tundra vehicle transport can adequately substitute for a gravel road to reach GMT1 year-round.

A gravel road also serves important purposes other than bringing resources in. **[18-006]** The gravel access road, constructed nearly parallel to the pipeline route, would also facilitate routine visual observation and investigation of pipelines. Conducting visual observation and investigation of pipelines from a gravel road would significantly reduce the number and frequency of aircraft flights needed to visually inspect pipelines. And a road would provide for timely evacuation of personnel in case of a dangerous situation on the GMT1 pad.

The heightened challenges to oil spill and emergency response posed by the constrained access options under Alternative D is not in dispute, as recognized in the DSEIS:

> [Under Alternative 0], mobilizations of emergency response equipment, supplies, and personnel housed at APF would be challenging, particularly during periods of adverse weather. Safety response time could also be compromised when air access is restricted by adverse weather. . . . Under Alternative D, the incremental challenges associated with being able to timely respond to Emergency Live Saving and Spill events increases safety and environmental risks throughout the life of the project. [DSEIS at 49.]

[18-007] In light of the importance of these issues, the final SEIS should more clearly and prominently differentiate among the project alternatives with respect to safety and incident response.[3] More detail and discussion of these important issues are set forth in Appendices 1 and 5 to this comment letter. Particular areas of the SEIS where additional discussion of these issues should be inserted within the existing analysis are identified in Appendix 6.

III. SUBSISTENCE AND ENVIRONMENTAL JUSTICE

ConocoPhillips' has critical concerns about the subsistence and environmental justice impact analyses in the DSEIS. ConocoPhillips recognizes the importance of subsistence resources and subsistence activities, including the need for project design features and mitigation measures to protect against impacts on subsistence. ConocoPhillips also appreciates the discretion afforded BLM as the lead agency in evaluating environmental impacts under NEPA. However, for the reasons summarized below and detailed in Appendices 2-4, we urge BLM to carefully review and reevaluate the draft impact findings based upon the available data and in the context of prior North Slope environmental analyses. **[18-008]** We believe the analysis in the current DSEIS, which concludes that the GMT1 project alone will have "major" impacts on subsistence and environmental justice, represents a dramatic departure from prior approaches that is not justified by new information or new analysis. This issue is important because it could set a precedent that confounds and undermines the balanced policy choices that are reflected in the 2013 NPR-A Integrated Activity Plan record of decision, and in the Alaska Native Claims Settlement Act (ANCSA).

A. Subsistence

The findings in the GMT1 DSEIS -that there are likely to be major adverse project specific impacts to subsistence from all project action alternatives, and that adverse cumulative impacts to subsistence are also major- conflict with NEPA policy and precedent, are not supported by the data and analysis in the DSEIS, and conflict with existing NEPA analyses of subsistence by the BLM and other federal agencies regarding North Slope oil and gas activities. Appendix 2 to this comment letter contains detailed discussion of these issues, and includes important information that has been omitted from the DSEIS. A brief summary of the issues is set forth in this comment letter.

[18-009] NEPA regulations and precedent clearly establish that the purpose of an EIS is to identify the probable environmental impacts, not to perform a worst-case scenario analysis. *See Robertson v. Methow Valley Citizens Council,* 490 U.S. 332, 359 (1989) ("[W]e conclude that

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[3] *See* 40 C.F.R. § 1502.2(b) ("Impacts [in an EIS] shall be discussed in proportion to their significance.").

NEPA does not require a 'worst case analysis.'"). Moreover, there is no "precautionary principle" applicable to NEPA, and there are no presumptions directing that in case of doubt conclusions should be drawn in favor of higher environmental effects. **[18-010]** Despite these well-established NEPA principles, the "major" adverse findings for subsistence in the DSEIS reflect a series of speculative, negative assumptions that lead in their totality to the false conclusion that the one satellite drill site under consideration, which is neither the first nor the closest to Nuiqsut, would nevertheless be the only oil and gas project in the history of the North Slope to cause "major" adverse subsistence impacts. When all reasonably available information is considered, and the probable impacts are considered as opposed to the worst-case scenarios, this conclusion is unsupportable. The conclusion also cannot be reconciled with the conclusions about subsistence in the 2004 ASDP EIS or the 2012 NPR-A Integrated Activity Plan (IAP) EIS.

Several factors stand out as problematic in the current subsistence analysis:

- **[18-011]** The impact criteria adopted by BLM for GMT1 for subsistence are poorly defined. As narratively described, the criteria are so conservative that a "major" impact finding seems predetermined. The criteria applied would likely dictate a "major" finding for any proposed oil and gas project on the North Slope in contradiction to every previous NEPA analysis performed by BLM and its sister federal agencies. This circumstance suggests a policy shift to find all subsistence impacts "major" and to require an EIS for every future development proposal, rather than a GMT1-specific subsistence impact finding that is genuinely based on new information since the project was analyzed in 2004.

- **[18-012]** The subsistence impact analysis is premised upon a one dimensional analysis of subsistence use areas within close proximity to Nuiqsut that overlap with the project study area. However, data exists for a multi-dimensional analysis, such as was undertaken in the Point Thomson EIS. A multi-dimensional analysis would consider harvest location data as a key measure of subsistence, and also look to other data such as subsistence resource abundance. These additional data are available, but have not been used in the DSEIS. The data show that the proposed GMT1 project area is not a primary location for subsistence harvest of caribou or other species, and that the GMT1 project is not expected to impact the abundance of subsistence resources.[4] In fact, the data show that ConocoPhillips' proposed Alternative A has an equal or lesser impact on subsistence than any other action alternatives. **[18-013]** In the past four years for which data are available, no caribou has been harvested within a mile of the proposed GMT1 drillsite.[5] **[18-014]** The data also demonstrate that rates of subsistence for the Nuiqsut community have remained relatively constant regardless of Alpine oil and gas development.[6]

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[4] See, e.g., DSEIS at Table 4.1-2 (overall impacts to fish, birds, terrestrial mammals from proposed development (Alternative A) would be "minor"; impacts to marine mammals and threatened and endangered species would be "negligible").

[5] See the figure on page 5 of Appendix 2 to this comment letter.

[6] **[18-015]** See, e.g., Braund, Nuiqsut Caribou Subsistence Monitoring Project: Results of Year 4 Hunter Interviews and Household Harvest Surveys (July 19, 2013WNuiqsut Year 4 Survey"), p. i (no observed trend in hunting areas, frequency, duration or harvest amount over four year period of study), p. 59-61& Table 21(most common reason for change in subsistence amount is "personal reasons").

- The "project study area" has been expanded in the GMT1 DSEIS to include Alternative C, known as the "Nuiqsut Hub" option. Under Alternative C - a scenario preferred by no one - the GMT1 access road would be rerouted to Nuiqsut so that the village may be used as a logistics and operations center. Because the Alternative C project area includes Nuiqsut, so too does the "project study area" that BLM has used pervasively to analyze potential impacts. **[18-016]** BLM's analysis fails to distinguish between these very different project infrastructure alternatives, and effectively treats Alternative A as if it will have the same effects on Nuiqsut that Alternative C would have. **[18-017]** The figure provided as Appendix 8 to this comment letter shows just how limited of an area the proposed Alternative A infrastructure would occupy,[7] even using BLM's 2.5 mile buffer criteria. The DSEIS should use information like the figure in Appendix 8 to more clearly differentiate among the action alternatives and their differing effects on subsistence activities based out of Nuiqsut. Doing so shows that Alternative A clearly has lesser impacts on Nuiqsut subsistence because the infrastructure would be located farther away from Nuiqsut. These conclusions are corroborated by the figures attached to Appendix 2, which show actual Nuiqsut caribou harvest locations in relation to Alternative A.

- **[18-018]** The current analysis attributes adverse impacts to GMT1 from both presumed avoidance of developed areas and from increased access afforded by the GMT1 access road. The presumed avoidance is overstated because it is based on worst-case assumptions, including an assumption that area in the vicinity of infrastructure are "lost" to subsistence. That assumption conflicts with data that show subsistence harvests have remained stable even around Alpine. The conclusion that increase access via the road constitutes an adverse impact reflects a negative bias in the analysis. **[18-019]** ConocoPhillips will make the road available for subsistence use by Nuiqsut residents. The is a benefit that is appreciated by the community as a benefit to subsistence, as reflected in the public testimony set forth in Appendix 4 to this comment letter. The road would be accessible and available to no community other than Nuiqsut, so it would not increase competition for subsistence resources. The countervailing benefit for a road should be recognized in the final SEIS.

- **[18-020]** Many of the potential adverse impacts to subsistence activities are addressed in a variety of ways through mitigation measures that the DSEIS does not address before reaching a "major" impact finding for subsistence. At the broadest scale, the BLM's 2012-2013 NPR-A IAP decision foreclosed oil and gas development across a majority of the NPR-A and imposed specific mitigation measures to further lessen subsistence impacts.[8] Moreover, one of the "best management

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[7] The figure does not include as part of Alternative A the water line that would be installed on existing VSMs and run parallel to existing lines. Such additional infrastructure would have no more than a negligible *effect*, if any.

[8] *See* NPR-A IAP Record of Decision ("ROD") at 28 ("Specifically, the decision makes unavailable for leasing large tracts of land important for the Teshekpuk Caribou Herd and the Western Arctic Herd, both of which have great importance for subsistence use. The decision in this ROD also makes unavailable for leasing coastal lands and waters that contain important subsistence resources and wildlife habitat, provides enlarged infrastructure setbacks from rivers important for subsistence *use*, and provides other protections for subsistence users and subsistence resources and their habitats.").

practices" ("BMPs") identified in the NPR-A IAP decision to mitigate subsistence impacts is stipulation H-1. ConocoPhillips has adhered to the letter and the spirit of this stipulation for the GMT1 project.[9] At the project design level, the entire drill site has been moved out of the Fish Creek buffer area, the road and pipeline have been shortened (reducing gravel usage and potential avoidance and conflict impacts) and the Ublutuoch River bridge has been lengthened to span the setback area as recommended by ADF&G and supported by the cooperating federal agencies. Additional extensive subsistence mitigation concerning project design, aircraft disturbance, pipeline glare, subsistence access, pipeline height, community consultation and dispute resolution, and subsistence mitigation funds, among others, is detailed in Appendix 3 of this comment letter. These mitigation measures should be considered before drawing a conclusion of "major" effects on subsistence.

[18-021] In its present draft form, the subsistence analysis tends to emphasize adverse impacts, ignore or minimize countervailing benefits and mitigation, and omit important existing data. The result is a negatively biased analysis that conflicts with the letter and spirit of NEPA and is irreconcilable with other, recent NEPA analyses of similar issues. As the draft analysis progresses to a final document, these areas of concern must receive focused reconsideration.

B. Environmental Justice

Environmental justice analysis addresses the concern that minority and low-income populations are often underrepresented in public processes. As a result, minority and low-income populations are at a heightened risk of being targeted for the siting of activities and facilities that have significant adverse environmental impacts. For purposes of the GMT1 analysis, however, the location of the project is exclusively a function of where oil and gas resources are found and accessible. It also bears emphasis that GMT1 is not a project that imposes environmental costs on the local population without substantial countervailing benefits. To the contrary, the Alaska Native stakeholders at the local and regional levels desire and support the GMT1 project notwithstanding its impacts.

[18-022] Insofar as ConocoPhillips is aware, no NEPA documents that have been prepared over the past several decades on oil and gas leasing, exploration, development or pipeline activity in the State of Alaska that have been found to have "disproportionately high and adverse human health or environmental effects" on minority or low-income communities, as is determined for GMT1 in the DSEIS . Nothing about the size, location, design, or other aspect of the GMT1 project can justify the decision to treat it as the first project on the North Slope to have a major impact on environmental justice. Nor does the DSEIS explain why this conclusion of a major impact is reached for the first time on the GMT1 project.

In light of this context, we believe the following points on environmental justice merit special scrutiny as the DSEIS is progressed to a final document:

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[9] *See* NPR-A IAP ROD at 68 (purpose of H-1stipulation is "to provide opportunities for participation in planning and decision making to prevent unreasonable conflicts between subsistence uses and other activities"); Nuiqsut Year 4 Survey at p. ii (results of years 3 and 4 surveys "indicate an increasing number of individuals who report fewer impacts and improved communication with CPAI").

- Nuiqsut residents have been well-represented throughout the GMT1 NEPA process. See, e.g., DSEIS at§ 1.5.2. In addition to individual involvement and government-to-government consultation, the interests of the Alaska Native stakeholders have been represented by the North Slope Borough and the Native Village of Nuiqsut (both of whom are cooperating agencies in the SEIS) as well as Kuukpik Corporation and Arctic Slope Regional Corporation ("ASRC"). We are confident that the BLM has heard and accepts that the local community is informed about the project impacts and also broadly in support of the GMT1 development. The testimony in Appendix 4 to this comment letter highlights some of this support as expressed at public meetings. **[18-023]** Given this circumstance, there is no reasonable basis for an extraordinary finding of disproportionately high and adverse impacts.

- **[18-024]** The GMT1 development is located in part on Kuukpik surface lands and will recover subsurface hydrocarbon resources owned by ASRC, on which Kuukpik has an overriding royalty interest. The associated revenue will benefit ASRC and Kuukpik shareholders (i.e., the affected Alaska Native community) and, through application of Section 7(i) and 7U) of Alaska Native Claims Settlement Act ("ANCSA"), to the substantial benefit of other Alaska Natives as well. It would be an especially ironic outcome if, on one hand, all other oil and gas development across Alaska on State, federal and private lands has proceeded with findings that there are not disproportionately high and adverse impacts to Alaska Natives and, on the other hand, the opportunities for Alaska Natives to responsibly develop and benefit from their own natural resources under the regime codified in ANCSA are impeded by an unprecedented and tenuous finding of "major" disproportionate and high adverse environmental justice impacts.

[18-025] Based upon the DSEIS findings, GMT1 would be the first and only project on the North Slope with a finding of disproportionate and high adverse environmental justice impacts. We very firmly believe that such an extraordinary finding is without precedent, unsupported and unwarranted. Attachment 2 to this comment letter includes more details and discussion about problems with the environmental justice analysis in the DSEIS.

IV. ECONOMICS

[18-026] Subchapter 4.4.2 of the DSEIS addresses the potential economic effects of a GMT1 project, but includes errors and omissions of important information. Most significantly, the subchapter essentially ignores a key economic characteristic of the GMT1 project: the payment of royalties to Alaska Native corporations, which fulfills the goals of the Alaska Native Claims Settlement Act (ANCSA) by allowing economic benefits to flow specifically to Alaska Natives as a result of responsible development of Native lands.

[18-027] Development of GMT1 oil resources would result in royalties paid to Arctic Slope Regional Corporation (ASRC, a Regional Corporation under ANCSA), BLM, and the State of Alaska (through shared royalties regulated by Federal law). The reference in the DSEIS to GMT1 royalties of $2.9 million is vastly understated; it represents less than one percent of the royalty reasonably expected to be paid over the GMT1 production period.

About ninety percent of the GMT1 oil reservoir is located on lands for which ASRC owns the mineral estate. The potential royalties on oil and gas production from these lands represents a substantial economic benefit for shareholders in those two corporations. Furthermore, through the sharing provisions of ANCSA §§ 7(i) and 70), seventy percent of these royalty benefits flow

to Alaska Native corporations across the State of Alaska, and to associated Village Corporations and shareholders, so that the benefits are not limited to the North Slope. **[18-028]** ConocoPhillips currently estimates that the total capital cost of the GMT1 project will be approximately $900 million. The GMT1 Alternative A cost of $400 million, as stated in the DSEIS, apparently includes only the capital costs of construction, and does not include the capital costs of drilling wells. **[18-029]** The DSEIS is reasonably accurate with respect to the incremental costs for Alternatives B, C, and D; but like Alternative A, the other action alternatives do not incorporate costs for drilling. The additional spend associated with drilling costs translates to a substantial amount of additional contracting and employment opportunities for many Alaskans and Alaskan companies. In 2012, 87% of all the dollars ConocoPhillips Alaska spent for goods, transportation and services went to Alaska-based companies.

[18-030] The local employment impact of GMT1 is underestimated in the DSEIS, which states, "local hire of Nuiqsut and other NSB residents is expected to be minimal." Using the 2010 census data in Section 3.4.1.6 of the DSEIS (page 131), the total available workforce in Nuiqsut is 232 people (55.9% of total population) and the number of people unemployed was 29.3 % of the workforce or 68 unemployed Nuiqsut residents. During the 2013-14 winter construction activities at CD5, approximately 32 Nuiqsut residents and Kuukpik shareholders were employed in various positions as subsistence representatives, ice road monitors, and construction trades. This is in addition to the approximately 14 Nuiqsut residents that have year-round employment in the existing oil field operations such as Alpine, Kuparuk and Prudhoe Bay (Table 3.4-5 DSEIS page 135). The level of local employment is significant and it should increase with new development such as GMT1 and with the completion of the Nuiqsut Spur Road, which will allow year-round access between Alpine and Nuiqsut.

[18-031] Finally, the DSEIS underestimates the potential tax benefits to the NSB and the State of Alaska. The DSEIS uses the 2004 property tax approximation of $0.05 per barrel (page 298). This methodology is no longer in use in the NSB, it its inclusion in the DSEIS underestimates the property tax benefit to the NSB by an order of magnitude. In addition, the DSEIS fails to mention the GMT1 production will be subject to State of Alaska production severance tax. Due to the royalty sharing provisions and the inaccurate estimate of royalty revenue mentioned above, the State will also see a much greater economic benefit than is described in the DSEIS. ConocoPhillips recommends that BLM work with the NSB and the State of Alaska to reflect a more accurate description of the significant economic benefits.

V. PROJECT ALTERNATIVES

The ultimate purpose of NEPA's procedural requirements is informed decision-making. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 351 ("NEPA merely prohibits uninformed . . . agency action"). In the context of GMT1, the decision before BLM concerns whether to authorize GMT1 project activities in the NPR-A and, if so, under which preferred action alternative. Because the DSEIS lacks clarity on some important issues, and in omits some salient information, it fails to adequately differentiate the impacts of the project alternatives. Below are highlighted some key distinguishing factors demonstrating that Alternative A (the proposed project) should be approved and, conversely, that it would be arbitrary for the BLM to select Alternative D (the aircraft and ice road access scenario).

Alternative A proposed by ConocoPhillips has been modified by ConocoPhillips since its original conceptual proposal in 2004 "to reduce the overall impact" by moving the drillsite entirely out of the Fish Creek buffer area, shortening the road and pipeline length to reduce the scale of the project and the amount of affected wetlands, and increasing the length of the Ublutuoch River

bridge to remove infrastructure from the floodplain setback established by BLM in 2008. DSEIS at p. 1; *see id.* at § 2.4. Alternative A results in the shortest access road of the roaded proposals (7.8 miles) , and both the smallest wetland impact footprint (72.5 acres) and the least total gravel usage (625,500 cubic yards (cy)) of any project alternative. *See* DSEIS at Tables 2.3-2 and 2.3-3 (p. 23). As such, Alternative A is the presumptive Least Environmentally Damaging Practicable Alternative ("LEDPA") under the§ 404(b)(1) Guidelines for Clean Water Act ("CWA") § 404 permitting purposes. *See* 40 C.F.R. pt. 230. Because Alternative A would result in the minimum impacts to the aquatic ecosystem among the action alternatives, the U.S. Army Corps of Engineers ("USAGE") is prohibited by the CWA from issuing a § 404 permit for another project design unless USAGE determines that because of "other significant adverse environmental consequences" of Alternative A, a different practicable alternative is the LEDPA 40 C.F.R. § 230.10(a).[10]

As described in the DSEIS, under Alternative D, "there is no year-round access between GMT1 and the existing APF." DSEIS at p. 45. "In this roadless or limited access scenario, transportation to GMT1 from the existing APF would be primarily by aircraft approximately 9 months of the year (May through January), and primarily via ice road approximately 3 months of the year (February through April)." *d.* This creates serious issues with respect to oil spill and emergency response, as addressed in detail in Appendices 1 and 5.

Alternative D would result in the second largest gravel footprint among the action alternatives – 87.3 acres – which is approximately a 17 percent increase over Alternative A *See* DSEIS at Table 2.3-2. Total gravel requirements for Alternative Dare more than 25 percent greater than Alternative A *d.* As such, Alternative D is not a permissible choice under the CWA § 404(b)(1) Guidelines unless there are other important countervailing environmental consequences to Alternative A that would be substantially avoided or minimized by Alternative D. Importantly, the impact analysis in the DSEIS demonstrates that there are no countervailing environmental impacts that would be avoided or minimized by Alternative D.

Based upon the DSEIS, the most sensitive project impacts concern potential adverse effects on subsistence, particularly caribou hunting. But the BLM's analysis correctly confirms that Alternative D would result in the maximum adverse impacts to subsistence:

> In terms of overall subsistence impacts, *Alternatives A and B would likely have the fewest impacts to subsistence* because they require less air traffic close to

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[10] This letter does not address Alternatives B (avoid Fish Creek Setback) and C (alternative access via Nuiqsut) in detail. However, in brief, Alternative B differs from Alternative A by routing the project access road and pipeline from GMTI to the south entirely out of the Fish Creek setback. *See id.* at§ 2.5. This modification increases the length of the GMTI access road by approximately 10 percent, resulting in an incrementally larger gravel footprint and associated wetland impacts. The DSEIS does not document any material environmental benefits to Alternative B in comparison to Alternative A; however, in addition to increasing the total wetland impacts, the Alternative B route would be "technically challenging for road construction and maintenance (e.g., poor soils, thaw stability)." *d.* Alternative C differs from Alternatives A and B by routing the project access road to Nuiqsut. *See id.* § 2.6. This access route modification increases the gravel footprint of the project by over 25 percent to 97.5 acres, resulting in the maximum adverse impacts to wetlands among any of the project alternatives. The DSEIS does not document any material environmental benefits to Alternative C in comparison to Alternative A.

> the community and because development related ground traffic would be limited to the road between CD5 and GMT1. . . . *Alternative O would likely have the greatest impact to subsistence uses and activities of all the alternatives, as* it would result in increased air traffic in hunting areas west of the community and would create a new source of air traffic that did not exist before. As noted above, air traffic is the most frequent reported caribou hunting impact associated with development. [DSEIS at p. 305 (italics added).][1]

The DSEIS also demonstrates that Alternative D would result in the maximum adverse impacts to caribou. *See* DSEIS at pp. 280-281 (finding adverse impacts to terrestrial mammals, especially caribou, "minor" from Alternatives A, Band C, and "moderate" from Alternative D).

[18-032] Even in reaching findings that adverse impacts to subsistence and to caribou would be greatest under Alternative D because of substantially more air traffic disturbance, the DSEIS fails to address other important differentiating impacts to subsistence and caribou between Alternative D and the road access alternatives. **[18-033]** Alternative D would require annual construction of an ice road to GMT1, resulting in construction work beginning in December, and project traffic during the winter months. Accordingly, in addition to the significant disturbance impacts from many more air flights *(see* Appendix 7 (flight frequency comparison)), Alternative D would result in more vehicle traffic (see Appendix 7 (vehicle trip comparison)) than Alternative A, all of which would be concentrated during the period of time when the project area is most used by the Nuiqsut community for caribou subsistence activities. *See, e.g.,* DSEIS at Table 3.4-6 (Nuiqsut annual cycle of subsistence activities). Moreover, as addressed further in Appendix 5, Alternative D would delay and extend drilling activities from GMT1, thereby doubling or tripling the duration of drilling impacts.

As addressed in Section II of this letter, the DSEIS documents that Alternative D presents the greatest risks of any alternative associated with safety, and spill detection and response. As addressed in Section III of this letter, the DSEIS documents that Alternative D results in nearly a 20 percent increase in wetland impacts over Alternative A (which impacts the least amount of wetlands among the project alternatives). Moreover, Alternative D is projected to result in "major" air quality impacts, in comparison to "moderate" impacts for all other project alternatives. *See* Table 4.1-2. Noise and transportation systems impacts are also elevated ("moderate") for Alternative D in comparison to all other project alternatives ("minor"). */d.*

Although Alternative D is not described to include a seasonal drilling limitation, because that possibility was not carried forward for analysis, ConocoPhillips recognizes that the possibility has been raised during public comment hearings. **[18-034]** A seasonal drilling restriction on GMT1 would have a significant adverse impact on project economics. The project may not be able to support the necessary investment with the imposition of a seasonal drilling restriction. The issues that would be raised by a seasonal drilling restriction are addressed directly in Appendix 5.

One final point regarding Alternatives A and D warrants emphasis here. As BLM knows, there are national advocacy groups that hold a policy preference against oil and gas activity in the NPR-A. These advocacy groups are expected to comment on GMT1 in favor of either denying ConocoPhillips access to GMT1 altogether or, alternatively, limiting GMT1 development to

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[11] This finding is further emphasized in the cumulative impacts analysis. See id. p. 386 ("Aiternative D would likely have the greatest impact to subsistence uses and activities of all the alternatives").

Alternative D because it would impede development of GMT1 by ConocoPhillips, and discourage future exploration and development within those limited areas of the NPR-A where the BLM allows oil and gas activity.

In 2012, the BLM engaged in a comprehensive review and analysis of resources and activities within the NPR-A. The resulting February 21, 2013 ROD emphasizes that the BLM balanced resource development and resource protection by setting aside vast areas in which no oil and gas leasing would be permitted and yet still provided for a "robust" oil and gas program:

> Two federal laws mandate protection for surface values in the NPR-A. . . . The decision adopted in this ROD achieves these goals in a number of ways. The decision adds large areas to two existing Special Areas and creates the new Peard Bay Special Area. While allowing for a robust oil and gas program in NPR-A, the decision makes nearly half of the Reserve unavailable for oil and gas leasing. Areas made unavailable for leasing encompass critical wildlife habitat and other important surface values in the Special Areas and adjacent coastal water, thus maintaining these lands largely undisturbed. In some of the lands in which leasing would not be allowed, the plan prohibits nearly all new non-subsistence permanent infrastructure. For those lands on which leasing and development can occur, the plan provides stipulations and best management practices to minimize impacts[.]
>
> . . . .
>
> The plan adopted by this ROD, however, makes lands in the eastern-most part of the TLSA available for oil and gas leasing. These lands, which have valuable waterfowl and caribou habitat, also include or are close to existing leases, including those with oil discoveries in the Greater Mooses Tooth Unit. Consequently, these lands, at least through the remainder of this decade, offer the greatest promise for oil and gas development and making them available for leasing constitutes a proper balancing of BLM's management responsibilities for NPR-A. [NPR-A IAP ROD at 16, 21.] [12]

In light of many ways which Alternative D would impose more adverse environmental impacts than the other action alternatives, it would appears that the only reason to favor that Alternative D, or any variation that does not allow for a road, would be to subvert the balanced policy choices made by the BLM barely a year ago in the IAP. An imperative to impede or preclude development in the limited areas of the Petroleum Reserve designated by the BLM for oil and gas leasing, exploration and production is not a lawful or rational basis for selecting Alternative D for GMT1.

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[12] Notably, the NPR-A IAP anticipated the proposed GMTI development project as described in Alternative A *(i.e.,* with an access road). *See* NPR-A IAP ROD at 51-54 & Table 4-7.

The comments that ConocoPhillips offers in this letter and Appendices 1 – 8 identify weaknesses in the draft environmental analysis that can and should be addressed in the final analysis without delay. We appreciate the hard work that the BLM and cooperating agencies have done to get the draft prepared, and we look forward to progressing GMT1 on the basis of strong supplemental EIS.

Sincerely,

Lynn DeGeorge

Lynn DeGeorge

cc: Mike Gieryic, DOI Solicitor's Office

Comments on GMT1 DSEIS

APPENDIX 1

Oil Spill and Emergency Response: Importance of Gravel Road Access to GMT1

ConocoPhillips

Comments on GMT1 DSEIS

Appendix 1

Oil Spill and Emergency Response:

Importance of Gravel Road Access to GMT1

ConocoPhillips relentlessly focuses on the details necessary to conduct operations safely, without incident, and without adverse environmental impacts. As part of prudent operations -- and also because it is required by law -- we maintain robust plans for responding to incidents that can arise and pose a threat to environmental resources, property, or human life. This planning is especially important on the North Slope, where Arctic conditions demand unique preparations for safety and incident response, and where the cultural dependence of local communities on subsistence resources presents an especially important reason to guard against adverse environmental impacts. Quick, reliable, and effective response upon first notice of a potential spill or other emergency is of utmost priority.

The ConocoPhillips proposal for GMT1 development includes a gravel road connecting the drill site with the CD5 road, which provides year-round vehicle access to the Alpine Central Processing Facility (APF). APF is a centralized facility that provides support to satellite drill sites in a variety of ways, including the equipment, personnel, and other support that are necessary to be able to respond to potential emergencies. This road connection to the resources at APF is an important part of the project design.

[18-035] The DSEIS has not adequately described the importance of a road connection to GMT1 for oil spill and emergency response. This Appendix 1 provides information and explanation that should be incorporated into the final SEIS to give this issue analysis and consideration commensurate with its importance.

Robust Dedicated Response Resources Currently Available at APF.

[18-036] ConocoPhillips maintains a robust suite of dedicated, full service medical, fire, and spill response personnel, facilities, and equipment at APF. Following are lists of dedicated medical and emergency response equipment currently and immediately available locally at APF:

Medical:

- 1 full time Medical Clinic, trauma care and patient stabilization
- 2 dedicated Physician's Assistants
- 2 volunteer Paramedics
- 24 volunteer Medical Emergency Medical Technicians Levels 1, 2, and 3 (approx. total)
- 1 Ambulance (Basic Life Support and Advanced Life Support services)

Fire and Hazardous Materials Response:

- 1 dedicated Emergency Response Chief
- 1 dedicated Fire Technician
- 46 volunteer firefighters (average 16 per shift)

- 12 trained volunteer Hazardous Materials Response Team personnel (approx. total)
- 1 Fire Engine, 1500 gallons/minute Pumper Truck
- 1 Fire Engine, 1500 gallons/minute Ladder Truck
- 1 Command Vehicle

High Angle Rescue:

- 1 Rescue Truck – Technical Rescue
- 19 volunteer Rescue Technicians (Average 8 per shift)

Other Response Resources Available from Alpine Operations:

- Alpine Emergency Operations Center
- Alpine Spill Response Center
- Bobcat
- Crane / Lift
- Flatbed truck
- FLIR, aircraft-mounted
- Loader
- Passenger vehicles (Bus, trucks, vans)
- Portable Fuel Storage Tanks
- Portable Generators
- Portable Heaters

Dedicated Spill Response Resources Available at Alpine CD1 and CD2:

- 6 Alaska Clean Seas professional trained spill responders (3 per 2-week shift)
- 42 volunteer Alpine Spill Response Team trained spill responders (average 12 per shift)
- Extensive inventory of spill response equipment, see Table 1

TABLE 1: DEDICATED SPILL RESPONSE EQUIPMENT AT CD1 AND CD2

ITEM	DESCRIPTION / USE	CAPACITY	QUANTITY*
Anchor System	Securing boom	18 or 40 lbs	14
ATV	Equipment transport, transfer of recovered fluids and/or oiled snow	6 x 6	1
ATV, Winch	Equipment transport, transfer of recovered fluids and/or oiled snow	8 x 8	2
Auger, Ice	Drill hole in ice		3
Avgas Trailer	Fuel for boats	200 gal or 500 gal	3
Blower, Boom Inflation	Inflates boom	388 cfm	4
Boat Motor, Spare	Spare parts to ensure continuous service	Varies: 10, 15, 30, 40, 115 hp	10
Boat, Airboat	On-water response and transportation	19 ft	2
Boat, Airboat	On-water response and transportation	22 ft	4

TABLE 1: DEDICATED SPILL RESPONSE EQUIPMENT AT CD1 AND CD2

ITEM	DESCRIPTION / USE	CAPACITY	QUANTITY*
Boat, Aluminum Skiff	On-water response and transportation	14 ft	2
Boat, Aluminum Skiff	On-water response and transportation	16 ft	2
Boat, Flat Bottom	On-water response and transportation	14 ft	1
Boat, Flat Bottom	On-water response and transportation	20 ft	1
Boat, Flat Bottom Tunnel Hull	On-water response and transportation	28 ft	1
Boat, Inflatable	On-water response and transportation	14 ft	2
Boat, Jet	On-water response and transportation	21 ft	1
Bobcat, 4x4 All Terrain	Build containment berm, oiled snow recovery		1
Bobcat, Mini Loader	Build containment berm, oiled snow recovery		1
Boom, Delta River	Swift water containment / deflection		6,675 ft
Boom, Shore/Tide Seal	Containment, onshore or on-water		1,700 ft
Boom, Sorbent	Containment, oil absorption	8"x10' or 4"x10'	1,840 ft
Chain Saw	Cutting ice		5
Generator	Portable power source	Varies in KW	14
GPS, Garmin	Site location and navigation		21
Heater	Portable heat source		2
Hose, discharge	Transfer of recovered fluids	Varies: 2", 3", 4", 5"	2,125 ft
Hose, suction	Transfer of recovered fluids	Varies: 2", 3", 4"	2,200 ft
Hydraulic Power Unit	Runs/controls skimmers and pumps	Varies	7
Light Stand	Portable light source		4
Portable Storage, Bladder	Temporary storage of recovered fluids	5,000 gal	5
Portable Storage, Bladder	Temporary storage of recovered fluids	500 gal	3
Portable Storage, Fast Tank	Temporary storage of recovered fluids	2,400 gal	4
Portable Storage, Folding Tank	Temporary storage of recovered fluids	3,000 gal	13

TABLE 1: DEDICATED SPILL RESPONSE EQUIPMENT AT CD1 AND CD2

ITEM	DESCRIPTION / USE	CAPACITY	QUANTITY*
Portable Storage, Folding Tank	Temporary storage of recovered fluids	1,500 gal	2
Portable Storage, Folding Tank	Temporary storage of recovered fluids	1,000 gal	3
Portable Storage, Folding Tank	Temporary storage of recovered fluids	600 gal	5
Portable Storage, Open Top Tank	Temporary storage of recovered fluids	2,500 gal	6
Pump, Diaphragm	Transfer of recovered fluids	3", 100 gpm	4
Pump, Floating	Transfer of recovered fluids	140 gpm	3
Pump, Peristaltic	Transfer of recovered fluids	2", 88 or 115 gpm	2
Pump, Submersible	Transfer of heavy oil / fluids	3", 132 gpm	1
Pump, Trash	Transfer of recovered fluids	4", 370 or 600 gpm	4
Pump, Trash	Transfer of recovered fluids	2", 220 gpm	3
Pump, Trash	Transfer of recovered fluids	3", 340 gpm	3
Radio, VHF Mobile	Field and Command Post communications		22
Rubewitch Sled	Guides chainsaw to safely cut slots in ice		2
Sandbags	Weighting equipment, containment/barrier, culvert blocking	varies	approx. 15 totes
Shotgun	Animal hazing, bear protection	12 gauge pump	7
Shower, Portable	Decontamination		1
Skimmer, Action Brush/Drum	Oil recovery	100 bph	1
Skimmer, Brush	Oil recovery	252 bph	1
Skimmer, Disc	Oil recovery	143 bph	1
Skimmer, Drum/Brush	Oil recovery	100 bph	2
Skimmer, Rock Brush	Oil recovery	75 bph	1
Skimmer, Rope Mop	Oil recovery	14 bph	3
Skimmer, Weir Manta Ray	Oil recovery	54 bph	4
Snow blower	Recovery of lightly oiled snow, build snow containment berm	50 ton/hr	1
Snow machine	Equipment transport, transfer of recovered fluids and/or oiled snow	550cc	6

TABLE 1: DEDICATED SPILL RESPONSE EQUIPMENT AT CD1 AND CD2

ITEM	DESCRIPTION / USE	CAPACITY	QUANTITY*
Sorbent Pads	Oil recovery, oiled surface cleaning	18"x18", 100 per bag	63 bags
Sorbent Pads	Oil recovery, oiled surface cleaning	36"x36", 100 per bag	50 bags
Sorbent Pom Pom	Oil recovery, oiled surface cleaning	30 per bag	44 bags
Sorbent Roll	Oil recovery, oiled surface cleaning	36"x150'	70
Survival Suits	Cold water immersion survival	Adult	11
Toilet, Portable	Personnel comfort	3 or 20 gal	5
Tracking Buoy	On-water oil plume tracking		6
Trailers, Various	Utility, boat, ATV, snow machine, etc.	Varies	~16, 1 per vehicle/ vessel
WeatherPort	Temporary shelter	Varies: 12'x10', 13.5'x16'	6
Wildlife, Hazing Kit	Hazing wildlife to prevent oiling		4
Wildlife, Hazing, Bird Scare Cannon	Bird hazing to prevent oiling		1
Wildlife, Net Launch Kit	Capture of oiled wildlife		1

**Quantity may not be exact; numbers may vary slightly, more or less, due to continuous inventory maintenance and control.*

[18-037] Table 1 represents the level of resources that ConocoPhillips has determined is appropriate to have available for incident response in and around Alpine. It is not feasible to duplicate these resources at each drill site, for it is not enough to simply have the equipment. Keeping the equipment response ready requires buildings for warm storage, space for maintenance activities, personnel to conduct maintenance, camps to house maintenance workers, and a long list of additional support. **[18-038]** Furthermore, a significant number of willing, trained volunteers is required to operate response equipment and skillfully perform complex response actions. **[18-039]** Having centralized response resources, both equipment and personnel to maintain and operate it, is therefore a practical necessity; but it requires provision for reliably transporting the resources to a drill site or other area where they may be needed -- without delay -- in case of a spill, threatened spill, or other emergency incident.

Timely and Effective Response.

The resources maintained at APF are separated by roughly 15 miles of tundra, rivers, and lakes from GMT1, although part of that distance will have a road upon completion of CD5. The way to ensure resources can be reliably made available for a timely and effective incident response is with a gravel road that would allow year-round transport and mobilization. Project Alternatives A – C each include a

road connecting GMT1 to CD5, which allows for continuous road access to APF. But Alternative D lacks a gravel road, and thus lacks year-round road access between GMT1 and APF. Instead, Alternative D contemplates transportation to GMT1 supported by aircraft approximately 9 months of the year (which poses disruption to subsistence activities) and by ice road approximately 3 months of the year (the construction of which also poses disruption to subsistence activities). Alternative D would involve some duplication of operational support facility infrastructure, such as materials storage, camp, drilling equipment, and emergency response equipment. Still, many of the resources that are necessary for full emergency response preparedness would remain only at APF [1].

Alternative D would leave GMT1 inaccessible by road from APF for approximately 9 months every year, which is three-quarters of the industrial operational window. **[18-040]** Locations to the west of the Nigliq Channel, including the proposed GMT1, are frequently impacted by weather conditions that affect flight operations, presenting a significant logistical liability for human life safety and effective emergency response. Due to weather related flight restrictions, air access to the proposed GMT1 drill site is likely to be restricted 13% to 22% of the year (based on historical flight restrictions observed since 2010). In addition, locations west of the Colville Delta are not accessible by response watercraft originating from APF, which further restricts transportation options during an emergency. **[18-041]** Heavy equipment necessary for fire, rescue, and spill response, as well as critical medical equipment such as the ambulance stationed at APF would not be capable of traveling cross-tundra or across wet environments. **[18-042]** Although tundra-travel vehicles (e.g., rolligon or tracked vehicle) may be permitted to travel cross-tundra to GMT1 during an emergency, they have serious limitations: lack of integrated medical life support equipment, slow travel speeds (average 5 mph); irregular routes around water bodies; limited weight and volume capacities; serious risks of bogging down and getting stuck; and risks of tundra disturbance that can affect natural resources and is a concern to local residents and local government officials. Neither air transport nor tundra vehicle transport is an adequate substitute for a gravel road to reach GMT1 from APF.

Under different circumstances, ConocoPhillips has been capable of developing a drill site without a gravel road connection to APF. The CD3 drill site provides an example. CD3 is much closer to APF than GMT1 and it is not separated by a river channel. **[18-043]** Operators and emergency responders from APF can access the nearby CD3 pad by boat for maintenance and emergency response operations if unsafe weather conditions limit aircraft support. In the event of an emergency, CD3 is accessible year-round by either watercraft using the Tamayayak and West Ulamnigiaq channels of the Colville River, or via surface vehicle through shallow waters or areas of grounded ice. These alternative methods of access have been employed numerous times within the past four years to transport personnel who were stranded at CD3 due to weather that prohibited flying. ConocoPhillips has a year-round tundra access permit to

[1] As described in the DSEIS and as referenced in this Appendix 1, Alternative D provides for drilling year-round and includes a 5,000-foot airstrip and aviation support facilities located within approximately 1 mile of the drill site. Discussion of a roadless development scenario involving only seasonal drilling during the ice road reason is found in Appendix 5.

Pipeline Releases or Well Control Incidents.

A gravel access road connecting GMT1 to the Alpine field road system and the APF would provide effective and reliable response support to common operational spills at GMT1, as well as worst-case pipeline or well control incidents. The ConocoPhillips-proposed gravel access road would be constructed near-parallel to the production pipeline route also proposed for the project. **[18-044]** This placement of the gravel road would facilitate routine visual observation and investigation of pipelines to detect leaks or other problems that could cause a spill incident. Routine observation and investigation of pipelines would occur as part of ConocoPhillips' operational best practices, as well as in compliance with regulatory requirement to conduct pipeline inspections. Conducting visual observation and investigation of pipelines from a gravel road would significantly reduce the number and frequency of aircraft flights needed to visually inspect pipelines. **[18-045]** Annual summer deployment of boom and pre-staged equipment along the pipeline route and its subsequent removal prior to winter could be effectively managed from a gravel road, which would also reduce the number and frequency of aircraft flights required to deploy and then remove the equipment. In addition, the gravel road would support equipment staging and provide immediate access points for boats or other response vehicles, in the event of a pipeline spill; this would increase response effectiveness and reduce the potential for disturbance to tundra and wildlife caused by response activities.

Hazardous conditions from a worst-case well control discharge at GMT1 facilities could require site evacuation and locally staged equipment could become inaccessible or unusable due to oiling or unsafe operating conditions. Permanent road access to GMT1 provides assurance that response equipment and resources would be readily available and deployable. **[18-046]** During a worst-case well control event (e.g. blowout), oil and gas flowing from the well would be hazardous and there would be significant potential for an explosive atmosphere and threat of fire. Spill and fire response personnel and equipment would be required to mitigate potential hazards, while trained well control specialists clear away damaged structures and debris and employ surface control techniques to control the well. **[18-047]** Controlling a well at the surface requires use of heavy equipment such as loaders, cranes, abrasive jet cutters, and athey wagons, as well as specialized equipment mobilized and deployed by the contracted well control specialist companyIn addition, a rig would be required to control a well event.

Permanent road access connecting GMT1 to APF allows essential, reliable, and unrestricted mobilization of heavy equipment and spill and fire response resources readily available at APF, as well as contracted out-of-region well control resources.

[18-048] Current Alaska Department of Environmental Conservation (ADEC) spill response regulations require capability to respond to a blowout using Best Available Technology (BAT). ConocoPhillips's ADEC-approved Alpine Oil Discharge Prevention and Contingency Plan defines BAT for well blowouts as well capping. Specialized personnel, tools, and heavy equipment are required for well capping; most of these tools and equipment must be transported by aircraft from out-of-region. In the event of a worst-case well control incident (e.g., blowout), facilities at GMT1 would shut down and the area would be evacuated. Without a road, GMT1 support facilities and response resources could be rendered inaccessible to GMT1. Access to response resources at APF via gavel road to GMT1 would ensure effective response capability for well control (well capping) personnel and equipment.

Safety.

A safe operating environment is ConocoPhillips' number one priority. **[18-049]** Permanent road access to GMT1 would allow presence of fewer staff, which reduces the number of personnel placed at risk, should an incident occur. With a gravel road in place, personnel would be capable of immediate evacuation to safety during an emergency, at any time of the year. Furthermore, year-round connection to APF maximizes availability of response personnel and resources that may otherwise be rendered inaccessible or unusable if solely located at GMT1. Unlike CD3, development of GMT1 without a road would mean there is no reasonable alternative option for access when air access is prevented.

Summary.

Permanent gravel road access to the proposed GMT1 would provide safer overall operations, as well as reliable and timely response capability for responders and equipment from APF. **[18-050]** Access to personnel, materials, and resources at APF via gravel road connection decreases the need for duplicate or redundant operational and ancillary support functions and facilities at GMT1. **[18-051]** Access to APF and reduced operational capacity at GMT1 would lessen the number of personnel exposed to potential safety risks and would better ensure sufficient response resources are readily available to address lifesaving incidents or to sustain long-term response.

Under Alternative D where no gravel road is proposed, in the event unsafe weather conditions restrict or prohibit use of aircraft, there is no adequate alternative means of getting resources to GMT1 for effective emergency response. **[18-052]** A gravel road would also facilitate routine visual observation of GMT1 production pipelines for purposes of leak detection and spill response, and **[18-053]** provide a staging area for resources and ready access points near production pipelines without disturbing tundra or wildlife.

Without a gravel road connecting GMT1 to the Alpine road system, significant human safety and environmental protection concerns exist. The proposed project under Alternative D lacks sufficiently reliable alternative means of access to support year-round oil spill and emergency response for GMT1 facilities. As a result, ConocoPhillips does not support a development alternative for GMT1 that lacks a permanent gravel road.

Comments on GMT1 DSEIS

APPENDIX 2

Social Systems (Particularly, Subsistence)

ConocoPhillips

ConocoPhillips 4/22/2014

Comments on GMT1 DSEIS

Appendix 2

Social Systems (Particularly, Subsistence)

Introduction: The Greater Moose's Tooth 1 (GMT1) Draft Supplemental Impact Statement (DSEIS) analysis of social systems includes the following subchapters, which discuss the consequences "on or by the social and cultural systems":

- Socio-Cultural Systems (4.4.1)
- Subsistence (4.4.3)
- Environmental Justice (4.4.4)
- Cultural Resources (4.4.5)

These subchapters all are heavily influenced by the consideration of subsistence outlined in subchapter 4.4.3. The comments in this Appendix 2 focus first on the subsistence analysis, and then turn to the other social and cultural systems analyses, which rely on the subsistence analysis.

ConocoPhillips respects the subsistence culture of hunting, gathering, and sharing traditional foods, and we have worked closely with the community of Nuiqsut and other North Slope communities to minimize impacts to this culture. ConocoPhillips takes seriously the need to consider and address the potential impacts on subsistence resources and activities, and to reduce and mitigate those impacts. Our comments on the subsistence analysis in the DSEIS is founded largely on experience with these issues over many years at Alpine and its satellite developments.

Priority Concern: Failure to Consider Available Information and Differentiate Among Alternatives: This Appendix 2 addresses many important issues and provides information to support improved analysis of subsistence in the final SEIS. **[18-054]** The single most significant issue is that the DSEIS relies too heavily on one subsistence indicator, overlapping use area, while failing to recognize and use salient, available information on other measures of potential impacts, such as existing data on where key subsistence resources are actually harvested in relation to the proposed project. The available data show, for example, that caribou are not generally harvested in the location where ConocoPhillips has proposed to build the GMT1 drill site. **[18-055]** The omission of this fact and other available information in the DSEIS is a serious defect that contributes significantly to the incomplete and distorted (negatively biased) analysis of subsistence in the current draft. Among other consequences discussed below, selective use of the relevant subsistence information in the DSEIS results in an alternatives analysis that fails to fairly or rigorously differentiate among the project alternatives analyzed in detail.

Inconsistency with Prior Analyses: **[18-056]** The DSEIS is the first NEPA document to propose a finding of "major" impacts on subsistence and other social systems on the North Slope. The ASDP EIS (BLM 2004) considered the impacts of GMT1, along with five other drill sites, and concluded the projects as a whole

would affect subsistence activities, but that the effects, when considered along with mitigation measures, would be adequately mitigated and the project was approved. Similarly, the 2012 IAP EIS updated the subsistence analysis for the NPR-A planning area, including existing development and reasonably foreseeable future development (including GMT1), and did not reach a conclusion that even the potential scenarios of increased leasing and development would have a "major" impact on subsistence harvest patterns. [See IAP EIS at 128-29].

In fact, the analysis of subsistence impacts in the ANILCA § 810 evaluation for the IAP concludes that NPR-A development, including but not limited to GMT1, would not significantly restrict subsistence uses. [See IAP EIS, App. A at 12]. The IAP record of decision concludes "adequate stipulations and best management practices have been incorporated into the plan, including specific procedures for subsistence consultation with directly affected subsistence communities, requirements for extensive studies of caribou movement, and increased setbacks or other protective measures specific to birds, to ensure that significant restrictions to subsistence uses and needs would not occur. The impacts to subsistence resources and uses for this alternative are minimal. This finding applies to all villages in and near the planning area including Nuiqsut [See IAP ROD at 25}. The IAP analysis clearly assumes that GMT1 will be connected by road, and equally clearly analyzes the specific impacts on subsistence in Nuiqsut. [See IAP EIS Vol. II Ch.4 at 54]. Thus, the draft analysis for GMT1 reaches an entirely different conclusion with respect to subsistence impacts than BLM's analysis from just over one year ago.

[18-057] Although the current supplemental analysis is not necessarily constrained to reach the same conclusion as prior analyses, such a dramatic departure from prior analyses would be arbitrary unless justified with a clear explanation based on new information or a new line of reasoning. The difference in scale of the GMT1 SEIS and the 2012 IAP EIS analyses cannot explain the different conclusions. The IAP analysis of subsistence addressed impacts throughout the NPR-A, where multiple communities might potentially be affected by the development scenarios contemplated, but found a lesser impact. In comparison, the relatively small GMT1 project, considered just by itself and looking only at the direct and indirect impacts, is deemed to have a major impact on subsistence. Moreover, the GMT1 SEIS is an unreconciled departure from every other previous North Slope NEPA analysis, not just the IAP EIS.

[18-058] Because of the dramatic departure from related analyses and lack of adequate explanation, the conclusion that GMT1 would have major impacts on subsistence should be reconsidered. A fuller, fairer consideration of the potential impacts to subsistence would result in a conclusion of minor or moderate impacts on subsistence.

New Information: **[18-059]** Page 306 of the DSEIS references new information that was not available in the 2004 ADSP EIS and the 2012 IAP EIS, specifically information from the Nuiqsut Caribou Subsistence Monitoring Project Study Years 1-4 (SRB&A 2010b, 2011, 2012 and 2013b) and the Subsistence Mapping of Nuiqsut, Kaktovik and Barrow (SRB&A 2010a) conducted for MMS. In fact, all of these documents except SRB&A 2013b were available for the 2012 IAP EIS, so they can be considered new only with respect to the 2004 SEIS.

The "new" information is said to "provide additional context and information that indicate the intensity of these impacts and overall degree of impact are higher than previously anticipated." [DSEIS at 306.] The basis for this conclusion is not explained, nor is it apparent from the documents themselves. In this Appendix 2, ConocoPhillips describes how the information in these documents point strongly to a conclusion of minor or moderate impacts to subsistence.

Focus on Caribou: **[18-060]** Most of the new information provided in the Caribou Subsistence Monitoring project is specific to caribou. Similarly, the supplemental subsistence analysis in this Appendix 2 focuses on caribou. This is a reasonable approach because it adheres to the available information, and because it reflects the importance of caribou in the subsistence practices of Nuiqsut residents. It is recognized, however, that other subsistence resources are present in the project study area, such as geese and fish, and these are also important resources to subsistence hunters in Nuiqsut.

Over-reliance on Overlapping Use Areas: In the analysis of subsistence impacts only one aspect of the new subsistence information referenced appears to have been used in reaching a determination on the intensity of impact – areas of over lapping use. Overlapping use is determined based on GIS information to document use areas by survey respondents, aggregated to indirectly display the intensity of use of an area. **[18-061]** This method provides important information, but it does not, by itself, adequately reflect the other dimensions of intensity, such as frequency of use by an individual hunter, duration of use, amount of harvest, diversity of harvest, cultural or historic importance, or other key variables that determine the importance of subsistence or harvesting areas. (SRB&A 2010a, page 329).

The method for documenting overlapping use areas is an indirect metric for intensity of use in a portion of the overall subsistence use area. One hunter using an area once is given the same weighting as one hunter using the area many times. When all hunting trips begin and end in Nuiqsut, nearly all subsistence users will make some use of the areas near Nuiqsut at some time during the year. Thus, it is not at all surprising that 86% of respondents report use of some location within the project study area. [See DSEIS at page 301].

[18-062] The way the overlapping use area information is presented conveys an impression that the project study area, which is generalized to include land around all project alternatives, is the only and most important high use area for caribou subsistence activities. That is not a complete and accurate representation of subsistence use. It fails to differentiate among project alternatives, most of which do not propose construction of any new infrastructure within miles of Nuiqsut. It also fails to distinguish opportunistic use of areas near the village from areas of more intentional, successful, or culturally significant subsistence use. Selective reliance of the overlapping use area analysis, to the exclusion of other analyses, provides an incomplete and therefore distorted view of potential impacts on subsistence.

[18-063] The high overlapping use appears to occur primarily in the winter, when overland areas are accessible by four- wheeler or snowmachine. The DSEIS analysis relies heavily on one specific overlapping use area but fails to incorporate the harvest location data that are available from the Nuiqsut Caribou Subsistence Monitoring project. A central contribution of the analysis offered in the Year 4 report is that the harvest locations have been included as a part of a multi-dimensional assessment of the intensity of

the potential impact which in addition to caribou harvests over time also includes "(1) hunter observations and (2) caribou distribution, abundance, herd size, habitat quality [SRB&A 2013b, at Executive Summary (i)] yet the DSEIS subsistence analysis has omitted this information and relies heavily on a single variable.

[18-064] The project study area includes a portion of the Colville River that is commonly accessed by boat and used for subsistence, but will not be directly affected by new infrastructure associated with GMT1. While Section 3.4.3.4 in the DSEIS differentiates between inland and river use areas (at 143-144) and concludes that direct impacts would be limited to areas of new infrastructure, the impact analysis in Section 4.4.3 only recognizes in passing that "direct impacts" to subsistence in the areas along river channels that see heavy summer subsistence use "would be more limited in nature." [DSEIS at 301]. As a result, the analysis does not adequately recognize that proposed project activities and infrastructure occur almost entirely outside of river corridors, and therefore are reasonably expected to have very little impact on these areas of most intense subsistence use. The generalized overlapping use area analysis fails to depict this important point.

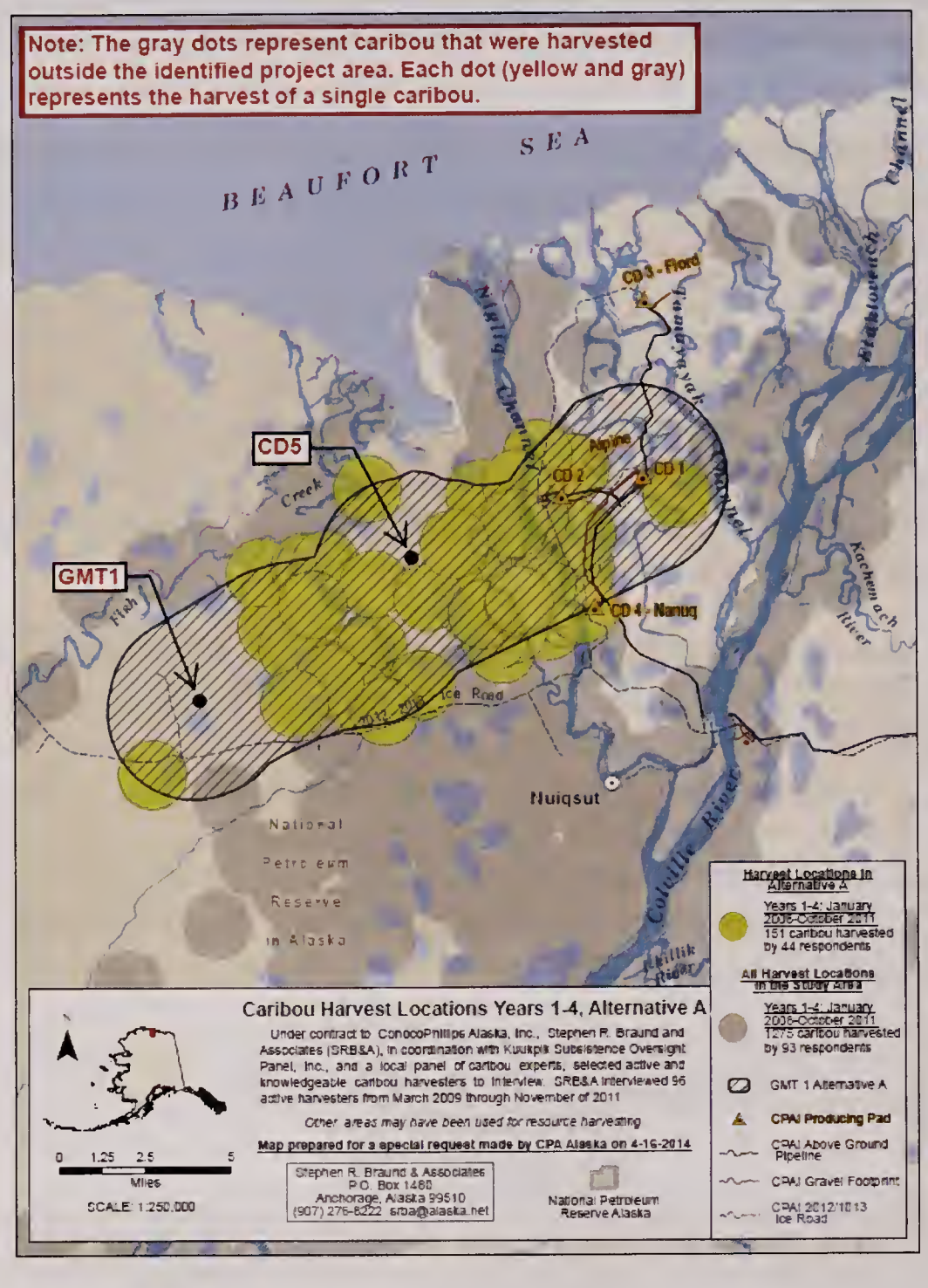
Available Harvest Data: **[18-065]** The caribou monitoring reports that constitute the "new" information for consideration in the DSEIS contain harvest information that can and should be used in the analysis of subsistence impacts. While there are many facets to subsistence activities and many different ways to measure impacts, it is recognized that "the amount harvested (number, usable weight) constitutes the single best measure of health of the subsistence lifestyle" (SRB&A 2010a, at 8). **[18-066]** The Nuiqsut Caribou Subsistence Monitoring Project documented a total of 530 caribou harvest locations and a total of 1275 caribou over the four year study period. The number and percent of harvest locations in the project area for each alternative is presented below:

Alternative	Total Number (%) of Caribou Harvests in Area (All Study Years)
Project Study Area	26% (334 out of 1275)
Alternative A	12% (151 out of 1275)
Alternative B	12% (155 out of 1275)
Alternative C	19% (239 out of 1275)
Alternative D	13% (167 out of 1275)
Clover Mine Site	7% (32 out of 1275)
ASRC Mine Site	3% (91 out of 1275)

*Note: Caribou harvested data obtained from SRB&A 2013b.

[18-067] This data indicates that 26% of caribou harvested from Nuiqsut are harvested in the project study area. Conversely, 74% percent of the caribou are harvested elsewhere. Looking at ConocoPhillips' proposed project, only 12% of caribou are harvested in the area associated with Alternative A. No project alternative has a lesser impact on harvest areas. Of that 12 percent, the vast majority of caribou harvested are taken along the rivers that are in the project study area only because they would be crossed at one location by a road and pipeline, which would not exclude the continued harvesting of caribou on those areas. [See Figure below "Caribou Harvest Locations Years 1-4 Alternative A."]

Figure: Caribou Harvest Locations Years 1-4 in Alternative A



[18-068] Moreover, the harvest data also shows zero harvest of caribou within over a mile of the proposed GMT1 drill site. These data demonstrate that the particular area that will involve the most project activity and, accordingly, which harbors the most potential to cause avoidance by subsistence users, is not an important area for harvesting caribou [Attached Figures]. The DSEIS does not recognize this significant information.

Viewed from a perspective informed by this important data, the proposed project is well designed to have minimal impacts on the paramount subsistence activity of caribou harvest. While this is not the only perspective from which potential subsistence impacts should be considered, failure to include this information in the DSEIS and give it full consideration in the analysis represents a significant omission that biases the resulting findings.

Harvest Data Relating to Existing Infrastructure: **[18-069]** Data from the Nuiqsut Caribou Subsistence Monitoring Project also show that the amount of harvest has remained relatively stable since the construction of Alpine and its satellite drill sites. Specifically, the Nuiqsut Caribou Subsistence Monitoring Project (2013b, Executive Summary p. i) concludes; "caribou harvest amounts have remained relatively stable over time." Harvest amounts, estimated pounds harvested, and the average pounds per household in the years 3 and 4 reports were greater than the mean of observed values since 1985. (SRB&A 2013b, Table 17, Page 58). This is powerful evidence that the existence of oil and gas drill pads, roads, and pipelines in the vicinity of subsistence activities does not necessarily result in reduced harvests, which is considered the single best measure of the health of a subsistence culture.

The evidence also contradicts the assumption that the areas with infrastructure development would be "lost" to subsistence. And it absolutely conflicts with the notion that new information shows that the intensity and degree of impacts on subsistence are higher than was anticipated in prior EISs. This new information tends to show the opposite, actually. It shows that subsistence practices are sufficiently resilient to adapt to well-designed projects and maintain stable subsistence harvests.

Caribou Density Information: Available information on caribou density is another important category of information to be given due consideration, but which receives minimal treatment in Section 4.4.3 of the DSEIS. **[18-070]** The biological information in Section 3.3 shows that the density of caribou in the project study area is relatively low, especially compared to other areas to the northeast and northwest, and that the project study area is not a concentrated calving area. Yet, the analysis of potential impacts on subsistence minimizes this information and analyzes the potential impacts on calving, barely mentioning that the area supports only low densities of caribou. **[18-071]** The available information on the density of important subsistence resources in the project area should be an important part of the analysis of potential impacts. If the proposed project were to take place in areas of higher caribou density, or higher subsistence use (such as along river systems) then a higher impact determination would be more reasonable. Here, the lower density of caribou in the areas where infrastructure is proposed to be built should lead to a lower impact determination.

Project Area and Project Study Area: The analysis of subsistence impacts proceeds through discussion for each proposed project alternative, but uses a single concept of the "project study area," which has been expanded in the DSEIS as compared to the 2004 ASDP EIS to include Alternative C, known as the "Nuiqsut Hub" option. Under Alternative C, GMT1 support would be directed from Nuiqsut so that the village could be used as a logistics and operations center. This means that the village is included in the area associated with Alternative C. And since the project study area includes the areas associated with any of the project alternatives, the **[18-072]** BLM's addition of Alternative C has expanded the project study area to include the village of Nuiqsut for all analytical purposes, even though the project proposed by ConocoPhillips, Alternative A, does not come within miles of Nuiqsut (except potentially to extract gravel form the ASRC mine site during construction). This circumstance could be addressed by an explanation that highlights and differentiates between alternatives on the basis of their location so as to ensure adverse subsistence impacts are not erroneously attributed to ConocoPhillips' proposal when those impacts are solely the result of Alternative C's proximity to Nuiqsut. This is particularly problematic in the context of the overlapping use area analysis, because the areas close to Nuiqsut

unsurprisingly show up as areas of high overlapping use. The final SEIS should better differentiate among project alternatives and avoid attributing the impacts associated with Alternative C to the other alternatives, which would not approach Nuiqsut.

Project Area Definition by Alternative: **[18-073]** In order to evaluate the potential impacts of each project alternative and understand the differences between alternatives, the project area for each alternative must be adequately described. But the DSEIS pervasively uses the aggregate project study area without differentiating among alternatives. **[18-074]** The acreage and length of the linear project component differs among alternatives and influences the potentially affected area. (See Figures attached to this Appendix 2: Harvest Locations Map, GMT1 current Project Study Area, GMT1 Proposed Infrastructure Alternatives A-D, ASRC Mine site, and Clover Mine Site.)

Alternative	Description[1]	Acreage
Project Study Area[2]	2.5 mile radius around all alternatives and project components	111,957
Alternative A	Alternative Components (2.5 miles radius)	63,829
Alternative B	Alternative Components (2.5 miles radius)	62,908
Alternative C	Alternative Components (2.5 miles radius)	88,322
Alternative D	Alternative Components (2.5 miles radius)	68,377
Clover Mine Site	Clover Mine Site (2.5 mile radius)	13,678
ASRC Mine Site	ASRC Mine Site (2.5 mile radius)	15,574

[1] Components of each alternative are described in Section 2.4 of DSEIS.
[2] Project Study Area was calculated from using SRB&A GIS data.

Thus, alternatives A and B include the smallest amount of area, and even those acreage numbers overstate the potential impact because the acreage numbers for Alternatives A-D include the area associate with laying a water line on existing VSMs all the way to CD-1. In reality, laying an additional line along the existing lines on existing VSMs will have negligible impacts. Looking at the potential impacts of Alternative A involves looking at a project area that is just over half the size of the entire project study area on which the DSEIS analysis focuses.

[18-075] Note that the figure in Appendix 8 of ConocoPhillips' DSEIS comments shows a more accurate and useful depiction of the potentially affected area around Alternative A infrastructure. That figure does not include the area around the water line that will be placed on existing VSMs along existing pipelines, because that additional line would have no more than a negligible impact, if any at all. ConocoPhillips recommends the use of the figure from Appendix 8, and associated acreage, throughout the analysis of Alternative A. The result would be even less acreage attributable to Alternative A than shown in the table above in this Appendix 2, and the difference would be substantial. Comments in Appendix 6 also refer to reduced acreage based on disregarding the non-impactful water line.

Alternative D Characteristics that Affect Subsistence Impacts: **[18-076]** The potential for additional air and helicopter traffic is referenced in the DSEIS for Alternative D, yet the need for constructing annual ice roads and the associated levels of traffic for that annual construction work were not included in the analysis. Construction and use of an ice road would likely cause higher traffic levels than a year-round

gravel road. The activity would occur in winter, in areas that are used for hunting with four-wheelers and snowmachines, and thus include potential for disruption of subsistence activities. These impacts must be considered as part of full consideration of Alternative D.

[18-077] New information in the Year 4 Caribou Monitoring Report states that the most common source of impact to subsistence hunting is helicopter traffic, and that impacts from manmade structures are dropping. This new information indicates Alternative D would have higher impacts to subsistence compared to the alternatives, without the added benefits that a year-round all-weather road would provide. Helicopter disturbance is clearly the issue of most concern to local residence because of the disruption it can cause to hunting. This is a major differentiating factor that weighs strongly in favor of finding that Alternative D would have more adverse impacts on subsistence than the other alternatives.

User Avoidance: User avoidance is one of the potential subsistence impacts described for all project action alternatives, and is relied upon as a basis for a conclusion of major impact. User avoidance is an appropriate concern to consider, but not a foregone conclusion, and one that is potentially offset to some degree by the addition of year-round subsistence access opportunities associated with a new road. **[18-078]** The Year 4 Caribou Monitoring Report notes that reported impact from manmade structures has dropped each year since Year 1.

[18-079] In 2011, nine percent of households in Nuiqsut said they avoided the Alpine area altogether because they believe they may experience impacts in the area (SRB&A 2013b, Table 41). However, nine percent of respondents do not provide the statistical confidence to extrapolate this action to the entire community of Nuiqsut. The DSEIS does state that "These responses were volunteered and not cued by researchers, and therefore the percentage of households or harvesters avoiding Alpine facilities may be higher because the study team did not systematically ask each respondent if they had avoided the Alpine area" (SRB&A 2013b, p. 303). This qualification on the method of collecting the data does not justify an extrapolation of the finding to the entirety of the community of Nuiqsut.

CPAI recognizes that project infrastructure and activities could result in impairment to the use of the vicinity, a corresponding impairment of harvest success in the project area. **[18-080]** However, the data from the Year 4 report points to a different trend rather than avoidance: the number of Alpine related impacts has decreased over the four years of study from 72% of respondents in year 1, to 31% in year 4. The most commonly reported cause of impacts to subsistence activities is helicopter traffic for all 4 years (SRB&A 2013b, p. 78, Table 40). The data do not support a strong conclusion with respect to user avoidance based on infrastructure.

Mitigation: **[18-081]** Many of the potential adverse impacts to subsistence activities are addressed through implementation of a variety of mitigation measures, but mitigation is not recognized and weighed in the DSEIS before reaching a conclusion that all project alternatives would have a major impact on subsistence. This is a serious omission that impairs the subsistence analysis.

[18-082] One form of mitigation is the removal of large tracts of land in the NPR-A from oil and gas development. The 2013 IAP record of decision states at page 28: "Specifically, the decision makes unavailable for leasing large tracts of land important for the Teshekpuk Caribou Herd and the Western Arctic Herd, both

of which have great importance for subsistence use. The decision in this ROD also makes unavailable for leasing coastal lands and waters that contain important subsistence resources and wildlife habitat, provides enlarged infrastructure setbacks from rivers important for subsistence use, and provides other protections for subsistence users and subsistence resources and their habitats." This action to protect subsistence resources is an important part of the context for oil and gas development on the remaining NPR-A leases which have been approved for development.

The areas that remain available to oil and gas development are subject to dozens of stipulations tailored to protect subsistence resources and reasonable access to those resources by subsistence users. The BLM imposes additional best management practices as another layer of protection. One of the Best Management Practices adopted in the IAP ROD is stipulation H-1, the stated objective of which is "to provide opportunities for participation in planning and decision making to prevent unreasonable conflicts between subsistence uses and other activities." [See IAP ROD at 68]. The same BMP is proposed in the GMT1 DSEIS. ConocoPhillips adheres to operational practices that comply with this objective, and Year 4 report indicate that the residents of Nuiqsut are increasingly satisfied with the way in which ConocoPhillips communicates about industry activities and addresses subsistence-related concerns (SRB&A, 2013a) and continually adapts procedures based on community feedback. For example, at the suggestion of the Native Village of Nuiqsut in 2013, ConocoPhillips hired a dedicated Subsistence Advisor to provide daily information on subsistence hunting activities to our helicopter coordinator as well as changed a key study plan to incorporate camping on location.

[18-083] In addition to the prescribed mitigation measures in the IAP record of decision, many of which are now standard operational practices or agreed to by ConocoPhillips in prior NEPA permits, ConocoPhillips modified the GMT1 project design to relocate the majority of the project out of the Fish Creek buffer and reduced the overall drill site footprint. The analysis of potential subsistence impacts omits reference to mitigation measures, either prescribed by BLM or those agreed to by ConocoPhillips as a means to reduce or protect subsistence interests and must be revisited in the final SEIS.

More details on mitigation measures are set forth in Appendix 3.

Countervailing Benefits: It is recognized in the DSEIS that the gravel roads constructed for the proposed project would be available for use by Nuiqsut residents, significantly improving year-round access to areas that support some subsistence use. Rather than acknowledging this benefit to subsistence activities, which has a countervailing effect to the adverse consequences, the analysis concludes that the road will increase competition for subsistence. (DSEIS at 308) This statement is made in the context of the Environmental Justice Analysis, but it clearly relates to subsistence. **[18-084]** The analysis fails to acknowledge that non-local oil and gas workers are prohibited from hunting in the area, and the road would not increase access for any subsistence users who are not residents of Nuiqsut, because it would not be connected to other communities. The proposed road would increase opportunity for Nuiqsut hunters, may open areas for subsistence activities that were inaccessible at some times of the year, and may have an effect of redistributing some subsistence use patterns; but the road would not put Nuiqsut subsistence users in competition for subsistence resources users with people from another community or even increase competition from within the community. The current analysis wrongfully draws a

negative inference from increased access. The subsistence analysis should acknowledge the countervailing benefit of a road that is available for Nuiqsut residents to provide access to subsistence activities.

Assumptions Leading to Worst Case Analyses: **[18-085]** CEQ guidance and federal case law clearly prohibit analysis that assumes "worst-case" scenarios as opposed to reasonably probable scenarios. The current subsistence analysis, however, presents worst-case scenarios in some areas, these areas should be re-examined to ensure the final SEIS complies with NEPA directives against worst-case assumptions.

As stated in the DSEIS at page 301: "The proposed project study area overlaps with areas that have been documented for multiple types of subsistence activities as described below. *This overlap results in loss of traditional use areas for resources in those areas.*" (Emphasis added.) **[18-086]** This is a worst-case conclusion. It suggests that the entire project study area -- which extends 2.5 miles in each direction from all project infrastructure for all project alternatives combined – would be *lost* to subsistence. In fact, very little of the subsistence use area would be so affected by the proposed project to be considered "lost," although some areas can reasonably be expected to be affected. The areas lost to subsistence are not much more than the actual gravel footprint of the project, which is miniscule in comparison to the subsistence use area. The notion of significant lost subsistence areas might support a conclusion of major impacts on subsistence, but the facts for the GMT1 project do not support a conclusion that significant areas would be lost.

[18-087] Even more dramatic is the cascading series of worst-case conclusions found at pages 303-04 of the DSEIS: "When subsistence users' opportunities to engage in subsistence are limited, their opportunities to transmit knowledge about those activities . . . are also limited. If residents stop using the project study area . . . the opportunity to transmit traditional knowledge to younger generations . . . would be diminished and eventually lost. The loss of that knowledge could result in a permanent reduction in Nuiqsut's subsistence area. If harvests . . . decline because of the effects of infrastructure, there would be fewer opportunities to teach younger generations the skills necessary to hunt . . . ultimately affecting the social cohesion of the community." The chain of "ifs" underscores the importance of protecting subsistence opportunity, but the speculative, worst-case assumptions have no bearing on the reasonably probable consequences of the proposed GMT1 development. There is no basis for concluding that the GMT1 project would substantially diminish the opportunity for Nuiqsut residents to participate in intergenerational subsistence activities and pass traditional knowledge to younger generations. In fact, well-designed projects that seek to avoid subsistence impacts and include appropriate mitigation can provide important economic opportunity that helps encourage younger generations to stay in the village, maintain continuity is subsistence participation, knowledge, and culture.

Cumulative Impacts: **[18-088]** ConocoPhillips strongly recommends that BLM reconsider the "major" impact conclusion for the direct and indirect effects of GMT1. **[18-089]** If BLM does that, it should similarly reconsider the cumulative impacts analysis. BLM has recognized that the cumulative impacts on resources associated with GMT1 and the potential GMT2 development are similar to the effects described in prior analyses, and that there have been no changes to the range of reasonably foreseeable future projects

that suggest the cumulative impacts of GMT1 and GMT2 would be different than the effects described in prior analyses. [See DSEIS at 349.] That is a recognition that GMT1 is a continuation of carefully planned, balanced development that ought to be evaluated and judged in a manner consistent with other projects, including the other ASDP projects that were approved along with GMT1 in 2004. A full consideration of the direct, indirect, and cumulative impacts of GMT1 development along with prior projects and reasonably foreseeable future projects leads to a conclusion of minor or moderate impacts. The DSEIS does not explain or justify the finding of major cumulative impacts.

Just as the countervailing benefits and mitigation ought to be considered in the context of evaluating the direct and indirect effects of a proposed project, **[18-090]** it is appropriate to consider the social and cultural benefits of prior development in the context of the cumulative impacts analysis. Oil and gas development in the area near Nuiqsut has made natural gas available to Nuiqsut residences at a very low cost, which is anecdotally said to be the lowest in the state of Alaska. This allows very inexpensive space heating, which is a tremendous benefit in an arctic environment and frees household income to spend more money on subsistence supplies. Access to a seasonal ice road system annually allows opportunities for travel to the communities of Fairbanks and Anchorage to procure supplies and materials at a lower cost.

Impact Criteria: **[18-091]** Under the criteria set forth in this DSEIS, if an alteration of a resource's function in a cultural context is "clearly and consistently observable" the impact is categorized as "high intensity," and if the possibility exists that an indirect impact might extend beyond the project study area, the impact is considered "regional" in extent. [DSEIS at 171]. As described, the application of these criteria in the subsistence analysis would lead to a conclusion that any detectable impact will result in a conclusion of major impact. This indicates the criteria are not well suited to distinguish among levels of impact.

In contrast to other resources in Chapter 4 (e.g., Section 4.2.1 -Terrestrial Resources), **[18-092]** the social systems subchapter, and specifically the subsistence analysis in subchapter 4.4.3, does not clearly articulate and apply impact criteria. Subsistence use areas, access, and community participation are analyzed in only general terms. This, too, may be an indication that the criteria announced, which appear to have no precedent on the North Slope, are not well suited to discern among levels of impact. Below, ConocoPhillips suggests alternative criteria, drawn from the DSEIS itself that might be used to analyze subsistence impacts. These criteria are rooted in the current analytical structure of the DSEIS, and use thresholds that have a precedent on the North Slope in the Pt. Thomson EIS. These criteria provide an objective basis for considering the new information and better differentiating among the project alternatives.

[18-093] Section 3.4.3.4 of the DSEIS lists 12 subsistence baseline indicators that can be useful in characterizing subsistence use: subsistence use areas, travel method, travel routes, timing of harvest activity, duration and frequency of trips, observed change in resources, harvest diversity, harvest amount, harvest participation, harvest success, harvest sharing, and harvest effort. These individual indicators are then grouped in three primary categories;

1. Subsistence Use Areas – defined as locations which subsistence users search for and harvest subsistence resources. This is dependent on being able to access the area and having subsistence resources in the area.
2. Resource Availability - describes the resources that are available in the study area or that move through the study area and are later harvested in other areas. Key indicators are harvest amounts, harvest numbers, percent of households attempting to harvest and harvesting, and harvest diversity. Habitat areas are important to characterizing resource availability.
3. Community Participation - refers to the levels of existing community involvement in subsistence activities.

ConocoPhillips suggests that these indicators be incorporated into development of impact criteria. Not only does this provide for a more accurate and robust multi-dimensional analysis (versus the one dimensional focus on overlapping use area in the DSEIS), it would be consistent with the Point Thomson Project EIS and other recent NEPA efforts.

[18-094] These indicators can be used to develop impact criteria as set forth in the following table, which uses thresholds very similar to those used in the 2103 Pt. Thomson EIS.

Impact Criteria – Subsistence Resources (Caribou)

Impact Category	Intensity of Impact	Specific Definition for Subsistence (Caribou)
Subsistence Use Area[1]	High	Potentially affected area provides >50% of average annual caribou harvests
	Medium	Potentially affected area provides 25-50% of average annual caribou harvest
	Low	Potentially affected area provides <25% of average annual caribou harvest
Resource Availability/Intensity[2]	High	Potentially affecting more than 25% of all caribou habitat in the project study area
	Medium	Potentially affecting more than 5% and less than 25% of all caribou habitat in the project study area
	Low	Potentially affecting 5% or less than of all caribou habitat
Community Participation[4]	High	Highly used overlapping use area > 50% of hunters interviewed
	Medium	Moderately used overlapping use area 25-50% of hunters interviewed
	Low	Minor used overlapping use area 0-25% of hunters interviewed
Duration[3]	Long Term	Impacts would cause a permanent change in the resource that would perpetuate even if the actions that caused the impacts were to cease
	Interim	Impacts would be frequent or extend for longer time periods (an entire project season)
	Temporary	Impacts would be intermittent, infrequent, and typically last less than a month

Geographic Extent[3]	State-wide	Impacts would potentially extend beyond the SEIS project study area and region (e.g., ACP) to include the entire State of Alaska.
	Regional	Impacts would extend beyond a local area, potentially affecting resources or populations beyond the SEIS project study area (e.g., the entire ACP)
	Local	Impacts would be limited geographically (within the project study area); impacts would not extend to a broad region such as the entire ACP.
Context[3]	Unique	The affected resource is listed as threatened or endangered under the ESA or is depleted in the locality and is not protected by legislation. The portion of the resource fills a distinctive ecosystem role within the locality or the region.
	Important	The affected resource is protected by legislation. The portion of the resource affected fills a distinctive ecosystem role (such as important subsistence resource) within the locality or the region.
	Common	The affected resource is considered usual or ordinary in the locality or region. The portion of the resource affected does not fill a distinctive ecosystem role within the locality or region.

[1] Impact criteria for subsistence use areas used in Pt. Thomson EIS to evaluate the magnitude of impact of subsistence resources (Table 5.22-1, page 5-587) and fits the definition in Section 3.4.3.4 of DSEIS, "locations which subsistence users search for and harvest subsistence resources."

[2] The criteria for the impact intensity to specific resource availability are analyzed in the environmental consequence analysis for terrestrial mammals, 4.3.4.1 (Table 4.3-13).

[3] The criteria for Duration, Extent and Context are defined on page 171 of the DSEIS.

[4] The hunters were interviewed in the CPAI Caribou Subsistence Monitoring Reports Years 1-4.

Application of Impact Criteria:

- Subsistence Use Area: **[18-095]** The subsistence use area should be evaluated with respect to the project area for each proposed project alternative, rather than for an aggregated project study area. The percentage of harvest that comes from that each project area is the key measure for evaluating the impacts and differentiating among the alternatives:

Alternative	Total Number (%) of Caribou Harvests in Area (All Study Years)
Project Study Area	26%
Alternative A	12%
Alternative B	12%
Alternative C	19%

Alternative D	13%
Clover Mine Site	7%
ASRC Mine Site	3%

Assuming the Clover mine site is used for each action alternative, only Alternative C meets the criteria for a medium intensity (19% + 7% = 26%, which is > 25%). All other alternatives meet the criteria for having only a low intensity.

- **Resource Availability:** The impact of the project on the availability of subsistence resources is evaluated in the specific resource section. Specifically, the potential impacts to caribou are summarized in Section 4.3.4.1. Alternatives A, B, and C are expected to result in minor impacts to terrestrial mammals, including caribou. The use of aircraft to access the site during non-ice road season under Alternative D would differentiate this alternative from the others with respect to potential impacts to caribou. The high number of flights is expected to result in moderate impacts to caribou in the project study area, and could extend into adjacent areas beyond the project area, resulting in a regional level extent of impact. In addition, winter ice road construction and associated traffic could also disturb caribou during the winter when the project area receives the greatest subsistence use.

- **[18-096] Community Participation:** The analysis of overlapping use areas is a reasonable way to evaluate community participation, and the BLM already has this data. In the DSEIS, however, it is presented in aggregate form without differentiating among the project alternatives by overlaying the use areas on the specific project areas. Doing this would remove the Village of Nuiqsut from the evaluation of Alternatives A, B, and D, although the ASRC mine site would need to be considered as a potential part of any of the alternatives other than the no-action alternative. Table 3.4-8 of the DSEIS notes that that aggregate project study area overlaps with 31% of the overland use area for all resources, and 22% of the overland use areas for caribou specifically. **[18-097]** It is important to note that caribou are opportunistically harvested on overland hunts for wolf and wolverine as well. This would result in a low to medium intensity rating for community participation based on the criteria table described above.

- **Duration:** The DSEIS concludes that all action alternatives would have long-term impacts defined as permanent in the impact criteria. **[18-098]** While CPAI agrees that long-term the impacts would exist for the 30 year life of the project, it is inappropriate to consider them permanent. In addition, long-term impacts are portrayed as loss of subsistence activities and intergenerational learning opportunities. It would be more accurate to describe impacts as impairment, and recognize that they could be partially offset by new intergenerational participation opportunities facilitated road access.

[18-099] It is important to note that the impacts in the mine site areas, either Clover or ASRC mine site, would be interim or temporary in nature, limited to construction. Due to its location and required rehabilitation monitoring, the impacts from Clover may include annual access via helicopter to monitor rehabilitation progress and reporting. As an existing mine site, it is not assumed that the use of the ASRC mine site would increase the annual monitoring requirements for this location.

- **Geographic Extent:** In analyzing the potential impacts to caribou subsistence activities, the impacts include the potential user avoidance of the project area and a corresponding reduction of harvest success in the project area. However, this impact may be off-set by the improved access to the area and the potential for year-round use and harvest success. Therefore, the impacts to subsistence use areas are local in nature, affecting a limited portion of the area used for subsistence by Nuiqsut. **[18-100]** The impact criteria described for geographic extent states that the local impacts are within the project area and are not expected to extend to a regional (e.g., ACP) level. The fact that some impacts may extend beyond the immediate vicinity of the project area does not elevate an impact from being essentially local to being regional in nature. The resource availability analysis concluded that the potential impacts to caribou were local for Alternatives A, B, and C and regional for Alternative D due to the increased impact from aircraft and helicopter access and the geographic extent should be similar for the subsistence analysis.

- **Context:** The subsistence resource, specifically caribou, has been defined as an important resource for all Alternatives.

- **Summary:** **[18-101]**

Impact Criteria	Alternative A	Alternative B	Alternative C	Alternative D
Subsistence Use Area	Low	Low	Medium	Low
Resource Availability	Low	Low	Low	Medium
Community Participation[1]	Low/Medium	Low/Medium	Low/Medium	Low/Medium
Duration	Long-Term	Long-Term	Long-Term	Long-Term
Geographic Extent	Local	Local	Local	Regional
Context	Important	Important	Important	Important

1: Overlapping use areas were not available for each alternative project area so community participation impacts are ranked the same for all alternatives with low specific to caribou only, and medium applicable to all resources.

CPAI is sensitive to the importance of subsistence and community concerns regarding potential project effects on access and user area avoidance, and continues to take measures to mitigate potential impacts. However, incorporating all the relevant new information from the Subsistence Monitoring Reports leads to a conclusion that the overall impacts on subsistence are minor or at most moderate, and that in any case Alternative D clearly would have more severe adverse impacts on subsistence than Alternatives A – C. This conclusion is reached on the basis of proposed objective impact criteria, and information including a broader look at heavily used areas of caribou harvest and relative contribution to harvest.

[18-102] These conclusions do not consider mitigation measures. For these reasons, they likely overstate the severity of impacts. Yet, the conclusions are based on a more comprehensive, multi-variable analysis than is reflected in the DESIS, and thus better reflects the reasonably probably level of impact, and also better differentiates among the project alternatives.

ANILCA § 810 Analysis: The subsistence analysis in Appendix L is required to use specific evaluation factors as required by ANILCA § 810 to determine whether the proposed action "may significantly restrict subsistence uses." This is a standard that is not part of a NEPA analysis, and which serves purposes that differ from the purposes of NEPA. **[18-103]** The § 810 analysis relies heavily on the analyses used in the DSEIS, and thus suffers from many of the problems that are identified and criticized above in this Appendix 2.

[18-104] A significant restriction to subsistence is said to occur in at least two instances cited in ANILCA: 1) when an action substantially reduces populations or their availability to subsistence users, and 2) when an action substantially limits access by subsistence users to resources. There is no basis for either of the two instances as there will be no reduction on caribou or other subsistence populations or access to that population as a result of the GMT1 project.

[18-105] The cumulative effects discussion in Appendix L [at 16-17] contains inaccurate statements about the relationship between the CD5 project and subsistence concerns as it pertains to current legal challenges. The pending claims regarding CD5 do not challenge the adequacy of the 2004 ASDP EIS at all; nor do the claims otherwise allege that subsistence impacts from CD5 have been inadequately or otherwise unlawfully addressed. The discussion of CD5 and litigation should be omitted altogether.

Socio-Cultural Resources: The socio-cultural discussion reaches a conclusion of major impacts solely based on the subsistence analysis, which itself is incomplete and therefore inaccurate. **[18-106]** The socio-cultural section 4.4.1 is incomplete, and does not yet include a summary or any discussion of criteria used to support a conclusion of major subsistence impacts. In effect, the conclusions reached on subsistence are magnified because they are relied upon to reach another "major impact" determination without any additional analysis or consideration of non-subsistence issues. The socio-cultural resources analysis should be separate and distinct from the subsistence analysis, or merged with it.

Cultural Resources: **[18-107]** Discussion in the cultural resources section of the DSEIS relies on the subsistence analysis to reach a conclusion of moderate impacts on the basis that impacts to the Nuiqsut Cultural Landscape "would result in detectable alteration" [DSEIS at 312]. The use of this phrase is unprecedented in BLM NEPA documents. The Nuiqsut Paisanich (Brown 1979) has served as the Nuiqsut Cultural Landscape since 1979 and presents the overarching principles used to guide oil and gas development since the beginning of development in the Nuiqsut area in the 1970s. Land use, movements, archaeological sites and places and cultural traditions have been assessed and impacts mitigated based since day one. The Colville River delta and Nuiqsut traditional land use area has been studied and documented extensively and this information has been taken into account in all prior NEPA evaluations and permit approvals. **[18-108]** Concluding that impacts to cultural resources warrants a moderate impact finding as a result of a "detectable alteration" to the cultural landscape is unwarranted and unsupported based on prior NEPA analyses, current regulatory requirements or the available evidence. As recognized in the DSEIS, there are no known cultural resources sites within the direct impact analysis area of any of the project action alternatives. DSEIS Table 4.4-3. The cultural resources section of the DSEIS should be rewritten to conform to standard analyses of cultural resource impacts.

Environmental Justice: Executive Order No. 12898 and environmental justice analysis is addressed to a concern that minority and low-income populations are often underrepresented in public processes. As a result, minority and low-income populations are at a heightened risk of being targeted for the siting of activities and facilities that have significant adverse environmental impacts. **[18-109]** It bears emphasis here, however, that the location of GMT1 (and other North Slope oil and gas development) is exclusively a function of where oil and gas resources are found and accessible (in this instance, on oil and gas leases issued by the BLM after a lengthy public evaluation process); not a choice to locate an industrial activity in an area where the resident population lacks a strong cohesive voice in public siting decisions. **[18-110]** It also bears emphasis that GMT1 is not a project that imposes environmental costs on the local population without substantial countervailing benefits. To the contrary, the Alaska Native stakeholders at the local and regional levels desire and support the GMT1 project notwithstanding its impacts.

The entire North Slope of Alaska, and each of the villages located there, qualify as minority populations. Nevertheless, insofar as CPAI is aware, with all the NEPA documents that have been prepared over the past several decades by many federal lead and cooperating agencies, there has never been a proposed oil and gas leasing, exploration, development or pipeline activity at the programmatic or project specific level in the State of Alaska that has been found to have "disproportionately high and adverse human health or environmental effects" on minority or low-income communities. **[18-111]** Nothing about the size, location, design, or other aspect of the GMT1 project makes it a likely candidate to be considered the first project on the North Slope to have a major impact on Environmental Justice. Nor does the DSEIS explain why this conclusion is reached for the first time on the GMT1 project.

Nuiqsut and the broader affected Alaska Native community have been well-represented throughout the GMT1 NEPA process. See, e.g., DSEIS at § 1.5.2. In addition to individual involvement and government-to-government consultation, the interests of the Alaska Native stakeholders have been represented by the North Slope Borough and the Native Village of Nuiqsut (both of whom are cooperating agencies in the SEIS) as well as Kuukpik Corporation and Arctic Slope Regional Corporation ("ASRC"). We are confident that the BLM has heard and accepts that the local community is both concerned about impacts to subsistence and, nevertheless, broadly in support of the GMT1 development. **[18-112]** Giv en this circumstance, there seems to be no adequate basis for an extraordinary finding of disproportionately high and adverse impacts. Among other things, such a finding reflects a conclusion by the BLM that the adverse impacts to the affected community are out of balance with (disproportionate to) the benefits; whereas the public comments indicate the community has reached the contrary conclusion, see Appendix 4 (Public Testimony Supportive of Alternative A).

[18-113] The DSEIS incorporates a legal impossibility in comparison between the environmental justice impacts of GMT1 (draft finding of "major") and the cumulative environmental justice impacts (draft finding of "minor"). Cumulative impacts are a combination of past, present and reasonably foreseeable future activities in the project area, including the proposed project. **[18-114]** It is not possible for the impacts of the proposed project to be "major" and yet for the totality of all activities, including the proposed project, to be less. See Table 4.6-4 (page 348). Also, the text of the cumulative impacts assessment of environmental justice impacts states for the combined effects of GMT1 and future GMT2 development,

"[o]verall, impacts to the minority community resulting from GMT1 Alternatives A, B and C, and conceptual GMT2, are expected to be long term and of medium intensity."

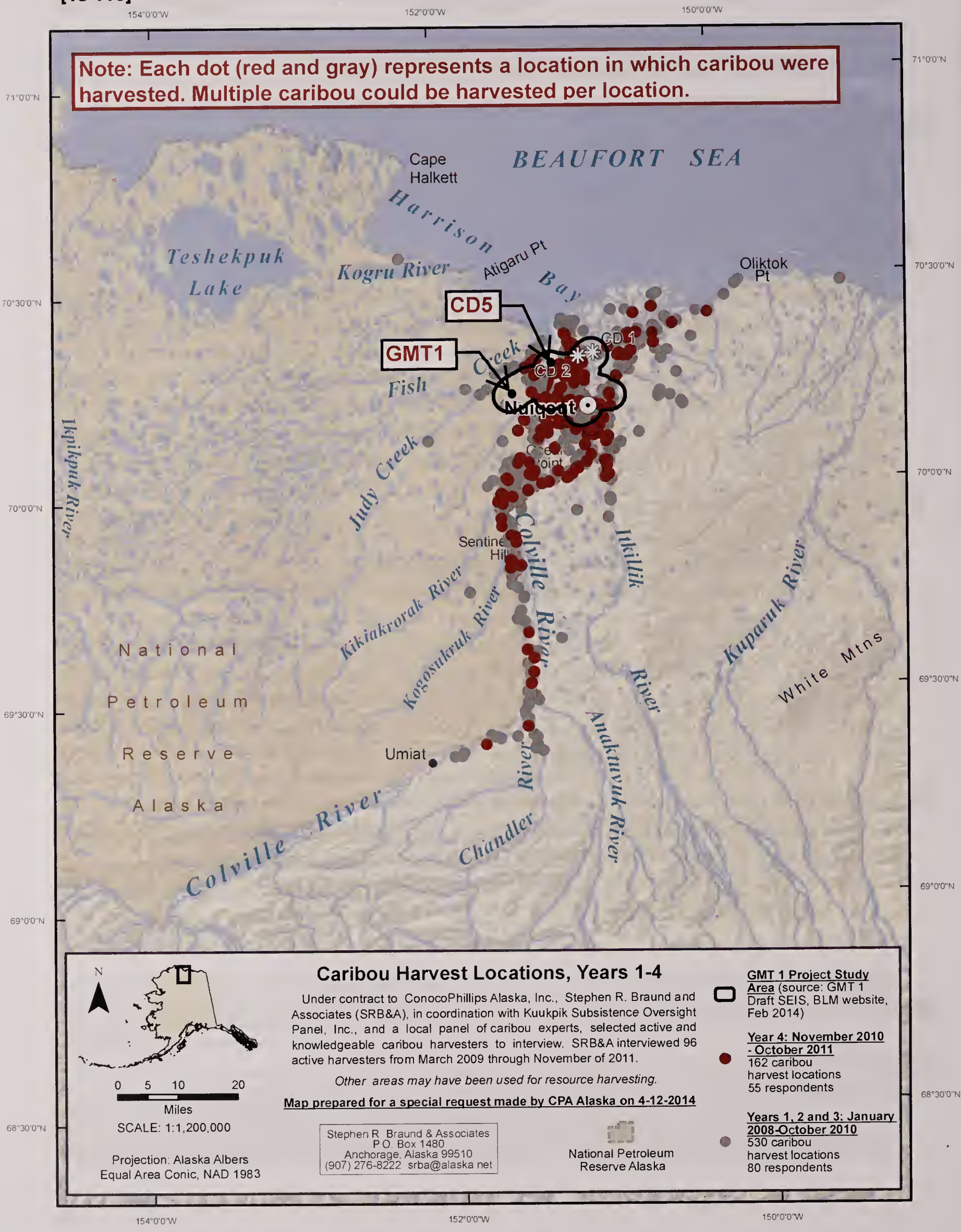
[18-115] The fi ndings of a minor cumulative impact and a medium intensity impact are well founded, supported by the available data, and broadly consistent with the way similar projects have been evaluated in similar areas in the past, including as recently as last year. So our point here is not to suggest that the cumulative impacts findings should be changed to "major" for the sake of internal consistency. Rather, we strongly encourage the BLM to reconsider adverse environmental justice findings for GMT1, which we believe are over-stated in their current, draft form.

GMT1 is located on Kuukpik surface lands and will recover subsurface hydrocarbon resources owned by ASRC. The associated revenue will inure to the benefit of ASRC and Kuukpik shareholders (i.e., the affected Alaska Native community) and, through application of Section 7(i) and 7(j) of Alaska Native Claims Settlement Act ("ANCSA"), to the substantial benefit of other Alaska Natives as well. It would be an especially ironic outcome if, on the one hand, all other oil and gas development across Alaska on State, federal and private lands has proceeded with findings that there are not disproportionately high and adverse impacts to Alaska Natives and, on the other hand, the opportunities for Alaska Natives to responsibly develop and benefit from their own natural resources under the regime codified in ANCSA are impeded by an unprecedented and tenuous finding of "major" disproportionate and high adverse environmental justice impacts.

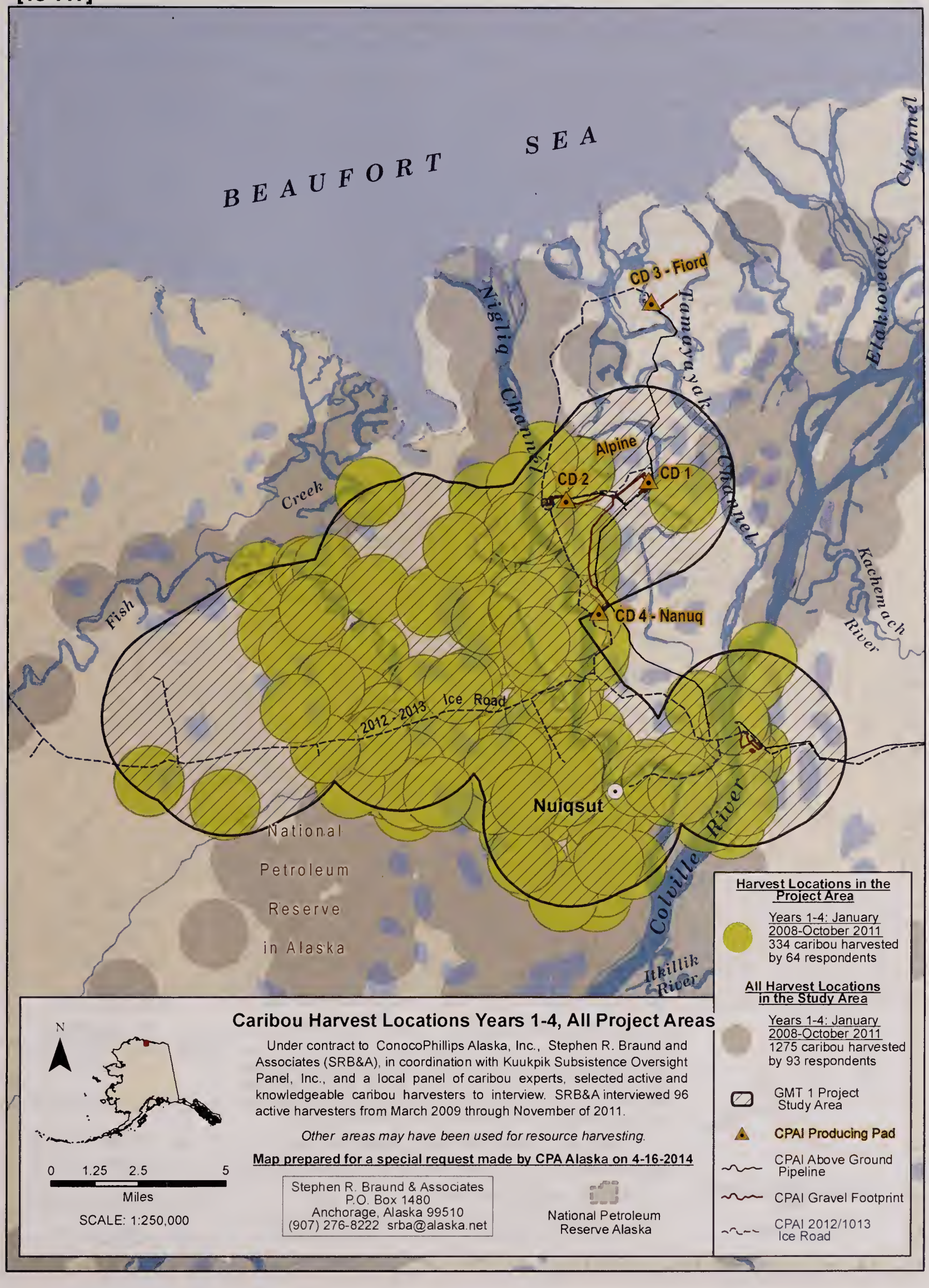
The subsistence findings discussed above are carried forward into the environmental justice impact analysis in such a way that the former dictates the latter. However, even if a "major" subsistence impact were warranted (which it is not), subsistence impacts and environmental justice impacts are not synonymous. As addressed in the first point above, the affected Alaska Native community has informed itself and balanced the adverse impacts, mitigation and benefits to conclude that GMT1 is beneficial and desirable. Under the circumstances here, there are important beneficial considerations that the BLM has not reasonably balanced against subsistence impacts.

Based upon the DSEIS findings, GMT1 would be the first and only project on the North Slope with a finding of disproportionate and high adverse environmental justice impacts. We very firmly believe that such an extraordinary finding is without precedent, unsupported and unwarranted.

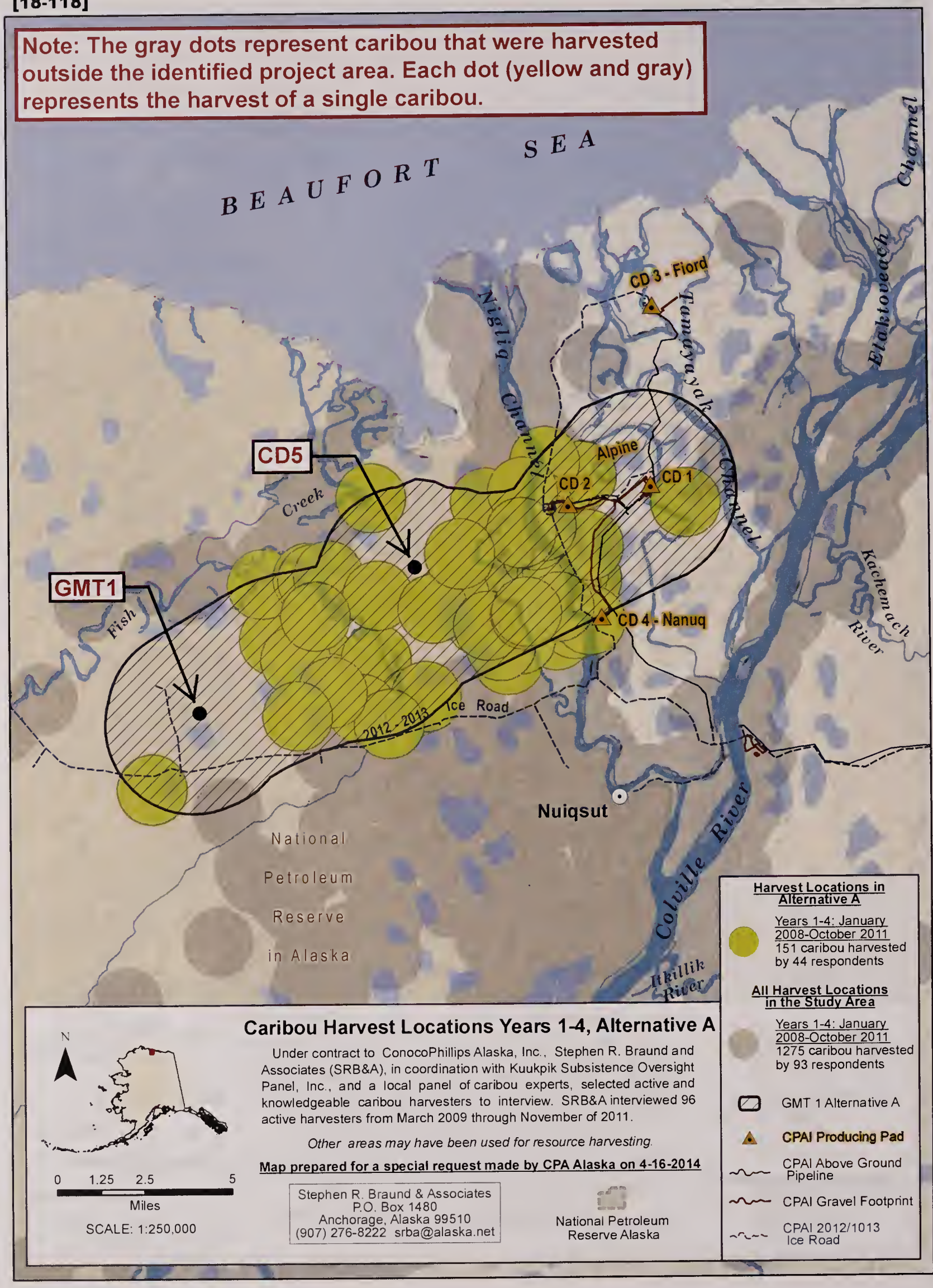
[18-116]


Note: Each dot (red and gray) represents a location in which caribou were harvested. Multiple caribou could be harvested per location.
154°0'0"W
152°0'0"W
150°0'0"W
71°0'0"N
70°30'0"N
70°0'0"N
69°30'0"N
69°0'0"N
68°30'0"N
BEAUFORT SEA
Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
CD5
GMT1
CD 1
CD 2
Nuiqsut
Fish Creek
Judy Creek
Ikpikpuk River
Sentinel Hill
Itkillik
Colville River
Kikiakrorak River
Kogosukruk River
Kuparuk River
White Mtns
Anaktuvuk River
Umiat
Chandler
National Petroleum Reserve Alaska
N
0 5 10 20
Miles
SCALE: 1:1,200,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Caribou Harvest Locations, Years 1-4
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-12-2014
Stephen R Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska net
National Petroleum Reserve Alaska
GMT 1 Project Study Area (source: GMT 1 Draft SEIS, BLM website, Feb 2014)
Year 4: November 2010 - October 2011
162 caribou harvest locations
55 respondents
Years 1, 2 and 3: January 2008-October 2010
530 caribou harvest locations
80 respondents

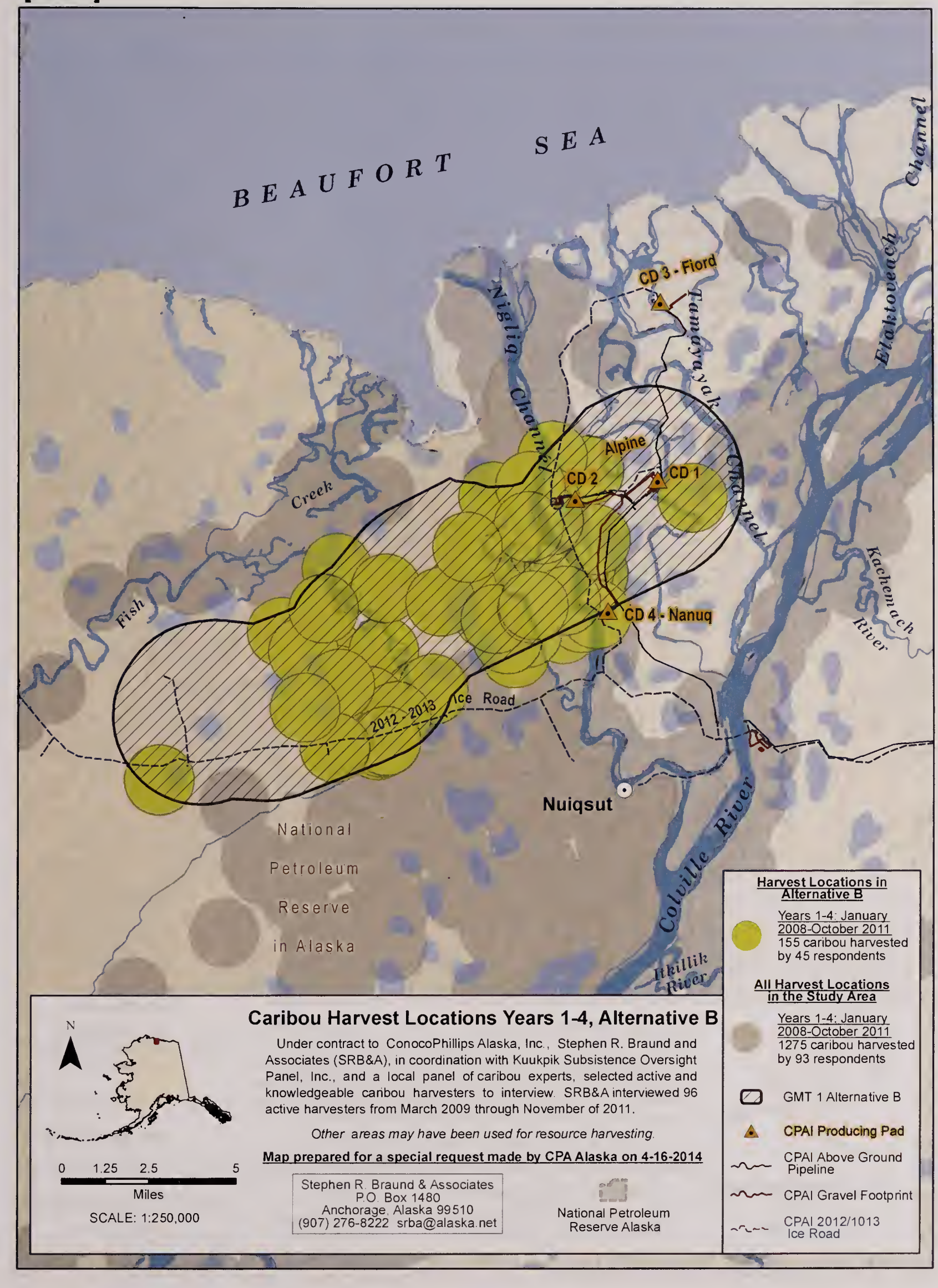
[18-117]


BEAUFORT SEA
Niglig Channel
Tangoyak Channel
Elaktoveach Channel
CD 3 - Fiord
Alpine
CD 2
CD 1
CD 4 - Nanuq
Fish Creek
Kachemach River
2012 - 2013 Ice Road
Nuiqsut
National Petroleum Reserve in Alaska
Colville River
Itkillik River
Caribou Harvest Locations Years 1-4, All Project Areas
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-16-2014
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
National Petroleum Reserve Alaska
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Harvest Locations in the Project Area
Years 1-4: January 2008-October 2011
334 caribou harvested by 64 respondents
All Harvest Locations in the Study Area
Years 1-4: January 2008-October 2011
1275 caribou harvested by 93 respondents
GMT 1 Project Study Area
CPAI Producing Pad
CPAI Above Ground Pipeline
CPAI Gravel Footprint
CPAI 2012/1013 Ice Road

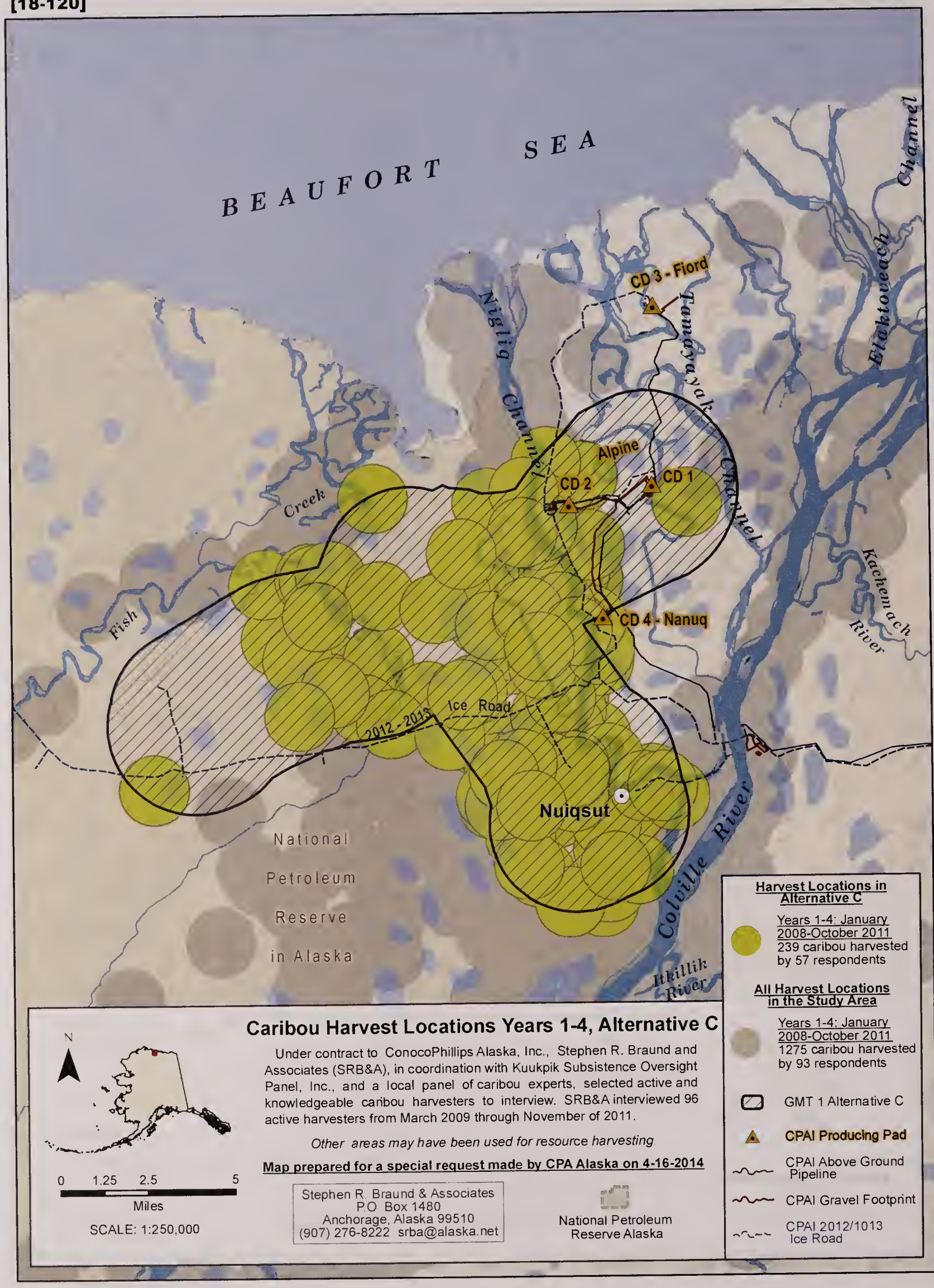
[18-118]


Note: The gray dots represent caribou that were harvested outside the identified project area. Each dot (yellow and gray) represents the harvest of a single caribou.
BEAUFORT SEA
Niglig Channel
Tamayayak Channel
Elaktoveach Channel
CD 3 - Fiord
CD5
Alpine
CD 2
CD 1
Fish Creek
GMT1
CD 4 - Nanuq
Kachemach River
2012 - 2013 Ice Road
Nuiqsut
National Petroleum Reserve in Alaska
Colville River
Itkillik River
Caribou Harvest Locations Years 1-4, Alternative A
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-16-2014
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
National Petroleum Reserve Alaska
Harvest Locations in Alternative A
Years 1-4: January 2008-October 2011
151 caribou harvested by 44 respondents
All Harvest Locations in the Study Area
Years 1-4: January 2008-October 2011
1275 caribou harvested by 93 respondents
GMT 1 Alternative A
CPAI Producing Pad
CPAI Above Ground Pipeline
CPAI Gravel Footprint
CPAI 2012/1013 Ice Road

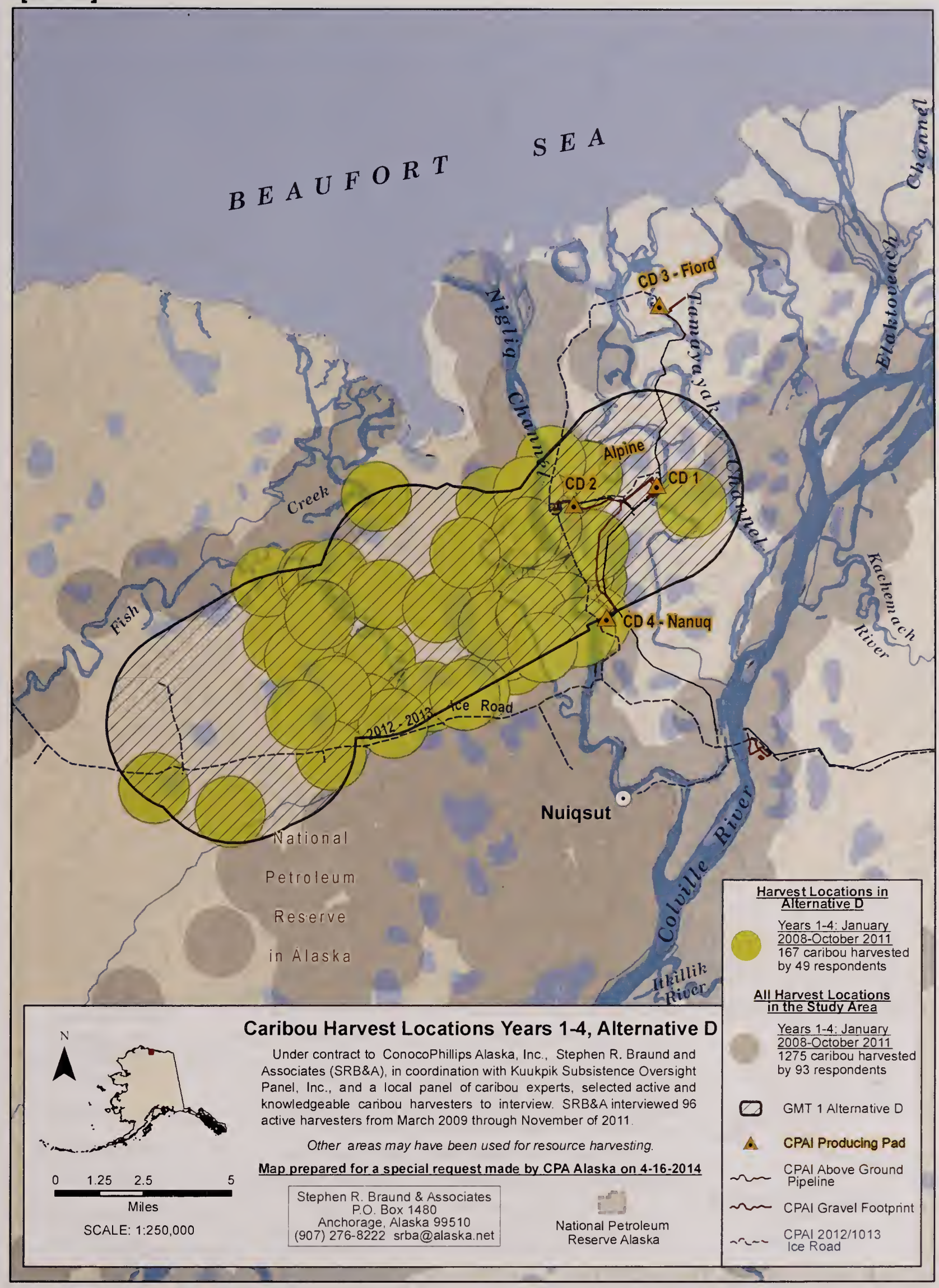
[18-119]


BEAUFORT SEA
CD 3 - Fiord
Tamayayak Channel
Niglig Channel
Elaktoveach Channel
Alpine
CD 2
CD 1
CD 4 - Nanuq
Kachemach River
Fish Creek
2012 - 2013 Ice Road
Nuiqsut
National Petroleum Reserve in Alaska
Colville River
Itkillik River
Harvest Locations in Alternative B
Years 1-4: January 2008-October 2011
155 caribou harvested by 45 respondents
All Harvest Locations in the Study Area
Years 1-4: January 2008-October 2011
1275 caribou harvested by 93 respondents
GMT 1 Alternative B
CPAI Producing Pad
CPAI Above Ground Pipeline
CPAI Gravel Footprint
CPAI 2012/1013 Ice Road
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Caribou Harvest Locations Years 1-4, Alternative B
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-16-2014
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
National Petroleum Reserve Alaska

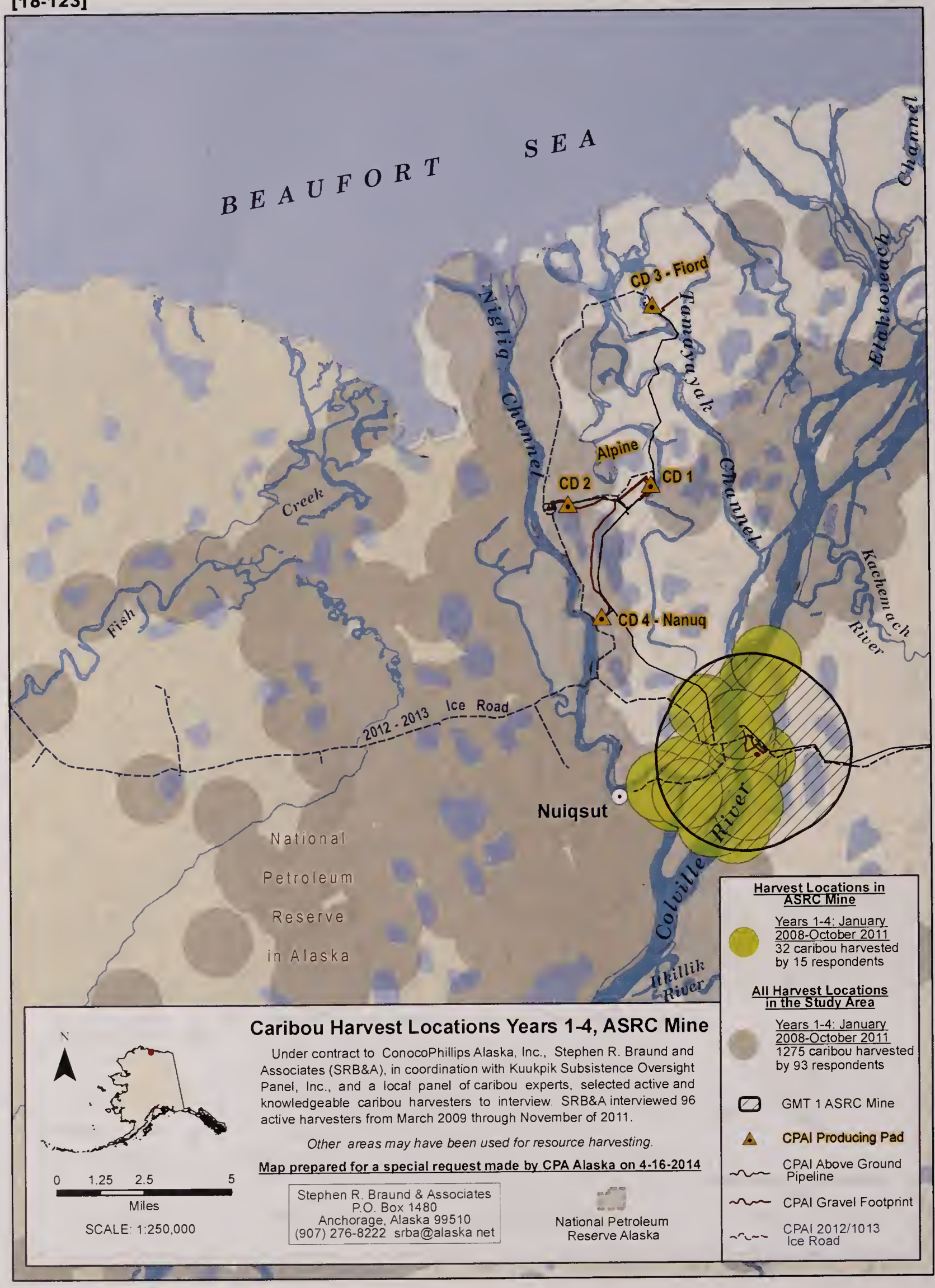
[18-120]

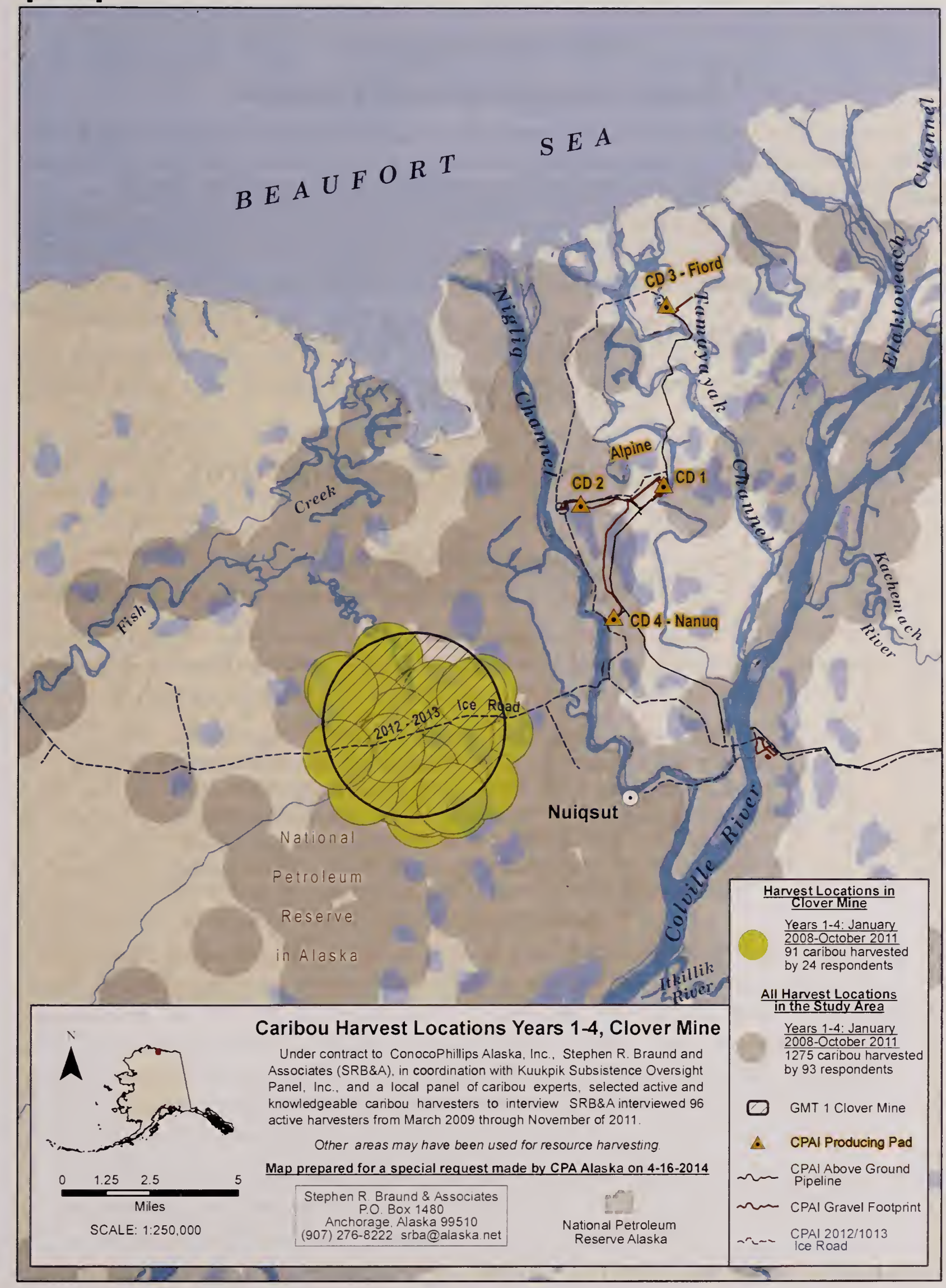

BEAUFORT SEA
Elaktoveach Channel
CD 3 - Fiord
Tamayayak Channel
Niglig Channel
Alpine
CD 2
CD 1
Creek
Fish
CD 4 - Nanuq
Kachemach River
2012 - 2013 Ice Road
Nuiqsut
National Petroleum Reserve in Alaska
Colville River
Itkillik River
Caribou Harvest Locations Years 1-4, Alternative C
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-16-2014
Stephen R. Braund & Associates
P.O Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
National Petroleum Reserve Alaska
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Harvest Locations in Alternative C
Years 1-4: January 2008-October 2011
239 caribou harvested by 57 respondents
All Harvest Locations in the Study Area
Years 1-4: January 2008-October 2011
1275 caribou harvested by 93 respondents
GMT 1 Alternative C
CPAI Producing Pad
CPAI Above Ground Pipeline
CPAI Gravel Footprint
CPAI 2012/1013 Ice Road

[18-121]


BEAUFORT SEA
CD 3 - Fiord
Niglig Channel
Tamayayak Channel
Elaktoveach Channel
Alpine
CD 2
CD 1
Creek
Fish
CD 4 - Nanuq
Kachemach River
2012 - 2013 Ice Road
Nuiqsut
National Petroleum Reserve in Alaska
Colville River
Itkillik River
Harvest Locations in Alternative D
Years 1-4: January 2008-October 2011
167 caribou harvested by 49 respondents
All Harvest Locations in the Study Area
Years 1-4: January 2008-October 2011
1275 caribou harvested by 93 respondents
GMT 1 Alternative D
CPAI Producing Pad
CPAI Above Ground Pipeline
CPAI Gravel Footprint
CPAI 2012/1013 Ice Road
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Caribou Harvest Locations Years 1-4, Alternative D
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-16-2014
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
National Petroleum Reserve Alaska

[18-123]


BEAUFORT SEA
Niglig Channel
Tamayayak Channel
Elaktoveach Channel
CD 3 - Fiord
Alpine
CD 2
CD 1
CD 4 - Nanuq
Fish Creek
Kachemach River
2012 - 2013 Ice Road
Nuiqsut
Colville River
Itkillik River
National Petroleum Reserve in Alaska
Caribou Harvest Locations Years 1-4, ASRC Mine
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-16-2014
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska net
National Petroleum Reserve Alaska
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Harvest Locations in ASRC Mine
Years 1-4: January 2008-October 2011
32 caribou harvested by 15 respondents
All Harvest Locations in the Study Area
Years 1-4: January 2008-October 2011
1275 caribou harvested by 93 respondents
GMT 1 ASRC Mine
CPAI Producing Pad
CPAI Above Ground Pipeline
CPAI Gravel Footprint
CPAI 2012/1013 Ice Road


BEAUFORT SEA
Niglig Channel
Tamayayak Channel
Elaktoveach Channel
CD 3 - Fiord
Alpine
CD 2
CD 1
CD 4 - Nanuq
Kachemach River
Fish Creek
2012 - 2013 Ice Road
Nuiqsut
National Petroleum Reserve in Alaska
Colville River
Itkillik River
Caribou Harvest Locations Years 1-4, Clover Mine
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.
Other areas may have been used for resource harvesting.
Map prepared for a special request made by CPA Alaska on 4-16-2014
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
National Petroleum Reserve Alaska
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Harvest Locations in Clover Mine
Years 1-4: January 2008-October 2011
91 caribou harvested by 24 respondents
All Harvest Locations in the Study Area
Years 1-4: January 2008-October 2011
1275 caribou harvested by 93 respondents
GMT 1 Clover Mine
CPAI Producing Pad
CPAI Above Ground Pipeline
CPAI Gravel Footprint
CPAI 2012/1013 Ice Road

Comments on GMT1 DSEIS
APPENDIX 3

Subsistence Impact Mitigation

ConocoPhillips

ConocoPhillips

4/22/14

Comments on GMT1 DSEIS

Appendix 3: Subsistence Impact Mitigation

One of the ways in which the potential impacts to subsistence resources and subsistence activities are addressed is with mitigation measures that minimize the potential for impacts, or provide countervailing benefits. **[18-124]** NEPA regulations require that an EIS address such mitigation measures as part of the analysis of impacts. *See* 40 CFR § 1502.16. Subsistence impact mitigation should be addressed more fully than it is in the DSEIS. When the reasonably likely impacts to subsistence are considered in conjunction with mitigation measures, a conclusion that all project alternatives would have a "major" impact on subsistence is untenable.

The information set forth in this Appendix 4 should be incorporated into the following sections of the SEIS to achieve a more comprehensive and objective analysis of the potential impacts to subsistence:

- Section 4.4.3
- Section 4.4.4
- Section 4.6.3
- Section 4.6.4
- Appendix L

NPR-A Lands are Protected by Set Asides and Stipulations

The BLM's 2013 NPR-A IAP decision precluded oil and gas development on about one half of the NPR-A and imposed dozens of stipulations and best management practices to lessen potential subsistence impacts of oil and gas development.. As stated in page 28 of the IAP record of decision:

> Specifically, the decision makes unavailable for leasing large tracts of land important for the Teshekpuk Caribou Herd and the Western Arctic Herd, both of which have great importance for subsistence use. The decision in this ROD also makes unavailable for leasing coastal lands and waters that contain important subsistence resources and wildlife habitat, provides enlarged infrastructure setbacks from rivers important for subsistence use, and provides other protections for subsistence users and subsistence resources and their habitats.

The fact that broad swaths of the NPR-A are protected from development should be recognized in the GMT1 SEIS, particularly in the context of the cumulative impacts of reasonably foreseeable future development. The 2012 NPR-A IAP also included numerous protective measures that "are intended to ensure the continued health of subsistence resources and to promote a responsive relationship between subsistence users, the BLM, and oil and gas companies." (Page 84, BLM 2012) Specifically, potential impacts to subsistence activities and resources are mitigated by design and operational requirements in the following stipulations and BMPs:

- Waste Prevention, Handling, Disposal, Spill and Public Safety: A-4, A-5, A-6, A-7, A-11 and A-12
- Water Use for Permitted Activities: B-1 and B-2
- Winter Overland Moves and Seismic Work: C-3, C-4, and C-5

- Facility Design and Construction: E-1, E-2, E-6, E-7, and E-19
- Use of Aircraft for Permitted Activities: F-1
- Subsistence Consultation for Permitted Activities: H1 and H-3,
- Orientation Program Associated with Permitted Activities: I1
- Additional Protections that Apply in Select Biologically Sensitive Areas: K-1 and K-2
- General Wildlife and Habitat Protection: M-1

Section 4.7 of the DSEIS includes information on how each of these mitigation requirements has been incorporated into the GMT1 and addressed by ConocoPhillips. Additional information is provided below on these and other mitigation measures. **[18-125]** However, the subsistence section does not specifically take into account the effectiveness of these measures when determining the potential impacts as required in NEPA. This is in contrast to the BLM 2012 IAP ANILCA 810 finding that, "Given these steps [the retention and of addition of several protective measures in the BMPs], as well as other lease stipulations and best management practices that serve to directly protect various subsistence resources or their habitat, the BLM has determined that Alternative B-2 includes reasonable steps to minimize adverse impacts on subsistence uses and resources." (Page 29, Appendix A, BLM 2012).

Project Design and Location:

The drill site location as approved in the 2004 ASDP ROD has been relocated outside of the 3-mile Fish Creek setback area. ConocoPhillips took this action voluntarily to build subsistence mitigation into the project design. This reduces potential subsistence issues, because the Fish Creek setback is a documented winter subsistence use area for caribou, wolves, and wolverines. Moving the site out of the setback area also eliminated 1 bridge. The following additional mitigation has been incorporated into the design since the 2004 ASDP ROD was issued.

- The road and pipeline length were reduced, thereby reducing the amount of fill required and reducing associated impacts to wetlands.
- The length of the Tiŋmiaqsiġvik (Ublutuoch) River bridge was increased to ensure the bridge abutments were out of the flow area and protect riparian habitat in the river channel.
- A bridge over Crea Creek was added instead of using culverts to ensure adequate flow is maintained in this drainage.
- The footprint of the Clover mine site was reduced from 65 to 18.7 acres.

Other elements of mitigation built into the project design include road access, pipeline glare, and pipeline height and separation from road, as follows:

- **Road Access:**
  [18-126] The residents of Nuiqsut will have access to ConocoPhillips' ice roads and gravel roads for subsistence activities and other purposes. With the construction of the Nuiqsut Spur Road, residents will have access year round to CD5 and Alpine. Upon construction of a road to GMT1, Nuiqsut residence will have access to the permanent gravel road with widened sections for subsistence users to park their vehicles. The annual access to the Alpine re-supply ice road is a substantial benefit to the residents of Nuiqsut, who utilize this access to travel the Dalton Highway to Fairbanks and Anchorage for supplies, including necessary equipment for

subsistence hunter such as boats, snow machines and four-wheelers. This ice road provides a safe and efficient route of transportation instead of personal risk of overland tundra travel that residents of other North Slope communities undertake to reach the Dalton Highway.

- **Pipeline Glare:**
  [18-127] New pipelines are designed with a muted (non-shiny) coating to avoid bright flashes from sunlight that may frighten caribou.

- **Pipeline Height and Separation from Road:**
  [18-128] Pipelines and roads are designed to allow free movement of caribou and the safe, unimpeded passage of the public while participating in subsistence activities. Above-ground pipelines are elevated a minimum of 7 ft as measured from the ground to the messenger cable installed on the pipeline VSMs. In most instances, this relates to a minimum distance of 9 ft from the ground to the bottom the pipeline (Figure 1). Depending on the terrain and the hydraulic design, this actual height can be much greater. For example, the height from the ground to the bottom of the pipeline for the CD5 pipeline ranges from 10 – 24 feet (at Lake M9525) (Figure 2). A minimum distance of 500 ft between pipelines and roads will be maintained, where feasible, as studies have shown that this facilitates caribou movement.

Figure 1: Proposed GMT1 Pipeline Design Height

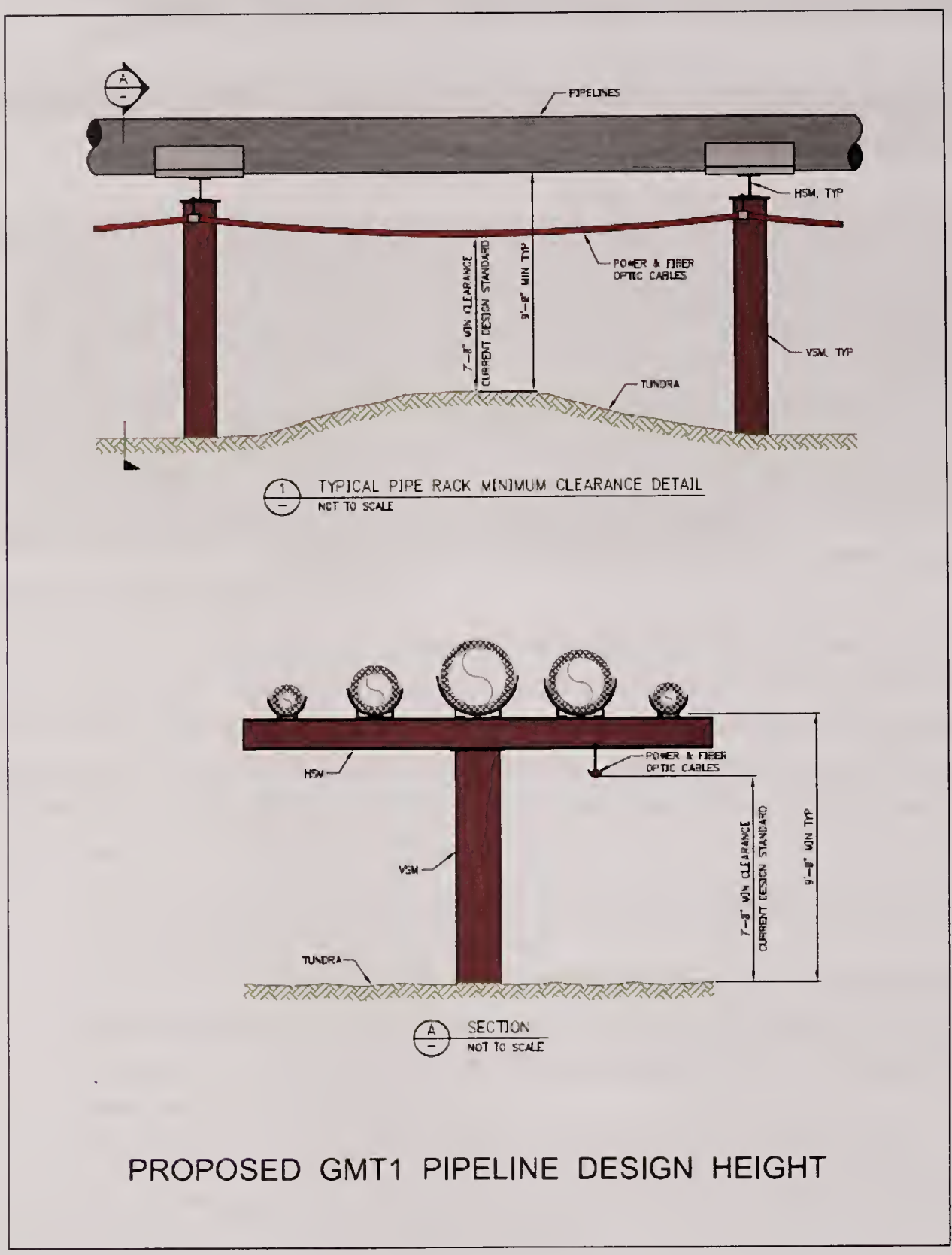
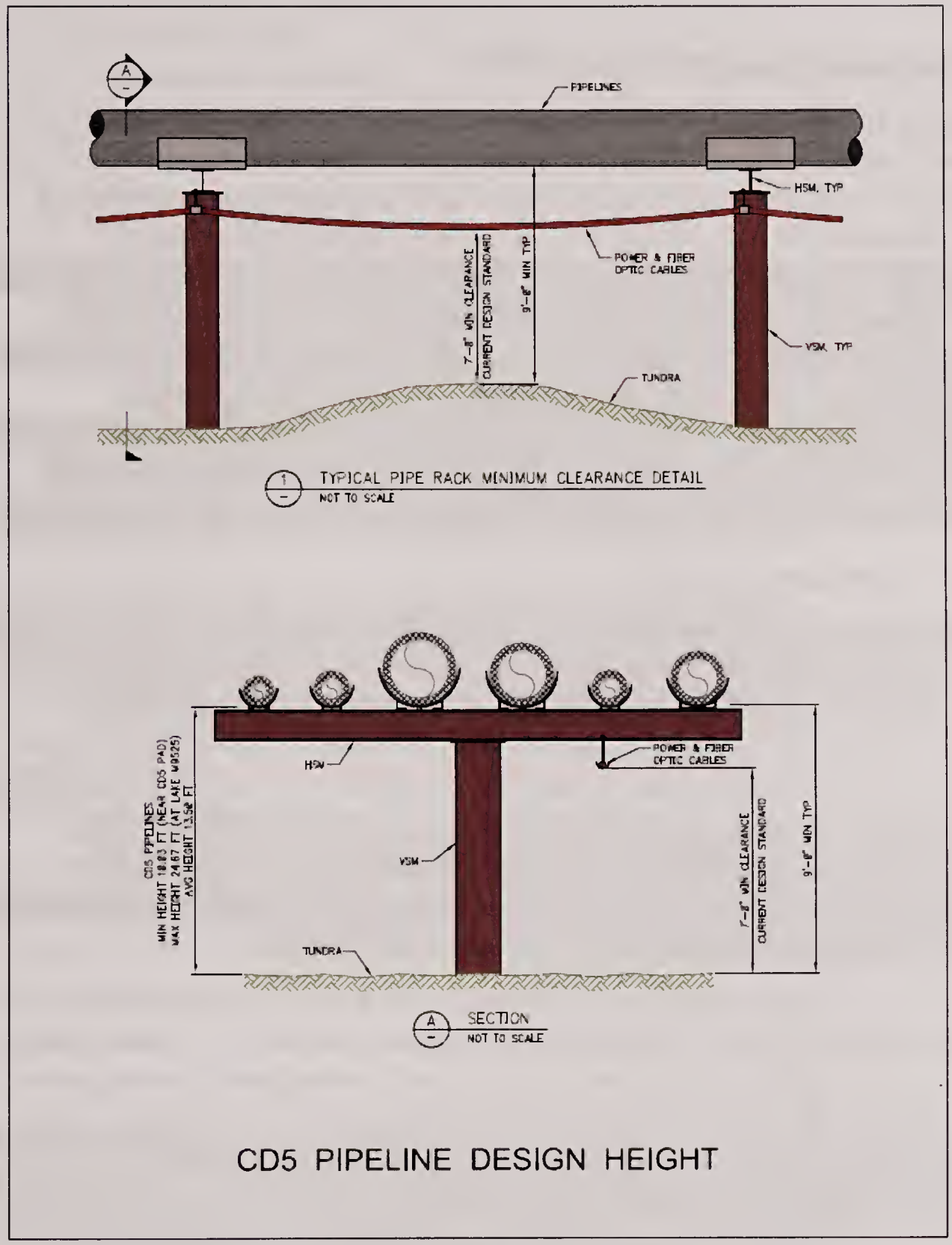


Figure 2: CD5 Pipeline Design Height



Kuukpikmuit Subsistence Oversight Panel (KSOP)

The Kuukpikmuit Subsistence Oversight Panel (KSOP) was formed during the original Alpine development to provide subsistence input, traditional knowledge and mitigation options to ConocoPhillips' operations in the Colville River Unit and NPR-A. KSOP consists of two representatives from each of the City of Nuiqsut, the Native Village of Nuiqsut and the Kuukpik Corporation.

[18-129] ConocoPhillips provides annual funding to KSOP to help support an executive director and coordinate KSOP activities. ConocoPhillips employs Subsistence Representatives (SRs) and Ice Road Monitors (IRMs) during the winter ice road/construction season who provide daily and weekly reports to KSOP on ConocoPhillips' activities and serve as the eyes and ears for the community in our operations.

[18-130] ConocoPhillips' consults with KSOP on new project design as well as winter ice road activities. This formalized body for oversight and communication helps prevent conflicts specifically with respect to subsistence activities, and provides a clear path for concerns to be brought to ConocoPhillips' attention.

Coordination with Subsistence Users

[18-131] ConocoPhillips has developed a process to ensure NPR-A winter activities are monitored using a combination of local Subsistence Representatives (SRs) and Ice Road Monitors (IRMs) from Nuiqsut who work closely with the ConocoPhillips Point of Contact (POC) and the Winter Activities Coordinator (WAC). SR and IRM are on shift daily and during seasons of heavy construction, ConocoPhillips employs SRs and IRMs for both day and night shifts at the request of KSOP to provide 24 hour coverage. **[18-132]** During summer studies activities, a local Subsistence Advisor (SA) participates in a daily conference call to exchange information with the ConocoPhillips Helicopter Coordinator to avoid interference with summer and fall subsistence activities. **[18-133]** In addition, the ConocoPhillips Village Liaison makes frequent trips to the village to communicate ConocoPhillips activities and address concerns.

For each report of potential or current threats to subsistence activities, the SR/SA gathers information reports to the ConocoPhillips Village Liaison and the WAC or Helicopter Coordinator. For more complex issues that are not easily and informally resolved, the SR will consult with ConocoPhillips management, the WAC (as appropriate), and other experts including the AO as required by each specific issue. The Nuiqsut Caribou Monitoring Study indicate that these coordination efforts are reducing impacts on subsistence activities as the number of respondents reporting Alpine-related impacts went down significantly in Year 4 with improved communication with ConocoPhillips specifically noted by the Caribou Panel as a potential reason for the decline. (SRB&A 2012 page 78).

Baseline Studies and Monitoring

[18-134] ConocoPhillips conducts baseline studies to better mitigate impacts associated with activities and to monitor for potential impacts. Typical annual studies in the Alpine and NPR-A area include:

- Water Quality Monitoring
- Spring Breakup Monitoring
- Lake Recharge Studies

- Hydrological Studies
- Thaw/Elevation Monitoring
- Aerial avian surveys
- Ground-based nest surveys
- Lake studies (bathymetry and fish presence/absence)
- Fish in streams studies
- Aerial mammal surveys
- Caribou monitoring studies
- Caribou subsistence monitoring studies
- Polar bear den FLIR surveys
- Cultural resources surveys

ConocoPhillips is conducting a monitoring study of the level of contaminants in locally-used subsistence foods to comply with BMP A-11. The monitoring study is designed to examine the level of contaminants in subsistence foods prior to the development of GMT1 and monitor the level of these contaminants throughout the operation and abandonment phases of the development.

Plans and Procedures to Address Aircraft Disturbance:

During development construction activities, summer studies and field inspections requiring aircraft use, ConocoPhillips will follow its GMT1 Aircraft Transportation Plan to minimize the effects of low-flying aircraft on wildlife, subsistence activities, and local communities. Under the GMT1 Aircraft Transportation Plan, aircraft maintain an altitude of at least 1,000 ft over caribou winter ranges from December 1 – May 1

ConocoPhillips will also use its standard operating procedure titled Aircraft Operations-Communication to Local Residents to communicate with the local SA, subsistence hunters, NVN and KSOP to minimize the disturbance to subsistence hunting activities.

The GMT1 Aircraft Transportation Plan is provided in Appendix 7, and an Aircraft Operations-Communication procedure for communicating with local residents is attached to this Appendix 3 for BLM's review and consideration.

[18-135] ConocoPhillips has recently taken the lead to include other oil and gas operators in daily coordination conference calls beginning this summer and fall (2014) when helicopter use has the potential to affect subsistence hunting and resources. These daily meetings will facilitate 2-way communication between hunters and operators to best minimize impacts on subsistence hunting.

In addition to the daily meetings, ConocoPhillips uses a 1-800 number with daily recordings with locations of planned helicopter operations. Hunters with concerns about activities in a certain area will be encouraged to contact the SA for reporting to ConocoPhillips.

Subsistence Mitigation Funds:

During the permitting of the Alpine Satellite at CD4, a mitigation fund was established in ConocoPhillips' NSB permit to mitigate impacts on local residents due to potential subsistence impacts. This original

fund was managed by the North Slope Borough with the assistance of representatives of the City of Nuiqsut, the Native Village of Nuiqsut and Kuukpik Corporation. The NSB CD4 permit required annual payments of $50,000 for ten years, the last payment was made in 2013.

In 2008, as part of an agreement with the Kuukpik Corporation to progress NPRA activities including CD5 and GMT1, **[18-136]** ConocoPhillips agreed to make annual payments to a mitigation fund administered by a joint committee of the City of Nuiqsut, the Native Village of Nuiqsut and Kuukpik Corporation of $50,000 a year per Alpine satellite pads in the NPRA and for the Nigliq Channel bridge as they are constructed. The mitigation fund committee determines how these funds are used to offset potential impacts to subsistence and has developed a program of fuel vouchers and payments to households. The first payment for CD5 and the Nigliq Bridge ($100,000) was made in January 2014. This existing mitigation program defrays any increase costs, such as fuel for travel, which might be incurred in connection with activities in NPR-A including GMT1.

Prohibit Employees from Hunting and Fishing:

[18-137] All ConocoPhillips employees and contractors working in the Colville River Delta or in NPRA are prohibited from hunting and fishing. This eliminates the possibility of introducing competition for subsistence resources as a result of the GMT1 project. The GMT1 project may result in some areas being avoided for hunting, and some new areas being used as a result of improved road access, but it will not result in new competition. While required in BMP H-3 in for operations in NPR-A, ConocoPhillips has enforced this prohibition for anyone working at Alpine or in the Colville River Delta since the beginning of development in the Alpine area.

ConocoPhillips Employee Training/Orientation

[18-138] ConocoPhillips provides all personnel involved in oil and gas and related activities information concerning applicable stipulations, best management practices, standards, and specific types of environmental, social, traditional, and cultural concerns that relate to the Colville River Delta and NPR-A region. All personnel and contractors involved in the GMT1 activities will attend an orientation program at least once a year to minimize cultural and resource conflicts. The orientation program will be submitted to the authorized officer for review and approval. While required BLM I-1 in for operations in NPR-A, ConocoPhillips has also made this training required for anyone working at Alpine or in the Colville River Delta.

ConocoPhillips Alaska, Inc.	CONOCOPHILLIPS ALASKA Greater Kuparuk Area & Western North Slope Aircraft Operations Communication to Local Residents		Approved: Effective: January 2014 Reviewed: January 2014
Retention Code: **ADM220**	**Procedure Owner/Author:** **Environmental Studies**	**Approved By:** **Director HSE Permits & Sciences**	**Review Frequency:** **E + 2Y**

[18-139]

1.0 Scope

The purpose of this document is to outline the responsibilities associated with communicating to local communities about the use of helicopters and fixed-wing aircraft activities conducted for various programs and projects on behalf of ConocoPhillips Alaska, Inc. (CPAI) on the North Slope.

The North Slope Borough (NSB), along with other landowners on the North Slope, authorizes CPAI programs and projects each year by issuing permits. A stipulation typically included within the permits requires CPAI to avoid impacting subsistence activities by communicating with the Village of Nuiqsut. CPAI has set up the communications link described below to comply with this stipulation.

2.0 Definitions & Acronyms

CPAI – ConocoPhillips Alaska, Inc.

KSOP – Kuukpik Subsistence Oversight Panel

NSB – North Slope Borough

NVN – Native Village of Nuiqsut

VHF – Very High Frequency

BLM – Bureau of Land Management

3.0 Process

1. Before each morning's scheduled flights, the North Slope Helicopter Logistics Coordinator and/or Subsistence Advisor (Representative) will call and/or email the KSOP, the NVN, and any other interested parties with the daily flight plans. The KSOP will be contacted again if the planned flight area changes during the day. A grid map will be used to communicate the approximate destination of the helicopter. Copies of the grid map will be posted in the KSOP office. The day's flight plans will also be available on a recorded hotline that interested parties can call for updates. The phone number for the hotline is (907) 659-1779 and is a local call from Nuiqsut. 24-hour notice will be given to KSOP if CPAI requires flights within a 3-mile buffer around the village of Nuiqsut.
2. The KSOP and NVN representatives will communicate the planned flight activity to the local residents and hunters. When known, the KSOP will communicate the approximate location of subsistence hunters to the North Slope Helicopter Logistics Coordinator or Subsistence Advisor, as well as the Environmental Studies Coordinator. If the helicopter plans to fly over or near an area where they know hunters will be, the pilot will make their best effort to seek an alternative route that will avoid the area or fly at a higher elevation as to not cause a disturbance.

3. Planned flight activity will be cascaded during a daily subsistence conference call. The subsistence call will allow for communication between the North Slope Helicopter Logistics Coordinator, the Subsistence Advisor, a BLM representative, the Environmental Studies Coordinator, CPAI Village Outreach representative, as well as any other stakeholders. The teleconference is held at 8:00am at toll free: 1-866-641-1232, passcode: 4721631885.

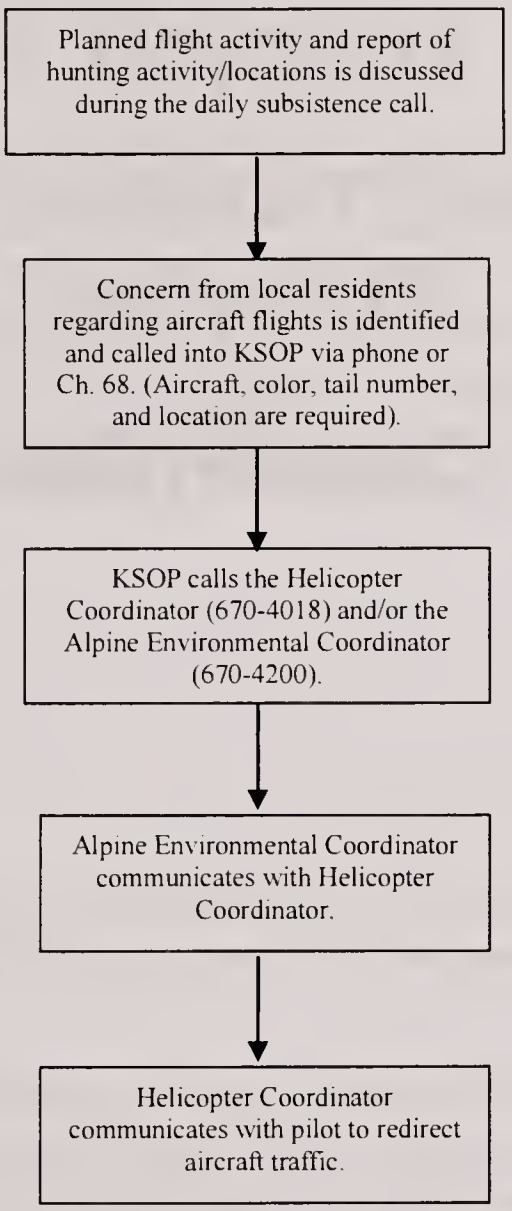
4. KSOP will be the point of contact for concerns or complaints from local residents and hunters, received either by phone or via Channel 68, which KSOP will monitor. Concerns or complaints should include a description of the aircraft color(s), tail number, and the specific location of the aircraft. VHF radios have been provided to the KSOP by CPAI for use by subsistence hunters to communicate their concerns. The Helicopter Logistics Coordinator will also monitor VHF Channel 68 for calls or dialogue regarding helicopter concerns.

   The KSOP representative will contact the Alpine Environmental Coordinator (670-4200) and/or the North Slope Helicopter Logistics Coordinator (670-4018) with details of the complaint. If necessary and if it is safe to do so, the North Slope Helicopter Coordinator can direct helicopter traffic to leave the area to avoid interference with the subsistence hunting activity.

5. A weekly summary report will be distributed to various Village, NSB, and KSOP personnel describing CPAI's previous week's flight activity as well as the upcoming week's scheduled activities. These reports are also shared with internal CPAI staff, State and Federal regulators, and environmental non-government organizations (eNGOs). This weekly summary will include all CPAI environmental studies as well as non-environmental project work using helicopters based out of Alpine. The report will include the generalized geographical area of the coming week's proposed activity in an effort to coordinate flight plans with subsistence activities.

Figure 1:

Process for Minimizing Helicopter and Fixed-Wing Aircraft Interference with Subsistence Activities



Comments on GMT1 DSEIS

APPENDIX 4

Public Comment Testimony Supportive of Alternative A

ConocoPhillips

Comments on GMT1 DSEIS

Appendix 4

Selected Statements in Support of Alternative A of the GMT1 Project

The following testimony is from the transcripts of the GMT1 public hearings that were held in the villages from March 10th, 2014 through March 20th, 2014. The page numbers refer to the respective transcript that is posted online at BLM's GMT1 SEIS Website (https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=50912).

After the selected comments, there is a list of all persons who vocalized support of Alternative A at the Community Public Meetings mentioned above.

Point Lay Meeting

"You know, I would probably go with A, because it leaves a smaller footprint that won't affect any migrating animals up in that area and (indiscernible) over the years of being on (indiscernible) I've seen Nuiqsut get cut off from the south or from the east because of Prudhoe Bay and then from the south with, you know, they're just almost surrounded in all areas, you know, on four or three different sides and then now, Shell trying to cut off the -- drilling out in the Beaufort Sea, you know, pretty much like boxed in, but you know, I'm glad that Nuiqsut has been able to subsist, even though development is all around them."

Willard Neakok
Native Village of Point Lay
Point Lay Meeting, Page 94

Atqaksuk Meeting

"For the record, my name is Mary Ellen Ahmaogak and I am on the Board of Directors of Arctic Slope Regional Corporation. ASRC supports Alternative A as it's -- as proposed by ConocoPhillips, our partner in development.

We support the efforts of Kuukpik Corporation to work with ConocoPhillips to design a project that meets the needs and concerns of the community of Nuiqsut. Alternative A responds to Nuiqsut's concerns over aircraft traffic in and around the village. The excessive amount of air traffic has a negative effect on the community and subsistence through disturbances to the animals.

ASRC agrees with the community that road access is better because it will allow broader access for subsistence to the west of the village in the Fish Creek area. Alternative A and the road also addresses safety issues, both for emergency situations, but also will allow for faster and more efficient oil spill response.

Local Nuiqsut residents will have use of access to the road to include access to subsistence hunting areas west of Nuiqsut, even northwestern NPRA.

ASRC owns most of the subsurface of the GMT1 development and will receive significant royalty revenue through the development. GMT1 is a project of ConocoPhillips that will produce oil from ASRC's subsurface, a right given to us through ANCSA to support our shareholders and through the sharing provisions, benefit Alaska Natives across the state.

It's through development like GMT1 and the revenue ASRC receives through its royalty ownership that keeps its dividend policy strong. GMT1 is an essential project to maintain North Slope production and the economic benefits that it brings to the North Slope oil through its tax based that supports the infrastructure of the North Slope communities, such as our community of Atqasuk.

GMT1 is not a new project. It was reviewed and approved by BLM and its cooperating agencies in 2004. It was then known as the CD6 development, a western satellite to the Alpine oil field.

Communities of the North Slope and within NPRA would like to have the benefit of the same amenities that non-rural communities have with respect to roads to provide connections between communities to larger cities and to allow fast, reliable telecommunications and internet services and to assist in lowering the cost of energy.

Communities would rather have roads developed over additional airstrips and increased air traffic for access because roads provide broader range and to access subsistence resources, whereas aircraft (indiscernible) negative impacts subsistence through sound disturbances to the animals.

We would also like to see the gravel remain in place after oil and gas activity to allow residents to have continued long-term access to subsistence resources. Gravel is a very valuable commodity on the North Slope, so to have the companies pick it up and haul it away after they are done with producing oil would be bad for our villages and our villages would have the opportunity to use the gravel in ways that benefit them. Thanks for listening."

Mary Ellen Ahmaogak
Board of Directors of Arctic Slope Regional Corporation
Atqasuk Public Meeting, Page 78

<u>Barrow Meeting</u>

"So I have to make up my mind and move forward and support projects like this that will benefit our people and not just us as Inupiats, everybody who lives on the North Slope, no matter what race, creed, or color they come from. That's the benefit of the -- of our system today. So we benefit everybody and that's why I have to support what we're doing here today.

I support Alternative A. It's the least impact, as you stated in your presentations to the community of Nuiqsut. There is (sic) impacts, but it's the least impact and it's most beneficial for the subsistence users,

as well. I, for one, in Wainwright cannot be telling the community of Nuiqsut what they should be supporting. So I'm supporting what they do -- what they're supporting, Alternative A, and that's -- and that's what we should be doing, supporting a community with the most impacts."

John Hopson
Mayor of Wainwright
Barrow Public Meeting, Page 85

Nuiqsut Meeting

"In addition to bringing direct benefits to the shareholders of Kuukpik, ASRC and other Native corporations entitled to 7(i) distributions, this project will benefit the North Slope Borough and the state of Alaska through the increased tax revenues and by extending the life of the Trans-Alaska Pipeline System. It will also bring benefits to the villages that rely heavily on funding from NPRA grants.

The North Slope Borough supports the Greater Moose's Tooth Project 1 and the adoption of Alternative A as the preferred alternative. We believe that Alternative A incorporates rigorous mitigation and best management practices that will enable this project to move forward in a responsible manner, while also protecting the ability of our local residents to continue their subsistence practices.

It also has the smallest gravel footprint of all alternatives, which is important given the scarcity of gravel on the North Slope. Alternative A also includes road connections that will provide increased access to hunting areas for local subsistence users. Roads will provide for more timely and efficient responses to an oil spill or other unforeseen incident.

Further roads will allow emergency responders access to the project site, even in the severe weather conditions. Roads will also enable residents of Nuiqsut to have access to the project site and will create greater employment and training opportunities for the village.

Alternative A will also minimize the amount of noise and required overflights by helicopters and fixed wing aircraft, which has been repeatedly expressed to the BLM and stated in the SEIS document as being more disruptive to subsistence hunting than any other activity and because GMT1 project (sic) is located in an area that is not heavily utilized by Teshekpuk or Central Arctic Caribou Herds, a road connection is unlikely to have any substantial impact to this important subsistence resource.

For all these reasons, we feel that Alternative D or any other alternative that would promote road-less development is a poor concept and should not be considered further as a viable alternative. As the SEIS acknowledges, air travel has been restricted at the Alpine site between 13 to 22% of each year over the last four years.

It is not prudent or reasonable to risk the life, health or safety of the workers at the project site, or hamper response times to oil spills for the sake of road-less development. Alternative D will also create more ambient noise and will have a greater negative impact to air quality than all of the other alternatives. The SEIS states, "Alternative D would likely have the largest impact to subsistence and thus

environmental justice for Nuiqsut." We agree and we feel that this alternative should not be recommended."

Charlotte Brower
Mayor of North Slope Borough
Nuiqsut Public Meeting, Page 74

"While Kuukpik's review of the draft supplemental EIS is still ongoing, our preliminary conclusion that Alternative A is the most balanced environmentally responsible of all alternatives and that Alternative A has the least impact to this community.

Kuukpik Corporation prefers Alternative A because Alternative A uses less amount of fill to the wetland and a small footprint and uses less amount of other resources like water, which would not have been building GMT1 at all (sic), would use less gravel and have a small footprint that the Alternative A identifies.

The people of Nuiqsut had complained repeatedly for years and years about aircraft, fixed wing, helicopter noises that interfere our subsistence hunt trying to gather for our food security and Nuiqsut consistently opposed building any more airstrips in our (indiscernible) land of the Kuukpik (indiscernible) because of disruption of our hunt.

Because of a large increase in aircraft traffic, a greater impact overall that Alternative D, the road-less alternative that (indiscernible) Kuukpik opposes Alternative D because of more impacts. In addition, if GMT1 were built road-less, it would make it more likely that the other satellites also would be built road-less and more airstrips to be built in the Fish Creek area and known as other satellites (sic).

A second airstrip near Fish Creek would be -- would be even more unacceptable than the first airstrip in Alternative D. Road-less development of Alternative D would require large amounts of unnecessary duplication of facilities at GMT1. A pad plus an absence of a road requires GMT1 to have more standalone facilities, including a year-round mancamp, incinerators, generators that cause emissions. From Alternative D, there would be less -- five times greater (sic) from the Alternative A.

Using Nuiqsut as the hub under Alternative C is not acceptable to Kuukpik at this time. Kuukpik does not want ConocoPhillips building roads, pads, other -- other facilities (indiscernible) and we understand that neither the industry nor the community would like that idea because it would increase impacts, social impacts, subsistence impacts. It would increase the air traffic, blocking operation -- operational activity. It would be accountable (sic) to this community.

Kuukpik would not make the land and (indiscernible) city limit available for this project because of impacts, air emissions, dust, you name it. Kuukpik also believes that trucking activity under C, like I indicated, dust, air control (sic) would be unacceptable."

Isaac Nukapigak
President of Kuukpik Corporation

Nuiqsut Public Meeting, Page 81

"Sometimes, you know, when you have a contradicting document that says this and that, but it's not on the same page as what they want to believe, but for Alternative A is most, for me, to be acceptable, because there's a lot of -- it's the least use of gravel, smaller footprint versus the alternative or that probably some years down the road, they will not have it, but not now. I have seen all these years of being observant. I have participated in some of the process. I've seen that. I thank you."

Joseph Nukapigak
Kuukpik Corporation, Natural Resource Director
Nuiqsut Public Meeting, Page 97

Anchorage Meeting

"Good evening. For the record, my name is Grant Yutrzenka. I'm here to speak in favor of Alternative A of ConocoPhillips' proposal for the Greater Mooses Tooth Unit oil and gas development, and though I believe the economic benefits are obvious with the estimated peak production estimated at 30,000 barrels per day, helping to offset the decline in the North Slope production and benefitting local, state and national economies with local hiring, et cetera.

I'm in favor of Alternative A for a few key reasons; 1) safety, should there be a serious injury at Greater Mooses Tooth 1, the road connection to Alpine could help in a more timely response, 2) in the event of an emergency spill, with road access from Alpine, a better, quicker response, more full response can happen from Alpine.

Lastly, Alternative A provides a smaller overall footprint with less noise, resulting in reduced economic or environmental impacts than Alternative D, the aircraft and ice road access alternative. Thank you."

Grant Yutrzenka
Anchorage Public Meeting, Page 14

List of Persons supporting Alternative A

Point Lay – Support of Alternative A	
Crawford Patkotak	Chairman of the Board, ASRC
Willard Neakok	Native Village of Point Lay
Atqasuk – Support of Alternative A	
Mary Ellen Ahmaogak	Board of Directors, ASRC
Paul Bodfish, Sr.	ASRC
Barrow– Support of Alternative A	
John Hopson	Mayor of Wainwright/Employee of ASRC
Edward Itta	Individual
Geoff Carroll	Individual views (works for ADF&G)
Nuiqsut– Support of Alternative A	
Charlotte Brower	Mayor of NSB
Bernice Kaigelak	Individual/Kuukpik
Isaac Nukapigak	President of Kuukpik Corporation
Crawford Patkotak	Chairman of the Board, ASRC
Gordon Brower	NSB, Land Managment
Joseph Nukapigak	Kuukpik Corporation, Natural Resource Director
Thomas Nukapigak	Individual
Dora Leavitt	President of Nuiqsut
Dwayne Hopson	City of Nuiqsut
Wainwright– Support of Alternative A	
John Hopson	Mayor of Wainwright
Joe Nukapigak	Kuukpik
Teresa Imm	ASRC
Anaktuvuk Pass– Support of Alternative A	
Joe Nukapigak	Kuukpik/Nuiqsut
John Hopson Jr.	ASRC
Fairbanks – Support of Alternative A	
Robert Ragar	Individual
John Hopson, Jr.	ASRC
Joe Nukapigak	Kuukpik/Nuiqsut
Anchorage– Support of Alternative A	
Tom Maloney	CH2M Hill
Mike Heiring	Individual/Udelhoven
Jeff Bruno	State of Alaska (ADNR)
Grant Yutrzenka	Individual
Lanston Chinn	Kuukpik
Carl Portman	Deputy Director of the Resource Development

	Council
Bill Muldoon	ConocoPhillips Alaska, Inc.
Caroline Higgins	Executive Director for Consumer Energy Alliance
Keith Silver	Individual
Rachael Petro	President and CEO of the Alaska Chamber
Francy Bennett	Communications Director for ProsperityAlaska.org
Maynard Tapp	Individual
Janeane St. John	VP at Lynden
Michael Jesperson	Individual/Family
Bill Binford	Self/Anchorage resident
Gary Dixon	Teamsters Local 959 VP
Stacey Aughe	Weston Solutions/Individual
Teresa Imm	ASRC

Comments on GMT1 DSEIS

APPENDIX 5

Seasonal Drilling is not Practicable for GMT1

ConocoPhillips

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4/22/2014

Comments on GMT1 DSEIS

Appendix 5

Seasonal Drilling is not a Practicable Alternative for GMT1

Alternative D currently assumes that drilling would occur year-round and the operational support facility infrastructure (storage, camp, airstrip, emergency response equipment) is available to support year-round activity. During the GMT1 DSEIS public hearings, environmental nongovernmental organizations questioned BLM on why a seasonal drilling alternative had not been included. ConocoPhillips understands that BLM is now evaluating a roadless/limited access alternative with seasonal drilling only. This Appendix 5 addresses issues associated with seasonal drilling at GMT1. For this analysis, seasonal drilling assumes drilling only when an ice road is available during the winter season (February-April), which, based on recent experience with ice roads on the North Slope, would allow drilling approximately 90 days per year.

Drilling Would be Limited to One or Two Wells per Year

[18-140] Due to the complex drilling subsurface conditions in the GMT1 area, it is expected that only one to two wells could be drilled per year during the 90-day ice road drilling season. It is estimated that the GMT1 wells will take 46- to 67-days to drill and complete. The estimate of 46- to 67-days is based upon CPAI historical experience drilling exploration wells in the GMT unit. Exploration wells in the GMT1 area have experienced shale stability problems drilling straight hole through the formations just above the reservoir. Horizontal development wells from GMT1 pad require directional drilling at high angles through the overburden. Rock mechanics analysis for using mud weight to maintain wellbore stability for tripping and running casing appears very problematic; therefore, the GMT1 well design includes an extra string casing run to the top of the shale formations and then drill with casing (DWC) through the shale section and the reservoir while holding angle. Once the drilling assembly is retrieved and the DWC interval cemented, a whipstock is used to exit the casing and the horizontal section drilled and completed. Installation of this four string well design and delivering a 6-inch bit for the lateral requires additional time when compared to previously drilled WNS wells due to larger hole and casing sizes, additional trips, slow penetration rates during the DWC process, and extra time needed to exit the casing via whipstock.

First Production Would be Delayed Over Two Years

[18-141] If drilling is limited by the ice road season, initial production from GMT1 will be delayed over two years. The delay is caused by the need to drill multiple injection wells and production wells before allowing production to flow to a processing facility. On the injection side, a sufficient number of injection wells would have to be drilled prior to production start-up to provide pressure support necessary for prudent reservoir management. On the production side, a sufficient number of production wells would have to be drilled before allowing the wells to flow because the facilities and pipelines will need to be sized from the outset to handle a full GMT1 development scenario and adequate pipeline flow velocities are required to mitigate corrosion risk. As a result of this need to drill multiple injection and production

wells prior to flowing oil, production would be delayed for two years, and resource recovery would be impacted versus a year round drilling scenario.

Production Delay Undercuts the Project Objectives and Economics

[18-142] The delay between facility construction and oil production significantly undercuts the development objectives and economics of the project for the working interest owners and the royalty owners including ASRC, Kuukpik ,the federal government, the State of Alaska, the North Slope Borough and all Alaska Natives that benefit from 7i and 7J revenue sharing. Specifically, seasonal drilling would result in deferred start of production and a lower production profile as described above, which in turn would result in deferred and lower revenues to all stakeholders. The lower revenue profile combined with expected higher costs caused by stringing out drilling (loss of synergies from a concentrated drilling campaign, multiple mobs and demobs) threaten to make the project unattractive for investment. A seasonal drilling restriction may be a de facto "no development" decision. Such an outcome would result in the greatest injustice to all stakeholders, and especially to the Native community of Alaska. As a result, seasonal drilling is not a practicable approach to GMT1 development.

Safe Operations and Environmental Stewardship are of Paramount Concern

Human safety, the protection of the environment, the protection of assets, maintaining our license to operate, and local support and cooperation are all critical considerations in the design of new developments and facilities. In addition to the myriad of codes and regulations, CPAI must balance the application of technology, expert knowledge, historical performance data and prudent operational philosophy to present a proposed development with acceptably low levels of risk in each of these areas.

For the reasons set forth in Appendix 1, which addresses the safety and environmental advantages of a permanent road connection to GMT1, **[18-143]** a seasonal drilling approach to Alternative D does not comport with the objectives of safe operations and environmental stewardship. Under a seasonal drilling approach, there will still be equipment and personnel on the GMT1 pad during times of the year when there is no ice road access, even though drilling would not occur during those times. Given the location of GMT1 and the lack of sufficiently reliable alternative means of access, ConocoPhillips does not support a development alternative for GMT1 that lacks a permanent road.

The resources to effectively respond to an operational problem, human safety matter, or other risk are housed at the main production facilities at Alpine, which is roughly 15 miles from GMT1 and across the Nigliq and Ublutuoch Channels (Without a road, roughly 15 miles of tundra, rivers, and lakes separate GMT1 from the resources at APF, although part of that distance will have a road upon completion of CD5). An aircraft and ice road only access development would be inaccessible by land route from the Alpine Central Facilities (ACF) for a minimum of nine months every year, or at least three-quarters of the industrial operational window. Locations to the west of the Nigliq Channel, including the proposed GMT1, are frequently impacted by weather conditions that affect flight operations, presenting a significant logistical liability for human life safety and effective emergency response. Due to weather related flight restrictions, air access to the proposed GMT1 drill site is likely to be restricted 13% to 22% of the year (based on the historical flight cancellations observed since 2010). The actual number of days

flight restrictions may have occurred is not captured in our records and is likely to be higher than 22%; we only track cancelled flights. Bad weather days which flights were not scheduled would not be captured.

In contrast, operators and emergency responders can access CD3, the only roadless drill site operated by CPAI on the North Slope, by boat for maintenance and emergency response operations if weather limits aircraft support. GMT1, unlike CD3 is landlocked, and cannot be reached by boat. This increased risk is why the a standalone operations support facility would still be required; including a permanent man camp, an airstrip, storage areas, rolling stock to travel between airstrip and drill site, fuel storage, and emergency response equipment staging.

Comparison to CD3

CPAI constructed, installed, and currently operates a roadless un-manned drill site development at CD3. Thus, we are not categorically opposed to limited access drillsites and seasonal drilling. But not every location where oil can be economically produced is well-suited to that more restrictive form of development. The CD3 drill site, located approximately 5.5 miles north of the ACF, was designed for winter-only drilling and un-manned operations. The winter-only drilling season is possible due to an annual ice road constructed to connect CD3 with the ACF and the extended timing of production is possible due to commencement early in the Alpine field life and the smaller volume of resource (fewer wells) to be recovered. For the remainder of the year, non-emergency personnel access to CD3 is accomplished via air travel.

In the event of an emergency, CD3 is accessible year-round from the Alpine Central Facility via watercraft using the Tamayayak and West Ulamnigiaq Channels of the Colville River, or via surface craft through shallow waters or areas of grounded ice. These alternative methods of access have been employed numerous times within the past four years to transport personnel who were stranded at CD3 due to weather that prohibited flying. CPAI has a year-round tundra access permit just for this reason. Ice road access from the main Alpine facilities to CD3 has historically been available for approximately 3.5 months (from mid-January to May 1). **[18-144]** The ice road season for access to GMT1 would be significantly shorter due to a much greater length of ice road required to be constructed[1] and the need to build an ice-bridge over the deep Nigliq Channel if a rig were to be moved to the GMT1 drill site on an annual basis. Based on experience gained from previous exploration ice roads in this area, the length of the ice road season between ACF and GMT1 would be a maximum of three months in a good year. In a year where a high number of weather delays occur, or an early break-up occurs, the ice road season would be shorter than three months. See Appendix 1 at note 2 (citations to U.S. Army Corps of Engineers ROD addressing and distinguishing CD3 from other Alpine satellites).

The Gravel Footprint with Seasonal Drilling as Mitigation Is Similar to the Alternative D Footprint

[1] The historical agency-approved ice road crossing for the Nigliq Channel is just north of Nuiqsut. This location requires approximately 12 miles of ice-road between the ACF and GMT1.

[18-145] The total gravel footprint of winter only drilling scenario at GMT1 is similar to that which would be required under a Limited Access (aircraft and ice-road access only) year round drilling scenario. The size of the gravel production pad and gravel airstrip would not change. Adding restrictions on the drilling season would not diminish the need for standalone operations support facilities to manage operations and emergency response operations year round.

Summary

The circumstances of GMT1 differ significantly from the circumstances of CD3. It is farther from ACF, separated by a river, and lacks access by water. It presents a bigger resource that requires more wells and more investment, but given the long time necessary for ice road construction, wells could not be drilled quickly enough to bring production on line sufficiently soon or to complete development in a reasonable time frame. For these reasons Alternative D is not logistically practicable to develop GMT1 without a road.

In addition, seasonal drilling would result in deferred startup and a lower production profile which would negatively impact the economic benefit to the State of AK, the federal government, the NSB, Kuukpik, ASRC and all Alaska Natives through reduced and deferred collection of taxes and royalties. Further, negative impacts of seasonal drilling on the project's economics could make it unattractive for investment which in turn would result in the greatest overall negative impact to all stakeholders. For these reasons, it is not practicable to develop GMT1 with seasonal drilling limitations either with or without a road.

Comments on GMT1 DSEIS

APPENDIX 6

DSEIS Comment Table

ConocoPhillips

CPAI Comments on Draft Supplemental EIS for the ASDP

GMT1 Development Project

APPENDIX 6

DSEIS Comment Table

General notes about the table:

- The following comment summary table includes comments on the Draft SEIS (DSEIS) BLM provided for review on February
- 19th 2014.
- Comments made in earlier sections of the document that apply to multiple sections should be carried throughout the analysis in subsequent sections.
- Page numbers associated with comments refer to the PDF version of the DSEIS.
- All references cited in the comment table are included in Appendix 9-Literature Cited.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	1.0	-	1	2	**[T18-001]** Suggest dropping "After 2004, it was determined that satellites CD6 and CD7 were not located in the same reservoir as CD3, CD4, and CD5 " As the last sentence in that paragraph explains the pad CD6 & 7 to GMT1 & 2 name changes. While the primary reservoirs all areas are Alpine Sand bodies, it was never believed that the Alpine sand accumulations at GMT1 & 2 area were connected to the similar sands in CRU. The naming convention was more likely associated with the fact the all pads would be producing through field facilities in CRU, there was never and belief these reservoirs were connected in the subsurface.
CPAI	1.0	-	1	3	**[T18-002]** States " Reasonably Foreseeable Development that could occur from discovered petroleum resources in the GMTU was consistently considered in all development alternatives, including the alternative adopted by the 2012 NPR-A IAP and 2013 IAP ROD."

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	1.0	-	1	3	**[T18-003]** The 2012 ANILCA Section 810 analysis findings (A.4.3) state, "Alternative B-2 would not significantly restrict subsistence by communities in or near the NPR-A (Anatuvuk Pass, Atqasuk, Pt. Lay, Barrow, Nuiqsut and Wainwright. " It goes on to conclude, "A.4.3 Reasonable Steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such action. When BLM began its NEPA scoping process for the current plan, it internally identified subsistence as one of the major issues to be addressed. The information found within the analysis of impacts to subsistence, including access, harvests, and traditional use patterns, as well as the results of public scoping meetings in the villages of the North Slope, meetings with the NPR-A Subsistence Advisory Panel and consultation with tribal and local governments were used to craft Alternative B-2. In addition, the BLM took into consideration comments from villages and individuals of the North Slope during the ANILCA Subsistence Hearings. This information resulted in the retention and addition of several protective measures that further minimize adverse impacts to subsistence uses
CPAI	1.0	-	1	3	**[T18-004]** In conclusion the 2012 IAP ANILCA Section 810 analysis states "Given these stipulations, as well as the other lease stipulations and best management practices that serve to directly protect various subsistence resources or their habitat, the BLM has determined that Alternative B-2 includes reasonable steps to minimize adverse impacts on subsistence uses and resources." However, the Draft SEIS states "The ANILCA Section 810 analysis for the proposed project concluded that, under all action alternatives, the effects fall above the level of significantly restricting subsistence use for the community of Nuiqsut. Please explain what information was used to discount the 2012 IAP and 2013 IAP ROD conclusions and come to this conclusion.
CPAI	1.1	-	2	3	Add between "(ASRC)" and ";" - "and approved by the BLM." (Their approval in effect makes them a party also.)
CPAI	I.1	-	2	4	Add "notional" between "identifies" and "Participating" in line 2. The actual PAs will be in place 6 months prior to the start of the production form that particular PA. Also, capitalize participating area in the next to last line.
CPAI	1.2	History of Operations in the Area	3	4	The text states "after a lengthy review process, including relocation of the Nigliq Channel bridge and subsequently the drill site, the Corps issued a permit for CD5" The bridge crossing the Nigliq Channel was relocated, and the road and pad were adjusted to conform with the new bridge location. Please correct the statement to reflect that the bridge was relocated.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	1.3	Purpose and Need for the Project	4	2	**[T18-005]** The list of benefits should include royalties to federal government and ANCSA corporations.
CPAI	1.4	Purpose and Need for Federal Action	4	5	**[T18-006]** The overall purpose should include development, production and transportation of hydrocarbons. The current text states "the overall purpose is to produce liquid hydrocarbons from the GMTU."
CPAI	1.4.2.1	-	9	3rd Bullet	**[T18-007]** ADECs air quality permit responsibilities include Title V Operating Permits and PSD permits as stated; however, the bullet also needs to include mention of the State minor source permitting program.
CPAI	Table 1.4-1	State Agencies Permits, Approvals, and other Requirements	10	BLM	**[T18-008]** The BLM authorizations should include "Grant relief of Lease Stipulation K-1 (Fish Creek Setback)."
CPAI	Sec 1.4.3	-	11 and 12	1	**[T18-009]** The 2012 Point Thomson Project Final EIS (recent cumulative effects analysis) is listed as a NEPA document that this SEIS tiers to. The other NEPA documents in the list all have subsequent paragraphs describing the documents and how they relate to the GMT1 SEIS. Suggest that the PT EIS also be described and its inclusion justified in this section or that it be referred to as a reference document, rather than a tiered document.
CPAI	1.4.5	Changes and New Information	14	1	**[T18-010]** Paragraph under table has a statement: "A review of new data and information contained in BLM (2012) shows there is no appreciable changes in the physical, biological or social resources associated with the project study area since BLM (2004)." --This may be helpful in the subsistence analysis.
CPAI	Table 1.4-3	-	15	-	**[T18-011]** Physical Atmospheric Environment "New Project Information or Regulatory Controls" indicates that "Detailed information on air pollutant concentrations in Nuiqsut ...." is new project information since 2004. This statement is not accurate. Detailed air pollutant concentration information was available from Nuiqsut in 2004 since the station has been in operation since 1998.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 1.4-3	Subsistence	15	New Project Information or Regulatory Controls	**[T18-012]** Indicates "Updated information regarding subsistence activities published in 2010 by Stephen Braund." This should not be characterized as updated information; it was published before the 2012 IAP.
CPAI	Table 1.4-3	Subsistence	15	-	**[T18-013]** The new project information for subsistence should include all additional reference information as described in Section 4.4.4.
CPAI	Table 1.4-3	Land Use	16	Changes in Nature of Resource	**[T18-014]** The Nuiqsut Spur road is now under construction.
CPAI	2.2	Summary of Proposed Project Changes from 2004	20	Bullet 1	**[T18-015]** The drill site, access road, and pipeline corridor were moved out of the Fish Creek buffer not only due to agency concerns but also in response to community and village corporation concerns.
CPAI	2.3.2	-	22	3	**[T18-016]** ConocoPhillips and BLM discussed the possibility of a potential seasonal drilling restriction, and that discussion should be documented in subchapter 2.3.2 as an alternative that was considered but not carried forward.
CPAI	2.3.2	-	22	3	**[T18-017]** "The rational that eliminated these alternatives from further consideration is provided in BLM (2004, 2.6)" Were the alternatives that were considered but not carried forward in this DSEIS the same as those in the 2004 EIS? Develop this whole section: why alternatives were chosen or not.
CPAI	Table 2.3-2	Footprints and Gravel Requirements for Project Alternatives	23	Pads (ac)	**[T18-018]** Should note pad acreage includes valve pads.
CPAI	Table 2.3-3	Road and Pipeline Lengths for Project Alternatives.	23	Pipeline Length (miles)	**[T18-019]** The Alternative B pipeline should be longer than the road. New info on Alt B is being provided separately.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 2.3-3	Road and Pipeline Lengths for Project Alternatives.	23	Pipeline Length (miles)	**[T18-020]** Pipeline lengths need correction: Alt A and D are 8.4 miles.
CPAI	Table 2.3-3	Road and Pipeline Lengths for Project Alternatives.	23	Pipeline Length (miles)	**[T18-021]** Note 1 is not accurate for the updated pipeline lengths and doesn't explain why the Alt C pipeline length is incrementally less than the other alternatives (tie-in moved to road).
CPAI	Table 2.3-3	Road and Pipeline Lengths for Project Alternatives.	23	Road Length (miles)	**[T18-022]** Alternative C road length does not include the 1.2 miles required for the Nuiqsut Airport Access road, nor the 5+ mile upgrade to the Nuiqsut spur road
CPAI	2.4	Alternative A:CPAI Proposed Project	24	1st bullet	**[T18-023]** Gravel supply from Clover site or (not and/or) the ASRC Mine Site. There is not enough time in the short winter season to build ice roads, open, mine, and rehabilitate two separate mine sites. This is inaccurate. Only one site will be used.
CPAI	2.4.2	-	24	bullet list	**[T18-024]** Missing: Fuel Gas Conditioning skid
CPAI	2.4.2	-	25	2	**[T18-025]** Power cables are suspended from the Horizontal Support Members (HSMs)
CPAI	2.4.2	-	25	4	**[T18-026]** CPAI plans to power the drilling rig from temporary power connection from ACF until Drill Site facility permanent power connection is made. (no plans for Drilling activities to use any diesel-powered electric generation).
CPAI	2.4.3	-	26	4	**[T18-027]** Suggest adding explanation about the relationship of road to pipeline (north or south). For Alternative A and C, the pipeline is located north of the road, so the road can act as a barrier to protect the lakes (give Lake numbers?) in the event of a pipeline spill. In Alternative B, through the wet thaw basin area, the pipeline was located south of the road for the same reason.
CPAI	2.4.4	-	27	4	First sentence edit, add red text and remove strikethrough: "At the point where the GMT1 road ~~crosses~~ connects to "
CPAI	2.4.5.2	-	28	1	Last sentence edit: The pipeline would cross Crea Creek on VSMs spanning the creek, downstream of the bridge

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	2.4.6	-	28	6	**[T18-028]** Do not know where the acreage and cubic yards of gravel from the Clover site came from. These do not appear to match what we assumed in our calculations.
CPAI	Table 2.4-1	-	29	-	**[T18-029]** The 25.4 acre footprint for the ASRC Mine site is too high. The correct footprint area for mining 626,000 cubic yards at the ASRC mine site should be 18.3 acres, if it was calculated using Phase 1 numbers (see below). However the Phase 2 area of the ASRC site done in 2005 had a smaller footprint area for the equivalent volume of gravel mined. Based on the 2005 pit, the footprint area for mining 626,000 cubic yards at the ASRC mine site would be 17.8 acres (see below). Based on these calculations, the current 25.4 acre footprint in this table is too high of an estimate. Backup information: Phase 1: Mined 1.03 million cubic yards of gravel from 30 acres = 34,300 cy / acre. Thus, mining 626,000cy at 34,300 cy / acre would disturb 18.3 acres. Phase 2: The 2005 gravel pit mined 558,000 cubic yards from 15.9 acres. An additional 2.7 acres was only partially mined. Mining 558,000cy from 15.9 acres = 35,100 cy / acre. Thus, mining 626,000 cubic yards at 35,100 cy / acre would disturb 17.8 acres. (Source of area and gravel volume mined in 2005 pit: CPAI as-built survey dated April 2, 2005, DWG# CE- APOO-119)
CPAI	2.4.6.2	ASRC Mine Site	29	3	**[T18-030]** The 1997 permit has expired; a new permit was issued in 2013 and should be referenced.
CPAI	2.4.6.2	-	29	5	**[T18-031]** "Access to the remaining 900,000 cubic yards within Phase 2 is practically unachievable. The 2005 existing cell contains more than 100 million gallons of water. To safely gain access to the gravel within 400 feet of an existing cell, any and all water must be removed prior to excavating the gravel." The requirement for a 400 foot wide buffer as stated in the SEIS is not consistent with the permitted buffers shown in the U.S. Army Corps of Engineers permit. Corps permit POA-1996-869-M5 was issued on September 16, 2013 for gravel mining in the Phase 2 area of the ASRC mine site. This permit shows that a 300 foot buffer will be maintained between gravel mining and the 2005 gravel pit lake, but only a 200 foot wide buffer is to be maintained between gravel mining and the gravel pit lake in the Phase 1 area. Also the Corps of Engineers permit does not require the de-watering of the adjacent gravel pit lakes prior to gravel mining.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	2.4.6.2	-	30	1	**[T18-032]** "Upon completing the excavation for the 2014 cell, supporting the CD5 Project and Nuiqsut Spur Road, it is estimated the 2014 cell will contain over 150 million gallons of water. Removing approximately 250 million gallons of water from the existing cells at the remotely located ASRC Mine Site is impractical and unachievable." The conclusions stated in the SEIS about pumping 250 million gallons from the Phase 2 area are not relevant to mining gravel from the immediately adjacent Phase 3 area of the ASRC mine site. Based on the exploration borings done in 1982-83, and using the volume of gravel actually mined between 1998 and 2007 in the Phase 1 and 2 areas, a preliminary estimate of the in-place gravel that may be in the 430 acres of the Phase 3 area is about 15 million cy.
CPAI	2.4.6.2	ASRC Mine Site	30	4	**[T18-033]** Is the statement, "Additionally, there is uncertainty as to whether the ASRC Mine Site has sufficient gravel to fulfill the needs of other public and private users (e.g. Nuiqsut Colville River boat ramp), the GMT1 project, and the reasonably foreseeable future development at GMT2."Please justify the conclusion with numbers.
CPAI	2.4.7.1	-	31	2nd bullet	one or more camps
CPAI	2.4.7.2	Water Use	31	1	**[T18-034]** "Potable water requirements are based on a demand of 100 gallons per day (gpd) per person (estimated up to 100 people at a remote camp), totaling 10,000 gpd " I believe staffing estimates were in the range of 315 during year 1 construction activities for the proposed development (Alternative A). If you are trying to state that each 100 man camp would require 10,000 gpd during the construction season this is accurate. But there will be several camps; so an estimate of 30,000 to 40,000 gpd is more accurate.
CPAI	2.4.7.1	-	31	2nd bullet	**[T18-035]** Consider mentioning that if there is more than one camp in Nuiqsut, one will be electrified.
CPAI	2.4.7.2	-	31	1	**[T18-036]** Insert as 3rd to last sentence: Ice pad footprints for Alt A will be 130 acres in Year 1 and 55 acres in Year 2 construction seasons. Equivalent to 32.5 MG and 13.7 MG respectively
CPAI	2.4.7.2	-	31	1	**[T18-037]** Add sentence for drilling water requirements: 2 MG per well, 8 wells per year equals 16MG per year for four years (includes rig camp personnel water usage)
CPAI	2.4.7.1	-	31	3	Change "recycled or trucked" to "recycled or transported" as no road to Deadhorse 9 months year. Same correction made throughout document
CPAI	Table 2.4-2	Water Use for the Project Alternatives	32	Ice Pads	**[T18-038]** The value in the column (2.2 mg for all alternative and each construction year) is incorrect. Alternatives A, B, and C require 32.5 mg for year 1 and 13.8 mg for year 2. Alternative D requires 22.5 mg for year 1 and 12.5 mg for year 2. As a result the Construction Total volumes are also incorrect.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 2.4-2	Water Use for the Project Alternatives	32	-	**[T18-039]** See revised water use table included in Appendix 7.
CPAI	Table 2.4-2	Water Use for the Project Alternatives	32	-	**[T18-040]** Table footnote addition for Alternative D: Additional camp support needs of 70 people during the drilling period.
CPAI	2.4.7.5	Access	33	1	**[T18-041]** Gravel mining, hauling and placement will occur over 1 winter season. The last sentence should read. "It is currently estimated that 12,000 vehicle round-trips between the selected material site and GMT1 construction locations would occur over a 2-3 month period during the 1-year construction phase. (Delete "each year of the estimated 2-")
CPAI	2.4.7.3	-	33	2	Strike first sentence about 400 X 400-foot ice pad. (Correct ice pad information appears in sentences following this first sentence).
CPAI	2.4.7.3	-	33	2	**[T18-042]** It should be mentioned here that Alternative D would require and Ice road for every year of drilling both at GMT1 and the future GMT2 development & drilling period.
CPAI	2.4.7.3	-	33	2	Last sentence: Alternative D should be added to this sentence, as it will have a 5-acre ice pad as well for each year of drilling.
CPAI	2.4.7.5	-	34	2	This paragraph should not be included in the "Alternative A" section, as it strictly relates to Alt D.
CPAI	Table 2.4-3	Flight Requirements for Project Alternatives	35	-	**[T18-043]** See revised flight requirements table included in Appendix 7.
CPAI	Table 2.4-3	Flight Requirements for Project Alternatives	38	Footnote 1	**[T18-044]** Gravel will only be mined and placed during year 1 of the construction activities.
CPAI	2.4.8	-	39	1	**[T18-045]** The text indicates that the drill rig and camp would burn ULSD until the power lines are installed. The rig will be on temporary power before it's put on highline power, and there is no plan for the rig to burn ULSD.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	2.4.8.1	-	39	1	**[T18-046]** The paragraph indicates that two to four vehicles trips per day during normal operations. The emissions calculations are based on a total of 50 per month which is on average only 1.7 per day.
CPAI	2.4.7.5	-	39	2	This paragraph should not be included in the "Alternative A" section, as it strictly relates to Alt D.
CPAI	2.4.8.1	-	39	3	This paragraph is not located in the correct place and contains incorrect information. See page 48, 1st 2 full paragraphs for correct information.
CPAI	2.4.8.2	-	40	-	**[T18-047]** drilling water requirements are 2MG/well x 8 wells/yr = 16MG/yr or 43,000 gpd (range should be 40,000 - 45,000 gpd not the 20,000 -38,000 gpd)
CPAI	2.4.8.6	-	42	6	Strike Class II from statement; there are only Class I wells at Alpine. Class II waste can be disposed in a Class I well.
CPAI	2.6	-	44	bullets	**[T18-048]** Add: Upgrading the road would require upgrading all culverts. In addition, a runway extension would add an additional bridge.
CPAI	2.7	-	45	1	Add as the 2nd-last sentence: Unlike Alternatives A, B, and C, movement of the drill rig to and from other drill sites would be limited to the 3-month ice road season
CPAI	2.6	-	45	3	**[T18-049]** This paragraph is contradictory. It states that there are interior water piping and sewage connections to all buildings in Nuiqsut, then later it states that they use honey buckets.
CPAI	2.7	On-Site Facilities	45	bullet list on the bottom of the page	This bullet list should include one incinerator and two emergency generators.
CPAI	2.7	Alt D	45	general comment	**[T18-050]** There needs to be an additional paragraph to include waste disposal. If an incinerator cannot be permitted (which could be the case based on what we know now), then additional emissions would occur as a result of increased air traffic to haul waste. The text should recognize the potential for wildlife interactions to increase.
CPAI	2.7	On-site Facilities	46	-	In the list of on-site facilities required for Alternative D, "mud plant and bulk cement facilities" and "waste water treatment plant" are listed twice.
CPAI	2.7	Access section	47-48	-	**[T18-051]** Note historic restrictions in air traffic due to weather within this section. Weather impacts air access 13-22% of the year.
CPAI	2.7	Emergency Response	48, 49	-	Move Emergency Response section to page 48, immediately following Access section. These issues are closely related and the logic flows better.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	2.7	access	48	3	"Drilling related activities in the first four months of 2018….." Delete red text, drilling flights would continue through all 2018 & beyond unt il 33 wells complete.
CPAI	Table 2.7-1	-	49	-	This table is inaccurate and is not consistent with the values described on Page 358 or the Alternative D ambient air quality impact analysis prepared by ConocoPhillips. To be accurate, the Table should reflect the following: Alternative A = 1 to 2 MWe depending on season. Alternative D incremental = 2.5 MWe in addition to that listed for Alternative A. Alternative D total = 3.5 to 4.5 MWe depending on season.
CPAI	2.7	Emergency Response	49	1	**[T18-052]** This is one of the very few spots, if not the only place, where lifesaving emergency response is talked about. Lifesaving capabilities discussions are inconsistent throughout document. Concerns with spills are repeated many times, but not lifesaving capability. The following are specific areas of the document where this should be addressed: 2.7, p. 49, para 1 4.2.2.4, p. 197, para 4 4.3.1.3, p. 248, para 4 4.3.2.1, p. 255, para 4 and 6 4.3.2.2, p. 257, para 4 4.4.3, p. 305, para 2 4.5.3.1, p. 330, para 5 4.5.5, p. 332, para 4
CPAI	3.1.1	-	51	4	**[T18-053]** Scope of project study area as 2.5 miles in radius from the proposed project is not justified. It would be helpful context to explain that the project study area is over 1000 times the area of the project footprint and provide justification.
CPAI	3.1.1	-	51	4	**[T18-054]** The current project study area fails to differentiate between alternatives and existing infrastructure. Address the project study areas individually for each alternative A-D. Also, the project study area should not include areas where infrastructure already exists and is not part of this project. In particular, laying the water line on existing VSMs between CD1 and CD4 differs substantially from laying new pipeline on new VSMs in an undeveloped area. See Appendix 8 for the revised Alternative A project study area figure.
CPAI	3.1.3.2	-	52	7	Would like to see more information in the section to better display CRU's spill performance through time and the degree of care that goes in to field operations to minimize and mitigate spills

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.I.3.2	-	-	-	**[T18-055]** Alternative D could better be described as "Aircraft and Ice Road only Access" rather than "Limited Access".
CPAI	3.1.3.2	-	52	1	**[T18-056]** Text states, "Daily oil production in 2011 from ACF averaged 80.1 MBD." Please revise with the current information: Daily oil production in 2013 from ACF averaged 62.1 MBD.
CPAI	3.1.3.2	-	53	5	**[T18-057]** There appears to be extraneous text in the last 2 paragraphs, "The most prevalent geomorphic ……."
CPAI	3.2.2.I	Rivers, Streams, and Drainage Basins	58	5	**[T18-058]** For the reasons identified for the previous comment on page 51, the statement that greater than 1/2 of the project area is in the CRD doesn't fairly represent the proposed project. See Appendix 8 for the Alternative A project study area.
CPAI	3.2.3.1	-	66	1 and associated bullet list	**[T18-059]** 1) Maximum and minimum temperatures listed in the bullet list are not presented using the same statistics as data in Table 3.2-5 which makes it look like the data collected by ConocoPhillips Alaska Inc. represents a much colder climate. If the statistics presented are going to be different, it should be explained why they are different; otherwise, the same statistics ought to be used to make and apples to apples comparison. 2) It is not apparent why information from the ConocoPhillips Alaska Inc. operated station is presented in the bullet list and not in Table 3.2-5 and vice versa. Together, items one and two could lead to confusion.
CPAI	3.2.3.1	-	68	1	**[T18-060]** The text appears to be referencing data collected at the private Nuiqsut station operated by ConocoPhillips Alaska, Inc. However, Table 3.2-5 seems to be referencing the Nuiqsut ASOS station. To be clear, the text should indicate that the wind data being analyzed comes from a different Nuiqsut station than the temperature data discussed in Table 3.2-5.
CPAI	3.2.3.2	-	68	2	**[T18-061]** This paragraph says "The NPR-A is in attainment of current National Ambient Air Quality Standards (NAAQS) and the Alaska Ambient Air Quality Standards (AAAQS)". This statement is not technically correct since the area is actually designated "unclassified" rather than in attainment. The assertion of attainment is an assumption.
CPAI	Figure 3.2-4	Nuiqsut Wind Rose (2008 – 2012)	68	-	**[T18-062]** Since data from two different stations (CPAI and ASOS) are being referenced in this section, the Figure title should be revised to specify which station it represents.
CPAI	3.2.3.2	-	69	1	**[T18-063]** This paragraph ought to mention that the primary Nuiqsut power source is natural gas fired, and not liquid fuel fired.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 3.2-6	-	70	-	**[T18-064]** The origin or derivation of these values should be described in the text. This information was provided with the tables in the air quality analysis from AECOM.
CPAI	3.2.4.3	Potential Climate Change Effects in the Project Study Area	75	4	**[T18-065]** Support for emergency response scenario (e.g., pipeline spill) under Alt D: "Any traffic over the surface during non-frozen periods would be expected to create more damage than under the present conditions."
CPAI	3.3.1	Vegetation and Wetlands	79	4th bullet	**[T18-066]** "No federally listed threatened or endangered plants are known to occur in the project study area, the Northeast NPR-A, or elsewhere on the ACP. There are nine species of plants known to occur within the NPR-A that meet the criteria for BLM sensitive species; one of these, Alaskan bluegrass (Poa hartzii ssp. Alaskana) was found within the project study area, but more than 2 miles from any proposed project alternative facilities." Suggest stating that no federal-listed threatened or endangered plant species occur in the project area but a number of BLM Sensitive plant species do. Then refer to full rare plant section below.
CPAI	3.3.2.2	Fish Species	86	2	**[T18-067]** No scientific names for species listed. I noticed that birds and other species were given Latin equivalents.
CPAI	Table 3.3-2	Fish Species Found in the Lower Fish Creek Watershed and Vicinity	86	Inupiaq Name	**[T18-068]** Inupiaq name for Chinook not given. Inupiaq name = Iqalugruaq and Northern pike (Esox lucius) not listed and Inupiaq name = siulik
CPAI	3.3.2.2	Fish Species	87	2	**[T18-069]** General comment: Given the number of studies and study years on the Crea, Ublutuoch and Fish Creek areas, there is relatively brief mention of other species beyond grayling. There is new information since 2004 that has not been mentioned.
CPAI	3.3.3	-	87	1	**[T18-070]** 3rd Sentence: "Data to support avian occurrence is not available.....". This is not true and must be rectified in this draft as they are the 'best available' data. They are available in CPAI reports (Johnson et al. 2003, 2005, Burgess et al. 2000, 2002a, b, 2003 a, b and Seiser and Johnson 2011) for the NPRA and the Alpine areas, including species found on breeding bird plots and ground-based nest searches. All of the data pertain to the ASDP area and many of the data were collected in the project area and are comprehensive for breeding birds.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 3.3-3	-	88-90	-	**[T18-071]** Disagree with some occurrence categories: yellow-billed loons, spectacled eiders, and snow geese should be upgraded to CB or common breeders; all outnumber some of the other common breeders (e.g., snowy and short-eared owls) and they occur regularly in appropriate habitats fitting the definition of occurrence in Johnson and Herter 1989. The cited table from the 2004 EIS is out of date and was probably in error at that time.
CPAI	Table 3.3-3	-	88-90	-	**[T18-072]** Update coding for SS status species; see: http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/ims.Par.52256.File.dat/im_ak_2010_018a1.pdf. Golden Eagle and Short-eared Owl are SS species. Winter (W) code not included on the table. Foot note C, NOAA 2013 probably does not pertain to birds.
CPAI	Table 3.3-3	-	88-90	-	**[T18-073]** Confirm that BLM dropped RTLO as a sensitive species; it is listed with SS in this table.
CPAI	Table 3.3-4	-	90	-	**[T18-074]** Table does not match figure. CD North Subarea is part of the project study area and includes the northern portion of CD1/APC. The Fish Creek Delta Subarea also is a small portion of the project study area.
CPAI	3.3.3	-	91	1	**[T18-075]** Status of species is listed in table but is not discussed in text except for TES species. Refer reader to BLM 2012 species accounts for conservation concerns about species with BCC or SS status.
CPAI	Tables 3.3-5; 3.3-6; 3.3-7; 3.3-8; 3.3-9; 3.3-10; 3.3-11; 3.3-15; 3.3-16	-	92, 95, 97, 98, 100, 113, 115	-	**[T18-076]** Error in tables: Total sum of density contours within project area larger than total project area of 102,487 acres.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.3.3.1	-	92	4	**[T18-077]** Text: "Over the study period, obvious nest occurrence trends were not discernible for either glaucous gulls or Sabine's gulls (Johnson et al. 2013)" is incorrect. Johnson et al 2013 reports a significantly positive growth in number of Glaucous Gull nests over 11 year period in CDSA. ABR documented an increase in number of GLGU nest on 50 lakes on the Colville Delta, at annual growth rate of 1.055 (Johnson et al 2013), which is a positive trend, similar to the trends documented on the ACP survey. Only in NPRA was data inadequate to calculate a growth rate because the survey area was not consistent over time. No attempt has been made to calculate a growth rate for Sabine's Gull because SAGU nest in a wider range of habitat than covered in the YBLO survey and single nests of these smaller gulls are difficult
CPAI	3.3.3-1	-	93	2	**[T18-078]** The term "impact zone" is confusing and needs clear definition. It appears to be used in several different ways: one appears to be specified as in 300 foot indirect impact zone, then there is an impact zone in streams and an impact zone of proposed infrastructure. The latter appears to be synonymous with the Project Study Area (2.5 mile boundary) which is labeled thus on all figures. It is confusing to have the same area referred to with two different names, and one of those names is not on the figures. As both terms are used throughout, I suggest using only one and having the boundary clearly labeled with the same terminology on the figures. This term is also used in tables and table footnotes. It is referenced to Section 4, but I have not been able to find a definition of impact zone there. If the impact zone varies by resource, it is a confusing concept and will have to be specified at each occurrence in text and tables.
CPAI	3.3.3.2	-	93	1	**[T18-079]** Review last sentence. There is not a lack of localized data for species other than LALO, in fact densities for other species are listed from local breeding bird plots done by ABR. The reason LALO are emphasized is they are the most abundant species and all others are relatively infrequent.
CPAI	3.3.3.2	-	94	3	**[T18-080]** Please explain why it is stated that data for population status of the common raven on the ACP is not available. Stehn 2013 lists Common Raven growth rates on the ACP and Larned (2012) comments on survey issues with Ravens.
CPAI	3.3.3.4	Snow Goose	97	2	**[T18-081]** 1st sentence; correction: Snow geese nest in small numbers around CD3, but that is not true for the whole Colville Delta. Suggest changing that to "small numbers nest in the Project Study Area", which is accurate. Their numbers have grown rapidly on the Delta in the last 10 years and they do nest in large numbers on the outer delta, so to say otherwise is inaccurate.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.3.3.4	Snow Goose	97	3	**[T18-082]** See the 2012 report (Johnson et al 2013) for more recent Snow Goose numbers in brood rearing period. No point in citing 2004 data for aerial surveys when more recent data exist. Also see Larned et al. 2011 for density polygons--highest densities are on the outer Colville Delta.
CPAI	3.3.3.4	Snow Geese	98	1	**[T18-083]** There is no data on snow goose nesting habitat in the report cited.
CPAI	3.3.3.4	King Eider	98	6	**[T18-084]** When comparing long-term average density of KIEI in NPRA to CDSA, NPRA is only 4.8 times greater than density in CDSA. Only in the year 2012 was the NPRA density 13 times greater than CDSA.
CPAI	3.3.3.4	Greater White-fronted Geese	100	4	**[T18-085]** Data was also collected in 2009. The highest GWFG nest density (17.9 nest/km2) was record in 2009 in an area east of the CD5 pad site and the lowest GWFG nest density (1.4 nests/km2) was found in the Lookout search area just north of the current proposed GMT1 pad.
CPAI	3.3.3.4	Greater White-fronted Geese	100	4	**[T18-086]** Goose nesting and brooding habitat data missing, see Johnson et al. 2005 for details. Unlike the other geese species, the majority of nests were not in aquatic habitats During the 4 years of nest searches, nests of GWFG have been located in as many as 14 different habitat types. The 4 habitats most commonly used by White-fronted Geese were Patterned Wet Meadow (30% of nests in 2004) and Old Basin Wetland Complex (27%), both of which were significantly preferred (Johnson et al. 2005). Two habitats were preferred for nesting in 2004: Patterned Wet Meadow and Old Basin Wetland Complex. During the brood-rearing aerial survey, Greater White-fronted Geese were located in or near lakes, rivers, streams, and marshes.
CPAI	3.3.3.4	Greater White fronted snow Goose and Canada Goose	100		**[T18-087]** This section doesn't identify preferred nesting habitat as it has been identified in earlier sections, it also doesn't specify how many are in the project area. This information should be included.
CPAI	3.3.3.5	-	101	4	**[T18-088]** Johnson et al. 2005 (NPRA report) is not a source of shorebird habitat information. This report measured habitat use by large water birds not shorebirds in NPRA.
CPAI	3.3.3.5	-	101	2	**[T18-089]** Correct the period of observations; shorebirds were only consistently documented on aerial surveys from 1992-2012.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.3.3.5	-	101	3	**[T18-090]** Discuss the shorebirds species that are listed with special status. Suggested text: Four shorebird species nesting in the project study are listed by USFWS as Birds of Conservation Concern: Whimbrel, Bar-tailed Godwit, Dunlin, and Buff-breasted Sandpiper. The large shorebirds such as Whimbrels and Bar-tailed Godwits nests have been recorded during ABR large waterfowl nest searches as well as in breeding bird plots. A Whimbrel nest was recorded only in 2001 near CD-4 (0.2 nests/km2; Burgess et al. 2000). Bar-tailed Godwits were recorded in low densities in both NPRA and CDSA breeding bird plots and during large water-bird nest searches in the project study area (Burgess 2002 CDS, Johnson et al. 2004 NPRA). Dunlins have been recorded nesting in NPRA and were recorded during Alpine breed-bird plots on an annual basis in densities ranging from 1.3 to 3.5 nests /km2. Buff- breasted Sandpiper nesting in NPRA is a rarer event, occurring only in 1 year of the 4 years of study but they were relatively numerous that single year, 6 nests were discovered in 2002 in NPRA (2.5 nests/km2; Burgess et al 2003).
CPAI	Table 3.3-12	-	103	-	**[T18-091]** Should add gray wolf as uncommon.
CPAI	3.3.4.1	Caribou habitat Use	105	1	**[T18-092]** Last sentence should be reworded to say 'during insect relief seasons in late June to early August...' or preferably discuss different timing and movement patterns during mosquito harassment and oestrid fly harassment.
CPAI	3.3.4.1	Caribou densities and distribution	106	1	**[T18-093]** First sentence should reference all years (2001-2012) shown in figure 3.3-9.
CPAI	3.3.4.1	Caribou densities and distribution	106	2	Make clear that many of the caribou observed in the NPRA survey area during the calving season are nonparturient animals.
CPAI	3.3.4.1	Caribou densities and distribution	106	3	**[T18-094]** Unclear what is meant by "...due to their winter presence being a result of migration routes". Migration routes are determined by winter distribution, not the other way around.
CPAI	3.3.4.1	Caribou densities and distribution	106	3	Should mention that large portions of the TH winter on the Seward Peninsula or Brooks Range in some years. In one year a large portion wintered in ANWR.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.3.4	Caribou- Densities and Distribution	107	2	**[T18-095]** "Since 2005, the only large groups of mosquito-harassed..." This is not a good indication of use, because few aerial surveys were conducted during this season. This should be removed or have the appropriate caveats. Large groups likely did occur but were difficult to survey due to unpredictable movements and timing.
CPAI	3.3.4	Caribou- Densities and Distribution	108	2	**[T18-096]** "In documenting the 2011 survey." These results pertain to all years of the study not just to 2011.
CPAI	3.3.4	Moose	108	2	Moose are very rare in open tundra of ACP and are generally close to riparian corridors with tall shrubs during all seasons not just winter.
CPAI	3.3.4	Wolf	109	2	**[T18-097]** "Population estimate was 240 to 390..." Indicate the area for the population estimate.
CPAI	3.3.4.1	Grizzly Bear	109	3	**[T18-098]** This paragraph implies that the project area and adjacent lands in the NPRA are more suitable habitat for grizzly bears and cites two figures in the 2004 BLM EIS document as supporting documentation. These statements are misleading as the figures show that the majority of grizzly bear observations and dens are actually located east of NPRA.
CPAI	3.3.5.1	-	113	3	**[T18-099]** Need to clarify that NASA densities of < 20% of CDSA is for 2012 only, not the long-term average, which is stated above at 38%.
CPAI	3.3.5.1	-	113	3	**[T18-100]** Need to clarify that SPEI occurred only in Fish Creek Delta in 2012; in other years they have been recorded in the other subareas, but always in low numbers.
CPAI	3.3.5.3	-	115	3	**[T18-101]** Last half of paragraph discussing distribution is problematic as is table 3.3-16. The author notes a difference in distribution between survey periods. Something appears to be wrong with the density polygons in the project area and Colville Delta from 2007-2010. The portrayed distribution does not match the distribution from 1992-2005 (see the BA or Larned et al. 2006). The Map figure cited from BLM 2012 (Fig 3.3.8-4) is from 2007-2010 and shows high densities where there are virtually no YBLO nests, and low densities where there are concentrations. The Colville Delta should be in a high density area, the Fish and Judy Creek area (not the Fish Creek delta) should also be high density. The distribution of YBLO nests has not changed from 2001 to 2013 in any way that could be registered in this type of portrayal. Possibly, this portrayal of densities is an artifact of the raw data or the GIS program used to automatically generate the polygons. Based on ABR data, Table 3.3-16 is incorrect.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.3.5.3	-	115	4	**[T18-102]** ABR has calculated population trends in the Colville Delta study area from 2000-2012 and those data are presented in Johnson et al. 2013 and they are very similar to the rate estimated by Stehn et al. 2013 for all the ACP. You should use those data and not territory occupancy to discuss population trends.
CPAI	3.3.5.3	-	115	4	**[T18-103]** Nest occupancy is not an index of population growth. Our data show that adults usually arrive on breeding lakes but that a variable proportion of those adults attempt to breed in a given year. The numbers cited are for nest occupancy, which is defined as the number of nests/total number of breeding lakes (territories) surveyed. So, it is a reflection of breeding effort, which does show yearly variation. As written, this paragraph does not present population growth rate data, so I would recommend removing reference to growth rates and instead referring to breeding effort.
CPAI	3.3.5.3	-	115	3	**[T18-104]** Last half of paragraph discussing distribution is problematic as is table 3.3-16. The author notes a difference in distribution between survey periods. Something is drastically wrong with the density polygons in the project area and Colville Delta from 2007-2010. The portrayed distribution does not match the distribution from 1992-2005 (see the BA or Larned et al. 2006). The Map figure cited from BLM 2012 (Fig 3.3.8-4) is from 2007-2010 and shows high densities where there are virtually no YBLO nests, and low densities where there are concentrations. The Colville Delta should be in a high density area, the Fish and Judy Creek area (not the Fish Creek delta) should also be high density. The distribution of YBLO nests has not changed from 2001 to 2013 in any way that could be registered in this type of portrayal. While I think the USFWS density polygons are good distribution maps at the regional scale for most species, in this one area and set of years, something is wrong. The map of the distribution in 1992-2005 is fairly correct (see Larned et al. 2006). We know this because we have extensive experience surveying for loons in these areas and it is apparent from figures of nest and brood distributions (adults have a similar distribution). I suspect this erroneous portrayal of densities is an artifact of the raw data or the GIS program used to automatically generate the polygons. It is correct to note this is a "pre-nesting" distribution, which for YBLOs do not necessarily correspond with the nesting distribution. However, I still can think of no biological reason behind the distribution of high densities south of Nuiqsut and in the project study area and low densities on the Colville Delta (see ABR reports and the draft BA). Loons collect in the earliest open water at the time of these surveys. This usually occurs on the Colville Delta and along Fish and Judy creeks, where there are dust shadows from river banks and dunes and flooding from streams into tapped lakes. Based on ABR data, Table 3.3-16 is incorrect.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.3.5.5	-	118	1	**[T18-105]** A new population estimate is available for Bowheads. Please update your numbers (16,892 in 2011, Givens et al. 2013)
CPAI	3.3.5.6	-	118	2	**[T18-106]** Most bearded seals in the Bering Sea DPS overwinter in the Bering Sea (not the Beaufort Sea, as stated). Please revise.
CPAI	3.4.1.5	Community Health and Welfare	125	Bullet List	**[T18-107]** In the bullet highlights under community health status evaluation for Nuiqsut.bullet one: "More than three-quarters (79 percent) of Nuiqsut heads of household reported their health to be at least good, with 21 percent reporting fair to poor health, generally consistent with other North Slope villages. The percentage of Nuiqsut adults reporting to have very good to excellent health (39 percent) was lower than adults statewide (56 percent), but similar to Alaska Natives statewide (42 percent)" (see NSB 2012 pg 296) The second bullet, last sentence should read, "The percentage of Nuiqsut children with reported very good to excellent health (55 percent) was less than the North Slope average of 63 percent (NSB 2012 p. 297) and considerably lower than the statewide estimate of 89 percent (BLM 2012 Table 3-45, page 492). It should be noted that Atqasuk (38%), Anaktuvuk Pass (41%) and Wainwright (54%) children reporting in good health were all lower than Nuiqsut (NSB 2012).
CPAI	3.4.1.5	Community Health and Welfare	125	Bullet List	**[T18-108]** New information from NSB 2012 which should also be added. · Rates of chronic ear infections and breathing problems among Nuiqsut children were not significantly different from other NSB communities combined. (NSB 2012 page 297) · Tobacco smoking among teens (as reported by the household) was notably and significantly more common in Nuiqsut (43%) than the rest of the North Slope communities overall (16%). NSB 2012 page 297 · Reported adult tobacco smoking was high, significantly higher than in the rest of the North Slope communities combined and almost three times the statewide adult smoking rate. (NSB page 297)
CPAI	3.4.1.5	Community Health and Welfare	126	2	**[T18-109]** Provide justification for the statement "The first two bullets above are those health factors most likely to be negatively affected by local development."
CPAI	3.4.1.6	-	131	1	**[T18-110]** Please add the reasoning behind why the NSB report is more reliable than the US Census.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	3.4.1.6	Population and Employment	131	-	**[T18-111]** Unemployment rate for NSB is 4.7% vs. statewide average of 6.5% -- ADOL Alaska Economic Trends January 2014 Employment Forecast for 2014. The number of unemployed in Nuiqsut, if calculated using data in the DSEIS, results in a labor force of 232 and 68 unemployed. This season at CD5, CPAI employed ~32 people in addition to those already working at Alpine.
CPAI	3.4.1.6	Population and Employment	131	3	**[T18-112]** The median household income for Nuiqsut from the US Census Bureau's 2008-2012 American Community Survey 5 year estimate is $93,833 vs. DSEIS figure $70,000. This compares to the NSB median household income of $76,679 (http://commerce.alaska.gov/cra/DCRAExternal/community/Details/c8bdb2ef-7075-4eab-9adc-743057baad86).
CPAI	3.4.2	Economy	131	5	**[T18-113]** Economy Section should include mention of royalties to ASRC and Kuukpik from mineral development at Alpine and CD5. The ANCSA 7i/7j sharing provisions mean that the royalties have statewide economic benefits directly to Alaska Native corporations throughout the state.
CPAI	3.4.2.1	State Economy	132	5	**[T18-114]** The State of Alaska's 50% share of revenues from NPRA oil and gas activities for FY 12 was $4.8 ~~billion~~ million. (Pg 3 of 2013 Spring Revenue Sources book).
CPAI	3.4.2.2	Local Economy: Community of Nuiqsut	134	-	**[T18-115]** There should be mention of here that Nuiqsut receives natural gas from the Alpine Field and as a result has the cheapest heat and electricity in the State (~$20-30 per month for the entire year). There is no mention of this economic, health and socio benefit which is so differential to other rural Alaska communities.
CPAI	3.4.2.2	Local Economy: Community of Nuiqsut	135	4	**[T18-116]** This section on NPRA Impact Mitigation Program should mention that since leasing was restarted in 1998, over $150 million has been awarded to NPRA communities for project and funding municipal services, with approximately $26 million going to programs and projects in Nuiqsut. Please see the National Petroleum Reserve-Alaska (NPR-A) Impact Mitigation Grant Program Report to the Second Session of the Twenty-Eighth Alaska Legislature, included in Appendix 9 - Literature Cited of this binder.
CPAI	Table 3.4-5	Data Sources, Subsistence, and Traditional Land Uses	138	-	**[T18-117]** The table should also include annual reports on the fall arctic cisco fishery from 1985 to present (MJM, LGL and ABR).

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 3.4-6	Nuiqsut Annual Cycle of Subsistence Activities	140	-	**[T18-118]** Perhaps change the resource "freshwater fish" to "fish" as in Table 3.4-7 (Arctic cisco being anadromous and rainbow smelt being increasingly consumed)
CPAI	3.4.3.4	Resource Availability	149	3	**[T18-119]** Sentence: "The Colville River is a particularly productive spawning and overwintering area for both broad whitefish and Arctic cisco". Arctic cisco are not known to spawn in the Colville River (Mackenzie River system). Should change to reflect that it is a "particularly important overwintering area for both broad whitefish and Arctic cisco. It also provides important spawning habitat for broad whitefish".
CPAI	Table 4.1-1	Major Project Components of the Action Alternatives	170	-	**[T18-120]** Please check tables 4.1-1, 4.2-2, 4.3-2, 4.3-9, and 4.3-3 for consistency of total gravel acreage with revised table provided in Appendix 7.
CPAI	Table 4.1-2	-	170	-	**[T18-121]** Footnote 1 referenced in the header of the first column is not listed. Therefore, the reader does not know what it refers to.
CPAI	4.2.1.2	-	178	3	**[T18-122]** This paragraph discusses the impacts of a dust shadow. However, it seems to ignore the fugitive dust mitigation measures that are discussed later in this document. This section should re-evaluate the size and severity of the dust shadow in light of fugitive dust controls.
CPAI	4.2.1.3	-	179	23	**[T18-123]** Add sentence to the end of the paragraph: Alternative B will cause more disturbance impact (extra traffic, more dust and fuel emissions from vehicle traffic, access to tundra by equipment and personnel) during the operating period for maintenance of gravel road and culverts, since the gravel road route through the ice-rich thaw basin is likely to experience more deterioration.
CPAI	4.2.1.3	-	179	3	**[T18-124]** Last sentence: 18.8 Acre alluvial terrace is referred to as Alternative D. Per Table 4.2-4, that is actually Alt. C. This sentence should be updated to reflect the actual numbers.
CPAI	4.2.1.3	-	180	1	**[T18-125]** The effects of Clover mine site are evaluated but not the ASRC mine site; earlier the text said both would be evaluated under each alternative; mentioned later under alternative gravel source, but this does not evaluate ASRC in context of soils, geomorphology, vegetation, wetlands, or water use as was done for Clover.
CPAI	4.2.2.1	-	186/187	8/1	**[T18-126]** Since the snow isn't even 4 feet deep, making the assumption there is 4 feet of water from snow melt runoff is unreasonably conservative.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.2.2.3	-	191	4	Permit application drawings are showing cross-drainage culverts approximately every 1000 feet (not 500).
CPAI	4.2.2.3	-	191	4	Last sentence cites a reference that culverts may be up to 60 inches in diameter. The GMT1 design does not plan to have culverts over 48 inches.
CPAI	4.2.2.3	Crea Creek	193	3	This paragraph applies to more than Crea Creek and should be moved to page 191, 4.2.2.3 Bridges and Culverts.
CPAI	4.2.2.4	-	194	4	Alternative B would cross the Tinmiaqsiugvik (Ublutouch) River, but not Crea Creek.
CPAI	Table 4.2-7	Summary of Major Components Potentially Impacting Hydrology	194	-	**[T18-127]** Alt C: Total length of new road: should be longer than Alt A due to the small road that will be put into Nuiqsut.
CPAI	4.2.2.4	-	196	I	**[T18-128]** "The total potential inundation area for the new road construction under Alt. C is considered approximately equivalent to Alt. A" If the airport and road extension were taken into account for Alt. C, the potential inundation area would be considerably greater than Alt. A.
CPAI	4.2.2.4	-	197	2	**[T18-129]** "..., there would be a comparable about of gravel discharged..." This statement is misleading because it suggests gravel discharged equivalency between Alternatives A and D.
CPAI	4.2.2.4	-	197	4	**[T18-130]** This is a good place to add a sentence about the relative limitations of spill response reliability and life safety response reliability compared to Alternative A.
CPAI	4.2.2.4	-	197	4	**[T18-131]** Paragraph currently reads "In comparison with the other action alternatives during the operation period, Alternative D could result in higher spill risk due to increased activity with aircraft operations and year-round living accommodations." I think the paragraph should also include potential response delay due to weather. Consider the following, "In comparison with the other action alternatives during the operation period, Alternative D could result in higher spill risk due to increased activity with aircraft operations, year-round living accommodations, and potential delayed spill response when air access is restricted during periods of adverse weather. Air travel has been restricted at APF 13 to 22 percent each year over the last four years."

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.2.3.2	-	201	2	**[T18-132]** Far field modeling was conducted to determine ambient air quality impacts (air concentrations) as well as visibility and deposition impacts.
CPAI	4.2.3.2	-	202	3	**[T18-133]** The paragraph says: ".....lead (Pb), hazardous air pollutants, and greenhouse gases such as carbon dioxide, methane, and nitrous oxide. Emissions of other regulated pollutants would be negligible." Lead emissions are considered negligible and should be included in the statement "other regulated pollutants would be negligible".
CPAI	4.2.3.2	-	202	3	**[T18-134]** The paragraph indicates: "Fugitive dust generated by driving on unpaved roads, particularly during summer months is assumed to be primarily PM10. Combustion particulate matter emissions are assumed to be primarily PM2.5." This statement is inaccurate, please strike. It generates confusion with respect to the modeling that was done. The modeling and emissions inventory are not consistent with this statement.
CPAI	4.2.3.2	-	202	5	**[T18-135]** Operational emissions include tailpipe emissions from vehicle travel, not just fugitive dust from vehicle travel. Also, Aircraft and Ice Road Alternative (Alternative D) includes aircraft emissions for the operational scenario.
CPAI	4.2.3.2	-	203	1	**[T18-136]** The paragraphs states: "Electric power from existing, off-site generation will be provided to the site after construction which will limit total project site emissions." It should say: Electric power from existing, off-site generation will be provided to the site during and after construction which will limit total project site emissions.
CPAI	4.2.3.2	-	203	3	**[T18-137]** The paragraphs states: "Air pollutant emissions from the project will be subject to federal and state air quality regulations under the CAA and the Air Quality MOU." The Air Quality MOU does not set air quality regulations applicable to project air emissions; therefore, the phrase "and the Air Quality MOU" should be removed from this sentence.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.2-9	Maximum Potential 12- Month Construction Emissions for Alternative A	204	-	**[T18-138]** Highest HAPs during construction is Year 3, Month 5, not Month 6. However, the tons per year number is correct. Highest GHG emissions during construction is Year 3, Month 3, not Month 7. However, the tons per year number is correct.
CPAI	4.2.3.2	Near-Field Analysis	205	5	**[T18-139]** The paragraph says: "Ozone was not modeled because the total VOC emissions of less than 50 tpy indicate that ozone formation will be minimized." Like secondary particulate, ozone was not modeled because the model does not have the capability to model ozone. Similarly, the analysis relied on a qualitative assessment. In addition, in Arctic environments the ambient concentrations of ozone are not sensitive to local VOC emissions.
CPAI	4.2.3.2	Near-Field Analysis	207	1	**[T18-140]** The highest 24-hour PM2.5 impacts are predicted from the road and pad construction scenario, not infill drilling. Also, please replace "high" with "highest".
CPAI	4.2.3.2	Near-Field Analysis	207	1	**[T18-141]** "Predicted annual emissions for PM2.5 and PM10 demonstrate compliance..." Incorrect use of word "emissions". It is predicted impacts that demonstrate compliance with the standards.
CPAI	4.2.3.2	Near-Field Analysis	207	2, see also par 1 on pg 210	**[T18-142]** BLM appears to be prescribing twice per day watering and this could easily result in overwatering. Overwatering is not recommended either because of the mud spray which can cause a bigger fugitive dust problem. Therefore, watering should be suspended when standing water is observed on the roads. Note: This would require the use of additional fresh water. We request that the last sentence of this paragraph be deleted, and allow the fugitive dust control plan to address this.
CPAI	4.2.3.2	Near-Field Analysis	207	2	**[T18-143]** The paragraph says that CPAI would be required to apply dust suppression measures to fugitive dust sources using a performance-based approach. An analysis submitted to the BLM on January 13, 2014 demonstrated that a simple watering plan (i.e., once per day watering) is all that is needed to obtain a high level of fugitive dust control. Since controls are easily achieved, and the result of the control does not need to be monitored, a performance based approach would not be necessary to achieve assumed controls.
CPAI	4.2.3.2	Near-Field Analysis	207	3	**[T18-144]** "High ambient NO2 impacts in excess of the NAAQS/AAQS were predicted during the..." Table 4.2-11 does not indicate any modeled concentrations above the NAAQS/AAQS for any pollutant.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.2.3.2	Near-Field Analysis	207	3	**[T18-145]** Paragraph is inaccurate and something that was likely left over from an earlier draft: High ambient NO2 impacts in excess of the NAAQS/AAAQS were predicted during the access road and pad construction due to emissions from construction equipment. The NO2 impacts are not high or in excess of the NAAQS/AAAQS, they are in compliance. This paragraph should be removed for two reasons: 1) It needs to be specific to averaging period, and 2) It is not true according to Table 4.2-11 and the Alternative A ambient air quality impact analysis.
CPAI	4.2.3.2	Air Toxics Impact Analysis	208	2	**[T18-146]** "Table 4.2-16 shows that the total cancer risk for both the MLE and MEI scenarios are less than 1.0E-06 near the pad and in the community of Nuiqsut which represents a less than one- in-one million cancer risk." Table 4.2-16 evaluates the cancer risk for the community of Nuiqsut, not near the pad.
CPAI	Table 4.2-16	Air Toxics Long-term Cancer Risk Analysis for Nuiqsut Community Receptor	209	-	**[T18-147]** Total Inhalation Cancer Risk should be 2.17E-09 for both MLE and MEI exposure scenarios. Pollutant column for MEI exposure scenario listed numbers when it should list Benzene, Ethyl benzene, and Formaldehyde similar to the MLE exposure scenario.
CPAI	4.2.3.2	Near-Field Analysis Conclusions for Alternative A	210	1	**[T18-148]** "The impacts were predicted using dispersion modeling of ambient air quality impacts ..." Inaccurate wording. Text should read: "The impacts were predicted using dispersion modeling of emissions ..."
CPAI	4.2.3.2	Near-Field Analysis Conclusions for Alternative A	210	1	**[T18-149]** In the 2nd sentence, BLM is using an air quality term of art, "significant", which is misleading or confusing. It would be better to delete this entire sentence because doing so preserves the message of the paragraph while minimizing confusion. Further, BLM should use the terminology defined on page 172 (i.e., minor or moderate) from the environmental consequences section rather than the undefined terms like "significant".
CPAI	4.2.3.2	Far-Field Analysis	210	2	**[T18-150]** "The purpose of the far-field analysis is to quantify potential far-field air quality impacts to both ambient air concentrations and AQRVs from air pollutant emissions of NOX , SO2 , PM10, and PM2.5". Incorrect wording. Text should read: "The purpose of the far-field analysis is to quantify potential far-field ambient air concentrations and AQRVs resulting from air pollutant emissions of NOX , SO2 , PM10 , and PM2.5".

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.2.3.2	Far-Field Analysis	210	5	**[T18-151]** "Impacts were analyzed for the community of Nuiqsut and the Sensitive Class II areas located within 185 miles (300 kilometers) of the GMT 1 Project shown in Table 4.2-17." Impacts in the community of Nuiqsut were addressed only in the cumulative analysis, addressed in Section 4.6.4.1. The current section discusses project-only impacts in the far-field. Impacts at Nuiqsut were not assessed for the project alone and there is no impact table for that analysis, thus, mention of a Nuiqsut community analysis should be removed from this section.
CPAI	Table 4.2-17	Class II Areas of Concern	210	-	**[T18-152]** To be consistent with the text, the table title ought to be called Sensitive Class II Areas or Federal Class II Areas after Nuiqsut is removed from the list. Nuiqsut should be removed from the table since an AQRV analysis was not done, or required, at Nuiqsut.
CPAI	4.2.3.2	Alternative C Emission Inventory	215	2	**[T18-153]** "...PDSEIS because operations activities have not yet been defined enough for Alternative D to know how goods and services..." This sentence is no longer applicable.
CPAI	4.2.3.2	Air Emissions	216	2	**[T18-154]** The paragraph indicates that pad access would be by aircraft for 9 months out of the year and ice road the rest of the year. In reality, pad access will be by aircraft 12 months out of the year and by land-based vehicles only during the ice road season.
CPAI	Table 4.2-29	Maximum Potential 12- Month Construction Emissions for Alternative D	217	-	**[T18-155]** Highest PM10 during construction is Year 3, Month 6, not Months 3-6. However, the tons per year number is correct. Highest PM 2.5 emissions during construction is Year 3, Months 6 and 7, not Months 7 and 11. The tons per year number is correct.
CPAI	Table 4.2-30	Maximum Potential 12- Month Operational Emissions for Alternative D	217	-	**[T18-156]** The highest CO emissions are during an Infill Drilling Production Year, not a Typical Production Year. However, the tons per year is correct.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 4.2-31	Alternative D Impacts Compared to Established Ambient Criteria	219	-	**[T18-157]** Based on an updated results table for the Infill Drilling Scenario (see Table 1 on UPDATES tab), the following should all be changed in the PM2.5 annual row: Infill Drilling Max concentration should be 6.9 ug/m3. Maximum Total Concentration should be 8.3 ug/m3. Percent of NAAQS/AAAQS should be 69. Scenario Resulting in Highest Concentration should be Road and Pad Construction. Refer to most recent AQIA for Alternative D.
CPAI	4.2.3.2	Alternative D Near-Field Results	220	1	**[T18-158]** PM impacts are described as high, when they're actually exceedances. High is not really a descriptive term.
CPAI	Table 4.2-33	Alternative D Impacts Compared to Established Ambient Criteria at the Community of Nuiqsut	220	-	**[T18-159]** Based on an updated results table from the AQIA (see Table 2 on UPDATES tab), the following should be changed: Total Concentration should be 80 ug/m3 for NO2 1-hour. Percent of NAAQS/AAAQS should be 43 ug/m3 for NO2 1-hour. Scenario Resulting in Highest Concentration should be Clover Material Source for all pollutants except PM2.5 Annual. Scenario Resulting in Highest Concentration should be Infill Drilling for PM2.5 Annual.
CPAI	4.2.3.2	Alternative D Air Toxics Impact Analysis	221	3	**[T18-160]** The second sentence reads: "Table 4.2-36 shows that the total cancer risk for both the MLE and MEI scenarios are 1.02E- 06 and 4.63E-06, respectively, at receptors adjacent to the well pad, which represents a greater than one-in-one million cancer risk." This statement is inaccurate as these values are not found on Table 4.2-36. Further, the values on Table 4.2-36 represent cancer risks in the community of Nuiqsut, all of which are well below one in one million.
CPAI	Table 4.2-35	Alternative D Air Toxics Acute Exposure Assessment	221	-	**[T18-161]** Maximum Modeled 1-hour Concentration: Benzene should be 0.19, Formaldehyde should be 0.40, Xylene should be 0.06. Maximum Modeled Annual Concentration: Benzene should be 1.10E-04, Formaldehyde should be 3.20E-04, Xylene should be 3.00E-05. Refer to most recent AQIA for Alternative D.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 4.2-36	Alternative D Air Toxics Long-Term Cancer Risk Analysis	222	-	**[T18-162]** The total Inhalation Cancer Risk for both MLE and MEI should be equal and equal to 2.2E-09, not the values listed in the table. Reference Attachment A, Table A-8 to a letter from Tom Damiana (AECOM) to Bridget Psarianos (BLM), Subject: Revisions to the Air Quality Impact Analysis for Greater Mooses Tooth 1 Alternative D, submitted December 24, 2013.
CPAI	4.2.3.2	Near-Field Analysis Conclusions for Alternative D	222	1	**[T18-163]** Bullet 2: "45-50 percent control of fugitive dust has been assumed in the analysis." While notable to the analysis, this statement does not qualify as an exception in this context and therefore should be removed.
CPAI	4.2.3.2	Near-Field Analysis Conclusions for Alternative D	222	2	**[T18-164]** See comment above regarding use of word "significant".
CPAI	4.2.3.2	Near-Field Analysis Conclusions for Alternative D	222	2	**[T18-165]** See comment above regarding use of word "significant".
CPAI	4.2.3.2	Summary of Air Quality Analysis Results	225	2	**[T18-166]** Add: Except for PM, "Alternative A emissions are predicted to be the lowest of all action alternatives for the maximum 12-month emissions for each pollutant." This statement appears to be correct for gaseous pollutants, but not for particulate pollutants.
CPAI	4.2.3.2	Alternative D	226	1	**[T18-167]** All 4 bullets discuss "emissions" that are predicted to exceed the NAAQS/AAQS. This is incorrect. It is "impacts" or "concentrations" that are predicted to exceed the NAAQS.
CPAI	4.2.3.2	Alternative D	226	3	**[T18-168]** The paragraph indicates that the far-field modeling demonstrates compliance with all criteria pollutants and standards within the community of Nuiqsut. However, far-field modeling results were not presented for the community of Nuiqsut. Instead, near-field modeling was conducted within the community of Nuiqsut.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Tables 4.2-47 through 4.2-51	Impact Evaluation for Air Quality – All Alternatives	228	-	**[T18-169]** Second column in tables is not consistent with the table on the previous page which describes the impact criteria. Under the magnitude column (should be intensity) the impacts are listed as either minor, moderate, or major. On the previous page, magnitude is defined by negligible, low, medium, or high with a definition for each impact rating. Alternative D in the operations phase is not shown to have a higher impact than the other alternatives, which is not consistent with the early statement that Alternative D will result in 7 times the air emissions as Alternative A.
CPAI	4.2.3.2	-	229	-	**[T18-170]** The new Potential Mitigation Measure 1 states "To the extent practicable, all oil and gas operations (vehicles and equipment) must be powered by natural gas or electric power rather than diesel fuel." Stationary drillsite equipment will be electrically powered or utilize natural gas. Western North Slope uses ultra-low sulfur diesel for all rolling stock, including portable heaters.
CPAI	4.2.3.2	-	229	-	**[T18-171]** The mitigation measures in section 4.2.3.2 are not consistent with the mitigation table on page 404 (table 4.7-1).
CPAI	4.2.3.3	Comparison of Alternatives	234	4	**[T18-172]** The DC-6 cargo plane should be included in the discussion and the decibel level should be noted as they are for the twin engine aircraft.
CPAI	4.2.3.3	Comparison of Alternatives	234	6	**[T18-173]** The potential for disturbance by Alt D is understated. While it's further from the village the approach of a runway at GMT1 would direct aircraft over rich subsistence use areas. Also, the planes would be low enough to be heard as they pass over the community of Nuiqsut.
CPAI	4.2.3.3	Comparison of Alternatives	235	1	Second full sentence typo. Should read "Helicopters managed by CPAI would be used during the summer season to support compliance-related and other needs associated with GMT1."
CPAI	Table 4.3-I	Impact Criteria – Vegetation and Wetlands	237	-	**[T18-174]** Geographic Extent: This definition changes depending upon the resource. This should remain constant for all resources.
CPAI	Table 4.3-I	Impact Criteria – Vegetation and Wetlands	237	-	**[T18-175]** Geographic Extents seem skewed and mislabeled. The 3 levels do not match scale in Pt. Thompson EIS, where extensive is largest, local is middle level, and limited is lowest level. To make the project study area a regional scale seems to be exaggerating the size of the study area (102,000 acres). The study area would be more appropriate as a local scale. A smaller scale impact (e.g., direct gravel coverage or impoundments) should be "limited" or some finer scale descriptive. "Statewide" is a misleading term as used in this context.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Tables 4.3-2; 4.3-3; 4.3-4; 4.3-9; 4.3-10	Direct Impacts of Construction on Vegetation and Wetlands	241, 243-244, 268, 269	-	Inconsistency in the total mapped acreage tables. Please reconcile.
CPAI	4.3.1.3	-	248	4	**[T18-176]** This is a good place to add a sentence about the relative limitations of spill response reliability and life safety response reliability compared to Alternative A.
CPAI	4.3.2.1	Construction	253	4	**[T18-177]** Confirm conclusions with NSB (Todd Sformo) based on most recent information.
CPAI	4.3.2.1	-	255	4, 6	**[T18-178]** This is a good place to add a sentence about the relative limitations of spill response reliability and life safety response reliability compared to Alternative A. See Appendix 1 and 5.
CPAI	Table 4.3-6	Comparison of Project Components Relevant to Fish Resources	256	-	**[T18-179]** Water for Ice roads and pads for all alternatives: numbers are not correct for any alternative as compared to the statement of basis. They should be: Alt A: yr 1 = 65.5; Yr 2 = 52.8 Alt B: yr 1 = 71.5; Yr 2: 54.3 Alt C: yr 1 = 79; yr 2 = 43.8 Alt D: yr 1 = 52.5; yr 2 = 66.5 See table in Appendix 7.
CPAI	Table 4.3-6	Comparison of Project Components Relevant to Fish Resources	256	-	**[T18-180]** GMT1 area airstrip/road/pads: Alt C: Please indicate gravel footprint for runway extension.
CPAI	4.3.2.2	-	257	4	**[T18-181]** This is a good place to add a sentence about the relative limitations of spill response reliability and life safety response reliability compared to Alternative A.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.3.3.3	-	266	2	**[T18-182]** I understand how indirect impacts are calculated for a 300-foot zone and that one habitat has more than 5% of its availability in that zone. However, the only passerines that nest in tall shrubs are Common Redpolls and Tree Sparrows. These may comprise less than 1% of the passerines nesting in the project area (the rest are Lapland Longspurs and a few Savannah Sparrows). The severest impacts of dust on the plant community are restricted to the heaviest fallout areas, usually within 35 feet of roads. Even within 50 ft of roads, it is not clear that shrubs will be killed or the veg community will change; in fact on non-acidic soils Salix increased in the areas with heavy dust (Auerback et al. 1997). It seems that the Intensity criterion (5-25% of habitat or a bird population) is triggered despite this being a very mild impact to a very small number of the bird community. This impact is given more weight than the displacement of nests from direct habitat loss, which will impact many more nests of tundra nesting birds than will be affected by dust in tall shrubs. It seems inconsistent to give the same weight to habitat modification (from dust) as to habitat loss from direct impacts of gravel coverage. The former is less severe than the latter.
CPAI	4.3.3.3	-	267	1	**[T18-183]** Include impacts on birds of hazing to deter birds from occupying the gravel airstrip (e.g., noise cannons). This is a disturbance source that does not occur with roads.
CPAI	4.3.4.1	Construction	275	1	Please use "could" instead of "would." Construction activities have the potential to affect terrestrial mammals.
CPAI	4.3.4.1	Disturbance	276	2	**[T18-184]** Since the onset of improved food waste management procedures by industry in the mid-1990s there are no longer food-conditioned bears in the oil fields.
CPAI	4.3.4.1	Disturbance	277	2	**[T18-185]** This paragraph implies that routine pipeline surveys are conducted by helicopters, which is incorrect. Routine surveys are conducted by either the Shared Service Aviation's Otter or CASA aircraft. In addition, the project area is not within a calving area.
CPAI	4.3.4.1	Disturbance	277	7	**[T18-186]** Data dating back to the late 1970s documents movement of CAH animals through the Kuparuk oilfield north to coastal insect relief habitats.
CPAI	4.3.4.1	Disturbance	277	-	This section should include a discussion of the relative disturbance between alternatives. Alternative D would result in higher levels of disturbance due to the much higher level of flight activity. As written, this section does little to demonstrate the higher level of impacts from Alternative D.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.3.4.1	Altered Survival or Productivity	278	6	"Food waste and the availability of infrastructure for thermal protection, escape cover, or den sites can benefit arctic foxes, bears, and weasels, potentially increasing their survival and productivity." -- It is against CPAI policy to feed wildlife or allow access of food waste to wildlife. Furthermore, animals gaining to access to food from operators is not considered a benefit to wildlife. Bears are hazed away from facilities and not given the use of facilities for denning.
CPAI	4.3.4.2	Spotted Seal	284	1	Chapter 3 implies that few spotted seals are likely to be present in the Colville River area; however, the discussion here states that an oil spill could impact "large numbers of spotted seals". The authors need to decide whether "a few" or "large numbers" of spotted seals are present, and maintain that consistency throughout the document. Spotted seals primarily use haulouts on the east side of the delta.
CPAI	4.3.5	-	285	-	In general, the Chapter 4 sections for listed marine mammals could benefit from a review for organization, clarity, and consistency. Some of the correct justifications for why impacts are unlikely should be explained more fully. A clear connection should be made between each potential impact and its unlikelihood of occurrence. Any habitat or life history information presented in Chapter 4 should also be present in Chapter 3.
CPAI	4.3.4.2	-	285	1	For consistency and completeness it would be good to include a statement on mitigation or lack of required mitigation with respect to marine mammals.
CPAI	Table 4.3-20	Potential Habitats of Spectacled Eider and Yellow- Billed Loon	287	-	**[T18-187]** For Yellow-billed Loon, under "Reported Use" the table should say "Nesting" not Pre- nesting ABR does not survey for pre-nesting loons.
CPAI	Table 4.3-20	Potential Habitats of Spectacled Eider and Yellow- Billed Loon	287	-	**[T18-188]** Title is misleading, these are preferred habitats that occur in the Project Study Area. There are more habitats that are used and therefore could be considered "Potential" habitats. Change Footnote 1 to in these are in the Project Study Area. Change accompanying text to match.
CPAI	4.3.5.4	-	289	6	**[T18-189]** "... incidental to the exploration, development and production operations associated with this project." - There are no exploration activities associated with this project.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.3.5.4	Habitat Loss	290	3	**[T18-190]** The text accompanying the reference to Figure 3.3-12 should be redrafted. In this present form, it may be read not to fully recognize the depiction of potential polar bear denning habitat within one mile of infrastructure as shown in the referenced figure.
CPAI	4.3.5.4	Habitat loss and alteration	290	4	"Under all the action alternatives, habitat loss and alteration impacts to polar bears are expected to be minor." This statement should be amended to clarify that habitat loss and alteration impacts to ***individual*** polar bears are expected to be minor. Furthermore, please reiterate that there are expected to be no more than negligible effects on polar bears at the population level. Any indication that effects on polar bears in general are more than negligible could compromise the ability for incidental takes to be authorized under MMPA.
CPAI	4.3.5.4	Disturbance	290	8	Similar as above "Potential disturbance and displacement impacts to polar bears would be minor for all the action alternatives." This statement should be amended to clarify that habitat loss and alteration impacts to ***individual*** polar bears are expected to be minor. Furthermore, please reiterate that there are expected to be no more than negligible effects on polar bears at the population level. Any indication that effects on polar bears in general are more than negligible could compromise the ability for incidental takes to be authorized under MMPA.
CPAI	4.4.1	Comparison of Alternatives	293	-	**[T18-191]** There is no summary of the impacts for this section, however they are tabulated in Table 4.1-2 (Summary of Impacts).
CPAI	4.4.1	Comparison of Alternatives	293	3	**[T18-192]** This paragraph introduces new information that should be discussed prior to comparing the alternatives. It also references a future section within the document (subsistence 4.4.3). It is suggested that the Subsistence section come before any section that references it.
CPAI	4.4.1	Comparison of Alternatives	293	5	**[T18-193]** "The impacts to socio-cultural systems under this alternative would be....." should read "...under Alternative D would be..."
CPAI	4.4.1	Comparison of Alternatives	293	5	**[T18-194]** We recommend that you verify ownership of the hotel and airport.
CPAI	4.4.1	Comparison of Alternatives	293	-	**[T18-195]** This information within this section does not come to any definitive conclusion as to the impacts on the Socio-Cultural Systems. Please address this while giving enough supporting information.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.4.1	Public Health	293	All	**[T18-196]** The Public Health subsection appears to be organized incorrectly. This should be its own section, i.e. 4.4.2, rather than a subsection of socio-cultural systems (4.4.1). A reason for this reorganization is that both the Socio-Cultural Systems and Public Health sections have a "Comparison of Alternatives" subsection. If this comment is adopted, then Public Health would also necessitate a line within the impacts table on p. 173 (Table 4.1-2)
CPAI	4.4.1	Public Health	295	All	**[T18-197]** This section does not come to any definitive conclusion as to the impacts on Public Health. Please address this while giving enough supporting information. It would seem that the impacts would be minor as "New data and information have not changed the discussion of impacts are presented in the 2012, so the discussion in BLM (2012) is still considered relevant to this proposed GMT1 Project SEIS."
CPAI	4.4.2	-	295	2nd bullet	**[T18-198]** ASRC will also have increased revenues.
CPAI	4.4.1	Comparison of Alternatives	295	2	**[T18-199]** Impacts criteria should be defined for all subsections of 4.4, as done for the other resources.
CPAI	4.4.1	Comparison of Alternatives	295	6	**[T18-200]** For consistency and completeness, this comparison of alternatives should also address potential impacts from increased air traffic under Alternative D on public health.
CPAI	4.4.2	-	296, 298	4, Table 4.4-1	**[T18-201]** The GMT1 oil forecast represented in the Economy section of the DSEIS uses the 2004 ASDP Final EIS GMT1 oil forecast which approximates CPAIs best technical estimate forecast for first year (2018) peak rate, ~20,000 BOPD, but declines at a lower rate, thus the cumulative oil production of the 2004 ASDP EIS forecast is almost double that of CPAI's best technical estimate. Recommend replacing the SEIS forecast with the 2014 DOR update when it becomes available. If this change is made the entire Economy section would need to be rewritten.
CPAI	4.4.2	-	297	2	**[T18-202]** "48" should be "50" in line 6.
CPAI	4.4.2	-	297	3	**[T18-203]** The royalty estimate from GMT1 is vastly underestimated. The stated royalty of $2.9 million is less than 1% of CPAI's estimate of royalty pay over the entire production period.
CPAI	4.4.2	-	298 and 299, 300	1 and 7, 3-5	**[T18-204]** The cost of alternative A is listed as $400MM. This cost does not include drilling, contingency, nor escalation. CPAI has publicly announced that the total cost of the GMT1 project is $900MM. The cost description should clarify this. Alternatives B, C, and D costs are represented as 12, 14, and 80% higher than Alternative A respectively. The overstated production forecast combined with the understated project cost may send the wrong message around the viability of Alternative D.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.4.2	-	300	1	**[T18-205]** See previous comment regarding ownership of airport and hotel.
CPAI	4.4.2	Comparison of Alternatives	300	5	**[T18-206]** "The impacts to the economy under this Alternative D would be similar…"
CPAI	4.4.2	Comparison of Alternatives	300	5	**[T18-207]** Last sentence: Pertains to Alt. C, not D. This sentence should be moved to the paragraph above.
CPAI	4.4.2	Comparison of Alternatives	300	6	**[T18-208]** "There will be no impacts to the state and local economy under this Alternative E."
CPAI	4.4.3	-	300	8	The reference for SRB&A 2013 should be "SRB&A 2013**b**" as this reference refers to the Nuiqsut Caribou Subsistence Monitoring Project, not the Cultural Resources Survey Report (2013 **a**). This applies to other references as well.
CPAI	4.4.3	-	302	4	**[T18-209]** Should be noted that the "construction period" is primarily limited to approximately 3 month periods in two winter seasons.
CPAI	4.4.3	-	-	-	**[T18-210]** Should also be noted that the Nuiqsut spur road in combination with roaded access to GMT1 under Alternatives A, B & C would provide improved access to hunting grounds in the NPRA area and hence would likely have a positive impact on subsistence.
CPAI	4.4.3	Community Participation	303	1	**[T18-211]** There is a statement that "These responses were volunteered and not cued by researchers, and therefore the percentage of households or harvesters avoiding Alpine facilities may be higher because the study team did no systematically ask each respondent if they had avoided the Alpine area". I think this statement should be removed as it is not accurate to speculate that the percentage may increase without data to back it up. There is always a possibility the percentage could decrease.
CPAI	4.4.3	Summary and Comparison of Alternatives	305	2	**[T18-212]** "User avoidance is expected to be the primary impact related to user access, as Nuiqsut residents will likely avoid the project study area drill pad and pipeline corridor." The only information that I read that relates to this claim was that in hunter interviews, 9% of Nuiqsut residents said they avoid developed areas altogether. This study did say that not every resident was asked this question. 9% is not enough data to base the above statement on. I don't believe they can make this claim, and this is what I believe is driving the "major impact" designation. More information would need to be collected to substantiate this claim, because you cannot, with any level of statistical confidence, make this assertion on the data that is currently available.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.4.3	Summary and Comparison of Alternatives	306	2	**[T18-213]** "... overall degree of impacts on subsistence do not vary substantially by alternative." I don't believe that this claim can be supported. I believe there is a substantial impact difference between increased aircraft/helicopter use and a road, and that is clearly stated throughout this entire document. How then can it be said that there is little difference within this section?
CPAI	4.4.3	-	306	3	**[T18-214]** Conclusion that "impact to subsistence is expected to be major because it is a high intensity impact" does not seem to take in to account positive impact the roaded access to hunting areas or the vast amount of wildlife data collected by extensive studies.
CPAI	4	-	309	2	**[T18-215]** Although aircraft use is considerable less in the winter months for ALT D we would still have some flights while the ice road was in. See Aircraft Plan.
CPAI	4.4.5	-	310	8	**[T18-216]** The direct and indirect impacts should be based upon the project study area with justification or existing regulatory criteria, such as, SHPO setback of 500 feet for cultural resources.
CPAI	4.4.5	Summary and Comparison of Alternatives	315	2	**[T18-217]** Justify conclusions and provide further information on detectable alterations in the following statement on page 315: "In contrast to BLM 2004, the current analysis identifies that the intensity of potential impacts to cultural resources would be medium, because the impacts to the cultural landscape would result in a detectable alteration." Elaborate on what is classified as a "detectable alteration" and how that impacts the cultural landscape.
CPAI	4.4.6	-	315	5	**[T18-218]** Add "not conveyed to ASRC and Kuukpik Corporation" after "east of NPR-A" in line 6 (There are some State lands that were conveyed to ASRC/Kuukpik.)
CPAI	4.4.3	-	315	5	**[T18-219]** Make sure the last line of this paragraph regarding native allotments is consistent with last line of paragraph Sec. 1.1 on page 2.
CPAI	4.4.6.5	Conclusions	318	5	**[T18-220]** Please explain how a conclusion of "moderate" was reached for Land Use and Ownership. [Intensity (low to medium), duration (temporary to long term), contact (common) and geographic (local)]
CPAI	4.4.8.1	-	323	1	The first 3 sentences should not be in this section as they pertain to drilling. They should be moved to section 4.4.8.2.
CPAI	4.4.8.3	Comparison of Alternatives	323	-	**[T18-221]** Include a description of Alternative D pointing out that it's a replication of camp and redundant facilities existing at ACF/CD1. Include in Comparison of Alts and Conclusions (4.4.8.5).
CPAI	4.4.9	-	324	-	**[T18-222]** Add emergency response to this section.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.4.9.3		325	-	**[T18-223]** Construction activities would require upgrading of the culverts, including removal and replacement of gravel.
CPAI	4.4.9.5	Conclusions	326	3	**[T18-224]** In sections 4.4.9.5, the impacts are described to be moderate for Alternative D around transportation. Need to get Nuiqsut, ASRC, and others to weigh in more heavily on impact to caribou hunting. Still comes across as in favor of Alternative A.
CPAI	4.5.1	Background	326	5	**[T18-225]** Please add: "The type of material most likely to be spilled..."
CPAI	4.5.4	Comparison of Alternatives	328-330	-	**[T18-226]** Improve section 4.5.4, 'Comparison of Alternatives', related to spill response. Compare and contrast CPAI's ability to leverage a large resource base back at ACF to respond in the most expeditious and efficient manner with a road. CPAI leverages oil spill response equipment; ancillary equipment (lights, generators, etc.); and a large human resource base of 500+ people back at ACF. The ability to do this is greatly jeopardized by not being able to fly and deliver those resources without a road. Access to these resources will help protect the environment. Suggest adding sentence at the end of paragraph 5 (p. 330) - "Spill response could be further challenged due to air travel restrictions, which have occurred approximately 13 to 22 percent of the year over the last four years, due to adverse weather conditions." Time is of the essence in an emergency response situation. See Appendix 1.
CPAI	4.5.4	Comparison of Alternatives	329	2	This section includes a discussion on the potential for an oil spill to affect marine mammals. This information is misplaced. This should be included where impacts from an oil spill are already discussed in the Marine Mammals/Threatened and Endangered Species (Sections 4.3.4.2 and 4.3.5).
CPAI	4.5.4	Waste Disposal	330	8, 9	**[T18-227]** Inconsistency in references to Alternative D as "roadless alternative" or "limited access alternative." Please check consistency throughout document and refer to Alternative D as "Aircraft and Ice Road Access."
CPAI	4.5.5	-	331	6	**[T18-228]** Replace "Another manual valve" with "One manual valve" and "A similar second valve"
CPAI	4.5.5	-	332	4	**[T18-229]** 'Oil spill responders would be able to reach the production ~~pads~~ pad by road or by air (depending on weather). several means.'

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.5.5	New Mitigation Measures	333	Bullet 1	**[T18-230]** The requirement for oil spill response equipment to be "designed in accordance with standard arctic engineering" is a misnomer. There are currently no formal "arctic standards" for design of oil spill response equipment. Current practices use best available technology and best management practices for acquisition and use of spill response equipment in arctic environments. Equipment is fit for purpose and manufacturer's specifications for use of equipment are followed. CPAI's contracted oil spill removal organization, Alaska Clean Seas (ACS), is a globally recognized leader in oil spill response in the arctic; ACS has established strategies and techniques to maintain response equipment effectiveness in extreme weather conditions. ACS regularly tests and trains with response equipment to ensure its functionality. ACS also works with vendors and/or in-house craftsmen or trained mechanics to modify equipment for use in arctic conditions. Equipment capabilities and limitations are well understood before they are put into use so as to ensure the safety of spill responders and effectiveness of the equipment. As personnel safety is priority number one both at CPAI and ACS, it goes without saying that equipment currently used for response operations along the Arctic North Slope is fit for purpose and/or service. CPAI recommends BLM consider revising Potential Mitigation Measure 2, bullet one, to state: "Equipment must be fit for service in arctic conditions; best available technology should be considered, where applicable".
CPAI	4.5.5	New Mitigation Measures	333	Bullet 2	**[T18-231]** CPAI has extensive experience working in arctic conditions on the North Slope of Alaska. Daily operations during winter (freezing) conditions occurs using heating equipment and warm storage. Strategies for keeping equipment (and personnel) warm and operational during freezing weather conditions is no different for a spill response. For winter response, portable heater units are used to keep equipment thawed and running. Heated shelters are provided for equipment storage and maintenance. Equipment such as hose floats or dunage help keep pump hoses off the ice surface to keep from freezing. Supplemental hose is made available in the event a hose line freezes; it can be replaced quickly. If frozen, a hose line could be place in a portable heated shelter for thawing out and then used again. CPAI's oil spill removal contractor, Alaska Clean Seas, tests, trains with, and utilizes skimmers with added steam nozzles to help prevent icing up and to keep product in liquid form for recovery. CPAI recommends BLM consider removing Potential Mitigation Measure 2, bullet two, as keeping equipment warm and operational in cold weather environments is routine and common with current operations. Overall, keeping spill response equipment operational requires use of best available technology, which would be addressed if BLM revises New Potential Mitigation Measure 2, Bullet 1.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.5.5	New Mitigation Measures	333	Bullet 3	**[T18-232]** CPAI has extensive experience conducting routine operations in dark arctic conditions. In addition, CPAI's oil spill removal contractor, Alaska Clean Seas (ACS) has extensive experience conducting spill response operations in dark arctic conditions. During the dark and cold periods (winter) on the North Slope, all surfaces (tundra wetlands and ponds, rivers, and streams) are generally frozen solid and covered by snow, which protects tundra vegetation and water sources beneath. Risk of oil reaching rapidly flowing water sources is very low, particularly in the GMT1 project area. Work conducted in dark arctic conditions is aided by use of portable light plants. Use of portable light plants during spill response is common; light plants are used on scene to aid in clean-up operations. In addition, spill area can be delineated and tracked using GPS devices and ice augers. ACS can use handheld infrared thermal imaging equipment to assist with tracking spilled oil under snow or ice. For spills under ice, ACS can also use underwater lights, ice augers, and water tight cameras. Ground Penetrating Radar is a developing technology for spill detection under snow and ice; it has been successfully tested, with limitations observed. ACS has developed, tested, and used various effective strategies and techniques for delineating and tracking oil spilled in snow and ice; specific tactics are presented in their Technical Manual. CPAI recommends BLM consider removing Potential Mitigation Measure 2, bullet three, as using lights and other equipment to delineate and track oil in snow and ice conditions is already routinely performed for successful spill response on the North Slope. Overall, delineating and tracking oil under snow and ice requires use of best available technology, which would be addressed if BLM revises New Potential Mitigation Measure 2, Bullet 1.
CPAI	-	-	334	-	On page 334 in the conclusions, I like the statement of "Alternative D would have the greatest potential risk of a spill or leak reaching fish bearing or marine waters before detection or before detection or before response teams could be mobilized to the spill site, given its limited access."
CPAI	4.6.1		335 (also, 343)	last	**[T18-233]** GMT2 is referred to on these pages and possibly on other pages as a "connected action," which is a regulatory term with particular significance in the NEPA process and does not fit here. GMT1 is not a connected action, because it does not depend on GMT2. GMT2 merits consideration only in the cumulative impacts discussion as a reasonably foreseeable future action, not as a connected action.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 4.6-1	Parameters of Cumulative Effects Analyses in the 2004 ASDP EIS and the 2012 NPR-A IAP/EIS	338	-	**[T18-234]** Last row, Threatened and Endangered Species: fails to mention yellow-billed loon is a candidate species whose listing decision is scheduled for 2014.
CPAI	4.6.1.2	-	339	bullets 2, 5	**[T18-235]** The geographic extent in Bullets 2 and 5 contain conflicting information.
CPAI	4.6.1.2	-	339	Bullet 4	**[T18-236]** The west boundary of the Kuparuk River Unit is much further than 10 miles east of GMTU.
CPAI	Table 4.6-2	Major Cumulative Effects Factors	341	-	**[T18-237]** Acreage for CD5 is too high; gravel coverage at CD5 = 58.5 acres.
CPAI	4.6.2.1	Community Footprint	341	2	**[T18-238]** Community Footprint definition. Pt. Lay outside of NPR-A.
CPAI	4.6.2.1	Existing Oil and Gas Infrastructure	342	3	**[T18-239]** After the sentence beginning "The Alpine production facilities... and ice roads to the..." include the following sentence "Winter only ice roads provide seasonal acces s to Alpine for resupply activities."
CPAI	4.6.2.1	Existing Oil and Gas Infrastructure	342	3	**[T18-240]** Please edit the following sentence: "Surface travel to the ~~Lower~~ Colville River Unit is by gravel road to the Kuparuk field, then ice roads are used for going westward in to NPR-A."
CPAI	4.6.2.1	Existing Oil and Gas Infrastructure	342	4	**[T18-241]** ASRC mine site has a 42 acre footprint.
CPAI	4.6.2.1	Proposed and Current Activities	343	3	**[T18-242]** We use messenger cables, not power lines. The total gravel footprint was 595,700 not 559,700 and the cubic yards of fill should be 58.5 not 60.5.
CPAI	4.6.2.1	Proposed and Current Activities	343	4	**[T18-243]** The road footprint is 39.3 acres, not 76 acres. Cubic yards of gravel fill is 478,000, not 633,000.
CPAI	4.6.2.1	Colville River Access Road	344	1	**[T18-244]** Direct impact should be 22.75 acres, not 58.5 acres. The estimated gravel fill should be 152,000 cubic yards, not 135,000.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.6.2.1	Proposed and Current Activities	344	1st and 2nd bullets	**[T18-245]** Cassin #1 and #6 wells were drilled during 2012/2013. Since then two additional wells (Rendezvous #3 and Flattop #1) have been drilled in GMTU. This section should be updated. Cassin wells shouldn't be included under "Proposed and Current Activities."
CPAI	4.6.2.1	-	344	2	**[T18-246]** The Umiat highway is speculative and should not be included in "proposed and current activities." The USACE Alaska District website shows that the application has been suspended.
CPAI	4.6.2.1	Winter Oil and Gas Exploration	344	bullet 3	**[T18-247]** Brooks Range did not drill this winter at the Tofkat Prospect.
CPAI	4.6.2.1	Offshore Development and Onshore Support Infrastructure	346	1	**[T18-248]** Including Chukchi Offshore Development and Onshore Support Infrastructure as a reasonably foreseeable future activity is a conservative approach given the nascent state of oil and gas exploration in the Chukchi Sea. We suggest that this analysis be qualified to explain that at this point, no leaseholder has drilled an exploration well to a hydrocarbon zone.
CPAI	4.6.2.1	Offshore Development and Onshore Support Infrastructure	347	1	**[T18-249]** Add as last sentence: The 2012 IAP makes much of the NPR-A unavailable for development. The ROD approved less than 52 percent of federally owned NPR-A for development.
CPAI	4.6.3	Cumulative Impacts Analysis	348	-	**[T18-250]** This table lists the "Direct and Indirect Impacts of Alternative A" as being "Minor." However the text in the Marine Mammal section on page 284 (Sections 4.3.4.2) indicates that "Assuming that no large oil spills occur, or reach the open water environment, impacts to marine mammals are expected to be negligible." The cumulative analysis on page 374 also indicates impacts on marine mammals are "negligible." Please correct table.
CPAI	4.6.3	Cumulative Impacts Analysis	348	-	**[T18-251]** Impacts findings of more than "negligible" for marine mammals would likely prevent issuance of LOAs needed for operations. The finding of "minor impact" must be supported with strong evidence. If this is in reference to individual bears (because it's an ESA species), not the population, that should be stated in this table and the table should also say that impacts on the population will be no more than negligible.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Table 4.6-4	Cumulative Impacts Analysis	348	-	**[T18-252]** The summary of cumulative impacts is not consistent with the Direct/Indirect impacts analysis. Specifically, impacts on Public Health was listed separately and was determined to be minor. Impacts on Environmental Justice and Land use were also considered "minor." These conclusions seem reasonable, but they're not consistent with the direct/indirect impacts analysis in Section 4.4.
CPAI	Table 4.6-4	Cumulative Impacts Analysis	348	-	**[T18-253]** Please update this table as it does not include "Socio-Cultural Systems".
CPAI	4.6.4	-	349	2	**[T18-254]** "There have been no substantial changes to the range of RFF projects or technologies considered by BLM in BLM (2012) that suggest the cumulative effects of the proposed GMT1 Project and the conceptual GMT2 Project cumulative impacts to resources would now be different"
CPAI	4.6.4.1	-	351	4	**[T18-255]** "Further, water use peaks during construction, which is temporary..." This is true for all alternatives except Alternative D, where water use peaks during operation.
CPAI	4.6.4.1	-	352	3	**[T18-256]** Limitations outlined in the NPR-A IAP do not allow for production in the Northern NPR-A.
CPAI	4.6.4.1	-	352	5	**[T18-257]** "Through 2011, oil and gas activities..." Need citation. Please put in context relative to the proposed development.
CPAI	4.6.4.1	-	353	3	**[T18-258]** "During most winters, ice roads are constructed between staging areas in the Kuparuk River Unit to locations wihin the NPR-A as far as the Barrow area go as far as Alpine and rolligon trails go as far as Barrow" Please don't imply that ice roads go all the way to Barrow.
CPAI	4.6.4.1	Air Quality	355-357	-	Tables 4.6-5 through 4.6-12 are not referenced in the text and is seems like they ought to be.
CPAI	4.6.4.1	Alternative A	356	1	**[T18-259]** The last paragraph says: "Additional model runs with refined source data would be expected to show reduced cumulative impacts on visibility." Similar to what was said about the criteria pollutant impacts, this statement ought to be reworded to say: Because of the close proximity of some of the RFD sources to modeled receptors, and their dominant influence on cumulative impacts, a change in characterization could result in an increase in cumulative results.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.6.4.1	Alternatives B and C	358	3	**[T18-260]** The paragraph says: Additional model runs with refined source data would be expected to show reduced cumulative impacts on visibility. Similar to what was said about the criteria pollutant impacts, this statement ought to be reworded to say: Because of the close proximity of some of the RFD sources to modeled receptors, and their dominant influence on cumulative impacts, a change in characterization could result in an increase in cumulative results.
CPAI	4.6.4.1	Alternative D	360	1	**[T18-261]** The last sentence of the paragraph says: Additional model runs with refined source data would be expected to show reduced cumulative impacts on visibility. Similar to what was said about the criteria pollutant impacts, this statement ought to be reworded to say: Because of the close proximity of some of the RFD sources to modeled receptors, and their dominant influence on cumulative impacts, a change in characterization could result in an increase in cumulative results.
CPAI	4.6.4.1	Alternative D	361	Bullets1, 2	**[T18-262]** It is concluded that Alternative A and D will have the same impacts at the Alaska National Wildlife Refuge and the Gates of the Arctic National Park. While this is true, it is true because the background concentrations are an order of magnitude higher than the model- predicted impacts. Therefore, the same result could be obtained without conducting any modeling at all. It would seem like this fact ought to be added to the explanation.
CPAI	4.6.4.1	Alternative D	361	3rd bullet	**[T18-263]** The third bullet reads: Alternative D is predicted to result in higher nitrogen and sulfur deposition at the Alaska National Wildlife Refuge and Gates of the Arctic National Park than Alternative A. 1) This statement is not true of Sulfur Deposition for either Class II area. Sulfur deposition does not change between Alternative A and Alternative D. 2) This statement is misleading since it implies that the higher nitrogen deposition for Alternative D is something more than negligible. The differences in nitrogen deposition between Alternative A and D are negligible and not worth highlighting.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.6.4.2	Birds	369	I	**[T18-264]** "Increased harvests resulting from increased access to remote areas via new roads, especially from subsistence hunting, were characterized as a serious cumulative factor." If adding access for subsistence hunting is a serious cumulative factor, then how can the project itself be a negative major impact?
CPAI	4.6.4.2	Terrestrial mammals: Grizzly Bear, Fox...	371	4	**[T18-265]** 2nd sentence: "and an airstrip" - implies that an airstrip will be built regardless of which alternative is selected, reword this sentence.
CPAI	4.6.4.2	Terrestrial mammals>Grizz ly Bear, Fox...	372	4	"The greatest threat to grizzly bears is increased hunter access under Alternative A, B, and C," The greatest threat under subsistence was stated to be hunter avoidance, yet here increased access is one of the greatest threats to grizzlies. The cumulative impacts section seems to contradict the findings of the subsistence impacts section.
CPAI	4.6.4.2	TES: Spectacled and Steller's	375	4	**[T18-266]** The text does not indicate why the effects on Steller's eiders could be synergistic.
CPAI	4.6.4.3	Socio-Cultural	381	I	**[T18-267]** Includes "development of a natural gas pipeline from the North Slope to Valdez or Cook Inlet" as a RFF action---this is not listed on page 345-346 listing of RFF activities and is not within the Harrison Bay or Lower Colville River Watershed described on page 339 (4.6-1).
CPAI	4.6.4.3	Public Health	382	-	**[T18-268]** It is not clear why the Socio-Cultural Systems and Public Health subsections are on the same organizational heading level here when they are not within section 4.4.1. The way these subsections are organized in this section appears to make more logical sense.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	4.6.4.3	Subsistence	386	4	**[T18-269]** Avoidance is an important issue but the countervailing impact to subsistence from an increase in access (via roads) should be included in the analysis. One of the reasons for building the Nuiqsut Spur road was to increase access to hunting areas as well as allow for residents to travel home after a work shift instead of remaining in camp. The road will allow year-round access to Fish and Judy Creeks and the Ublutuoch river using four-wheelers and snow machines. Increased access could decrease travel time and fuel costs when traveling to areas NW of Nuiqsut. There is potential for an increase in waterfowl harvest during the spring as well as an expansion of caribou hunting areas during the summer and fall in areas west of the Nigliq. Caribou hunting is often opportunistic, taking advantage of large groups of caribou passing by areas accessible to the village. This subsistence section emphasizes the reluctance to hunt in areas of oil development, but does not acknowledge the access that the road will provide and the ability to access areas north and south of the road that are away from oil development; that is, people will not have to hunt near development to take advantage of increased access. This will be the first time Nuiqsut has had road access to subsistence use areas. Increased access is mentioned as a serious cumulative effect in the 2004 EIS (pg 369, 1st para), and in the caribou section of Cum Effects (pg 370 2nd para), but it seems this same analysis is missing in the current subsistence section. Access by subsistence hunters will not be restricted as part of GMT1 or GMT2, and the road connections to Nuiqsut make it an obvious and easy trail to hunting areas.
CPAI	4.6.4.3	Environmental Justice	389	6	**[T18-270]** The discussion of the ANILCA section 810 findings from Appendix L repeats the problems that are found in that appendix. In particular, the bases for concluding that the project meets the criteria for finding a significant restriction to subsistence are not substantiated. This issue is discussed in Appendix 2.
CPAI	4.6.4.3	Recreation	396	1	**[T18-271]** The last sentence does not make sense as written.
CPAI	4.8	-	413	4th bullet	**[T18-272]** The word "pollutants" does not seem descriptive enough. Suggest changing to "criteria pollutants and HAP".
CPAI	Figure 1.1-1	Greater Mooses Tooth Unit Land Ownership	457	-	**[T18-273]** There should be a light green box depicting the BLM lands in the key under Surface Land Ownership.
CPAI	Figure 3.3-1	Vegetation	470	-	**[T18-274]** Make the Cassiope Dwarf Shrub Tundra a more stand out color. It is difficult to differentiate the brown from the purple. As this is the vegetation type that defines Alt A and C as Moderate impacts, it would be beneficial to clearly find and identify this type on the map.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Figure 3.3-6	Wildlife Habitat of the GMT1 Project Area	475	-	**[T18-275]** All alternatives should be displayed as they are for birds and polar bears.
CPAI	Figure 3.3-7	2012 Avian Survey in Relation to Project Study Area	476	-	**[T18-276]** Identify that the data in this figure are restricted to aerial surveys, otherwise include ground- based survey data, such as nest locations of eider and Red-throated Loons. Change the title to "2012 Avian Survey in the Project Study Area". (Remove "in Relation to"). Title is misleading.
CPAI	Figure 3.3-7	2012 Avian Survey in Relation to Project Study Area	476	-	**[T18-277]** Only 2012 data is displayed, when other years are available. Need to explain why in text; 2012 is probably a good representation of the distribution of these species, but if it is intended to show an "example" distribution, should state so explicitly.
CPAI	Figure 3.3-10	Ranges of the Teshekpuk and Central Arctic Caribou Herds, GPS and Aerial	477	-	**[T18-278]** Panels are out of order.
CPAI	Figure 3.3-11	Ranges of the Teshekpuk and Central Arctic Caribou Herds, Satellite and GPS	478	-	**[T18-279]** Panels are out of order.
CPAI	Figure 3.3-12	Polar Bear Habitat	479	-	**[T18-280]** Road to GMT-2 is not part of this project.
CPAI	-	-	-	-	**[T18-281]** There is no figure for Spectacled Eider distribution in the project area. Given this is one of 2 threatened species that occurs in the project area, this should be a priority figure for this document. Should use the same figure (from 2012 EIS) showing SPEI density polygons, which is used to develop the table 3.3-15

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Errata Sheet	Potential Mitigation #11	-	-	**[T18-282]** Proposal to limit helicopter flights for one month during peak caribou hunting season - flights are already restricted during June to August for spectacled eider. With this imposition, COP would virtually be prevented from conducting required biological and fish monitoring studies.
CPAI	Appendix L: A.2.1.1		4	4	**[T18-283]** The reference in the last sentence to the intensity and degree if impacts being greater than previously anticipated is unsupported. Appendix 2 contains important information and recommendations for improving the analysis of subsistence impacts. Also, per ANILCA definitions, the development will yield easier access to subsistence use areas, not decrease access. The only decreased accesses are the footprints of the roads and pads themselves, which is very small. Hunter avoidance is a personal choice not a mandated changes. Regardless of whether a hunter chooses to not hunt someplace, that does not diminish his opportunity to do so. Therefore hunter avoidance would not be a valid factor under ANILCA. If the majority of the findings for birds, fish, terrestrial mammals, and vegetation were minor, then how can then availability of these resources be substantially reduced?
CPAI	Appendix L: A.2.1.1		5	3	**[T18-284]** The discussion of potential loss of subsistence culture is abstract, speculative, and represents a worst-case analysis. This issue is discussed more fully in Appendix 2.
CPAI	Appendix L: A.2.1.4	-	7	2	**[T18-285]** "... while concurrently increasing competition among hunter who attempt to use the area..." Per BLM IM AK-2011-008 Appendix 6: The definition for Competition for harvestable resources only refers to increased competition from oilfield workers or outsiders using roads to the oil fields. Competition from other subsistence hunters from Nuiqsut is not a valid argument for significant restriction.
CPAI	Appendix L: A.2	-	3	7	**[T18-286]** Per BLM IM AK-2011-008 appendix 6: The reviewer is tasked to assess the significance of the impact for the following factors: Magnitude, duration, extent, likelihood of occurrence, and intensity. However there is no standard definition of these contexts. These should be defined for this analysis and then carried through to the EIS. See Appendix 2 for recommendation criteria and thresholds for distinguishing levels of impact. The comments in Appendix 2 should be applied to the ANILCA section 810 analysis.

Name	Section	Unnumbered subsection	Page	Paragraph	Comment
CPAI	Appendix L: A.1	-	2	-	**[T18-287]** Per BLM IM AK-2011-008, it is stated, "A proposed action and/or alternatives would be considered to significantly restrict subsistence uses if... it can be expected to result in a substantial reduction in the OPPORTUNITY to continue subsistence uses of renewable resources." In Appendix L, The word opportunity is not included in this section. It does not appear that the opportunity was evaluated in this document.

Comments on GMT1 DSEIS
APPENDIX 7

GMT1 Design Basis Criteria

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Comments on GMT1 DSEIS

Appendix 7

GMT1 Design Basis Criteria

List of Tables

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Aircraft Tables

2019 and Beyond Routine Alternative D Operations (to occur once construction and drilling are complete)

		January	February	March	April	May	June	July	August	September	October	November	December
Alternative D[2]	Flights for Operations Personnel at GMT1 (Otter/Casa)	4	4	4	4	20	20	20	20	20	20	20	20
	Construction to Alpine (Otter/Casa)	0	0	0	0	0	0	0	0	0	0	0	0
	Drilling (Otter/Casa)	0	0	0	0	0	0	0	0	0	0	0	0
	Operations Cargo (DC-6)	3	3	3	3	3	3	3	3	3	3	3	3
	Construction Cargo (DC-6)	0	0	0	0	0	0	0	0	0	0	0	0
	Drilling Cargo (DC-6)	0	0	0	0	0	0	0	0	0	0	0	0
	Large Cargo (C130)	0	0	0	0	0	0	0	0	0	0	0	0
	Pipeline Inspection Overflights (Otter/Casa)	4	4	4	5	4	4	5	4	4	5	4	5
	Flights to GMT1 for gravel working crew (Helicopter)	0	0	0	0	0	0	0	0	0	0	0	0
	Flights for Special Studies (Helicopter)	0	0	0	0	66	104	21	34	24	0	0	0
	Total New	11	11	11	12	93	131	49	61	27	28	27	28
	Total Including Baseline	159	141	200	208	332	535	553	324	313	247	246	228

[1]A, B and C (above current baseline): Alternative A drilling needs will be handled by flights that are already part of the ongoing operations. No additional flights are anticipated. Under Alternative A once construction of the GMT1 road and pad are complete there will be no need for routine additional fixed wing flights as operation and maintenance will be handled by staff at the existing Alpine Facility (CD1) who will travel by road. The planned order of construction is ice roads, bridges, and gravel roads January-May 2016. Gravel, CD5 Pad, and ACF work will occur during the summer season of 2016. Ice roads, pipelines, GMT1 pad, and VSM work winter will occur from January-May 2017. GMT1 modules, pipe rack, pipeline hydro-test, and tie-ins summer and possibly into fall 2017. Drilling and well tie-ins fall of season 2017. Special Studies above the baseline are primarily in support of environmental studies and surveying. Helicopter visits to spill response equipment related to the GMT1 development have been estimated and included in these values.

[2]Alternative D: First winter (2016), no runway or camp at GMT1. Construction crews will stage out of Nuiqsut Hotel, Nuiqsut 10-Acre, and Alpine. Construction Otter/Casa flights during the winter of 2016 will land at Alpine. May to October 2016, 2 helicopter flights a day for small gravel-working crew at GMT1- no GMT1 camp or runway availability. 2nd summer (2017) - GMT1 facilities install contractors working from GMT1 camp. Some personnel, cargo, and seasonal drilling flights would continue, beyond these dates, throughout the life of the project. Special Studies studies will peak during breakup (May & June). All of the special studies will be conducted using helicopter in the absence of a road. Helicopter visits to spill response equipment related to the GMT1 development have been estimated and included in these values. Pipeline Inspection Overflights (Otter/Casa) flights during facility operations are estimated at a frequency of once per week. If regulations dictate a different inspection frequency then these number could signficantly change. Pipeline overflights by fixedwing would be replaced by road-based inspections for Alternatives A, B, and C.

[3]Current (baseline): Otter/Casa flight counts are monthly averages from the years 2011-2013. DC-6 flight numbers may vary by month but are equally distributed based on the expected number of annual flights for estimation purposes. Special Studies includes biological and hydrological. Hydrological studies peak during breakup (May & June), biological studies remain constant. Helicopter visits to spill response equipment related to the CD5 development have been estimated and included in these values.

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Table 1: GMT1 Estimated Flight Needs by Alternative

Current Routine Flights into Alpine per Month (Baseline)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Other/Cargo	119	170	159	169	175	173	179	167	170	193	199	179
DC 6	30	30	30	30	30	30	30	30	30	30	30	30
Flights for Special Studies (Helicopter Landings in the RPP Alt)	0	0	0	0	34	196	295	46	86	0	0	0
Total	148	200	189	199	239	399	504	243	286	223	229	209

* Other/Cargo flight counts are monthly averages for the years 2011-2013

* DC 6 flight numbers may vary by month but are equally distributed based on the projected number of annual flights for estimation purposes.

* Special Studies - refers to biological and hydrological. Hydrological studies occur during breakup (May & June); biological studies remain constant. Helicopter visits to spill response equipment related to the CDS development have been estimated and included in these values.

Flights required, in addition to the current baseline, for Alternatives A, B, and C-Gravel Road Access

	Jan 16	Feb 16	Mar 16	Apr 16	May 16	Jun 16	Jul 16	Aug 16	Sep 16	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
Operations/Other/Fuel	5	10	10	10	10	15	15	10	10	10	10	10	5	5	5	5	10	0	10	10	10	10	5	5
Pipeline Inspection Overflights (Other/Fuel)	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flights for Special Studies (Helicopter Landings in the RPP Alt)	0	0	0	0	134	145	52	71	12	0	0	0	0	0	0	0	134	145	52	21	12	0	0	0
Total	5	10	10	10	144	150	67	81	22	10	10	10	5	5	5	5	144	155	62	31	22	10	5	5
Total New Construction Flights	153	185	180	205	287	324	277	243	308	233	239	219	153	153	153	153	292	303	232	252	233	223	234	214
Total Operations Flights	153	185	180	205	287	324	277	243	308	233	239	219	153	153	153	153	292	303	232	252	233	223	234	214

* Alternative A drilling wells will be handled by flights that are already part of the ongoing operations. No additional flights are anticipated.

* Under Alternative A, once construction of the GMT1 road and pad are complete there will be no need for routine additional fixed wing flights as operations and maintenance will be handled by staff at the existing Alpine Facility (CD1) and will access by road.

* The planned number of construction ice roads, bridges, and gravel roads (January-May 2016, Grave, CD5 Pad, and ACR work will occur during the summer season of 2016, ice roads, activities, GMT1 pad, and WAR work will occur between January-May 2017. GMT1 modules, associated, pipeline hydrotest and drilling, summer and possibly winter 2017. Drilling and commissioning of season 2017.

* Special Studies shows the baseline program in support of environmental studies and surveying. Helicopter use to spill response equipment related to the GMT1 development have been estimated and included in these values.

Alt A,B,C-Typical Routine Operations Only - Year

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	0	1	0	1	0	1	0	1	0
0	0	0	0	4	44	22	16	24	0	0	0
1	0	1	0	5	44	23	16	25	0	1	0
154	141	155	150	154	144	154	148	154	154	151	154

Alt D Typical Routine Operations Only - Year

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4	4	4	4	20	20	20	20	20	20	20	20
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
4	4	4	4	4	4	4	4	4	4	4	4
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	66	154	77	74	74	0	0	0
13	13	13	13	69	161	93	95	97	24	27	28
0	0	0	0	0	0	0	0	0	0	0	0
7	7	7	7	23	23	23	23	23	23	23	23
154	141	155	154	154	144	154	148	154	154	151	154

* Drill and Complete (D&C) Phase Flights during Alpine operations will begin in the Alpine Satellite Development Plan, Volumes 2A Alpha, and A Alpha.

* Construction Other/Fuel flights during the winter of 2016 will land at Alpine.

* May to October 2016, 2 helicopter flights a day for small gravel mining crew at GMT1; no GMT1 camp or runway available.

* 2nd winter (2017): GMT1 facilities under construction working from GMT1 camp.

* Some personnel, cargo, and heavier drilling flights would continue, beyond these dates, throughout the life of the project (see Typical Routine Operations table).

* Wildlife studies will occur during breakup (May & June). All of the special studies will be conducted using helicopter in the absence of a road. Helicopter visits to spill response equipment related to the GMT1 development have been estimated and included in these values.

* Pipeline Inspection Overflights (Other/Fuel) flights during facility operations are estimated at a frequency of once per week. If regulations dictate a different inspection frequency then these number could significantly change. Pipeline overflights by helicopter would be replaced by road-based inspections by Alternatives A, B, and C.

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GMT1 Aircraft Transportation Plan
Revision 1-March 26, 2014
DRAFT

This transportation plan was drafted in order to quantify levels of aircraft activity, and to establish how operations will be conducted. As the GMT1 Development Project is still in the early stages of planning the use of assumptions and estimations were necessary to begin formulation of this plan. As project specifics emerge, this plan will need to be updated continually until construction and facility operation begin to reflect changes in the scope of work, concerns of the stakeholders, or other arising factors.

Flights Required for Construction

Construction is scheduled to occur during the winters of Jan-May 2016 and 2017. Although the proposed GMT1 Development Project would not include an airstrip, construction activities will include some increase in air traffic; predominately work crew transportation to CD1/ACF. Some materials and equipment may also be transported to CD1/ACF by air. Detailed flight estimates are shown on Table 1. Aircraft would maintain elevations of 1,000 ft. or more except during takeoff and touchdown (within 3.6 miles of the airstrip). Flight paths would depend upon prevailing winds, but would generally align with the airstrip orientation.

Flights Required for Drilling

Drilling is scheduled to occur in 2017. During drilling activities at GMT-1 it is anticipated that there will be no need for routine additional fixed wing flights since drilling needs will be handled by flights that are already part of the ongoing operations at Alpine.

Flights Required for Operations

Once construction is complete, and the facility is transitioned to production, routine flights will not be necessary since the core Alpine personnel will handle the day-to-day operations and road access will be available from the main camp, CD1. Some helicopter flights will be required for special studies and staging/maintenance of spill response equipment.

Flights for Special Studies

The GMT1 development will require some additional environmental study and monitoring flights, the majority of which will be in support of hydrological assessments associated with the gravel roads and water use in the area. During the summer months helicopter flights will occur daily, likely originating and terminating at the Alpine facility, utilizing multiple landings and takeoffs. Values in Table 1 reflect

estimated landings and takeoffs that will occur in the NPR-A. All such flights will comply with the General Aircraft Requirements in the NPR-A discussed below.

Aircraft Support for Construction, Drilling, and Operation of a Roadless Facility

If GMT1 was developed as a roadless facility it would have a different level of facility and personnel requirements dependent upon aircraft support. Critical spares, materials inventory, and a resident workforce would need to be flown in year-round with the exception of what could be brought via a winter iceroad. An estimate of fixed wing and helicopter flights required for this scenario is included in Table 1.

General Aircraft Requirements in the NPR-A

If GMT1 were developed as a roadless facility a runway would be constructed on site, and would bring increased air traffic into the National Petroleum Reserve-Alaska (NPR-A). CPAI has operated aircraft in the NPRA for many years in support of their environmental studies and surveys. All aircraft and pilots are required to adhere to the following stipulations as identified in BLM's Final EIS/IAP and reiterated in the annual permits obtained by CPAI:

- Aircraft shall maintain an altitude of at least 1,500 feet above ground level when within 1/2 mile of cliffs identified as raptor nesting sites from April 15 through August 15 and an altitude of at least 1,500 feet above ground level when within 1/2 mile of known gyrfalcon next sites from March 15 to August 15, unless doing so would endanger human life or violate safe flying practices. Permittees shall obtain information from the BLM necessary to plan flight routes when routes may go near falcon nests.
- Aircraft shall maintain an altitude of at least 1,000 feet above ground level (except for takeoffs and landings) over caribou winter ranges from December 1 through May 1, unless doing so would endanger human life or violate safe flying practices. Caribou wintering areas will be defined annually by the authorized officer. The BLM will consult directly with the Alaska Department of Fish and Game in annually defining caribou winter ranges.
- Use of aircraft, especially rotary wing aircraft, near known subsistence camps and cabins or during sensitive subsistence hunting periods (spring goose hunting and fall caribou/moose hunting) should be kept to a minimum.
    - CPAI has developed robust helicopter protocols and communication with the village of Nuiqsut to minimize conflict with subsistence activities.
- Aircraft used for permitted activities shall maintain an altitude of at least 2,000 feet above ground level (except for takeoffs and landings) over the Teshekpuk Lake Caribou Habitat Area from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices. Aircraft use (including fixed wing and helicopter) by oil and gas lessees in the Goose Molting Area should be minimized from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices.
- Aircraft used for permitted activities shall maintain an altitude of at least 2,000 feet above ground level (except for takeoffs and landings) over the Utukok River Uplands Special Area from May 20 through August 20, unless doing so would endanger human life or violate safe flying practices.

- Hazing of wildlife by aircraft is prohibited. Pursuit of running wildlife is hazing. If wildlife begins to run as an aircraft approaches, the aircraft is too close and must break away.
- Fixed wing aircraft used as part of a BLM-authorized activity along the coast shall maintain minimum altitude of 2,000 feet when within a 1/2-mile of walrus haulouts unless doing so would endanger human life or violate safe flying practices. Helicopters used as part of a BLM-authorized activity along the coast shall maintain minimum altitude of 3,000 feet and a 1-mile buffer from walrus haulouts, unless doing so would endanger human life or violate safe flying practices.
- Aircraft used as part of a BLM-authorized activity along the coast and shore fast ice zone shall maintain minimum altitude of 3,000 feet when within 1 mile from aggregations of seals, unless doing so would endanger human life or violate safe flying practices.
- Include information for aircraft personnel concerning subsistence activities and areas/seasons that are particularly sensitive to disturbance by low-flying aircraft. Of special concern is aircraft use near traditional subsistence cabins and campsites, flights during spring goose hunting and fall caribou and moose hunting seasons, and flights near North Slope communities.

Table 2.4-2. Water Use for the Project Alternatives

Alternative	Year	Ice Roads (mi)	Construction Estimate (Million Gallons)					
			Ice Roads*	Ice Pads	Const. Misc.	Workforce a:Alpine b:Remote Camp	Summer Construction Workforce	Construction Total
A	1	22.0	33.0	32.5	1	a: 3.6		70.1
	2	26.0	39.0	13.8	1	a: 3.6	a:1.35	58.7
B	1	26	39	32.5	1	a: 3.6		76.1
	2	27	40.5	13.8	1	a: 3.6	a:1.35	60.3
C	1	31	46.5	32.5	1	a: 3.6		83.6
	2	20	30	13.8	1	a: 3.6	a:1.35	49.8
D	1	20.0	30.0	22.5	1	a: 3.6		57.1
	2	36	54	12.5	1	a:4.4	b:1.85	73.8

Alternative	Year	Drilling Estimate (Million Gallons)					Construction and Drilling Totals (MG)	Alternative SubTotal, Construction and Drilling Years 1-6
		Drilling: Ice Road, Bridge and Pad	Drill Water plus Rig Camp	Drilling Misc.	Drilling Years	Drilling Total per Year		
A	1						70.1	292.8
	2						58.7	
	3-6	24	16	1.0	4	41	164	
B	1						76.1	300.4
	2						60.3	
	3-6	24	16	1.0	4	41	164	
C	1						83.6	297.4
	2						49.8	
	3-6	24	16	1.0	4	41	164	

D	1						57.1	302.1
	2						73.8	
	3-6	24	17.8	1.0	4	42.8	171.2	

ALTERNATIVE	Annual Ops Water Use (Million Gallons)					Annual Totals (mg)	Operations 30-Year Total
	Ice Road, Bridge and Pads/Misc	Pipeline Inspection (ice road access)	Camp Support	Ops Years	Ops Total per Year		
Alt A – Year 1-4 starting 2017	0.5			4	0.5	2	15 MG
Alt A – Year 5-30	0.5			26	0.5	13	
Alt B – Year 1-4 starting 2017	0.5			4	0.5	2	15 MG
Alt B – Year 5-30	0.5			26	0.5	2	
Alt C – Year 1-4 starting 2017	0.5			4	0.5	164	15 MG
Alt C – Year 5-30	0.5			26	0.5		
Alt D – Year 1-4 starting 2017	2.5	2.4	0.9	4	5.8	23.2	694 MG
Alt D – Year 5-30	22.5	2.4	0.9	26	25.8	670	

For Alternative D, years 7 to 30 of the Operations period – an ice road is required to allow drilling and provide

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GMT1 Pipeline Route Lengths

	Alt A	Alt B -Road Tie-in **	Alt B - DS Tie-in	Alt C	Alt D
Production, MI, GI	8.4	8	9	8.4	8.4
Water Injection (WI)	18	17.6	18.6	18	18
Lake water and diesel	--	--	--	--	18
** estimated from Draft SEIS Figure 2.5-1 using legend scale and route depiction					

Table 4.1-1 MAJOR PROJECT COMPONENTS OF THE ACTION ALTERNATIVES

Component	Alternative A Proposed Project	Alternative B Avoid Fish Creek Setback (Road Tie-in)	Alternative C Alternative Access (via Nuiqsut)	Alternative D Limited Access
Drill Pad	11.8 acre	11.8 acre	11.8 acre	15.7 acre
Road (GMT1 to CD5)	7.8 miles; 60 acre	8.6 miles; 66.1 acre	7.8 miles; 60 acre	0
Additional road acccess to Nuiqsut	0	0	9 acres: 5.8 miles (Nuiqsut Spur Road upgrade plus ~1 mile Dump Road upgrade)	0
Bridge(s)	2 (Tingmiaqsiugvik R. and Crea Creek)	1 (Tingmiaqsiugvik R.)	2 (Tingmiaqsiugvik R. and Crea Creek)	0
Pipeline System GMT1 to CD5	8.4 miles	8 miles	8.4 miles	8.4 miles
Water Injection Pipeline CD1 to GMT1	18 miles	17.6 miles	18 miles	18 miles (also for Drill Site water and diesel supply line)
Ancillary Pads (2), east and west	East and west valve pads = 0.7 acres	East and west valve pads = 0.7 acres + 0.7 acre (CD5 tie in pad) = 1.4 acre	East and west valve pads = 0.7 acres	East and west valve pads = 0.7 acres
Air Access Facilities	0	0	9.0 acre Airport Upgrades (1.2 mile Nuiqsut airport access road plus Nuiqsut airport upgrades 500-foot runway extension/taxiway apron/logistics pad)	46.4 acre (Airstrip and apron) + 9.6 acre (1.2 mile airport access road) + 14.9 acre (occupied pad) = 70.9 acre
Ice Roads	22 miles - Year 1 26 miles - Year 2	26 miles - Year 1 27 miles - Year 2	31 miles - Year 1 20 miles - Year 2	20 miles - Year 1 36 miles - Year 2 12 miles - Years 3-30
Total Fill	625,500 cubic yards	682,000 cubic yards	859,700 cubic yards	845,600 cubic yards
Total Gravel Footprint	72.5 acres	79.3 acres	97.5 acres	87.3 acres
Total mine area	18.7 acres	19.8 acres	25.0 acres	24.5 acres
TOTAL FOOTPRINT	91.2 acres	99.1 acres	122.5 acres	111.8 acres

Original Notes, still valid:

1) Pipelines: Produced fluids pipeline, miscible injectant (MI) pipeline, injection water pipeline, lean gas pipeline, and messenger cable, and space for 24-inch future pipeline. In all alternatives, the 14" injection water pipeline extends 3.3 miles from CD1 to CD4N on new VSMs and 6.1 miles from CD4N to CD5 on existing VSMs.

2) Alternative C and D included additional facilities required for access by air (e.g. airstrip; airstrip improvements; ancillary pads).

3) Mine site use may vary with alternative gravel demand, as required (i.e. Clover, ASRC, or both). Proposed yield from an 18.7 acre Clover site is 626,000 cubic yards of gravel. Estimated yield from ASRC Mine Site, based on estimates of gravel within the permitted footprint, indicate that approximately 34,500 cubic yards of gravel will impact 1 acre of surface area.

4) Same pipelines for Alternative D and the other pipelines, with an additional 2-in diesel line and 2-in waterline from CD1 to GMT1 drillsite.

New Note:

Alternative B pipeline length estimated from Draft SEIS Figure 2.5-1 using legend scale and route depiction

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Project: GMT1
Document Title: Vehicle Trip Count Summary
Document Purpose: Supporting documentation for SEIS
Prepared for: Lynn DeGeorge
Prepared by: Wesley Oistad

GMT1 SEIS Option A vs. Option D Vehicle Trip Comparison

Option A: Roaded
Option D: Roadless

	OPTION A (ROADED SCENARIO) - Vehicle Trips/Season				
	Season 0	Season 1	Season 2	Season 3	TOTALS
Intercity Bus	0	3,052	5,194	1,428	9,674
Light Commercial Truck	0	17,516	19,007	8,568	45,091
Single Unit Short-Haul Truck	0	67,615	31,752	7,140	106,507
Passenger Truck	0	0	861	0	861
TOTALS	0	88,183	56,814	17,136	162,133

	OPTION D (ROADLESS SCENARIO) - Vehicle Trips/Season				
	Season 0	Season 1	Season 2	Season 3	TOTALS
Intercity Bus	0	1,512	4,746	1,764	8,022
Light Commercial Truck	0	6,428	22,963	16,852	46,243
Single Unit Short-Haul Truck	0	66,710	47,474	28,168	142,352
Passenger Truck	0	0	861	0	861
TOTALS	0	74,650	76,044	46,784	197,478

Season Zero	**Fall 2014**	**Nov 2014 - Oct 2015**
Season One	**Fall 2015**	**Nov 2015 - Oct 2016**
Season Two	**Fall 2016**	**Nov 2016 - Oct 2017**
Season Three	**Fall 2017**	**Nov 2017 - Apr 2018**

Comments on GMT1 DSEIS
APPENDIX 8

GMT1 Project Impact Area Comparison Figure

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151°30'0"W

151°0'0"W

70°2'0"N

70°10'0"N

National Petroleum Reserve - Alaska

CD1

CD2

CD4

CD5

GMT1

Clover Material Source

Colville River Unit

Kachemach Unit

ASRC Pit - Phase 2

Tofkat Unit

Nuiqsut

Greater Mooses Tooth Unit

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GMT1 Project Impact Area Comparison Figure

GMT1 Alternatives
- GMT1 Pad Alt: A,B,C,D
- Valve Pad Alt: A,B,C,D

Alt A – Proposed Project
- Pipeline
- Road

Proposed Infrastructure
CD5
- Pipeline
- Road
- Pad
- Nuiqsut Laydown Pad
- Mine Site

Alternative Project Areas
- GMT1 Project Area
- Alt A Project Area
- ASRC Project Area
- Clover Project Area

Setbacks
- Fish Creek 3 Mile
- Ublutuoch 1 Mile

Existing Infrastructure
- Road
- Pipeline
- Pad

Unit Boundary
- Unit

Land Status
- NPR-A
- State Land
- Not Conveyed
- Conveyed
- Camps and Cabins
- Native Allotment
- Private Property

0 2 4

Miles

ConocoPhillips Alaska, Inc.

April 22, 2014

Comments on GMT1 DSEIS

APPENDIX 9

Literature Cited

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Comments on GMT1 DSEIS

Appendix 9

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[T18-001]
The Final SEIS has been updated to reflect the suggested edit.

[T18-002]
The Final SEIS has been updated to reflect the suggested edit.

[T18-003]
The BLM has found that its current stipulations and BMPs will likely not be effective at reducing subsistence impacts to less than "major" for the Nuiqsut area for the GMT1 project. There are several potential mitigation measures that attempt to address these impacts, these have been provided to the applicant for their review.

[T18-004]
The 2012 NPR-A IAP/EIS was not evaluating the impacts of a specific development project, it was analyzing the impacts, NPR-A wide, of leasing alternatives. BLM has also incorporated new information and understandings gained through consultation with subsistence hunters, the NPR-A Subsistence Advisory Panel, and the Native Village of Nuiqsut into its analysis of GMT1. The subsistence section has been revised and expanded to more adequately describe these sources and justify conclusions.

[T18-005]
Text in the Final SEIS was revised to specifically mention royalties to different parties.

[T18-006]
The Final SEIS has been updated to reflect the suggested edit.

[T18-007]
The Final SEIS has been updated to reflect the suggested edit.

[T18-008]
The Final SEIS has been updated to reflect the suggested edit.

[T18-009]
BLM agrees that the Point Thompson EIS should not be included on the list of "tiered documents." The inclusion of the Point Thompson EIS has been clarified.

[T18-010]
The revised Subsistence section in the Final SEIS expands considerably on literature and data that was mentioned in the Draft SEIS to clearly support conclusions.

[T18-011]
The Final SEIS has been updated to reflect the suggested edit.

[T18-012]
The data was characterized as updated or new because it was not incorporated in the 2012 NPR-A IAP/EIS. The revised Subsistence sections in the Final SEIS explain previously unincorporated information more clearly.

[T18-013]
The new sources are described in the revised Subsistence section of the Final SEIS.

[T18-014]
The Final SEIS has been updated to reflect the suggested edit.

[T18-015]
The Final SEIS has been updated to reflect the suggested edit.

[T18-016]
CPAI, BLM, and cooperating agencies briefly discussed seasonal drilling early on in the NEPA process; however, since the issue was not raised during scoping, the discussion was dropped. NEPA directs the BLM to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources;..." (NEPA Sec102(2)(E)) Because there are potential differences in the environmental impacts of seasonal drilling, which meets the purpose and need of the project, BLM must analyze a seasonal drilling program. A seasonal drilling program was analyzed as Alternative D2.

[T18-017]
The Final SEIS has been updated to reflect the suggested edit.

[T18-018]
Gravel acreage for valve pads is combined with other pads in Table 2.3-2; this is noted in a footnote to the table. Gravel acreage for valve pads are separately identified in bullet under Section 2.5, Alternative A and in Table 2.5-1.

[T18-019]
Updated information about Alternative B was included in the Final SEIS.

[T18-020]
Updated information about pipeline lengths were included in the Final SEIS.

[T18-021]
Updated information about pipeline lengths were included in the Final SEIS.

[T18-022]
The Final SEIS has been updated to reflect the suggested edit.

[T18-023]
Comment is noted.

[T18-024]
The Final SEIS has been updated to reflect the suggested edit.

[T18-025]
The Final SEIS has been updated to reflect the suggested edit.

[T18-026]
The Final SEIS has been updated to reflect the suggested edit.

[T18-027]
Updated information about pipeline alignments were included in the Final SEIS.

[T18-028]
The Final SEIS has been updated to reflect the suggested edit.

[T18-029]
The Final SEIS has been updated to reflect the suggested edit.

[T18-030]
The Final SEIS has been updated to reflect the suggested edit.

[T18-031]
The Final SEIS has been updated to reflect the suggested edit.

[T18-032]
The Final SEIS has been updated to reflect the suggested edit.

[T18-033]
The Final SEIS has been updated to reflect the suggested edit.

[T18-034]
The Final SEIS has been updated to reflect the suggested edit.

[T18-035]
The Final SEIS has been updated to reflect the suggested edit.

[T18-036]
The Final SEIS has been updated to reflect the suggested edit.

[T18-037]
The Final SEIS has been updated to reflect the suggested edit.

[T18-038]
The Final SEIS has been updated to reflect the suggested edit.

[T18-039]
The Final SEIS has been updated to reflect the suggested edit.

[T18-040]
The Final SEIS has been updated to reflect the suggested edit.

[T18-041]
The Final SEIS has been updated to reflect the suggested edit.

[T18-042]
The Final SEIS has been updated to reflect the suggested edit.

[T18-043]
The Final SEIS includes additional information on aircraft activity.

[T18-044]
Comment is noted.

[T18-045]
The Final SEIS has been updated to reflect the suggested edit.

[T18-046]
The Final SEIS has been updated to reflect the suggested edit.

[T18-047]
The Final SEIS has been updated to reflect the suggested edit.

[T18-048]
The Final SEIS has been updated to reflect the suggested edit.

[T18-049]
The sentence referred to states that residents also use honey buckets, because, while less common now that there are water and sewage connections, honey bucket use still does occur.

[T18-050]
The Final SEIS has been updated to reflect the suggested edit.

[T18-051]
Comment is noted.

[T18-052]
BLM understands the importance of health and safety emergency response related to this project. BLM has reviewed CPAI's suggested areas for addition and has incorporated health and safety considerations where appropriate throughout the Final SEIS.

[T18-053]
This project area is based on that used for the Point Thompson EIS, which also dealt with infrastructure development in a remote area on the North Slope. Point Thomson Project Area habitat is based on the proportion of mapped habitat types extrapolated to a 375 mi2 area or the approximate area within 2.5 miles of gravel and ice components for all alternatives." (Corps 2012; p. 5-278, Table 5.10-2).

[T18-054]
The project study area is intended to evaluate all the direct and indirect impacts associated with the project. This includes increased activity at CD1, which under CPAI's proposed project and action alternatives, would be the source of support for the GMT1 project. Flights and vehicles would originate at CD1, and under the alternatives with road access to GMT1, staff would be housed at CD1 and waste trucked there for disposal. Under all action alternatives electricity for the project is being generated at CD1. Further, the ASRC mine site is included in the direct and indirect impacts analysis because of its potential use as a gravel source. Nuiqsut is included in the area due to its role in Alternative C and the increased use of its infrastructure as a result of GMT1.

[T18-055]
Naming conventions for all action Alternatives other than "CPAI's Proposed Project" have been removed from the document for the sake of simplicity for the reader. The Preferred Alternative will be identified as such in the Final SEIS.

[T18-056]
The Final SEIS has been updated to reflect the suggested edit.

[T18-057]
The Final SEIS has been updated to reflect the suggested edit.

[T18-058]
The project study area is intended to evaluate all the direct and indirect impacts associated with the project. This includes increased activity at CD1, which under CPAI's proposed project and action alternatives, would be the source of support for the GMT1 project. Flights and vehicles would originate at CD1, and under the alternatives with road access to GMT1, staff would be housed at CD1 and waste trucked there for disposal. Under all action alternatives electricity for the project is being generated at CD1. Further, the ASRC mine site is included in the direct and indirect impacts analysis because of its potential use as a gravel source. Nuiqsut is included in the area due to its role in Alternative C and the increased use of its infrastructure as a result of GMT1.

[T18-059]
The Final SEIS has been updated to reflect the suggested edit.

[T18-060]
The Final SEIS has been updated so that temperatures listed in the bullet list reflect the same statistics as those in Table 3.2-5. However, there is no value to adding the CPAI station data to Table 3.2-5; therefore, the table will not be updated. The Final SEIS text has been clarified to make it clear that there are two meteorological monitoring stations in Nuiqsut and to make it clear which data set is being used when numbers are presented.

[T18-061]
The Final SEIS has been updated to reflect the suggested edit.

[T18-062]
The Final SEIS has been updated to reflect the suggested edit.

[T18-063]
The Final SEIS has been updated to reflect the suggested edit.

[T18-064]
The Final SEIS has been updated to reflect the suggested edit.

[T18-065]
The BLM agrees with this comment. The impacts of traffic over non-frozen surfaces is described in Section 3.2.4.3, Potential Climate Change Effects in the Project Study Area.

[T18-066]
The Final SEIS has been updated to reflect the suggested edit.

[T18-067]
Scientific names for fish are provided in Table 3.3-2.

[T18-068]
The Final SEIS has been updated to reflect the suggested edit.

[T18-069]
Species other than grayling (e.g. broad whitefish, burbot, ninepsine stickleback) are mentioned, where appropriate. Section 3.3.2.2 discusses fish studies since 2004. All data from fish studies and inventories from before and after 2004 are integrated on Map 3.3-4 Fish Species Distribution.

[T18-070]
The introduction to Section 3.3.3, Birds of the Final SEIS has been revised to describe available data more effectively. A new appendix is included for the Final SEIS which contains a summary of all available avian survey records pertinent to the GMT1 project.

[T18-071]
Geographic extent of the referenced table is titled appropriately (it is the ASDP area). Additional language that references the table and its contents has been included and the status of birds has been revised, as necessary in the Final SEIS. The "occurrence" column is removed – literature to support current information in this category does not exist. The intent of occurrence is to demonstrate what the priority species are for the GMT1 area, and this is effectively done through selection of "focal species" within the Final SEIS bird discussions.

[T18-072]
Table 3.3-3 of the Final SEIS has been revised to correct bird conservation status, footnotes, coding, and source information, as necessary.

[T18-073]
Bird conservation status information for red-throated loon is revised in the Final SEIS.

[T18-074]
The Final SEIS has been updated to reflect the suggested edit.

[T18-075]
Clarification regarding conservation status listings under the USFWS and the BLM has been added to the Final SEIS.

[T18-076]
An explanation of impact zone has been added to introductory discussions of Section 3.3.3, Birds of the Final SEIS.

[T18-077]
The summary of referenced literature and data in the Final SEIS has been revised.

[T18-078]
An explanation of impact zone has been added to introductory discussions of Section 3.3.3, Birds of the Final SEIS.

[T18-079]
Discussion of Lapland longspur and available data in the Final SEIS has been revised.

[T18-080]
Section 3.3.3.2, Passerines of the Final SEIS has been revised to include population status information for the common raven.

[T18-081]
The snow goose discussion in the Final SEIS has been revised to better reflect available data.

[T18-082]
The snow goose discussion in the Final SEIS has been revised to better reflect available data.

[T18-083]
The referenced citation has been corrected and the snow goose discussion in the Final SEIS has been revised to better reflect available data.

[T18-084]
The king eider discussion in the Final SEIS has been revised to better reflect available data.

[T18-085]
The greater white-fronted goose discussion in the Final SEIS has been revised and reorganized.

[T18-086]
The greater white-fronted goose discussion in the Final SEIS has been revised and reorganized.

[T18-087]
Requested information has been added to the greater white-fronted and Canada goose discussions in the Final SEIS.

[T18-088]
Discussion of shorebirds in the Final SEIS has been revised and additional citations of shorebird habitat use added. Language to provide clarification between breeding habitat and pre-migratory staging habitat has been added.

[T18-089]
The survey year range in the Final SEIS has been corrected.

[T18-090]
Language which discusses nest observations for BCC shorebirds has been included in the Final SEIS.

[T18-091]
The Final SEIS has been updated to reflect the suggested edit.

[T18-092]
The Final SEIS has been updated to reflect the suggested edit.

[T18-093]
The Final SEIS has been updated to reflect the suggested edit.

[T18-094]
The Final SEIS has been updated to reflect the suggested edit.

[T18-095]
The Final SEIS has been updated to reflect the suggested edit.

[T18-096]
The Final SEIS has been updated to reflect the suggested edit.

[T18-097]
The Final SEIS has been updated to reflect the suggested edit.

[T18-098]
The Final SEIS has been updated to reflect the suggested edit.

[T18-099]
The discussion in the Final SEIS has been revised to better reflect available data for spectacled eiders.

[T18-100]
The discussion in the Final SEIS has been revised to better reflect available data for spectacled eiders.

[T18-101]
Yellow-billed loon information has been updated in the Final SEIS and additional information (e.g., density figures) has been included.

[T18-102]
The discussion in the Final SEIS has been revised to better reflect available data for yellow-billed loons.

[T18-103]
The Final SEIS has been updated to reflect suggested edit.

[T18-104]
Yellow-billed loon information has been updated in the Final SEIS and additional information (e.g., density figures) has been included.

[T18-105]
The Final SEIS has been updated to reflect the suggested edit.

[T18-106]
The Final SEIS has been updated to reflect the suggested edit.

[T18-107]
The Final SEIS has been updated to include the percentages of children reported in good health in the communities of Atqasuk, Anaktuvuk Pass, and Wainwright for relative comparison.

[T18-108]
Revisions to text were made to include more information from NSB 2012 Final Baseline Community Health Analysis Report.

[T18-109]
Text revised to indicate the first two bullet applicable if the development occurs within a community's subsistence harvest area.

[T18-110]
NSB reports are usually based on comprehensive surveys of every household, such as the NSB Village Profiles (URS 2005). These surveys are administered by social scientists and are designed to elicit NSB-specific data.

[T18-111]
This information is included in the revised Sociocultural Systems section (Section 4.4.2) and Economy section (Section 4.4.3).

[T18-112]
This information is included in the revised Sociocultural Systems section (Section 4.4.2) and Economy section (Section 4.4.3).

[T18-113]
The Final SEIS has been updated to reflect the suggested edit.

[T18-114]
The Final SEIS has been updated to reflect the suggested edit.

[T18-115]
The Final SEIS has been updated to reflect the suggested edit.

[T18-116]
The Final SEIS has been updated to reflect the suggested edit.

[T18-117]
Data from the annual fall fishery study were excluded from data tables because they do not represent harvests for a full calendar year (as do other harvest studies). However, it is useful to cite these reports in the text and provide estimates on the average size of the fall fishery (or the range over all study years). We agree that these data are valuable in describing subsistence uses of the project study area.

[T18-118]
The Final SEIS has been updated to reflect the suggested edit.

[T18-119]
The Final SEIS has been updated to reflect the suggested edit.

[T18-120]
The Final SEIS has been updated to reflect the suggested edit.

[T18-121]
The Final SEIS has been updated to reflect the suggested edit.

[T18-122]
The Corps has used different distances from gravel infrastructure in determining the extent of indirect impacts from the “dust shadow” effect (among other impacts), and in requiring

compensatory mitigation for those impacts. Two recent Department of the Army permits issued by the Corps pursuant to the Clean Water Act Section 404, for oil and gas projects in the same geographic area (to wit, the Colville River Delta and surrounding area), used 330 ft. for the CD5 project (Corps No. POA-2005-1576 dated 12/19/11), and 300 ft. for the Pioneer Natural Resources – Alaska, Inc. Nuna Project (Corps permit No. POA-2005-1295-M6 dated 2/26/13) in the calculation of indirect impact extents. For the Point Thomson Project, a 300 ft. distance was used (Corps permit No. POA-2001-1082-M1 dated 10/26/12). Presumably CPAI was required to perform similar watering mitigation in those projects for fugitive dust controls. EPA and USFWS suggested that this SEIS adopt a similar distance, from 300 to 330 ft.. BLM analyzed 300 feet for the extent of indirect impacts – found to be applicable in recently issued Corps permits for similar activities in similar, adjacent ecosystems. While fugitive dust mitigation measures are expected to improve the dust shadow, BLM prefers to make conservative estimates about the extent of impacts.

[T18-123]
The Final SEIS has been updated to reflect suggested edit.

[T18-124]
The Final SEIS has been updated to reflect suggested edit.

[T18-125]
The Final SEIS has been updated to reflect suggested edit.

[T18-126]
The four feet depth of water was not obtained from snowmelt but was an assumed depth of impounded water the height of the culvert (four feet).

[T18-127]
The Final SEIS has been updated to reflect suggested edit.

[T18-128]
The potential inundation for both Alternatives A and C were considered approximately equivalent because the majority of the new roadway to be constructed is the GMT1 access road which is the same for both Alternatives.

[T18-129]
BLM has revised the impacts comparison throughout the document for Alternative D (now D1) and D2 to provide a better distinction between linear fill as opposed to one large area of gravel fill.

[T18-130]
Information about the relative limitations for spill response for all alternatives has been incorporated into the appropriate sections of the Final SEIS.

[T18-131]
An assessment of oil spill risks for each alternative, including potential limitations due to adverse weather conditions when air traffic is restricted, has been included in the Final SEIS.

[T18-132]
The Final SEIS has been updated to reflect the suggested edit.

[T18-133]
The Final SEIS has been updated to reflect the suggested edit.

[T18-134]
The Final SEIS has been updated to reflect the suggested edit.

[T18-135]
The Final SEIS has been updated to reflect the suggested edit.

[T18-136]
The Final SEIS has been updated to reflect the suggested edit.

[T18-137]
The Final SEIS has been updated to reflect the suggested edit.

[T18-138]
The Final SEIS has been updated to reflect the suggested edit.

[T18-139]
The Final SEIS has been updated to reflect the suggested edit.

[T18-140]
The Final SEIS has been updated to reflect the suggested edit.

[T18-141]
The Final SEIS has been updated to reflect the suggested edit.

[T18-142]
The specific watering frequency and observations which require water application for dust suppression (or cessation of water application) will be defined in the fugitive dust control plan. The Final SEIS has been updated to reflect the suggested edit.

[T18-143]
The specific watering frequency and observations which require water application for dust suppression (or cessation of water application) will be defined in the fugitive dust control plan. The Final SEIS has been updated to reflect the suggested edit. BLM monitors for effectiveness of mitigation and stipulations, which would include ensuring CPAI fulfills its obligations under its the fugitive dust control plan to meet control efficiencies.

[T18-144]
The Final SEIS has been updated to reflect the suggested edit.

[T18-145]
The Final SEIS has been updated to reflect the suggested edit.

[T18-146]
The Final SEIS has been updated to reflect the suggested edit.

[T18-147]
The Final SEIS has been updated to reflect the suggested edit.

[T18-148]
The Final SEIS has been updated to reflect the suggested edit.

[T18-149]
BLM agrees with this comment, "significant" is a NEPA term of art. Impact criteria from Section 4.1.2 will be used.

[T18-150]
Existing text is sufficient and was not changed in the Final SEIS.

[T18-151]
The Final SEIS has been updated to reflect the suggested edit.

[T18-152]
The Final SEIS has been updated to reflect the suggested edit.

[T18-153]
The Final SEIS has been updated to reflect the suggested edit.

[T18-154]
The Final SEIS has been updated to reflect the suggested edit.

[T18-155]
The Final SEIS has been updated to reflect the suggested edit.

[T18-156]
The Final SEIS has been updated to reflect the suggested edit.

[T18-157]
The Final SEIS has been updated to reflect the suggested edit.

[T18-158]
The Final SEIS has been updated to reflect the suggested edit.

[T18-159]
The Final SEIS has been updated to reflect the suggested edit.

[T18-160]
The Final SEIS has been updated to reflect the suggested edit.

[T18-161]
The Final SEIS has been updated to reflect the suggested edit.

[T18-162]
The Final SEIS has been updated to reflect the suggested edit.

[T18-163]
The Final SEIS has been updated to reflect the suggested edit.

[T18-164]
BLM agrees with this comment: "significant" is a NEPA term of art. Impact criteria included in Section 4.1.2 is used in the Final SEIS

[T18-165]
BLM agrees with this comment: "significant" is a NEPA term of art. Impact criteria included in Section 4.1.2 is used in the Final SEIS

[T18-166]
The Final SEIS has been updated to reflect the suggested edit.

[T18-167]
The Final SEIS has been updated to reflect the suggested edit.

[T18-168]
The Final SEIS has been updated to reflect the suggested edit.

[T18-169]
The first part of the comment is accurate and the tables in the Final SEIS have been corrected. The "Magnitude" column was changed to read "Intensity". "Major", "Moderate", and "Minor" were changed to "High", "Medium", and "Low", respectively.

Regarding the second part of the comment, it is true that Alternative D emissions will be higher that all other alternatives, however, neither Table 4.2-44 nor Table 4.2-45 in the Draft SEIS show that emissions will be 7 times higher. Therefore, it is not clear where the assertion of "7 times" is coming from or if it is accurate. Regardless, since Alternative D emissions are as much as twice that of the other alternatives and impact criteria for all activities except "Operations" are worse than that of the other activities, the impact classification given to Alternative D (now Alternative D1) Operation in Table 4.2-50 was re-evaluated in the Final SEIS.

[T18-170]
The Final SEIS has been updated to reflect the suggested edit.

[T18-171]
Comment is noted. Mitigation measures which this project are already subject to - from the 2013 IAP ROD and 2004 ASDP EIS – have been incorporated into 4.2.3.2.

[T18-172]
The Final SEIS has been updated to reflect the suggested edit.

[T18-173]
BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[T18-174]
BLM agrees. The term "statewide" should be replaced with "North Slope wide", unless a particular resource does in fact affect the entire state. The regional scale seems large, but given that it includes Nuiqsut BLM feels this is an appropriate context for "regional impacts." BLM agrees that "local" should be a smaller scale and will adjust this geographic area to be the project footprint and extending 300 feet from project comments to capture dust shadow impacts.

[T18-175]
BLM agrees. The term "statewide" should be replaced with "North Slope wide", unless a particular resource does in fact affect the entire state. The regional scale seems large, but given that it includes Nuiqsut BLM feels this is an appropriate context for "regional impacts." BLM agrees that "local" should be a smaller scale, and will adjust this geographic area to be the project footprint and extending 300 feet from project comments, to capture dust shadow impacts.

[T18-176]
Information was included about the relative limitations for spill response for all alternatives in the appropriate sections.

[T18-177]
This paragraph on *Saprolegnia* has been deleted from Section 4.3.2, Fish. Information on *Saprolegnia* and the presence of it observed on broad whitefish in fall 2013 is discussed in the Subsistence section of the Final SEIS. BLM is coordinating with NSB on language to describe last year's observations with broad whitefish and what is known in general about the "water mold".

[T18-178]
The Final SEIS has been updated to reflect the suggested edit. Information was included about the relative limitations for spill response for all alternatives in the appropriate sections.

[T18-179]
The Final SEIS has been updated to reflect the suggested edit.

[T18-180]
The Final SEIS has been updated to reflect the suggested edit.

[T18-181]
Information was included about the relative limitations for spill response for all alternatives in the appropriate sections.

[T18-182]
Added language has been included in the Final SEIS to clarify the spatial extent of indirect impacts vs. the smaller spatial but greater environmental consequence of direct impacts.

[T18-183]
A discussion of hazing as a mitigation measure was added to disturbance and displacement sections of Section 4.3.3, Birds of the Final SEIS.

[T18-184]
The Final SEIS has been updated to reflect the suggested edit.

[T18-185]
The Final SEIS has been updated to reflect the suggested edit.

[T18-186]
The Final SEIS has been updated to reflect the suggested edit.

[T18-187]
The referenced table has been replaced. Edits to the survey type have been carried through to two new tables (Tables 4.3-20 and 4.3-21) in the Final SEIS which contain similar information.

[T18-188]
The referenced table was completely revised to show quantitative assessment of impacted high value habitat (such as tables 4.3-9 and 4.3-10). The table title was also updated in the Final SEIS.

[T18-189]
The Final SEIS has been updated to reflect the suggested edit.

[T18-190]
The Final SEIS has been updated to reflect the suggested edit.

[T18-191]
The revised Sociocultural Systems section (Section 4.4.2) is expanded to include a clear break down of potential impacts and explains more clearly how conclusions were reached.

[T18-192]
Social Systems discussions in Chapters 3 and 4 have been reorganized to try to address this type of issue, but it is not entirely avoidable in this type of document.

[T18-193]
The Final SEIS has been updated to reflect the suggested edit.

[T18-194]
The Final SEIS has been updated to reflect the suggested edit.

[T18-195]
The Section 4.4, Social Systems has been reorganized and the Sociocultural Systems section is considerably revised and expanded, including clearly described conclusions.

[T18-196]
The Final SEIS has been updated to reflect the suggested edit.

[T18-197]
Conclusion language for impacts on Public Health for the community of Nuiqsut, which is derived from both the BLM 2012 NPR-A IAP/EIS and from the Air Quality analysis presented in the SEIS have been added to the Public Health discussion in Section 4.4.6. In addition, a Public Health summary was added to Table 4.1-2.

[T18-198]
The Final SEIS has been updated to reflect the suggested edit.

[T18-199]
Impact criteria tables have been incorporated in the Final SEIS for all resources, where appropriate.

[T18-200]
The Final SEIS includes additional information on aircraft activity including the different alternatives.

[T18-201]
Assumption on production volumes were revised based on decline rates provided by CPAI. The Final SEIS has been updated to reflect the suggested edit.

[T18-202]
The Final SEIS has been updated to reflect the suggested edit.

[T18-203]
Text in the Final SEIS was revised to correct the royalty payment estimates. The revised estimates are based on new information on production volumes as well as a correction in the formula to reflect annual production volumes instead of daily production volumes.

[T18-204]
Text in the Final SEIS was revised to clarify capital costs. In addition to $400 million for construction of facilities, $500 million is estimated to be spent on drilling CAPEX.

[T18-205]
The Final SEIS has been updated to reflect the suggested edit.

[T18-206]
The Final SEIS has been updated to reflect the suggested edit.

[T18-207]
The Final SEIS has been updated to reflect the suggested edit.

[T18-208]
The Final SEIS has been updated to reflect the suggested edit.

[T18-209]
The Final SEIS has been updated to reflect the suggested edit.

[T18-210]
The countervailing impact of facilitated access was described in the Draft SEIS and is described in much greater detail in the Final SEIS. The many potential benefits are clear and are disclosed. These benefits do not release BLM of its obligation of disclosing, explaining, and attempting to mitigate any and all negative impacts. Other comments are also addressed in the revised Subsistence section.

[T18-211]
The section on avoidance has been revised and expanded. It acknowledges that some hunters are habituating to infrastructure and explains the ongoing issue in depth. These data were based on an 82% sample of households. Previous studies on the North Slope have systematically documented cued versus volunteered responses related to impacts. These studies have consistently shown that a higher percentage of respondents report impacts when asked a cued question rather than providing volunteered reports of impacts (SRB&A 2009).

[T18-212]
The study cited here said that 9% of households (not 9% of residents or 9% of harvesters) volunteered avoiding the Alpine area. However, that is not what the conclusion that avoidance will be the primary impact is taken from. Input from subsistence hunters and researchers on the avoidance effect has been continuous and strong. It has been corroborated by subsistence research in the Nuiqsut area. The revised Subsistence section reflects that research and those comments.

[T18-213]
There are substantial impacts associated with helicopter traffic. Helicopter traffic is expected to increase over the baseline regardless of the Alternative selected, and aircraft is already having a major impact on subsistence. The differences in impacts between the various alternatives are expanded in a much clearer and more precise discussion in the Final SEIS.

[T18-214]
In the Final SEIS, when findings of major impacts are discussed, the impact criteria are more clearly defined and explained. The countervailing impact of facilitated access was described in the Draft SEIS and is described in much greater detail in the Final SEIS. The many potential benefits are clear and are disclosed. These benefits do not release BLM of its obligation of disclosing, explaining, and attempting to mitigate any and all negative impacts.

[T18-215]
The Final SEIS includes additional information on aircraft activity including the different alternatives.

[T18-216]
For the GMT1 SEIS, the authors used the definition for cultural resources provided in USDOI, BLM (2004b). According to that document and BLM's definition of cultural resources (USDOI, BLM 2004a), cultural resources are more than just archaeological resources (e.g., ancestral houses, burials) and aspects of the built environment (e.g., cabin, trading posts). Cultural resources also include traditional cultural properties and cultural landscapes. Large-scale cultural resources such as landscapes, particularly ones that are characterized by natural resource use, are defined with generalized boundaries. Applying these type of criteria to a cultural landscape that extends beyond the project study area results in a 500 foot set back from the entire cultural landscape, which is inappropriate for a cultural resource of this type. Instead of applying these types of criteria to the Nuiqsut Cultural Landscape the authors considered the impacts on the cultural landscape within the project area, thus affecting the cultural landscape.

[T18-217]
See earlier responses of regarding the definition of cultural resources and the source of the phrase "detectable alteration." The CPAI Environmental Evalution Document language regarding intensity provided three options. Existing data indicate the development would not have a low intensity impact (Option 1: "no change in function or cultural context") nor a high intensity impact (Option 3: "consistently measurable or observable alteration"). The data do document detectable alterations in the Nuiqsut Cultural Landscape (Option 2) due to past developments.

[T18-218]
The Final SEIS has been updated to reflect the suggested edit.

[T18-219]
The Final SEIS has been updated to reflect the suggested edit.

[T18-220]
A definition of Moderate is included in Section 4.1.1, Impact Criteria in the Draft SEIS.

[T18-221]
The Final SEIS has been updated to reflect the suggested edit.

[T18-222]
The Final SEIS has been updated to reflect the suggested edit.

[T18-223]
There are currently no culverts or gravel roads in the NPR-A that would need to be removed or replaced.

[T18-224]
The differences in impacts between the various alternatives are expanded in a much clearer and more precise discussion in the Final SEIS.

[T18-225]
The Final SEIS has been updated to reflect the suggested edit.

[T18-226]
Information was included on the limitations with aircraft and ice-road only access to GMT1 and the limited capability or delayed response for emergency health and safety measures.

[T18-227]
Naming conventions for all action Alternatives other than "CPAI's Proposed Project" have been removed from the document for the sake of simplicity for the reader. The Preferred Alternative has been identified as such in the Final SEIS.

[T18-228]
The Final SEIS has been updated to reflect the suggested edit.

[T18-229]
The Final SEIS has been updated to reflect the suggested edit.

[T18-230]
Section 4.5.5, Impacts of Oil, Saltwater, and Hazardous Material Spill, Mitigation was reworded to eliminate "arctic standards" and replaced with "equipment should be designed to be effective under arctic conditions". Equipment must be fit for service in arctic conditions; BAT must be applied.

[T18-231]
BLM concurs with CPAI's statement that this is standard Arctic operations practice. This potential mitigation measure has been updated to reflect the suggested edit in the Final SEIS.

[T18-232]
Concur with CPAI's statement that this is standard Arctic operations practice. This potential mitigation measure has been updated to reflect the suggested edit in the Final SEIS.

[T18-233]
BLM understands that GMT2 is not a "connected action" under the terms of NEPA. The Final SEIS has been updated to reflect suggested edit.

[T18-234]
In Table 4.6-1 of the Final SEIS, the following addition was made to yellow-billed loon text: " U.S. Fish and Wildlife Service must make a decision on listing the Pacific walrus by October 2017 and a decision on listing the yellow-billed loon by October 2014."

[T18-235]
The discussion on geographic extent has been revised in the Final SEIS, but it includes analysis at multiple scales (e.g., GMT area and/or Harrison Bay/Lower Colville watersheds), depending on the resources being analyzed.

[T18-236]
The Final SEIS has been updated to reflect the suggested edit.

[T18-237]
The Final SEIS has been updated to reflect the suggested edit.

[T18-238]
The revised section only includes Nuiqsut in the community footprint.

[T18-239]
The Final SEIS has been updated to reflect the suggested edit.

[T18-240]
The relevant text of the Final SEIS has been edited follows: "Surface travel to the Lower Colville River Unit from the Kuparuk field is by gravel road. Ice Ice roads are used for going westward into NPR-A."

[T18-241]
The Final SEIS has been updated to reflect the suggested edit.

[T18-242]
The Final SEIS has been updated to reflect the suggested edit.

[T18-243]
The Final SEIS has been updated to reflect the suggested edit.

[T18-244]
The Final SEIS has been updated to reflect the suggested edit.

[T18-245]
The Final SEIS has been updated to reflect the suggested edit.

[T18-246]
Although the Umiat Road and Chuckchi pipeline are on hold, environmental planning action has been undertaken, so these are beyond speculative. The cumulative impacts analyses in the Final SEIS include these proposed projects.

[T18-247]
Text in the Final SEIS was revised to indicate no drilling this winter.

[T18-248]
The Final SEIS has been updated to reflect the suggested edit.

[T18-249]
The Final SEIS has been updated to reflect the suggested edit.
[T18-250]
The Final SEIS has been updated to reflect the suggested edit.

[T18-251]
The relevant text in the Final SEIS has been edited to replace "Minor" with "Minor for some individuals, Negligible at population level" for the polar bear entry.

[T18-252]
A table summarizing the impacts for all alternatives has been included in the cumulative section of the Final SEIS.

[T18-253]
A table summarizing the impacts for all alternatives has been included in the cumulative section of the Final SEIS.

[T18-254]
The Final SEIS has been updated to reflect the suggested edit.

[T18-255]
The Final SEIS has been updated to reflect the suggested edit.

[T18-256]
Comment is noted.

[T18-257]
The Final SEIS has been updated to reflect the suggested edit.

[T18-258]
Comment is noted. The citation was in the next sentence in the Draft SEIS, but has been added to the sentence in question in the Final SEIS to ensure clarity of information source.

[T18-259]
The Final SEIS has been updated to reflect the suggested edit.

[T18-260]
The Final SEIS has been updated to reflect the suggested edit.

[T18-261]
The Final SEIS has been updated to reflect the suggested edit.

[T18-262]
Comment is noted. The following additional statement has been added to each of the first two bullets the Final SEIS: "Note that this is because background concentrations are significantly higher than modeled concentrations and thus background concentrations dominate the total impact for both Alternatives."

[T18-263]
The comment is inaccurate because sulfur deposition does change between the two Alternatives, slightly, for both Class II areas. However, it is agreed that the change is insignificant. Therefore, the third bullet will be changed to: "While Alternative D deposition impacts are predicted to be slightly higher than those for Alternative A, the difference is negligible."

[T18-264]
The revised subsistence section clarifies the potential for increased access. The countervailing impact of facilitated access was described in the Draft SEIS and is described in much greater detail in the Final SEIS. The many potential benefits are clear and are disclosed. These benefits do not release BLM of its obligation of disclosing, explaining, and attempting to mitigate any and all negative impacts. Other comments are also addressed in the revised Subsistence section.

[T18-265]
The Final SEIS has been updated to reflect the suggested edit.

[T18-266]
The concept of synergy is found throughout the cumulative section of the Final SEIS in various contexts. The impacts on spectacled eiders associated with each new development are likely to be additive. However, the development process itself may involve synergies. For example, the discovery of certain types of petroleum resources and/or initial development of some types of key infrastructure can make subsequent developments more economical. As a result, new development could possibly undergo a period of nonlinear (e.g., exponential) growth.

[T18-267]
The gas pipeline is outside the geographic range and it was removed as a RFF action.

[T18-268]
The Sociocultural Systems section and Public Health section are separate sections in Chapters 3 and 4 in the Final SEIS.

[T18-269]
The countervailing impact of facilitated access was described in the Draft SEIS and is described in much greater detail in the Final SEIS. The many potential benefits are clear and are disclosed. These benefits do not release BLM of its obligation of disclosing, explaining, and attempting to mitigate any and all negative impacts. Other comments are also addressed in the revised Subsistence section.

[T18-270]
BLM's analysis, in part based on the expert evaluation done by SRB&A and after reviewing and discussing numerous other sources, is that GMT1 would have major impacts to subsistence. This means that the Environmental Justice section will also have a similar conclusion.

[T18-271]
The text was revised to: "Past, present, and RFF activities in the vicinity of GMT1, when considered together, would cause a permanent loss of wilderness characteristics."

[T18-272]
The Final SEIS has been updated to reflect the suggested edit.

[T18-273]
The Final SEIS has been updated to reflect the suggested edit.

[T18-274]
The Final SEIS has been updated to reflect the suggested edit.

[T18-275]
The Final SEIS has been updated to reflect the suggested edit.

[T18-276]
The title for the referenced figure title has been changed in the Final SEIS to reflect data displayed. Additional edits have been made to this figure as requested in other comments.

[T18-277]
The reference to Figure 3.3-7 has been removed from Section 3.3.5. The nature of a supplemental document is to communicate new data not presented previously. This is what the Final SEIS text does; however, it also provides data from previous years within the text for comparison. BLM does not agree that an explanation should be included that the primary focus of a supplemental EIS is to communicate new data. Explanation of this concept is adequately provided in Section 1.4: "This SEIS has been developed to supplement the 2004 ASDP EIS, focusing on the changes that have occurred in the interim to the project design, the affected environment, and the regulatory framework in order to provide sufficient information for BLM and other federal agencies to fulfill their NEPA responsibilities."

[T18-278]
The Final SEIS has been updated to reflect the suggested edit.

[T18-279]
The Final SEIS has been updated to reflect the suggested edit.

[T18-280]
The road to GMT-2 will be removed from figures used in the Affected Environment section of the document since it was not considered in analysis of GMT1 project. It will, however, be used in maps depicting the Cumulative impact of this project.

[T18-281]
The text within the Final SEIS communicates that spectacled eider populations only occur at low densities within the project study area (paragraph directly above Table 3.3-15). Yellow-billed loon densities occur at higher densities within and near the project study area. Higher densities within or near the project study area necessitated a visual display for population concentrations near GMT1 for yellow-billed loon. References to the 2012 EIS figures for spectacled eider is sufficient as it is in the text currently.

[T18-282]
Comment is noted.

[T18-283]
The reference is supported by new information that was not analyzed as part of previous NEPA projects in the area. It is not completely clear that access will be only facilitated by development. Access could be obstructed by the road by hunters attempting to cross it (or descend and ascend). Hunter avoidance may be construed as a personal choice but it is still considered an impact. BLM has been routinely citizen for underestimating avoidance effects by subsistence hunters. BLM will reconsider whether avoidance is a valid factor under ANILCA. Availability of resources could be reduced by displacement of resources, by avoidance, and by obstructed access.

[T18-284]
The potential loss of subsistence culture has consistently been noted as of supreme importance to North Slope Inupiat. BLM is obliged to disclose this admittedly abstract impact due to its central importance to subsistence hunters and Inupiaq culture. Language in the ANLCIA 810 is revised to more accurately describe the sources for this impact.

[T18-285]
The Final SEIS discussion of increased hunting pressure presented by local hunters accessing the same area has been reworded. BLM considers that it is a valid argument for potential impacts because subsistence hunters have discussed it as a concern.

[T18-286]
In the GMT1 Draft SEIS, BLM utilized impact criteria to determine magnitude of impact. In the Final SEIS, BLM expands on the definition of those contexts vis-à-vis subsistence and incorporates other accepted metrics to analyze impacts.

[T18-287]
The Final SEIS has been updated to reflect the suggested edit.

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April 22, 2014

Via Email: gmt1comments@slrconsulting.com

GMT1 SEIS Comments
Attn: Bridget Psarianos
222 West 7th Avenue, #13
Anchorage, AK 99513-7504

Re: Draft Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth One Development Project
Public Comment Deadline: April 22, 2014

Dear Ms. Psarianos:

The City of Nuiqsut ("City") and Kuukpik Corporation, the Alaska Native Claims Settlement Act ("ANCSA") village corporation for Nuiqsut ("Kuukpik"), submit these comments on the Draft Supplemental Environmental Impact Statement ("Draft SEIS" or "SEIS") for the proposed Greater Moose's Tooth One Development Project ("GMT1").[1]

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[1] The City of Nuiqsut is the local municipal government for Nuiqsut and represents all of the residents of Nuiqsut, both Native and non-Native. As the ANCSA village corporation for Nuiqsut, approximately 90 percent of the residents of Nuiqsut are shareholders in Kuukpik Corporation, are married to Kuukpik shareholders, or are descendants of Kuukpik shareholders (and will thus become shareholders of Kuukpik in the future through inheritance). Kuukpik is one of the largest private landowners in the NPR-A, having received title to approximately 74,000 acres of ANCSA surface estate in NPR-A.

Nuiqsut is located within NPR-A, and is the community most affected by oil development on the North Slope to date. Alpine is only 8 miles from the village of Nuiqsut and can be seen from the village, night and day. The Nanuq/CD-4 satellite pad is only four miles from Nuiqsut. By comparison, Barrow and Atkasuq are each over 130 miles away from the closest active commercial oil field. Residents from Barrow, Atkasuq and the other North Slope communities are also impacted by oil and gas development, but so far Nuiqsut's residents have borne the greatest brunt of those impacts. Likewise, Nuiqsut is also the community that will be most affected by the decisions made in response to the Final SEIS on GMT1, which is anticipated to be developed just a mere 11.5 miles from our village. GMT1 DSEIS, p. 230 The impacts of this analysis therefore hit very close to home and are critical for our organizations and the community of Nuiqsut.

I SUMMARY

The Draft SEIS is not only deficient is many respects, but is one-sided in reaching many of its conclusions. Many portions of the Draft SEIS are largely accurate as far as the literal text of specific impact discussion goes, but are inaccurate as a whole because of omitted issues, considerations, and information. The conclusions stated in many sections of the Draft SEIS are not only unsupported, but in some instances are adrift from and almost unrelated to the specific data, impact discussion, and other information in the rest of the section.

When it comes to issues specific to the Native community, the problems with the Draft SEIS are even greater. In the guise of concern and dispassionate findings over potential impacts on Native Socio-cultural Resources, Subsistence, and Environmental Justice, the Draft SEIS paints an exaggerated and almost alarmist portrait of a small and relatively benign satellite oil field development located at the edges of a sensitive area.[2] The NEPA analysis is intended to focus on reasonably probable scenarios, whereas the Draft SEIS seems more focused on worst case scenarios. Part of this distorted picture in the Draft SEIS is that the Draft SEIS downplays or ignores some very real benefits to the Inupiat people of Nuiqsut, to all Inupiat people of the North Slope of Alaska, and, indeed, to all Alaska Natives. A full and balanced discussion of both the impacts and the benefits of GMT1 is an essential part of the project evaluation under NEPA.

[19-001] The Draft SEIS repeatedly determines that the nature and degree of impacts do not vary substantially by alternative (except for the No Action Alternative). (*See, e.g.*, p. 306, 293, 315, 392) This is both inaccurate and totally contrary to the widely held views of the Native community of Nuiqsut (the "Kuupikmiut") and of the North Slope. So we have the very odd situation where the Draft SEIS makes determinations that all the construction alternatives are basically the same when it comes to the needs and concerns of Native interests and that, as far as these key Native issues are concerned, all of the construction alternatives are bad. But that is directly contrary to what the Native community itself, in Nuiqsut and across the North Slope, have determined. The City and Kuukpik think that it is the collective wisdom of the Native residents of Nuiqsut and the North Slope that is correct, and that it is the Draft SEIS that is wrong.

In evaluating Native concerns, the Draft SEIS would have it that the sky will fall for Nuiqsut and the Native community if GMT1 is built and that the impacts of this one small satellite oil field are "Major," "Long-Term," High Intensity, "Regional," and "Important." In very sharp contrast, the Native residents of Nuiqsut and the North Slope, about whom the Draft

[2] The size of a facility is often less important, of course, than where it is located and what habitat it impacts, but size is still one of many relevant factors in determining impact.

SEIS is so concerned, have testified in very high numbers that the sky is not falling and that they support Alternative A and oppose Alternative D (in spite of the Draft SEIS' repeated conclusions that the impacts of Alternatives A, B, C and D are basically the same for these Native interests). (See, e.g., p. 306, 293, 315, 392)

Kuukpik and the City are highly skeptical of the conclusions in the Draft SEIS that there will be "Major" impacts (the highest and worst category of impacts in the NEPA process) from this one small satellite oil field. Kuukpik and the City have regularly reviewed and commented on oil and gas development issues on the North Slope for some 12 years now. We've been there, and done that, and the idea that this one small satellite oil field, which is almost entirely outside of the Fish Creek buffer, will have "Major" impacts that are "High Intensity, Long Term, Regional and Important" on Native Socio-cultural Resources, Subsistence, and Environmental Justice simply will not fly.[3] We have seen and opposed past oil industry projects that fit those labels, and while this project does have impacts, those impacts simply do not arise to the level of those labels.

It is perhaps a little unconventional in a "summary" to get specific, but it is useful to look at a paradigm example of these deficiencies in the Draft SEIS at the very beginning of these comments, so that discussions of other sections that have these same problems can tier off of this initial example. The SEIS analysis of Socio-cultural Systems in Nuiqsut in Section 4.4.1 is seriously deficient and one-sided (pp. 292-295), especially in its comparison of the Alternatives. This leads the SEIS to mistakenly assign all but the No Action Alternative impact ratings of High Intensity, Long Term, Regional and Important impacts in the Summary of Impacts Table at Table 4.1-2 (p. 173).[4] Similarly, it leads to a Summary finding that the Socio-cultural impacts of all of the Alternatives (but for the No Action Alternative) overall are "Major." Id.

These findings are so divergent from the widespread testimony in support of Alternative A from the Native community in the public hearings held in Nuiqsut, Point Lay, Atqasuk, Barrow, Wainwright, Anaktuvuk Pass, Fairbanks and Anchorage that they call into question the

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[3] Almost as questionable are the equally unsubstantiated and slightly less extreme conclusions for Native Cultural Resources. See below.

[4] **[19-002]** Note that what is a "regional" impact is not clearly defined for the reader. Page 171 of the draft offers one definition, but its already vague language is rendered effectively meaningless by the caveat that the definition itself "depend[s] on the resource" under discussion. The subsistence analysis at page 306 suggests that the term means the area encompassed within "the whole of Nuiqsut's subsistence activities ("regional")..." but then goes on to discuss disruptions that would extend beyond the "project study area" to "a broader area-wide level." Id. The Final EIS should identify both the scope and the bases for all of the "regional" impact conclusions.

impartiality of the BLM process and whether the process is predisposed to a particular result.[5] Kuukpik had members of its Board of Directors attending all of those public hearings. Those directors have reported back to Kuukpik that the Native testimony in all of those communities was overwhelmingly in favor of Alternative A and that there was very little testimony in favor of any other Alternative. None of the reports from these directors indicate that there was any support expressed for the No Action Alternative. We strongly advise BLM to review those transcripts closely, as they will readily confirm this point.

The City of Nuiqsut and Kuukpik share the views of the vast majority of Natives who testified, and we support Alternative A. We see clear differences among the Alternatives and see Alternative A as having far fewer impacts on the Native community than would Alternatives C and D. In light of the support of the Native people of the North Slope for Alternative A, it is very clear that they do not share the conclusions of the Draft SEIS that all of the development alternatives would have "Major" impacts on Native interests and values. It is also very clear that North Slope Natives do not share the conclusions of the Draft SEIS that mistakenly assign all but the No Action Alternative impact ratings of High Intensity, Long Term, Region-Wide and Important impacts on specifically Native interests in Socio-cultural Resources, Subsistence, and Environmental Justice. (See the Summary of Impacts Table at Table 4.1-2 , p. 173).

[19-003] The fact that findings of these high levels of impacts to Native interests are, as far as Kuukpik and the City can tell, unprecedented in all of the Environmental Impacts Statements that have been conducted on North Slope oil projects and leasing programs (in NPR-A and on the State side) makes all the more suspicious and puzzling this wide disparity between what the Native population thinks would be good for it on the one hand, and what BLM says that Native population should think on the other hand. These types of disparities are a recurring theme in this letter because they raise suspicions that the NEPA process here is not neutral and that policies other than the best interests of Natives are influencing these analyses and conclusions on Native interests.

[5] We recognize that the studies on which the Draft SEIS sections on Native Socio-cultural Resources, Subsistence, and Environmental Justice are based is not simply a matter of polling the Native population on their opinions, but the opinions and experiences of those Natives are a very significant part of those studies. The disconnect between the analysis and conclusions in the Draft SEIS sections on Native Socio-cultural Resources, Subsistence, and Environmental Justice and the widely prevailing opinions of the populations of Nuiqsut and other Inupiat communities in the public hearings on GMT1 last month shows that the authors of the studies may be interviewing a substantially less than representative sample of the Inupiat population of Nuiqsut and these other North Slope communities for those portions of the studies that are interview-based.

[19-004] It appears patronizing, paternalistic and presumptuous for the Draft SEIS and its authors to reach conclusions about the likelihood and severity of impacts on the Native community that are so markedly different from the extensive Native testimony that BLM has gathered in the many public hearings on the Draft SEIS.[6] **[19-005]** It doesn't help that the Draft SEIS cites "new" information to justify these heightened impact finding, but doesn't explain what that new information is and similarly doesn't explain why the BLM, using most of the same "new" information in the 2012 NPR-A IAP/EIS reached very different conclusions about impacts on Nuiqsut and Native populations. The Subsistence section of the Draft SEIS states of these "new" studies that:

> Overall the types of impacts (e.g., subsistence use areas, user access, resource availability, community participation, oil spills) identified above are similar to those identified in BLM (2004) and BLM (2012). New information since these EISs including the results of CPAI's Nuiqsut Caribou Subsistence Monitoring Project (SRB&A 2010b, 2011, 2012, and 2013) and the Mineral Management Service's subsistence mapping project in Nuiqsut for the 1995-2006 time period (SRB&A 2010a) provide additional context and information that indicate the intensity of these impacts and overall degree of impact are higher than previously anticipated.

(p. 306) Just from the dates of publication alone, four out of the five "new" studies cited should have been available to the BLM during the 2012 NPR-A IAP/EIS process.

These assertions about the importance of the information from these "new" studies are obviously very important, but **[19-006]** nowhere in the Draft SEIS is there any explanation of what these new findings were, why they are significant, or of why BLM now interprets these studies differently than it did in the 2012 NPR-A IAP/EIS. This black box explanation amounts to a "Trust us" approach. That isn't the way the NEPA process is supposed to work. It especially doesn't work here, where the conclusions about what is good or bad for the Native community are so far astray from the widespread, actual sentiment in the Native community and where there are a number of indications that bias is creeping into the process.

In evaluating the conclusions that impacts on Socio-cultural Resources are Major, High Intensity, Long Term, Regional and Important, should the Native community conclude that BLM's experts with their technical degrees and field trips to North Slope communities know

[6] The fact that a small satellite oil field at the fringes of a sensitive area is the basis for these findings makes us and probably others in the North Slope Inupiat community wonder whether the fact that this development is the first on federal land in NPR-A has more to do with these findings than does any actual, objective analysis of this small satellite oil field.

more about the health and likely sensitivity of Native sociocultural health and the likely impacts of oil and gas development in Nuiqsut and on the North Slope than the large body of testifying Natives who live that subsistence lifestyle every day, have done so their entire lives, and also see the impacts of oil and gas development on themselves, their social networks, their communities, and their people every day and every time they go hunting, fishing, whaling, or sealing? The City and Kuukpik think not.

If there is any hint of agency bias or motivation going on (and even if there weren't), such findings would also be entirely contrary to the Congressional mandates of the Alaska Native Claims Settlement Act ("ANCSA"), which transferred relatively small portions of ancestral Native lands to village and regional corporations so that those corporations could choose when and how to develop those lands for the benefit of the Native peoples that those corporations represent. The fundamental policy underlying ANCSA was one of self-determination for Native communities. The mandates of ANCSA do not eliminate the requirements of NEPA, but those ANCSA mandates certainly do (and should) inform and heavily influence agency application of all of these statutory mandates and underlying agency policies.

Under those ANCSA self-determination policies, federal agencies should be deferring to Native development decisions and preferences, such as those for Alternative A, as much as possible, consistent with other statutory requirements, not presuming to tell or determining for the Native community what is good for Native Sociocultural Resources, Subsistence, and Environmental Justice.

[19-007] Significant portions of the information used in the studies that form the basis for the Native Sociocultural Resources, Subsistence, and Environmental Justice sections of the Draft SEIS are based on interview information. That being the case, for the Draft SEIS in these sections to be so far removed from prevailing sentiment in the Inupiat community in Nuiqsut and other North Slope communities, begs the question of just who the authors of these sections were talking to in Nuiqsut and elsewhere that their conclusions on the likely impacts on the Native population are so far astray from the widespread, actual sentiment in the Native community?[7]

[7] By agreement of the City, Native Village of Nuiqsut, and Kuukpik in 1995, Kuukpik has taken the lead for the community of Nuiqsut on oil and gas issues. As discussed in Section II(A) of this letter, Kuukpik has immersed itself in protecting Nuiqsut's subsistence lifestyle, resources and rights, particularly through the EIS and agency permitting process for oil projects since 2002. In light of this history, it **[19-008]** is thus very odd to Kuukpik to see the Draft SEIS cite new studies that purport to find higher intensity impacts and greater overall degrees of impact than previously understood by any prior studies (p. 306) and to find that Kuukpik has not been contacted in connection with these new studies or been provided with those studies. Kuukpik is

The deficiencies in the Draft SEIS section on Socio-cultural Systems in Nuiqsut continue on a more specific level. The text in that section is generally fairly accurate (if somewhat alarmist)—the problem lies in both areas omitted and in conclusions drawn that are not supported by that data. **[19-009]** The text of the SEIS accurately recognizes that subsistence is "central to the cultural identity and social cohesion of the community"[8] and continues, less accurately, that disruption to subsistence "may affect social and kinship ties, many of which are based on the harvesting, processing distribution and consumption of subsistence resources." [9]

aware that the Native Village of Nuiqsut ("NVN") has recently determined to comment on oil projects on its own and has withdrawn from the 1995 Resolution, but the fact that NVN also wants to participate is a reason to talk to both organizations and their members, not a reason to cut Kuukpik and its members and their hard won knowledge and expertise out of the process.

[8] Most outsiders do not understand the depth of the Inupiat people's dependence on subsistence resources, perhaps because they come to Nuiqsut and see a grocery store and think we're like rural residents of the lower 48 who depend on hunting for some of their food. The situation in Nuiqsut is radically different. Most employment in Nuiqsut is seasonal, so heads of household are working typically three months of the year on ice road work for the oil industry to make money to pay for utilities and fuel and ammunition to go hunting. But the food on our tables mostly comes from subsistence resources. This is not just a generalization: BLM's analysis states that "in 1985 and 1993, 100 percent of Nuiqsut households reported using subsistence resources…and over 90 percent of households participated in subsistence activities…." Nuiqsut's residents harvested 267,818 pounds of subsistence resources in 1993 (apparently the last year that there are numbers for the total subsistence harvest). That comes to 742 pounds of subsistence resources per person in Nuiqsut. *See*, GMT1 DSEIS' (p. 122); Alpine Satellite Development Plan Final Environmental Impact Statement ("ASDP FEIS"), p. 3-303.

[9] **[19-010]** It would be more accurate to say that disruption of subsistence "likely" or "will" affect social and kinship ties, since the sharing of subsistence harvest that is so key to Inupiat culture is far more difficult to maintain if harvests are disrupted. As the Alpine Satellite Development Project Final EIS states:

> The sharing of subsistence foods is essential to the maintenance of family ties, kinship networks and community well being. Disruption of subsistence-harvest patterns could alter these cultural values and affect community social structure. For the system of sharing to operate properly, some households must consistently produce a surplus of subsistence goods. For this reason, the supply of subsistence foods in the sharing network is more sensitive to harvest disruptions than the actual harvest and consumption of these foods by the primary producer. Thus, when disturbance to the subsistence harvest occurs, it could disrupt the community culture.

Having recognized the importance of subsistence and sharing, however, **[19-011]** this entire Sociocultural section completely omits any discussion of **THE** most important difference between GMT1 and any other oil industry development on the North Slope that has preceded GMT1—that is that due to construction of the Nuiqsut Spur Road, the GMT1 project and its road will for the first time open new and broader access to key subsistence areas and harvests in large areas that are currently either inaccessible or difficult to access through much of the year. For the first time, instead of an oil project removing subsistence-critical areas from the available harvest areas, the project offers the prospects of improved access to offset oil development by connecting the GMT1 road to the Nuiqsut Spur Road.

This aspect of the Nuiqsut Spur Road is one of the underlying realities of any new development in this part of the National Petroleum Reserve-Alaska. This isn't about analyzing the Spur Road project—it's about recognizing and considering the new reality in which a GMT1 road would operate. The Spur Road is part of the context of the GMT1 project, just as local habitat or resources are part of the context that has to be considered in evaluating the impacts of GMT1. In fact, the Draft SEIS recognized that at the time of its publication, the Nuiqsut Spur Road was "in final permitting." (p. 343) The fact that the full scope of the changes that the Spur Road will bring are not yet completely clear does not mean this new reality can be ignored in determining impacts and categorizing their importance, scope and duration. **[19-012]** Relegating any discussion of this changing subsistence access to the cumulative impacts section or failing to address it in each substantive section it affects is to arbitrarily ignore key information and reality. The analysis of Alternatives A, B, and C, for example, should indicate the different levels and types of access the proposed road offers in conjunction with the Spur Road.

Final EIS p. 4A- 615.

The ripple effect of disruptions is potentially enormous due to the number of households which depend on others for large parts of the subsistence foods they consume. Forty-four percent of the households in Nuiqsut share half or more of their subsistence harvest with other households, according to the Nuiqsut Profile subsection of the North Slope Borough's 2003 Economic Profile and Census Report. (p.33) Thirty-six percent of Nuiqsut households substantially dependent on subsistence foods get half or more of their food through sharing by other households, again according to that 2003 Census. (p. 34). Only 35 percent of Nuiqsut households substantially dependent on subsistence foods got little or none of their subsistence foods through sharing. (id.) Only 10 percent of the households in Nuiqsut would be unaffected by a decrease in sharing, and sharing is especially sensitive to harvest disruptions. (id.) The Nuiqsut Profile section of the 2003 Economic Profile and Census Report included responses from 101 out of 105 households in Nuiqsut. (Nuiqsut Profile, p.2) The adverse impact of any disruption in harvests and the corresponding disruption in sharing would fall on other North Slope Borough communities as well, since 39 percent of the respondents in Nuiqsut shared their subsistence harvest with residents of other North Slope Borough communities.

The City and Kuukpik have to ask, how did this key aspect of the project and this positive impact get left out of the Socio-cultural analysis in the Draft SEIS? All of Kuukpik's permit applications stated repeatedly that the primary purpose of the Nuiqsut Spur Road is for subsistence access and mitigation of oilfield impacts. The additional subsistence access created by the Nuiqsut Spur Road is a countervailing benefit, pure and simple. As such, the Draft SEIS is incomplete and abitrarily so in its present form. **[19-013]** The Draft SEIS should be asking questions such as what types of game harvests at what times of year will be improved by this road access? Does the improvement in access for hunting for migratory species differ from that for game that is resident year round ?[10] Answer—it certainly should because the Teshekpuk Lake Herd migrating through certainly isn't going to run short of caribou because of some extra harvests, while a fixed, purely local population might become scarcer. Does the road improve access to fishing locations and increase fish harvests? Answer—it certainly should. Does it increase the overall supply of subsistence foods in Nuiqsut? Answer—it should, but that's part of what the SEIS should be analyzing.

Without having asked these and similar questions and made an attempt to understand these countervailing benefits, the analysis in the section is fundamentally flawed, as are the Draft SEIS conclusions in Table 4.1-2 that GMT1 would create "Major" impacts and that those impacts would be of "High Intensity, Long Term, Region-Wide and Important" on Native Socio-cultural Resources. The text of the Draft SEIS itself demonstrates this point. BLM's stated goal in this SEIS is to identify and evaluate "the changes in the project, the affected environment, and regulations that might affect the determinations and decisions" associated with this project, with a specific "focus on updated or more site specific information" developed since the original Alpine Satellite EIS was finalized in 2004. (p.13) **[19-015]** The changes in access that the Spur Road will bring are clearly changes in "the affected environment" and in "site specific information." According to the Draft SEIS, the "secondary objective" is to review the information presented in the 2004 EIS and evaluate whether any changes or new information exist, and if so, to evaluate the potential effects of the project against the updated information. Again, the changed access is precisely that type of "changes or new information."[11]

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[10] **[19-014]** In the Cumulative Effects section, the analysis leaps to the conclusion that increased competition will ultimately nullify any benefits from improved access, without ever having discussed the benefits of improved access. That is yet another example of "worst case scenario" analysis rather than "reasonable probability scenario" analysis. Of course, it is also an example of ignoring all of the countervailing benefits that the GMT1 road would bring because of its connection to the Spur Road. In addition, for a migratory species such as caribou, increased competition among hunters is unlikely to have any significant impact.

[11] **[19-016]** The Draft SEIS seems unduly skeptical about whether the Spur Road will be built and uses that skepticism to avoid any real discussion of the effects of the Spur Road. (pp. 308, 309, 302)

It is true that possible improvements in subsistence access from the Spur Road and a GMT1 access road are discussed elsewhere in the Draft SEIS in the Cumulative Effects section, but only in a cursory way. In any event, that doesn't make its omission from the possible impacts in this Socio-cultural section any less critical and damaging to the value of the analysis or conclusions. The points that are made in Section 4.4.1 about possible risks and impacts are no more important than the possible increased subsistence access, and many of them are less important. There is no excuse for omitting the Spur Road's possible effects, and its omission completely discredits the conclusions drawn in Table 4.1-2 that the impacts of GMT1 are "Major" and of "High Intensity, Long Term, Region-Wide and Important" on Native Socio-cultural Resources because those impacts with the Spur Road effects included are likely very different in scope and magnitude. The underlying analysis needs to be redone, with the Spur Road's possible effects included in that analysis.

[19-017] Please also note that there is essentially no discussion in the entire Socio-cultural section, 4.4.1, of how the BLM jumps from the specific possible impacts identified in Section 4.4.1 to the conclusions drawn in Table 4.1-2. It is these conclusions that will be the key "takeaway" from the SEIS in the permitting process, yet there is a gaping hole in the Draft SEIS where there should be a discussion of how and why BLM reached these conclusions.

[19-018] Table 4.1-2's conclusion that the impacts of GMT1 are "Regional" is also unsupported. We infer that this conclusion must be based on possible reductions in subsistence harvests from GMT1 and a potential concurrent reduction in sharing subsistence foods with other communities, but this is nowhere apparent or explained.[12] It's true (as further discussed in footnote 9) that sharing subsistence harvest across communities is a key part of Inupiat culture, but recognition

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Yet, the permit applications for the Nuiqsut Spur Road were submitted in early 2013, about a year before the Draft SEIS was published. As a simple project with limited impacts, agency input indicated very early in the process that there was no question about whether the permits would be granted to construct the road—the time-consuming questions focused on how many acres of compensatory mitigation wetlands would be required. The Draft SEIS recognizes at one point only that at the time of its publication the Spur Road was "in final permitting." (p. 343) Some degree of skepticism may have been appropriate until a project is under construction, but the degree of skepticism here was excessive and apparently was used as an excuse to avoid analyzing the effects of the Spur Road on the GMT1 project. Since the Spur Road is currently under construction and the Draft SEIS is deficient already in how it addresses the effects of the Spur Road, there is no excuse for not correcting those deficiencies in the Final SEIS.

[12] **[19-019]** Increased air traffic is one type of possible impact that the SEIS discusses as occurring over a broader area, but the "region" involved would still be limited to the traditional subsistence range of Nuiqsut Native residents, not those of other communities.

of that aspect of Inupiat culture is the only factual or analytical support that we can find in the Draft SEIS for a finding in Table 4.1-2 that the impacts of GMT1 would be "Regional." If that is the only criteria for a finding of "Regional" impact, then in fact every single oil and gas project ever constructed on the North Slope or that ever will be constructed is necessarily "Regional" in its impact. The use of the finding in that fashion would render it meaningless. If it is BLM's intent that all future oil industry projects be seen as "Regional" in their impacts (and the Cumulative Impacts analysis section of the Draft SEIS offers some support for that theory), then there is a lot of litigation coming down the pike.

It is no secret that the City, Kuukpik and Nuiqsut generally thought that BLM under the Bush Administration was overly pro-development. It is with some considerable dismay that we see that BLM under the Obama Administration seems just as biased at the other extreme, against development. Nuiqsut and our organizations have always supported balanced and environmentally responsible oil development and opposed development that does not meet that standard. We have to wonder why it is that BLM can't seem to adopt an equally moderate, balanced and environmentally responsible approach while avoiding either extreme.

The difference in conclusions that a change in Administrations make is readily apparent in the different conclusions that BLM draws now from essentially the same impacts that BLM under the Bush Administration used in order to draw entirely different conclusions. For instance, the Draft SEIS notes that:

> The direct and indirect impacts to resources from the proposed GMT1 project and alternatives are similar to that described in BLM (2004)[the Final Alpine Satellite Development Project EIS]. ... There have been no substantial changes to the range of RFF projects or technologies considered by BLM in BLM (2012) that suggest that the cumulative effects of the proposed GMT1 Project and the conceptual GMT2 Project cumulative impacts to resources would now be different.

Draft SEIS, p. 349. Yet **[19-020]** the Final Alpine Satellite Development Project EIS (and the ensuing BLM Record of Decision) under the Bush Administration found that the impacts of GMT1 (then called CD-6) were within acceptable limits, whereas the Draft SEIS now effectively reaches the opposite conclusion in evaluating largely the same information. Government agencies should not be playing politics with development of Native lands, especially ANCSA lands.

The fact that the Draft SEIS frequently concludes that all four of the development alternatives (A through D) are similar in impact does not reassure us, since that would only make it easier for political appointees to use the questionable findings of "Major" impacts to the Native community that are "High Intensity, Long Term, Region-Wide and Important" to determine that the No Action Alternative should be the Preferred Alternative. As evidenced by the widespread support from the Native community in all of the public hearings for Alternative

A, the Inupiat residents of the North Slope see very clear differences between the impacts of the various Alternatives, even if BLM does not. Indeed, it is Alternative A that the vast majority of the Native community thinks will be good for North Slope Natives and, through the revenue sharing provisions of 7(i) and 7(j) of ANCSA, for all Alaska Natives.

[19-021] The bottom line is that there is quite a bit of accurate information in the SEIS analysis of Socio-cultural Systems in Nuiqsut in Section 4.4.1, but overall the section and its conclusions are both incorrect and inadequate because of these omissions, unsupported conclusions, and seeming bias.

There are many other aspects of the Draft SEIS on which we will comment in this letter as well, but the discussion of impacts on the Native community is our area of greatest expertise and will be our chief focus. Attachment 1 to this letter is a set of largely technical corrections to the Draft SEIS that are not susceptible to or do not require narrative discussion. Extensive revisions are need in the conclusions summarized in Table 4.1-2 (p. 173) and in the underlying sections that are summarized there.

We will spend less time discussing Alternative C than the other construction alternatives since it cannot be permitted because (a) ConocoPhillips has stated that it would not use the Nuiqsut airport, and (b) Alternative C cannot happen without upgrading and using the privately-owned Nuiqsut Spur Road, and Kuukpik as the owner of both the underlying land and the Spur Road has stated that it will not make the Road available or allow additional Kuukpik lands to be used to upgrade the Spur Road. For that matter, Kuukpik will not make other Kuukpik lands in Nuiqsut available for other essential Alternative C facilities because of unacceptable risks and impacts to Nuiqsut posed by Alternative C.[13]

II SUBSISTENCE

A. Subsistence and the Spur Road

Kuukpik's and the City of Nuiqsut's defenses of the Kuukpikmiut's subsistence resources, lifestyle, and culture speak for themselves. For over 12 years, we have participated extensively in each of the IAP/EIS processes for NPR-A (in 2004, 2008, and 2012) as well as in Clean Water Act and other permitting processes for oil projects on the traditional subsistence lands of the Kuukpikmiut, such as Alpine, CD-3, CD-4, the Alpine Satellite EIS, Qannik, and CD-5 (all ConocoPhillips), Oooguruk (formerly Pioneer, now owned by Caelus and Apollo

[13] For Kuukpik's statement of position on making the Spur Road available or upgrading it, see Kuukpik's letter of November 14, 2013 to Bridget Psarianos of BLM.

Global), and Nikaitchuq itself and Cross Island-related waste water discharge permits (now ENI).

In 2002, we were among the first to call for an EIS for the CD-3 and CD-4 projects. For over four years, from 2004 when the CD-5 project was first introduced with a bridge location at CD-2 that we and the community at large thought posed unacceptable risks to fish populations and other resources, we fought tooth and nail against that project through the EIS process and the subsequent permitting process, through numerous comment letters, public hearings, a petition, and many meetings. When the proposed bridge was moved, but to an equally unacceptable location, we continued the fight to defeat a project that was not balanced and environmentally responsible. After the permit applications for the unacceptable designs were withdrawn, with the input of Nuiqsut's elders we proposed and secured agreement on a CD-5 bridge location that was acceptable to the vast majority of the residents of Nuiqsut. That community support was evidenced in a public meeting with the Corps of Engineers in Nuiqsut in November 2009, when approximately 85 to 90 percent of the attendees, on a show of hands, supported the compromise bridge location. It was that Nuiqsut elder-backed bridge that was ultimately permitted as part of the CD-5 project and that is now being constructed.

The City and Kuukpik have always supported balanced and environmentally responsible oil development and opposed development that does not meet that standard. We think our credentials as careful, cautious, prudent, determined, and forceful advocates for subsistence are second to none.

Having said that, we are troubled by the analysis and conclusions on Subsistence in Section 4.4.3 of the Draft SEIS. **[19-022]** As with the Socio-cultural section discussed above, we are troubled by how much greater the Draft SEIS perceives the potential impacts of GMT1 to be than do the very people practicing a subsistence lifestyle in Nuiqsut. The public testimony at the Nuiqsut hearing was uniformly in favor of Alternative A. No one attending that hearing testified in favor of the No Action Alternative.

Just as with the Socio-cultural section discussed above, the new reality of the greater subsistence access offered by the Spur Road and the GMT1 road was not adequately addressed in the Subsistence analysis. **[19-023]** In the seven pages of information and analysis in Section 4.4.3 on Subsistence, there are all of two or three offhand sentences addressing possible effects of the Nuiqsut Spur Road. For the reasons stated above as to the Socio-cultural section, that omission fundamentally undercuts and makes invalid the entire analysis and conclusions reached in Section 4.4.3.

In an attempt to address and reduce the Avoidance effect and its impacts on subsistence, Kuukpik has invested an enormous amount of time, resources, money, and prestige in permitting

and developing the Nuiqsut Spur Road[14] and in informing the subsistence users in Nuiqsut of what the Spur Road is for and what it can do for subsistence. Greater access for subsistence has always been the primary purpose of the Nuiqsut Spur Road. Jobs and employment for the community at Alpine have always been a secondary purpose. The very limited commercial benefits to Kuukpik of the storage pad and road have been a distant and almost incidental tertiary purpose.

The Avoidance effect is about perception.[15] The Draft SEIS acknowledges that in its discussion, both in noting that the Avoidance effect causes hunters to avoid areas near facilities "even if resources are present in the area" (p. 302) and in discussing Avoidance generally (*see, e.g.*, pp. 302, 303, 304 , 305).[16] For instance, the Subsistence section, 4.4.3, includes the statement that:

[14] The partial reimbursement of Spur Road construction costs that Kuukpik negotiated with ConocoPhillips was achieved by giving up bargaining leverage and other potential benefits to Kuukpik. For an oil company, such negotiations are a "zero sum game." In other words, Kuukpik gave up a lot of other potential benefits to itself in order to secure the benefit of the Spur Road to the community. Kuukpik's willingness to sacrifice commercial profit for the benefit of the community is also shown by the free natural gas that Kuukpik secured in its negotiations with ARCO Alaksa, Inc. for Nuiqsut, a benefit which allows Nuiqsut residents to pay a flat charge of only $25 per month to heat their homes. Similarly, thanks to Kuukpik's almost single-handed efforts, Nuiqsut residents pay what are almost certainly the cheapest electric rates in the State of Alaska.

[15] **[19-024]** The Avoidance problem—subsistence users avoiding areas around oil and gas development even if it is technically not off-limits—is well-known to BLM but is not always adequately explained and almost never quantified in any useful way. The NPRA EIS/IAP, V.1, p. 400 states that: "Subsistence users' reasons for avoiding or not avoiding areas in response to oil development in the late 1980s were similar to those noted in the 1983 Institute of Social and Economic Research study and included regulatory constraints [in Prudhoe Bay], cultural prohibitions from using developed areas, lack of cultural privacy, notice or belief that a resource is contaminated, and physical obstacles and barriers such as low pipelines and steep gravel road side-slopes (Institute of Social and Economic Research 1983, Impact Assessment, Inc. 1990a)."

[16] The Draft SEIS also implicitly recognizes that Avoidance is a matter of perception when it states that "Subsistence hunters often avoid areas of development due to concerns about contamination and because of residents' discomfort with hunting near human or industrial activity." (p. 386)

> User avoidance will be most acute near the proposed drill pad and pipeline to CD5. Concerns about shooting near or toward pipelines also could cause residents to avoid hunting near the project, even if resources are present in those areas.

[19-025] These perceptions can be changed, as there is no legal or contractual reason that subsistence users cannot hunt near these facilities except for a 1,000 foot buffer around the footprint of the facilities.[17]

That this perception and the possibility of changing it are important is apparent from the Draft SEIS itself. As the SEIS states:

> User avoidance is expected to be the primary impact related to user access, as Nuiqsut residents will likely avoid the project study area, drill pad and pipeline corridor.

(P. 305).

The Nuiqsut Spur Road is in large part an attempt by Kuukpik to change perceptions in the community, to do something about Avoidance as a major side effect of development that, to date, has removed large amounts of perfectly useable land and harvestable resources from the available subsistence inventory for Nuiqsut. Government agencies try and document the problem, while Kuukpik is trying to do something about it.

In light of BLM's statement above about the importance of Avoidance, for the Draft SEIS to spend so little time and effort discussing the effects of the roads in Alternatives A, B, and C in confluence with the Nuiqsut Spur Road undercuts the validity of all of the SEIS's analysis of these Native-centric issues.

[19-026] The invalidity of BLM's present analysis in the Draft SEIS is emphasized by the fact that Native testimony at the GMT1 hearing in Nuiqsut last month was so consistently favorable to GMT1, and to Alternative A in particular. That testimony is strong evidence that Kuukpik is having success in changing the perceptions that lead to Avoidance, at least as to the GMT1 road as it is accessed through the Nuiqsut Spur Road. If the participants thought that the study area was going to be removed from use by Avoidance, it makes absolutely no sense that they would testify in support of Alternative A. And that makes sense because, for the first time an oil field facility, the GMT1 road, will be an aid to subsistence activities, rather than an obstacle. For the

[17] Kuukpik secured these rights by contract with ARCO Alaska, Inc., which is now renamed ConocoPhillips Alaska, Inc.

first time, the Kuukpikmiut can use an oil industry road for subsistence activities, rather than it simply being an obstacle that they have to go around or cross.

In light of that evidence, there is no excuse for the Final SEIS to fail to fully consider the combined effects of GMT1 roads in conjunction with the Nuiqsut Spur Road, not only in its analysis, but also in its conclusions.

B. Subsistence Impacts Comparison

Kuukpik and the City strongly disagree with much of the Subsistence section's Summary and Comparison of Alternatives. (pp. 305-306). For instance, the Draft SEIS reaches the conclusion that:

> Although there are differences between the alternatives in terms of air and ground traffic and associated effects on subsistence, the nature and overall degree of impacts on subsistence do not vary by alternative.

(p. 306) (Underlining is added) As noted above, **[19-027]** the City of Nuiqsut and Kuukpik share the views of the vast majority of Natives who testified on the Draft SEIS and who do see, contrary to the Draft SEIS, differences among the Alternatives in "the nature and overall degree of impacts." id. Our organizations support Alternative A because we see substantial differences among the alternatives and see Alternatives A and B as acceptable while C and D have unacceptable impacts.

We think the same deficiencies exist in this section of the SEIS analysis as are discussed above. Those deficiencies lead to the unsubstantiated conclusions of the Draft SEIS, conclusions that conflict with the conclusions of the Native residents of Nuiqsut and the North Slope about the likely impacts of GMT1. Again, the Draft SEIS is deficient because it does not adequately examine the combined effect of the GMT1 road and the Spur Road, which Kuukpik and the City believe will make a significant difference in both the type of impacts and in the overall degree of impacts between the three roaded alternatives and the roadless Alternative D.

Similarly deficient is the Draft SEIS' conclusion that the intensity of impacts would be High "because the impacts to subsistence use areas and user avoidance would be consistently measurable or observable." (p. 306) We're not even sure what that means, but the public testimony in Nuiqsut and the discussion of avoidance and the Spur Road above mean that that conclusion needs to be thrown out and the issue re-analyzed. The same faults exist in the section's conclusions regarding the duration of the impacts and their supposed regional character.

III ENVIRONMENTAL JUSTICE

[19-028] The Environmental Justice section, 4.4.4, does discuss the increased subsistence access offered by the Nuiqsut Spur Road in combination with the GMT1 road, which certainly confirms that the Spur Road effects are appropriate topics for analysis in these sections. However, the discussion is wholly one-sided in that it refers only to risks that could reduce the value of the Spur Road for subsistence without discussing the range of possible benefits:

> The gravel access road constructed under Alternatives A, B, and C could provide increased access for Nuiqsut residents to subsistence use areas, depending on the construction of a proposed Nuiqsut Spur Road, which would link Nuiqsut to the existing Alpine satellite road system. However, the ease of road access to the area will likely decrease the quality of the area, increase hunting competition in the area, and decrease the success rate of those who hunted there in the past.

(p. 308) That is in no way, shape, or form a neutral or balanced discussion of the possible impacts of a GMT1 road and the Spur Road—it only discusses the negatives. It certainly isn't a complete discussion, either. [18] Construction of this Spur Road connection to an Alternative A, B, or C road is not hypothetical—it is happening right now—so that can't be used as an excuse for not analyzing the effects. Note that even the Draft SEIS noted that at the time it was being written, the Spur Road was "in final permitting." (p. 343).[19]

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[18] As noted previously, we can even offer a sample of the types of issues that the Draft SEIS should be examining: The Draft SEIS should be asking questions such as what types of game harvests at what times of year will be improved by this road access? Does the improvement in access for hunting for migratory species differ from that for game that is resident year round ? Answer—it certainly should because the Teshekpuk Lake Herd migrating through certainly isn't going to run short of caribou because of some extra harvests, while a fixed, purely local population might become scarcer. Does the road improve access to fishing locations and increase fish harvests? Answer—it certainly should. Does it increase the overall supply of subsistence foods in Nuiqsut? Answer—it should, but that's part of what the SEIS should be analyzing.

[19] The omission in the Draft SEIS of the effects of the Spur Road in conjunction with the GMT1 road alternatives may possibly be partly explained by the fact that BLM was mistaken about when the Spur Road would be built. At page 343, the Draft SEIS states the time of construction as the 2014-2015 season. This mistake is inexplicable because it is stated repeatedly in the permit applications for the Spur Road (and has been repeated frequently throughout the permitting process) that the Spur Road construction is geared to occur at the same time as the ASRC mine is opened for the CD-5 construction, since that timing saves well in excess of $1 million. Now that that mistake in the Draft SEIS is corrected and the Spur Road is currently under construction, there can be no excuse for the Final SEIS to avoid discussing these effects.

So **[19-029]** the only time in these three key sections on Native interests—Native Socio-cultural Resources, Subsistence, and Environmental Justice—that the impacts of the Spur Road gets any serious discussion, the discussion is entirely negative and disparaging. The Draft SEIS's "discussion" appears to amount to an approach that "If there are benefits to the Spur Road, let's find a way to minimize them." This is a "worst case scenario" approach, while "reasonably probable scenarios" are what is required by NEPA.

[19-030] There is a passing reference later in the Environmental Justice section to access for Nuiqsut to the GMT1 road and to possible "positive and negative impacts the road would entail" (p. 309), but while the negative potential is discussed, the potential positive aspects are not. There is no excuse for this one-sided analysis, which the text of the Draft SEIS itself demonstrates where it states that:

> Environmental Justice analyses weigh the benefits of a proposed project (e.g., increased economic activity or access to improved infrastructure) on the minority community, which may offset the adverse environmental effects from construction, drilling, or operation.

(p. 310) So, the Draft SEIS states that it should explore the positive effects of the Spur Road, but in fact essentially fails to explore or discuss, let alone "weigh," those benefits. Given their relative degree of importance, the combined effects of a GMT1 road and the Spur Road should be listed among the three bullet-pointed "issues to be addressed" in the fourth paragraph of Section 4.4.4—the effects of the Spur Road are of a magnitude that requires analysis at that level.

As a result of these omissions and deficiencies, the entire Environmental Justice analysis and its conclusions are fundamentally flawed and not consistent with the standards that the Draft SEIS itself recognizes as applicable.

IV CULTURAL RESOURCES

The Cultural Resources section suffers from some of the same deficiencies as the Socio-cultural Resources, Subsistence, and Environmental Justice sections. For instance, the Summary states that "Impacts on cultural resources are similar across all sections," even though the section also acknowledges that:

> **[19-031]** [N]oise impacts may be higher under Alternative D due to the increased air traffic associated with this alternative in an area where air traffic was previously low.

(p. 314) (emphasis added) "May" be higher? This is so cautious as to be misleading. Kuukpik's analysis at Section V(C) below demonstrates, using the Draft SEIS' own figures, that in some

years Alternative D would lead to more than 2,000 additional flights per year. If GMT2 were also built roadless, which the Draft SEIS recognizes as the likeliest scenario, that number would approximately double to around 4,000 flights per year.

This dismissal of aircraft impacts in comparing the alternatives displays either acute indifference to Native concerns or a disposition to reach a predetermined result that all the action alternatives are similar. The Draft SEIS notes more than once that air traffic has risen to the top of many Nuiqsut residents' list of concerns.[20] BLM recognizes that:

> [H]elicopter and plane traffic tends to divert caribou or cause skittish behavior, resulting in reduced harvest opportunities. During interviews with Nuiqsut caribou hunters for the 2008-2011 study years, helicopter traffic was the most commonly cited impact on caribou hunting…followed by plane traffic, and human made structures.[21]

There is a major, unacceptable disconnect here between the recognition of aircraft traffic as a major issue for the Native community on the one hand, and the dismissal without discussion of the significance of that issue on the other hand when it comes to comparing the alternatives and summarizing the significant differences among them. Are the authors not listening to the Native community and to the Kuukpikmiut in particular? This is our Inupiat culture in a section discussing that culture, and we unequivocally state that the difference in noise impacts is a very, very large impact from the standpoint of the Kuukpikmiut. We do NOT see the impacts of the alternatives as similar. Alternative D is simply unacceptable as a result of its increased air traffic and the resulting impacts.

[19-032] Thus, in Table 4.1-2 on page 173, the impacts of Alternative D all need to be adjusted. They should show as "High Intensity, Long Term, Regional and Important," and the summary rating should show as "Major." A review of the testimony of last month's Nuiqsut public hearing on GMT1 and, indeed, many other public hearings in Nuiqsut on oil development over many years will confirm that the City and Kuukpik are stating views here that are very widely held in Nuiqsut.

V COMPARISON OF ALTERNATIVES

[20] GMT1 DSEIS, p. 303, 304, 305.

[21] GMT1 DSEIS, p. 303.

The City of Nuiqsut and Kuukpik Corporation think that the main choice here is not whether to build GMT1 or not, but rather whether to build a road to it or not. The secondary choice is where that road will be located. The City and Kuukpik believe that BLM's decision for the Preferred Alternative should come down to which gravel road alternative to select, A or B. Our strong preference is Alternative A, but Alternative B would be acceptable, as well.

A. Alternative A versus Alternative B

Alternative A uses the least amount of gravel, has the shortest road, the smallest footprint, and uses the least amount of water of all of the construction Alternatives. Only Alternative E, the No Action Alternative, would use less gravel, have a smaller footprint and use less water than Alternative A.

As to the differences between Alternatives A and B, the appeal of Alternative B is in the abstract: it would avoid the Fish Creek Buffer. That abstract appeal compared to Alternative A does not withstand closer scrutiny. Kuukpik and the City have always defended the Fish Creek Buffer, which was previously applied to federal lessees through BLM Stipulation 39(d), now Stipulation/Best Management Practice K-1[e]. It prohibits "Permanent oil and gas facilities, including gravel pads, roads, airstrips, and pipelines…in the streambed and adjacent to the rivers" within 3 miles of the highest watermark of the creek.[22] This setback-—the largest in NPR-A—reflects the value of the drainage for wildlife and our community.

However, the reality is that **[19-033]** the road route of Alternative B actually lies largely in lower, marshier, more valuable habitat than does the road route of Alternative A, which lies along a low ridge of higher, drier habitat. The marshier Alternative B route is more challenging to build.[23] Nearly half of the B road would be built on ice-rich thaw basin terrain, which is one of the least desirable types of terrain and ground cover for building roads on in the North Slope.[24] A road

[22] NPR-A Final ROD, 2/21/13, pp. 74-75.

[23] **[19-034]** GMT1 DSEIS, p. 43. We therefore disagree with BLM's conclusion that Alternatives A and C would have "moderate" impacts on vegetation and wetlands, whereas B and D would be "minor." GMT1 DSEIS, p. 250. It's not clear how this conclusion was reached, or why an arbitrary percentage of a type of vegetation impacted would be determinative of impacts. Healthy wetlands are far more complex than this type of analysis suggests. The path for B is much more sensitive than A, regardless of arbitrary percentages. Moreover, as will be evident below, the wetlands impacts of Alternative D are significantly greater than either A or B.

[24] GMT1 DSEIS, p. 179.

that deteriorates quickly or requires constant grading will ultimately have more impacts on surrounding wetlands due to lost fill and increased dust.[25]

[19-035] Alternative B also requires more culverts than Alternative A, which means more areas will need to be excavated during construction and more areas may suffer from restricted natural flow and drainage.[26] Even with the increased culvert system, Alternative B has a higher risk of inundation than A.[27] Increased inundation impacts vegetation and increases thermokarsting.[28]

[19-036] The ostensible advantage presented by Alternative B is eliminating some of the bridge and pipeline crossings that A will require. While recognizing the theoretical value of these differences, the bridges that would be eliminated are over waterways so small that BLM concludes that removing them offers only a "minor" benefit.[29] It's also not clear that the benefit of having the impacts occur just outside the Fish Creek buffer (in Alternative B) outweighs the value of simply decreasing those impacts overall (in Alternative A).[30]

Having flown and walked sizeable parts of the Alternative A and B routes, as well as having studied habitat mapping, we feel that in this instance the Alternative A route is superior from a habitat standpoint even though it is closer to Fish Creek and partly within the Buffer. As noted, Alternative A also uses the least amount of gravel, has the shortest road, the smallest footprint, and uses the least amount of water.

[19-037] In addition, the Draft SEIS overlooks another disadvantage of Alternative B, namely that its road and pipeline routes would require much of the pipeline and road to be built side by side

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[25] GMT1 DSEIS, p. 195.

[26] GMT1 DSEIS, p. 194, 195. Note that the DSEIS acknowledges that the culvert estimates for both proposals are likely a little low (GMT1 DSEIS, p. 191), but highlights this fact with regard to Alternative B specifically because the proposed route goes through so much thaw basin and associated wet ground. GMT1 DSEIS, p. 194, Table 4.27-t, Fn 2.

[27] GMT1 DSEIS, Figures 4.2-2 and 4.2-3; Table 4.2-6.

[28] GMT1 DSEIS, p. 186.

[29] GMT1 DSEIS, p. 195.

[30] GMT1 DSEIS, p. 194.

without the recommended 500 foot separation.[31] This would not conform to BMP E-7 for the NPRA. Putting the road and pipeline right next to each other makes it more likely that caribou will avoid the area, as they tend to shy away from a single larger unnatural feature more than two smaller ones separated by a reasonable distance. The road proposed in Alternative A would conform to this stipulation and can be expected to lessen the impacts on migrating caribou in the area.

Fundamentally, it doesn't advance the purpose of the Fish Creek Buffer to require the road to go around the Buffer. Avoiding the setback increases the overall length of the road by nearly a mile. This fact alone is enough to cause a lot of concern because that is an extra mile of fill, gravel, and disrupted wetlands that can be avoided by selecting Alternative A. More road also means more time spent driving on that road and more dust and indirect impacts.

[19-038] The Spur Road also changes the calculus between Alternatives A and B. With local residents using the Spur Road and the GMT1 roads to access Fish Creek, the GMT1 road would not be an obstacle, but a starting point for a subsistence harvest, so being closer to Fish Creek is potentially an advantage, not a problem. As noted above, Kuukpik thinks the fact that the GMT1 road can be used to access subsistence area creates a fundamental difference between the GMT1 road and any other oil industry road on the North Slope and presents an opportunity to change and reduce the impact of Avoidance and to make available habitat and resources that would otherwise be removed from the available inventory.

In spite of the overlap of Alternative A at the edge of the Fish Creek Buffer, Alternative B's proposed road would actually have more impacts on the environment and subsistence resources than Alternative A. Slight intrusions of the road into the southern edge of the Fish Creek Buffer, under all these circumstances, are acceptable. In this case, the proscriptive rule of the Fish Creek Buffer should give way, and Alternative A should be chosen over Alternative B.

B. Alternative C

[19-039] As to the other Alternatives, Alternative C offers no obvious gain (and is likely not feasible anyway, as discussed at the end of Section I above). The Draft SEIS is misleading in that it largely fails to recognize that Alternative C cannot be built and that there is therefore little point in analyzing it.

[31] GMT1 DSEIS, p. 329, BMP E-7 ("To be as effective as possible, elevated pipelines should be separated at or beyond the recommended minimum distances of 500 feet from roads (Cronin et.al., 1994). Likewise, if the pipeline is greater than 1,000 feet from the road, the benefits of co-locating the pipeline with the road are reduced.")

In our review of the Draft SEIS, the first time that there is any reference to the fact that Alternative C cannot be constructed is 167 pages into the Draft SEIS (in the "Visual Resources" section, of all places). As best we can tell, that is the first place where the Draft SEIS finally acknowledges that the Spur Road will be built on Kuukpik land.[32] Even then BLM does not acknowledge that Kuukpik stated to BLM more than three (3) months before the Draft SEIS was published that Kuukpik would not make its private land or its road available for Alternative C. Three months is more than enough time to modify the Draft SEIS to reflect this critical point. This issue should be addressed much earlier in the document, and the Final SEIS should explain in much more detail and in multiple locations these very real limitations and acknowledge the fact that Alternative C is not viable.

In addition, we think the impacts of Alternative C would be substantially greater than those of Alternatives A or B, yet the Draft SEIS once again insists the impacts are similar. The Draft SEIS states that:

> Impacts to socio-cultural systems under Alternative C are similar to those described above under Alternative A. However, the potential for interactions between Nuiqsut residents and non-local workers will likely be much higher due to the use of the community as a hub for industrial activity and resulting traffic along the upgraded Nuiqsut Spur Road.[33]

The assertion that the impacts are basically the same across alternatives is unsupported. The reality is that Nuqisut would become a major operational center under Alternative C, changing it from a quiet arctic village into a remote industrial oil and gas support center. That impact is patently substantial on multiple levels. Roads in Nuiqsut would be expanded, the airport enlarged and turned into an industrial logistics center, and oil industry equipment and supplies would be stored in Nuiqsut instead of at GMT1.[34]

BLM does not believe the Alternative C scenario would require upgrading facilities in Nuiqsut, but that seems completely unrealistic considering the amount of material and workers that would pass through Nuiqsut during all phases of construction and operation.[35] It's more

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[32] GMT1 DSEIS, p. 167. It should also be noted that the Colville River access road is not located entirely on private land, as this passage also seems to indicate. That road is on lands owned by Kuukpik as well as BLM.

[33] GMT1 DSEIS, p. 293.

[34] GMT1 DSEIS, pp. 44-45.

[35] GMT1 DSEIS, p. 44.

reasonable to expect that Nuiqsut would get more construction projects as production ramped up and the existing infrastructure proved inadequate to handle it.

C. Alternative D versus Alternatives A and B

1. Increased Air Traffic

The Draft SEIS itself acknowledges that Alternative D is the most harmful of the action-based Alternatives: "Alternative D would likely have the greatest impact to subsistence uses and activities of all of the alternatives." (p. 305) (*See, also e.g.*, pp. 304, 314, 303, 293) Alternatives A and B do have impacts, but nothing as serious as Alternative D.

A "roadless" production facility in the arctic may sound great in the abstract, but the reality is far different. The gravel footprint of Alternative D is 20% larger than Alternative A.[36] The Draft SEIS concludes that taking away the road would increase impacts on caribou and other animal resources.[37]

Again, in the abstract it might sound preferable to have one "island-style," isolated facility in order to avoid the gravel and footprint involved in an access road. But in this case, the "isolated facility" is exponentially larger than the road-connected alternative, creates unnecessary air and water pollution, requires more pipelines, yearly ice roads, and is potentially unreachable in emergency situations of personal injuries, blowouts, or accidents in the event of inclement weather.

[19-040] From a safety standpoint, a roadless facility is inaccessible in this part of NPR-A an unacceptably high percentage of the time. ConocoPhillips has at various times mentioned that air traffic is weathered out around 20 percent of the time. Kuukpik's and the City's experience is that that number is low, perhaps because ConocoPhillips is apparently counting entire days when air travel is shut down, so days of partial shutdowns are not included. Kuukpik's and the City's experience is that for 30 to 35 percent of the days in the typical year, air traffic is shut down for

[36] GMT1 DSEIS, p. 170.

[37] GMT1 DSEIS, pp. 281, 370. Elsewhere the Draft states that it is "unclear" whether the decrease in road and road traffic "would be offset by increased air traffic and the continued presence of the pipeline." GMT1 DSEIS, p. 304. Since the aircraft flights would occur basically over the same route as the pipeline (GMT1 DSEIS, p. 267), it seems unlikely that the combination of repeated flyovers and a pipeline could be any better than the combination of vehicle traffic and a pipeline, especially since the flyovers impact a far broader area than vehicle traffic even when the latter is more frequent.

at least part of a day. In an emergency situation, hours can be critical and days of partial shutdowns in air traffic is the better measure.

[19-041] For Nuiqsut, the biggest issue with Alternative D, though, is the increase in air traffic that it would bring. The impacts of Alternative D's increased air traffic on subsistence are vastly under-estimated and under-stated. Even where estimates may be somewhat accurate, much of the information is obscured or arranged in ways that appear contradictory or are difficult to compare. Until these deficiencies are corrected, the Draft SEIS fails to take a hard look at the impacts associated with the proposed road less alternative.

The SEIS notes more than once that air traffic has risen to the top of many Nuiqsut residents' list of concerns.[38] BLM recognizes that: "[H]elicopter and plane traffic tends to divert caribou or cause skittish behavior, resulting in reduced harvest opportunities. During interviews with Nuiqsut caribou hunters for the 2008-2011 study years, helicopter traffic was the most commonly cited impact on caribou hunting…followed by plane traffic, and human made structures."[39] As part of the Environmental Justice and ANILCA analysis, BLM must fully recognize such impacts, not note them and then ignore them when it comes time to reach conclusions and compare alternatives.

But instead of an in depth discussion of the impacts of air travel in the study area or a quantitative analysis of those impacts, the SEIS simply notes that local residents have "expressed concern" over the impacts of noise caused by oil and gas development.[40] This is especially frustrating because the air traffic issue is one of the key issues in this Draft SEIS. That's because as BLM notes, increasing the already high number of flights will result in "major" impacts on caribou and on the Kuukpikmiut's subsistence lifestyle.[41]

[19-042] There is no comprehensive analysis of this issue in the Draft SEIS. The flight information is for the most part so scattered throughout this Draft that it is hard to even tell what

[38] GMT1 DSEIS, p. 303, 304, 305.

[39] GMT1 DSEIS, p. 303.

[40] GMT1 DSEIS, p. 72-73. Even this is immediately followed up with a reminder that "noise emissions from fixed place facilities attenuate rapidly with distance from the facility," as if BLM wants everyone to remember that just because it's loud doesn't mean it's *that* loud. And besides, people can always move farther away from the facility, right? But as we have pointed out at length above, it's getting harder and harder to find any direction that avoids production facilities. And the airplanes and helicopters cross the entire region, so there's no avoiding those.

[41] GMT1 DSEIS, p. 306.

data is being compared. Table 2.4-3 is so overwhelmingly full of categories and details that it is basically uninformative and unuseable. Part of this problem is the way the Draft breaks down the expected flights information into specific sub-categories based on the type of plane and whether it is supporting drilling, construction, or operations activities. We understand that this type of data is probably valuable to someone, but it makes for a very cluttered comparison that is very difficult to decipher for most users of the Draft SEIS. It doesn't really matter to subsistence users or for evaluating impacts on subsistence users whether a flight is for construction or drilling purposes; what matters is how many of them will occur and when. If the breakdown is important to BLM, then there should also be a summary that presents a compilation in a more useable format by presenting monthly and yearly estimates.

The most critical long-term information is simple: what increase in flights is expected over the baseline under each alternative? The SEIS confuses the answer to this most important question by breaking down the analysis into construction, drilling and operations phases without making it clear that this distinction is taking place. **[19-043]** Early in the analysis, the narrative states that in Alternative D "No flights beyond baseline are expected to occur past 2017."[42] That is not true—flights will increase by, in some cases, hundreds of flights per month after 2017. Table 2.4-3 acknowledges this (if you can find it through the weeds of detail), but it's not immediately clear that there is any caveat to the quoted statement above. It is only 14 pages later in the "drilling and operations" section of the analysis that we see what BLM has done here—separated the "construction" flights and the "drilling and operations" flights. And there will be hundreds more flights after construction is complete. So while the statement above is technically true—that there will be no more *construction* flights after 2017 (hopefully)—it is fundamentally misleading and does not present an accurate picture of the reality because there will be many additional flights after 2017, just for a different purpose.

Misleading statements such as the one above that under Alternative D "No flights beyond baseline are expected to occur past 2017"[43] can lead to exactly the type of erroneous conclusions to which Kuukpik and the City have already objected, such as the statement elsewhere in the Draft that "the nature and overall degree of impacts on subsistence do not vary substantially by alternative."[44]

The reality is that if Alternative D is selected, BLM would be imposing the worst possible disruption on Nuiqsut: hundreds of flights per month during the summer and moderate increases year round. **[19-044]** The compilation below is a table that SHOULD appear in the Final SEIS,

[42] GMT1 DSEIS, p. 34.

[43] GMT1 DSEIS, p. 34.

[44] GMT1 DSEIS, p. 306.

as it shows the difference between the number of flights expected under Alternatives A,B, and C versus Alternative D (which would have been a most useful comparative line for Table 2.4-3):

Additional flights expected for Alternative D over Alternatives A,B, and C[45]

	J	F	M	A	M	J	J	A	S	O	N	D	Total
2016	5	-5	-5	-5	309	354	158	163	56	61	5	5	1410
2017	0	0	0	30	414	414	217	223	118	116	126	128	1590
2018	97	77	77	82	540	540	282	282	23	23	23	23	1981
2019 and beyond	7	7	7	7	540	540	282	282	23	23	23	23	1764

This chart tells the user the information that is really needed to evaluate Alternative D. And it tells the user and BLM everything needed in order to choose between these alternatives. If the roadless alternative is adopted, 1,410 more flights can be expected the following year alone, which is in addition to the nearly 3,000 flights that that constitute the baseline of existing air traffic.[46] The following year, the roadless alternative will generate 1,590 more flights, and by 2018, the number increases to nearly two thousand more flights a year under Alternative D than under any other alternative.

By contrast, under any other alternative, there will be no more additional flights by 2018 than there are now because there will be a road to absorb the traffic that Alternative D proposes to send over our heads. Additionally, **[19-045]** a road would allow some studies that currently take place by air to be conducted by road and boats. So Alternatives A, B, and C could actually reduce the number of flights from the current baseline. Alternatives A, B, or C could actually make the current situation better, versus Alternative D which would dramatically worsen the situation. Moreover, the flights to be reduced by Alternatives A, B, and C would be the highly intrusive research flights. Those are the most intrusive of all because they fly low and slow in a big grid. That flight pattern assures they get a good count of all the resources in the area, and probably gives their pilots a great view of all the animals scattering and running as far away as possible. Reducing the intrusiveness of these studies would be an unqualified benefit to everyone in Nuiqsut and would offset some of the other impacts of the GMT1 project.

Finally, although the chart stops being specific at 2019, the air traffic under Alternative D won't stop—or even slow down—five, ten or even fifteen years down the road. Instead, if Alternative D is selected we can expect about 1,764 flights related to GMT1 alone every year

[45] *See* GMT1 DSEIS, Table 2.4-3, comparing "total new" under each alternative.

[46] Id., Alternative E, 2016.

until the oil runs dry.[47] That is not an acceptable when it is so obvious that these flights can be avoided by using any of the road-based alternatives. Or at least it would be obvious if these estimates were organized in way that made them easier to compare and comprehend. The Final SEIS needs to include a chart that summarized the information in the format shown above.

[19-046] Even these estimates of the increased number of flights may be on the low side. If GMT1 drilling results are more successful than the base case that is anticipated or other reservoirs could be reached from the GMT1 pad, the drilling phase would last longer. That is precisely what happened at Alpine, where the initial oil reserves were roughly 365 million barrels, but the reservoir proved to better than expected so that present reserves are over 500 million barrels. Instead of development drilling at Alpine ending in roughly 2006, it continues to this day, almost eight years later, albeit at a reduced pace. In the event of that type of success at GMT1, more development drilling would occur and there would be a correspondingly higher number of flights than what is discussed here and which should be shown in the Draft SEIS.

[19-047] Other issues may also substantially increase the number of airplane and helicopter flights associated with Alternative D. For example, a roadless pipeline requires fly-over inspections each month during operations.[48] Are these accounted for in Table 2.4-3, or would these be additional flights right through the critical project area?

[19-048] But the single biggest factor that the Draft SEIS overlooks regarding the flight estimates is that a roadless GMT1 all but guarantees a roadless GMT2.[49] BLM appears to assume that is true as well, but this is not always clear.[50] However, considering that BLM agrees for the

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[47] *See also* GMT1 DSEIS, p. 362 for the cumulative impacts analysis of noise under all alternatives.

[48] GMT1 DSEIS, p. 42.

[49] GMT1 DSEIS, p. 35:

> It is noted that a GMT2 Project is not currently pending authorization, modification, or rejection as part of this SEIS, and that CPAI has not indicated when, or if, an application for the GMT2 development, as conceptually depicted, may be filed. BLM has determined that the conceptual GMT2 Development Project should be treated as a connected action (40 CFR 1508.25(a)(1)), not ripe for decision, but appropriate for analysis in the cumulative effects because it is reasonably foreseeable (BLM 2008c, H-1790-1, p.45).

[50] Compare GMT1 DSEIS, p. 235 and 338 (referring to a "road and pipeline systems connecting GMT2, GMT1, and CD5…."). We also recognize that GMT2 could be attached to GMT1 by a road even if GMT1 was roadless. If GMT1 were roadless, we would likely be in favor of a

purposes of the cumulative impacts analysis that GMT2 would be roadless if GMT 1 is,[51] it must take that assumption into account when analyzing the flight impacts of selecting Alternative D for GMT1. But that information is not presented in the Cumulative Effects section or anywhere else.[52] This is a critical error and presents a wholly inaccurate picture of the likely impacts of selecting Alternative D.

Selecting a roadless GMT1 likely leads to a roadless GMT2, which in turn would double the number of flights, double the footprint, double the infrastructure, and double the operating equipment associated with a roadless GMT1 alone.[53] That means within the next decade or so, the number of flights would double, on top of the number that a roadless GMT1 is expected to produce by itself.[54] That would be about 3,000 flights more than what there would be if BLM

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connecting road in order to minimize air travel between two sites located so close together, as well as for safety reasons to minimize conflicting air traffic from different air strips. However, developing both facilities as roadless is absolutely a reasonably foreseeable alternative, as BLM itself recognizes in Table 4.6-3, so there must be an analysis of that scenario.

[51] *See* GMT1 DSEIS, p. Table 4.6-3 (noting the expected material required for a gravel road between GMT1 and GMT2 if Alternative D is selected for GMT1: "None." and that ancillary access facilities including an airstrip and connecting road would use 515,000 cubic yards of gravel and have a 61.3 acre footprint).

[52] Of course the big picture cumulative impacts are not even set out in this document. Rather the document again "tiers" to this critical information in a string cite that amounts to 695 pages spread across four EIS's going back a decade. Given the amount of time it took us to get through this Supplement EIS alone, we cannot offer in depth comments on those analyses, but we did so in our previous comment letters. We assume the odds of anyone going back to find and review those letters simply because we designate them "tiered" to this letter are about the same as anyone going to review nearly 700 pages of cumulative impacts analysis that isn't even included in this document. Everyone wants to save time, but referencing 700 additional pages of analysis doesn't even begin to help anyone, including BLM, take a hard look at this project.

[53] Even those impacts that will not be doubled will increase significantly. An additional 2.5 MWe will be required to run a roadless GMT2, for example, on top of the 1 to 2 MWe that Alpine will have to generate to power a roadless GMT1. GMT1 DSEIS, p. 358; *see also* GMT1 DSEIS, p. 295 (increased air emissions anticipated under Alternative D could potentially lead to increased impacts to public health."). Only Alternative D requires this much increase in power generation. Yet the emissions resulting from this scenario were not included in the Alternative D emissions inventory. *Id.* Why not?

[54] GMT1 DSEIS, p. 362.

allows a road to be built to support GMT1. That's about an extra flight every daylight hour of every day.

More flights is the opposite of what everyone in Nuiqsut is asking for. But that is what would most likely happen if Alternative D is selected. That likely outcome should be added to the analysis under Table 4.6-3, at least, and should be highlighted earlier in the flights analysis. The amount of GMT1 flights alone is unacceptable to Nuiqsut, even without adding in the likely GMT2 flights. With the GMT2 flights properly added to the analysis, the decision becomes even more clear. The roadless alternative will cause even more completely unnecessary harm to our community than this Draft SEIS already concludes—and that is saying something.

2. Duplication of Facilities

Alternative D also requires so much duplication of facilities and extra footprint that any savings from eliminating a road is more than cancelled out. The description of the required facilities for a roadless development span pages 45-47 of the Draft SEIS. The lists includes 41 individual "facilities" that are required to conduct drilling and operations at a roadless GMT1 site. The other alternatives list fewer than about 20 similar items.

However, it is not just a difference in numbers of facilities—instead Alternative D requires an entirely different scale of facilities in order to operate separately from the rest of the Alpine infrastructure. Some of these are to allow access and long term storage: a 5,000 foot landing strip and pad space for storing up to ten months' worth of equipment, for example. Others are tanks to store large amounts of fluids: water, bulk cement, mud, mineral oil, diesel, brine, and (unidentified) "chemicals." Still others are to transport other substances all the way from Alpine: a 2 inch diesel pipeline and a separate 2 inch water line.

Crews residing at an Alternative D are also necessary to both build and run the facility. They can't go anywhere since there's no road, so they'll all have to live at GMT1. This means the facility will also need a "permanent full service operations camp", as well as sleeping quarters, kitchen and dining room, recreation, office and storage space waste, not to mention a water and wastewater treatment plant, solid waste processing, and drinking water storage. And finally, while it's using all those facilities, CPAI will have to get rid of the waste it will generate. So, roadless GMT1 would also need a class 1 disposal well and injection facility, disposal tanks, piping, and pumps, and various raw water and mud pumps.

The roadless alternative would also cause much greater impacts on the water and hydrology of the area than would Alternatives A or B. The Draft SEIS states:

> Despite the elimination of the access road which parallels the pipeline, the new gravel foot print is larger than Alternative A due to the addition of the airstrip and increase in pad size to support a remote, self-sufficient camp and drilling operation.

> In addition, the degree of ice road construction and water usage for ice road construction, drilling and camp use is greater.[55]

Ponding and artificially directed runoff will be required around the larger gravel pad, which is likely to reduce groundwater recharge in the immediate area.[56] The need for 35% more gravel under D will increase the impacts of mining the gravel.[57] And the increased travel distance required to move it all will result in both worse impacts at the gravel mine and increased risk of spillage during transport.[58]

3. Water Quality and Quantity.

Alternative D offers no water quality benefits.

As to water *quantity*, even though the Draft SEIS says that Alternative D's impacts to lake and ponds "would be of the same type" as under A, **[19-049]** the roadless alternative stands to vastly increase the intensity of those impacts because of the enormous difference in water that will be used to support Alternative D:

> [T]here would be considerably more water usage over the life of the project due to the reliance on ice roads on an annual basis during the operational phase. In addition, there is water usage in the summer months to support drilling. Water usage is over twice as much during the construction and drilling phase and 30 times greater during the operational phase.[59] (emphasis added)

These estimates beg the question of how the Draft EIS can treat thirty times the water use of the other alternatives as "similar" to the other alternatives?

These are not small quantities of water: Alternative D is estimated to require a total of about 100 million gallons during construction alone and nearly 162 million gallons during

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[55] GMT1 DSEIS, p. 196; *see also id.* pp. 194 and 197 ("Although less gravel and its associated impacts would not be dispersed along the road corridor under Alternative D, there would be a comparable amount of gravel discharged onto the tundra surface for construction of an airstrip and additional pad space for living quarters and storage.").

[56] GMT1 DSEIS, p. 196.

[57] GMT1 DSEIS, p. 197.

[58] GMT1 DSEIS, p. 197.

[59] GMT1 DSEIS, p. 197.

drilling.[60] We are not even told how much water it would require during operations, but we know that it will be at least 20-24 million more gallons than any other alternative for ice roads alone.[61] Additional water will be needed to support the facility and workers during the life of the facility. In short, the roadless alternative puts our water supply at significantly more risk than the road-based alternatives.

4. Air Quality.

Air quality is another of those areas where Alternative D has much greater impacts than all the other alternatives. Alternative A is projected to cause the least amount of impacts in part because it requires the shortest road, and therefore the least amount of driving to generate mobile source emissions.[62] Like Alternatives B and C, A requires a smaller production facility. Even that facility potentially will result in exceeding some AQS (such as NO2)[63] during construction, but at least emissions will be reduced once GMT1 moves into operations stage. The result is that no "significant" air quality impacts are expected if Alternative A, B or C is selected.[64]

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[60] GMT1 DSEIS, Table 2.4-2; *see* GMT1 DSEIS, p. 57-60 for technical analysis of hydrology. Even that figure is likely too low because at least some of BLM's data is unrealistic or contradicted by other parts of the Draft. The Draft SEIS states that about 10,000 gallons/day (enough water for 100 people) would be used in camps during construction. GMT1 DSEIS, p. 31. While the correlation is correct, construction activities would require far more than 100 people to be housed in either remote camps or at the Kuukpik Hotel. This same flaw exists in Table 2.4-2, Water Use for the Project Alternatives on Page 32 (see the Construction, Misc. category). In fact, elsewhere the Draft SEIS indicates that a 300 person construction crew would be required (p. 299), and even that number seems unrealistically low.

[61] GMT1 DSEIS, p. 48.

[62] GMT1 DSEIS, p. 213, 215.

[63] GMT1 DSEIS, p. 207.

[64] GMT1 DSEIS, p. 210, 213, 215. Alternative C has the added drawback of significantly increasing the necessary driving to GMT1 because vehicle traffic would essentially travel back and forth between GMT1 and Nuiqsut every day. The Draft mentions this change, but does not analyze its impacts. GMT1 DSEIS, p. 215. Shifting that much vehicle traffic right into Nuiqsut and all along the road would seem to change the analysis enough to warrant a more complete evaluation of the air impacts that the Nuiqsut hub alternative would generate.

By contrast, the Draft SEIS states that Alternative D is likely to have "Major" impacts on air quality.[65] "[Si]gnificant air quality impacts will result from the construction and operation of Alternative D for particulate matter."[66] The Draft SEIS helpfully identifies the precise cause of the increased impacts as well: "no permanent road access."[67] The access limitation requires a huge number of flights and vehicle traffic by ice road, which more than offsets the amount of vehicle emissions expected under the other alternatives.[68]

The Alternative D facility would also require significantly more stationary sources at the site, including a waste incinerator and two backup generators.[69] All of this would be in addition to the onsite emissions sources required for a road-based facility, not instead of them.[70] As the SEIS notes:

> If Alternative D were to be constructed, the GMT2 pad would also be roadless with an additional 2.5 MWe electrical demand placed on Alpine generators."[71]

There are two very important components to this statement. The first is that an entire new additional combustion turbine would have to be installed at Alpine to meet this increased demand. The impacts of that increase were for some reason omitted from the expected impacts analysis under alternative D.[72] **[19-050]** The second issue is the recognition that the air quality impacts of a roadless GMT1 need to be doubled to account for a roadless GMT2, just as would be the case for the expected hydrological impacts of Alternative D. All of these doubled "Major" impacts add up quickly under Alternative D.

[19-051] In the Cumulative Effects section, the Draft SEIS states that these GMT2 impacts are not required to be part of the main analysis of the Draft SEIS because no permit application has been submitted for GMT2 and that analysis of these impacts in the cumulative impact is all that is

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[65] GMT1 DSEIS, p. 228, Tables 4.2-47 through 4.2-51.

[66] GMT1 DSEIS, p. 222.

[67] GMT1 DSEIS, p. 216.

[68] GMT1 DSEIS, p. 216.

[69] GMT1 DSEIS, p. 216.

[70] GMT1 DSEIS, p. 216.

[71] GMT1 DSEIS, p. 358.

[72] GMT1 DSEIS, p. 358.

required. (p. 335) As one of the landowners at GMT2, we think that there is little to no doubt that an application to construct GMT2 will be forthcoming. Even if BLM's decision to exclude GMT2 impacts from the main analysis is technically defensible at some level, this relegation of the GMT2 impacts to the cumulative impacts section as to Alternative D distorts and renders inadequate the discussion of the various alternatives for GMT1 and has the effect of dramatically understating the impacts of Alternative D. This distortion makes much of the NEPA analysis incomplete and invalid and misleads reviewers about the likely impacts of Alternative D.

In spite of the repeated assertions to the contrary in the Draft SEIS, the reality is that in no way, shape, or form are the impacts of Alternative D similar to those of Alternatives A, B, or even C.

VI CONCLUSIONS

For the reasons discussed above, Kuukpik Corporation and the City of Nuiqsut think that the Draft SEIS is deficient in many ways and needs substantial revisions, corrections, and additions. Based on all of the available information, Kuukpik Corporation and the City of Nuiqsut think that Alternative A should be the Preferred Alternative.

Please contact us with any questions or comments.

KUUKPIK CORPORATION

4/22/14
DATE

By: Isaac Nukapigak
Isaac Nukapigak
President

CITY OF NUIQSUT

4-22-14
DATE

By: Thomas Napageak
Thomas Napageak
Mayor

Enclosure: Attachment 1

cc: Mayor Charlotte Brower (NSB)
Nuiqsut City Council
Kuukpik Board of Directors
Bud Cribley (BLM)
Neil Kornze (BLM)
Pat Pourchot (Dept. of Interior)
Linda Lance (BLM)
Steve Ellis (BLM)
Lanston Chinn
Brian Boyd

GREATER MOOSE'S TOOTH ONE (GMT1)

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS)

Miscellaneous Corrections Needed in the Draft SEIS

[19-052] Page 6, 1st non ● passage: The document states "...wetlands (which incorporate the vast majority of the project study area)...". Kuukpik is not aware of any part of the project study area which is not wetlands

[19-053] Page 6, ● below above passage: This passage states the project is entirely located in wetlands. This statement is correct but when coupled with the above statement, seems somewhat confusing and/or misleading.

[19-054] Page 8, 3rd ● under ADEC: References a Class I well permit. The CPAI proposal does not include this type of well. Only Alternative D would require a Class I well.

[19-055] Page 14, 1st paragraph below Table 1.4.3: The conveyance in 2010 of surface lands that are part of the project to Kuukpik and subsurface lands to ASRC should be noted as part of this "Changes and New Information" list.

Page 16, Section 1.5.1: Kuukpik Corporation should be added to the list of those who submitted scoping letters.

Page 16, Table 1.4.3: The Nuiqsut Spur Road permitting information should be updated to reflect that all permits have been received and construction is underway.

[19-056] Page 29-30: Section 2.4.6.2 discusses the ASRC Mine Site. The wording used gives the image/impression that this site has insufficient gravel to support the Colville River Access Road, GMT 1, and GMT 2. Kuukpik's understanding is that this is not true. ASRC should be consulted on these statements.

[19-057] Page 31, Section 2.4.7.2 Water Use: The data as presented is flawed. The document states that about 10,000 gallons/day (enough water for 100 people) would be used in camps during construction. While the correlation is correct, construction activities would require far more than 100 people to be housed in either remote camps or at the Kuukpik Hotel. Elsewhere, the SEIS states that 300 workers would be required for construction (p. 299), but even this seems low. This same flaw is shown in Table 2.4-2, Water Use for the Project Alternatives on Page 32 (see the Construction, Misc. category).

[19-058] Page 33: Section 2.4.7.5 on Access cites an estimated 12,000 vehicle round trips between the material site and GMT 1 construction sites for 2-3 months each year of the estimated 2 year construction phase. This may be correct for the first year of construction, but seriously overstates vehicle traffic for the second year. Section 2.4.7 Construction Activities (Page 30) calls for gravel placement in 1 season (i.e. 1st quarter of 2016). The 2nd season work is VSM and pipeline work , which would require only a small fraction of the gravel-pit related traffic involved in constructing roads and pads to their required thickness. The vast majority of the supposed truckloads to and from the mine site in Year 2 are actually non-existent?

[19-059] Page 33: Section 2.4.7.5 on Access talks about additional CASA/Otter flights. The document states that June and July would experience the most flights to support construction. Why June and July? This position only applies to Alternative A, B, and C.

[19-060] Page 34: Section 2.4.7.5 on Access discusses flights for Alternative D. These numbers seem to be enormously low, since they are less than what is shown for Alternatives A, B, and C.

[19-061] Page 39: Section 2.4.8 Drilling Operations states it will require 15-48 months to drill all of the planned wells. This 15-48 month figure is a very large difference in time spans and should be refined.

[19-062] Page 40-42: There is no discussion of relief well capabilities. The previous text in Section 2.4.8 (Drilling and Operations) on Page 39 states drilling would begin in the 2nd quarter of 2017 and continue until all planned wells are completed, which is estimated to be 15-48 months.

[19-063] Page 43-45: Alternative C is discussed here. (This is the spur road widening alternative.) There is no reference to the Nuiqsut municipal boundaries and how that may factor into any plans in this area. The text states that the BLM does not have jurisdiction over the Nuiqsut airport, which is private land (actually it is owned by the North Slope Borough). However, the text

neglects to mention the fact that the entire 5.8 mile long spur road is also on private land and that the BLM has no jurisdiction on that land either. The text also talks about a bridge being needed for the airport expansion and should explain what is involved, since Kuukpik's understanding is that this bridge would be so large and costly that by itself it would make Alternative C impracticable. The last line in the 2nd full passage on Page 45 talks about water availability in Nuiqsut. As currently shown, it is misleading. This passage should be revised to read "Some residents also have individual water tanks ..." or something similar.

[19-064] Page 45: The Alternative D (Roadless) write-up states that a 5000 foot airstrip and parking area needs to be Herc-capable to transport a relief well drilling rig. There is no similar blowout discussion on any of the other alternatives, which should acknowledge that a relief rig under those Alternatives would have road access.

[19-065] Page 51: Section 3.1.2 Existing and Planned Infrastructure states on the last passage on this page that the Kuukpik storage pad is located near the juncture of the CD 5 road and spur road. The pad is actually located <u>at</u> the juncture of these 2 roads.

[19-066] Page 62: The discussion of Lake Water Use make no reference to the use of ice chips from grounded areas of selected lakes, as permitted.

[19-067] Pages 121-122: Section 3.4.1.3 Economic Organization makes no reference to the municipal boundaries of Nuiqsut.

[19-068] Page 134: In the write-up on the Local Economy-Community of Nuiqsut, Nanuq is referred to as a Kuukpik Corporation joint venture. Nanuq is a Kuukpik subsidiary. This same passage cites storage of ice road equipment but does not state which business benefits from this activity.

Page 135-136: These passages talk about the NPR-A Impact Mitigation Program. It specifically references $2,318,988 as being provided for gravel purchase for the Colville River access road. However, the NSB purchase documents for the gravel show an amount of $2,153,988.

Page 138: Section 3.4.3.3 Overview of Nuiqsut and Subsistence Uses. The next to last sentence in the 1st passage should be revised to read "...the village corporation (Kuukpik Corporation) and its subsidiary companies <u>and joint business ventures</u>, the NSB ...". Kuukpik joint business ventures, whether limited liability companies or joint business ventures, are mandated to hire and train local residents, whether or not they are Kuukpik shareholders, and to offer paid student internships for high school students.

[19-069] Page 150: Towards the bottom of the page, the document states "In 2011, nine percent of households in Nuiqsut said they avoid the Alpine area altogether because they believe they may experience impacts in the area (SRB&A 2012:79, Table 41)". What impacts are being referenced here?

Page 159: Cultural Resources in the Project Study Area. The 1st ● cites AEIDC but the Draft SEIS and Acronyms List do not identify this acronym. It is believed the reference is to the Arctic Environmental Information and Data Center.

[19-070] Page 165: Section 3.4.7 Recreation references "float boating" but not motorized boating, which is the primary boating technique used by Nuiqsut residents. This section does state that "there is little recreational use of the area other than that associated with the upper Colville River and to a lesser extent the Colville River between Umiat and Nuiqsut." What about boaters on the Colville River and between Nuiqsut and Fish Creek for purposes other than subsistence?

[19-071] Page 167: Section 3.4.8 Visual Resources is the first acknowledgment that the Nuiqsut Spur Road is on private land. This acknowledgment should have been stated much earlier in the document. The statement that the Colville River access road is located entirely on private land is wrong—a sizeable portion, around half, is located on BLM land. The BLM was made aware of this situation in the last joint BLM, NSB, ICAS, NVN, and Kuukpik teleconference call on January 29, 2014.

[19-072] Page 169: Section 3.4.9 Local Transportation references bulk supplies occasionally being delivered by barge and/or cargo ships to the mouth of the Colville River. These supplies are then supposedly transported to Nuiqsut by smaller vessels. That type of shipping happened sometimes in the 1970s, but it hasn't happened in the past 30 years and isn't practicable under current river conditions. It's misleading to have the statement in the SEIS at all, since it implies that it is a presently feasible practice.

[19-073] Page 173: Table 4.1-2 Summary of Impacts is confusing and the classifications seem subjective.

[19-074] Page 175: Section 4.2.1 Terrestrial Resources – Construction paints an unbalanced and unduly alarmist picture for impacts from gravel roads and pads. There undoubtedly are significant impacts, but this section in its entirety overstates them For instance, the first paragraph at the top of page 176 on thaw bulb formation in flooded gravel pits does not acknowledge that the

standard practice in the Colville River Delta (over the four times that the ASRC pit has been opened since 1998) has been to replace overburden into the excavated area in order to create shallow areas with bird habitat and to minimize the area and extent of deep water. The last full paragraph on that page concludes that stockpiling of overburden mixes soils and that the overburden "will likely not redevelop." (Underlining is added) That has not been the case in any of the three rehabilitation efforts at the ASRC mine in the last 16 years. In fact, the entire current tundra rehabilitation project just east of the ARC mine pit (aimed at repairing tundra damage from the dewatering effort in the summer of 2013) is predicated on using such overburden to repair tundra damage. A conclusion that the overburden "might not" redevelop seems justifiable. However the existing conclusion that it "will likely not redevelop" seems unjustified, subjective, and biased in favor of the "no action" alternative.

Page 191: Section 4.2.2.3 Bridges and Culverts. There is reference to CD 7 in the 3rd passage. This should be GMT 2.

Page 211: There are 2 references to the "Alaska National Wildlife Refuge". This should be the Arctic National Wildlife Refuge (ANWR).

[19-075] Page 256: Table 4.3-6 Comparison of Project Components Relevant to Fish Resources. This table shows less stream crossings and bridges for Alternative B (Maintain setbacks) but less lakes within 500' of pipelines for Alternative A. It is not understood why Year 1 ice road stream crossings number 4 but in Year 2 the number is 3 for Alternatives A, C, and D.

[19-076] Page 259: Section 4.3.2.5 Conclusion. The document states Alternatives A, B, and C are anticipated to have impacts of long term duration with respect to fish and fish habitat but Alternative D is expected to have an interim duration. This conclusion seems flawed since Alternative D would require ice roads and ice bridges for +/- 30 years.

[19-077] Page 267: The conclusion that Alternative D is expected to result in minor impacts to birds seems flawed. How can adding 540 flights/month in May-June and 282 flights/month in July-August for the life of the project have minor impacts to birds? The answer is that it cannot have only "minor" impacts—this conclusion is simply wrong.

[19-078] Page 276: The 4th passage in the disturbance write-up is the 1st acknowledgment that locals will have use of the road system for hunting. This is a key mitigating effect that should be

prominently mentioned and discussed in all of the sections evaluating impacts on the human environment, subsistence, Nuiqsut, public health, environmental justice, etc.

[19-079] Page 277: The passage at the end of the page states "As discussed in Section 2, all proposed gravel roads associated with the proposed project would have an average thickness of 7 feet." Information located in Section 2 on road thickness stated that roads would have a minimum thickness of 5 feet. Where did the 7 feet thickness figure come from?

[19-080] Page 278: Mortality. The end of the 1st passage and 2nd passage state that caribou would "likely" be lost due to vehicle collisions. Where is the data to support these statements? Kuukpik cannot think of a single instance of vehicle collisions with caribou. This is uninformed speculation masquerading as data-based conclusions.

Page 280-281: Conclusions are correct. Alternatives A, B, and C are expected to have minor impacts to terrestrial mammals, while Alternative D is expected to have moderate impacts.

Page 293: The 4th passage under Comparison of Alternatives states that Alternative C may lead to increased economic benefits for the Native Village of Nuiqsut due to additional use of its airport and hotel. The airport belongs to the North Slope Borough and the Hotel belongs to Kuukpik. It should say "...from the use of the Nuiqsut airport and Kuukpik Hotel."

[19-081] Page 297: The 2nd passage acknowledges some of GMT 1 reserves are from Native land but does not quantify how much. In fact, roughly 90 percent of the oil reserves lie on Native lands. BLM has this information available from either the applicant or from BLM's own minerals and leasing divisions.

[19-082] Page 299: Table 4.4-2 Operations Manpower of GMT 1 Production Pad. It is not understood how the calculation of the cumulative number of 12 hour positions at the production pad was determined. Also, the last passage on this page states local hire of Nuiqsut and other North Slope residents will be minimal due to a lack of skills. This is wrong. ConocoPhillips, its contractors, Kuukpik and its subsidiaries, and Kuukpik joint business ventures are mandated to hire and train local Nuiqsut residents, whether or not they are Kuukpik shareholders, and to offer paid student internships for Nuiqsut high school students (though the paid student internship positions are voluntary on the part of ConocoPhillips).

[19-083] Page 300: The 2nd passage under the Comparison of Alternatives again references increased economic benefits to the "Native Village of Nuiqsut." It should reference the North Slope

Borough and Kuukpik, since neither of the two income sources is received by the Native Village of Nuiqsut. Also, the 2nd sentence in the 1st passage of Section 4.4.3 Subsistence references primary impacts to subsistence. It lists "reduced access to subsistence use areas." This is simply wrong, since the Nuiqsut Spur Road and the CD-5 and GMT-1 access roads will, overall, likely increase access even after allowing for the Avoidance effect.

[19-084] Page 302: User Access. These passages seem to be conflicting.

[19-085] Page 306: The 1st sentence in the 2nd passage states the nature and overall degree of impacts do not vary significantly by Alternative. This is incorrect. The SEIS itself at Page 303 (1st passage) shows Nuiqsut hunters state helicopters and planes are the two most impacting activities. Alternative D would result in large increases of both types of aircraft.

[19-086] Page309: The 1st full passage states Alternative D would have the largest impact to subsistence, which is accurate, but contradicts the statements on Page 306.

[19-087] Page 320: Section 4.4.7.3 Comparison of Alternatives. The document states that under all alternatives, residents of Nuiqsut will continue to have access to existing Alpine field transportation facilities, including limited access on ice roads. This is technically true but misleading without practical context. Nuiqsut residents do have access to Alpine roads now as a matter of contract and right, but eight or nine months of the year have had no way to access those roads. Currently, Nuiqsut residents only have effective access to Alpine roads during winter via ice road. The Nuiqsut Spur Road will correct this situation, starting in early May, 2014.

Page 341: Table 4.6-2 Major Cumulative Effects Factors. This table lists the development footprint for the Nuiqsut Spur Road (and storage pad) as being 77 acres. The correct number is 51.0 acres, including the landfill road upgrade.

Page 343: Nuiqsut Spur Road. The spur road, storage pad and landfill road upgrade has a footprint of 51.0 acres, not 76 acres as shown. The amount of gravel fill under the Nuiqsut Spur Road 404 permit is 455,000 cubic yards, not the 633,000 cubic yards shown in the Draft SEIS. Also, construction is expected to take place this winter, not 2014-2015 as shown. The Clean Water Act 404 permit for the Nuiqsut Spur Road was issued on March 12, 2014, and construction of the Nuiqsut Spur Road is currently underway.

[19-088] Page 344: Colville River Access Road. The text states the application also identifies an alternative undeveloped gravel source about 4 miles west of the landfill that may be used. Where is this source located and what is it called? Kuukpik suspects that this is a reference to the Clover site with an erroneous distance from the landfill, but that is not certain.

Page 349: Last passage on the page references the Native Village of Nuiqsut but should say "City of Nuiqsut" in 2 places.

Page 355: ANWR is listed as the AK National Wildlife Refuge in the text and table heading.

Page 356: Same ANWR listing issue.

Page 357: Same ANWR listing issue in tables and text.

Page 358: Same ANWR listing issue in 2nd passage and last passage.

Page 359: Table 4.6-13 has the same ANWR listing issue.

Page 360: Same ANWR listing issue in all 3 tables and in the text in the last passage (in 2 places).

Page 361: Same ANWR title issue in the table and in the text (2 places).

Page 362: In the 4th passage, the document cites the Native Village of Nuiqsut. It should cite the City of Nuiqsut.

[19-089] Page 368: The 2nd passage on birds states Alternative D would have the greatest potential impact to birds. This is accurate, but conflicts with Page 267 wording where Alternative D impacts to birds was the same as all other alternatives and "minor." Kuukpik believes that Alternative's D impacts to birds would be moderate or greater and persist over the life of the project and beyond.

[19-090] Page 381: The 1st passage states that increased employment of Nuiqsut residents could disrupt social systems by removing residents for extended periods of time from their families. Text should be added at the end of that sentence stating, for instance ", though the ability to commute daily to Alpine-related employment on the Nuiqsut Spur Road now being constructed by Kuukpik Corporation should reduce any such impacts."

[19-091] Page 382: The 3rd passage states that there would likely be several years between the start of production at GMT 1 and the start of construction of GMT 2. What is the basis for this statement?

Page 385: The 2nd passage states Kuukpik collects revenues from ownerships in the Alpine field and for permits to use Kuukpik lands. This is misleading, as Kuukpik enters surface access or use agreements for which it receives income, but does not issue "permits", per se.

[19-092] Page 385: The last passage states that "substantial" number of jobs in Nuiqsut are technically NSB jobs but are paid for with NPR-A impact funds from the State. This is inaccurate. NPR-A impact funds occasionally pay for construction-related jobs, but they have historically not occurred in "substantial" numbers in Nuiqsut and are infrequent (whether directly or indirectly, through the North Slope Borough).

[19-093] Page 386: The 2nd passage states "User avoidance is expected to be the primary impact related to user access, as Nuiqsut residents will likely avoid the project study area drill pad and pipeline corridor. Subsistence hunters often avoid areas of development due to concerns about contamination and because of residents' discomfort with hunting near human or industrial activity." The following text or something like it needs to be added: "For the first time, though, oil industry gravel roads would be used for subsistence access, which may offset in substantial part the Avoidance effect.

[19-094] Page 397: The 3rd passage states "While the GMT 1 and conceptual GMT 2 developments would introduce the first permanent oil and gas infrastructure into subsistence areas west of the community of Nuiqsut, …". This statement ignores CD 5 which is northwest of Nuiqsut.

[19-001]
BLM has revised the Subsistence and Environmental Justice sections of the Final SEIS to better address these concerns. The Final SEIS, however, does acknowledge differences in impacts among alternatives, but concludes that the impacts are "major" across the action alternatives.

[19-002]
Impact criteria tables are incorporated for individual resources throughout Chapter 4 - Environmental Consequences. EIS's commonly use varied geographic scopes to account for differences between resources (see NPR-A IAP/EIS, Pt Thompson EIS, referenced in GMT1 Final SEIS).

[19-003]
Interviews and discussions with various residents of the North Slope, in addition to public testimony, overwhelmingly focus on the negative impacts of development on subsistence activities. While this project may have the support of the community for various reasons, it does not change the fact that there will be impacts on subsistence. The subsistence analysis was conducted without consideration of non-subsistence benefits, such as economic benefits, on the community. Those benefits are addressed under Sociocultural Systems and Economy sections.

[19-004]
The benefits and widespread support for the GMT1 project are clearly recognized and described. The analyses of impacts in the Social Systems section was based in large part on testimony at public meetings and subsistence hearings on development in the Nuiqsut area, including on GMT1, and on consultation with several residents, as well as more clearly quantified data on impacts.

[19-005]
Agreed, any new subsistence information should have been included in the 2012 NPR-A IAP/EIS. Any omission was a mistake. The new information that informs the current analysis is cited: it includes 4 years of SRB&A's caribou monitoring project and testimony and comments at NPR-A Subsistence Advisory Panel meetings and GMT1 Public hearings.

[19-006]
Agreed, any new subsistence information should have been included in the 2012 NPR-A IAP/EIS. Any omission was a mistake. The new information that informs the current analysis is cited: it includes 4 years of SRB&A's caribou monitoring project and testimony and comments at NPR-A Subsistence Advisory Panel meetings and GMT1 Public hearings.

[19-007]
Sociocultural and subsistence research from the 1970s and onward formed the basis for those sections. That data was augmented by the analysis of subsistence impacts conducted by the contracted specialist and by testimony and comments submitted by a wide range of residents of Nuiqsut.

[19-008]
Industry manages the subsistence studies in the project area. In the future, BLM will assure that the applicant provides Kuukpik with subsistence studies. BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[19-009]
The Final SEIS has been updated to reflect the suggested edit.

[19-010]
The Final SEIS has been updated to reflect the suggested edit.

[19-011]
Discussion of facilitated access provided by the spur road is expanded in the Final SEIS.

[19-012]
Discussion of facilitated access provided by the spur road is expanded in the Final SEIS.

[19-013]
Benefits of the Spur Road are explained much more clearly in the Final SEIS.

[19-014]
Comment is noted.

[19-015]
The Spur Road is included in Alternative E - the no action alternative because BLM understands that it is authorized apart from the current NEPA process and currently under construction. It is not yet part of the "affected environment" because it has not been built.

[19-016]
The revised Subsistence section eliminates this language and acknowledges that the Spur Road is currently permitted and under construction.

[19-017]
The revised Sociocultural section in the Final SEIS is expanded and explains more clearly how conclusions were reached.

[19-018]
The language describing the conclusion (in Section 4.4.5) explains the use of the term regional: "While the spatial extent of impacts during construction and certain operational impacts (e.g., direct loss of subsistence use areas) would be localized, the indirect effects of operation (e.g., increased cost, time, effort) could extend beyond the local area and affect the whole of Nuiqsut's subsistence activities (i.e., regional) in addition to introducing disruptions to caribou availability and other resources that could extend outside of the project study area and to a broader area-wide level. Lastly, the context of subsistence is an important resource that fills a unique role in the regional sociocultural environment. Thus, by the metric established in this SEIS, the overall degree of impact to subsistence is expected to be major because it is a high intensity impact, will have effects of long-term duration, extend to regional extents..." and is an important resource.

[19-019]
For direct and indirect impacts this is true, there could be added effects in the cumulative case.

[19-020]
The conclusion reached in the GMT1 Draft SEIS largely confirms and corroborates findings in the ASDP. However, the GMT1 SEIS uses impact criteria to summarize findings. Also, substantial new information indicating that impacts from GMT1 were likely to be greater than previously anticipated was originally identified as a reason for requiring a SEIS.

[19-021]
The Sociocultural Systems section of the Final SEIS has been revised and updated with more information to support the conclusions. The primary reason for that revision was strong testimony from residents regarding the nature of sociocultural impacts in Nuiqsut and frustration that the government has underestimated them in the past.

[19-022]
Many people are supportive of the GMT1 project while at the same time highly sensitive to impacts to subsistence. BLM is obliged to disclose and analyze all impacts. Impacts to subsistence are evaluated through testimony on the Draft SEIS as well as numerous other sources and studies.

[19-023]
Updated explanations of the benefits provided by the Spur Road as it would relate to a GMT1 road are included in the Final SEIS in the Sociocultural Systems and Subsistence sections.

[19-024]
The revised Subsistence section in the Final SEIS expands considerably on the avoidance effect and various estimates of how it should be quantified.

[19-025]
The Final SEIS analysis acknowledges that some Nuiqsut hunters are becoming accustomed to hunting near infrastructure. BLM is obliged to analyze the avoidance effect due to continuing input from hunters that indicate it continues to be a negative impact.

[19-026]
The CD5-GMT1 road will provide facilitated access for subsistence hunters. BLM is obliged to disclose and evaluate all potential negative impacts of the road as well, many of which have been identified by subsistence hunters. BMP E-1 requires that all roads be designed to protect subsistence use and access to traditional hunting and fishing areas. Subsistence users have already experienced significant access issues with the new CD5 road because the road is too high and too steep to be able to cross it with snowmachines or ATVs. BMP E-1 is a particularly significant measure for the GMT1 project because the road route (in alternatives A, B, and C) will transect several main travel routes between Nuiqsut and areas to the northwest, and subsistence access will have to be assured. One way that access would be provided under those alternatives would be via the GMT1 road itself (using the Kuukpik Spur Road to gain access to the CD-5 and GMT1 roads). However, the design of the road itself will have to allow for access by subsistence users who need to cross it or need to descend from and ascend onto the road.

[19-027]
The differences in impacts to subsistence under the various alternatives are fleshed out in the revised Subsistence section.

[19-028]
The range of benefits associated with facilitated access are more clearly explained in the Final SEIS. Findings of negative impacts to subsistence are based on avoidance and the impact of aircraft as well as potential access issues.

[19-029]
Updated explanations of the benefits provided by the Spur Road as it would relate to a GMT1 road are included in the Final SEIS in the Sociocultural Systems and Subsistence sections.

[19-030]
The range of benefits associated with facilitated access are more clearly explained in the Final SEIS.

[19-031]
The Final SEIS has been updated to reflect the suggested edit.

[19-032]
The Social Systems sections recognize and describe the substantially greater negative impacts of Alternatives D1 and D2.

[19-033]
BLM acknowledges that thaw basins present different challenges for road construction, and this is analyzed in the Draft SEIS and Final SEIS.

[19-034]
The threshold for a moderate impact to vegetation was chosen as 5% of the total acreage of a single vegetation type occurring within the project study area. Impacts less than 5% were considered minor. Alternatives A and C each impacted more than 5% of a single vegetation type whereas Alternatives C and D did not. The Impact Criteria used in Table 4.3-1 are similar to those used in the Point Thomson EIS and are appropriate for determining the magnitude of impacts.

[19-035]
The BLM concurs that Alternative B will increase the risks of inundation due to the greater number of culverts through an area with thaw basins and wetter topography. Section 4.2.2.4 describes these increased impacts.

[19-036]
The BLM is required to consider alternatives to minimize impacts and placing the road route outside the 3 mile Fish Creek setback was seen as an important consideration to protect subsistence resources.

[19-037]
The comment is correct in that roads and pipelines within a certain distance of one another have shown a synergistic effect on the movements of caribou, with the result being delay or diversion of caribou movements.

[19-039]
BMP E-1 requires that all roads be designed to protect subsistence use and access to traditional hunting and fishing areas. Subsistence users have already experienced significant access issues with the new CD5 road because the road is too high and too steep to be able to cross it with snowmachines or ATVs. BMP E-1 is a particularly significant measure for the GMT1 project because the road route (in alternatives A, B, and C) will transect several main travel routes between Nuiqsut and areas to the northwest, and subsistence access will have to be assured. One way that access would be provided under those alternatives would be via the GMT1 road itself (using the Kuukpik Spur Road to gain access to the CD-5 and GMT1 roads).

However, the design of the road itself will have to allow for access by subsistence users who need to cross it or need to descend from and ascend onto the road. These issues overshadow the difference in proximity to Fish Creek between Alternatives A and B, and B has other less impactful aspects that A does not have.

[19-039]
The Final SEIS recognizes that Kuukpik Corporation, as the landowner of the Spur Road, has stated its opposition to widening the Spur Road. Thus, BLM is not able to select it as a practicable alternative to the proposed action.

[19-040]
The Final SEIS has been updated to reflect the suggested edit.

[19-041]
The "Totals Including Baseline" categories should be highlighted in Table 2.4-3. New summary tables are used in the Final SEIS.

[19-042]
The "Totals Including Baseline" categories should be highlighted in Table 2.4-3. New summary tables are used in the Final SEIS.

[19-043]
The Final SEIS includes additional information on aircraft activity.

[19-044]
The Final SEIS includes additional information on aircraft activity.

[19-045]
This is reflected in the tables.

[19-046]
The Final SEIS includes additional information on aircraft activity.

[19-047]
Flyover inspections are included in the aircraft data.

[19-048]
The Final SEIS includes analysis of roadless vs. roaded scenarios for GMT2.

[19-049]
Impacts from Alternatives A through D (now Alternative D1) have many impacts common between them which are similar. The differences between them are most easily identified by the miles of road and total gravel required, number of bridges and culverts and water requirements. Alternative D (now D1) does have significantly more water requirements than the other alternatives but is offset by a reduced footprint in gravel roads, bridges and culverts.

[19-050]
The statements made in the air quality impact analyses included as Appendix K of the Draft SEIS regarding GMT2 should not imply that GMT2 is part of the project being evaluated, or that GMT2 will be built. Therefore, the assertion made by the commenter overreaches the scope of the SEIS.

The statement made in the air quality impact analysis is specific to planning for potential future power demand requirements at Alpine if Alternative D (now D1) is selected. The selection of Alternative D1 or D2 will likely drive the decision to increase the power generation capacity at Alpine. In order to avoid upgrading the power generation infrastructure multiple times in the future, the size of the power generation unit selected will include planning for future demand growth which could include a GMT2 among many other projects. Therefore, the statement made about GMT2 in the air quality impact analysis is about factors that could drive CPAI to install power generation capacity larger than that strictly required for Alternatives D1 and D2 and was not an attempt to anticipate impacts from GMT2.

[19-051]
The Final SEIS includes additional information on GMT2 and Bear Tooth Unit.

[19-052]
Three percent of the study area is Barren Upland (Us) which is not considered wetlands.

[19-053]
Comment is noted.

[19-054]
The Class I permit identified in this referenced comment does not permit the well construction or classification as a Class I disposal well. The EPA is responsible for issuing Class I disposal well permits in Alaska. Similar to how BLM permits the act of disposal of fluids produced from federal lands into properly classified disposal wells but does not issue disposal well classifications, ADEC permits the act of disposal of nondomestic wastewater into properly classified wells.

Other than in Alternatives D1 and D2, CPAI plans to utilize the already permitted and constructed Class I well at ACF. Under AS 46.03.100(b)(1), ADEC may require this permit either for a specific facility or disposal activity. It would then be at ADEC's discretion to determine whether an existing permit remains valid for this disposal activity or whether this new wastewater material warrants classification as a new specific disposal activity. In summary, a Class I well permit is not required, but an ADEC permit to use the Class I for disposal of this particular type of wastewater is likely required.

[19-055]
The Final SEIS has been updated to reflect the suggested edit.

[19-056]
The Final SEIS has been updated to reflect the suggested edit.

[19-057]
For the Final SEIS, the previous water consumption table (Table 2.4-2 in Draft SEIS) was split per alternative into Tables 2.5-3, 2.6-2, 2.7-2, 2.8.2 and 2.9-2 (Alternatives A, B, C, D1 and D2, respectively) and information updated in the Final SEIS to reflect increased water consumption during construction activities and text was modified to reflect the larger manned camps.

[19-058]
The Final SEIS will include additional information on aircraft activity.

[19-059]
In Alternatives A, B, and C construction could occur during the summer. Flights are used to support the transportation of gravel working crews. The construction schedule would remain the same across all action alternatives. The Final SEIS will include updated information on flight traffic.

[19-060]
The Final SEIS includes additional information on aircraft activity.

[19-061]
The 15-48 month window has been explained in more detail in the Final SEIS. Under the year-round alternatives, CPAI requires a minimum 15 months to drill, complete, and test the 8 Lookout Participating Area wells. There are two other anticipated GMT Unit Participating Areas to be developed from the GMT1 drill site, Mitre Participating Area and Flat Top Participating Area. The additional 25 well slots on GMT1 drill site are slated for those wells but additional geologic, geophysical or reservoir engineering analysis is necessary to determine exact development patterns and timelines. Based on current geophysical or reservoir engineering information, CPAI has forecasted a 48 month total window to accomplish this full development at GMT1 in year-round alternatives.

[19-062]
Relief wells are to be included as part of the ODPCP. BLM will evaluate if a potential mitigation measure requiring this should be included in the Final SEIS.

[19-063]
The Nuiqsut municipal boundaries and how it factors into the spur road widening are out of the BLM's purview. Additional language has been included in the description of Alternative C in the Final SEIS to describe the fact that an additional bridge would need to be constructed to support the airport extension.

[19-064]
The Final SEIS has been updated to include discussion of transportation of relief well drilling rig for all alternatives.

[19-065]
The Final SEIS has been updated to reflect the suggested edit.

[19-066]
The Final SEIS has been updated to reflect the suggested edit.

[19-067]
The Final SEIS has been updated to reflect the suggested edit.

[19-068]
The Final SEIS has been updated to reflect the suggested edit.

[19-069]
More accurately, the report indicates that 9% of households reported that they did not experience any Alpine-related impacts because they avoid or do not hunt near Alpine infrastructure.

[19-070]
Motorized boating by Nuiqsut residents would fall under the wide range of subsistence activities and impacts to them described in Sections 3.4 and 4.4. BLM does not have any permitted recreation occurring on the Colville River between Nuiqsut and Fish Creek. Any activity taking place would be either personal recreation or transportation for another purpose. Travel on waterways is a legal activity, which does not require an authorization from the BLM. Access to private lands along a waterway is not within the BLM's control.

[19-071]
The relevant sentence has been edited in the Final SEIS to read: "It should be noted that the existing or pending modifications to the visual resources associated with Nuiqsut spur road are all on land owned by Kuukpik and not subject to the BLM management objectives described above."

[19-072]
The Final SEIS has been updated to reflect the suggested edit.

[19-073]
The table is intended as a summary for readers so that they can quickly determine BLM's rating of impacts for resources - it is not meant to fully analyze impacts for each resource.

[19-074]
The Final SEIS has been updated to reflect the suggested edit.

[19-075]
Ice roads for the various alternatives are provided on Figures 2.4-4 (Alternative A), 2.5-2 (Alternative B), 2.6-2 (Alternative C), 2.7-2 (Alternatives D1 and D2) of the Final SEIS.

[19-076]
The Final SEIS has been updated to reflect the suggested edit.

[19-077]
Based on the impact criteria and available literature, a rating of low under Alternatives D1 and D2 is appropriate. Johnson et al. (2003), along with three other impact criteria, other provides reasoning to assign an overall low/minor impacts from Alternatives D1 and D2.

[19-078]
Updated explanations of the benefits provided by a GMT1 road are included in the Final SEIS in the Sociocultural Systems and Subsistence sections.

[19-079]
The relevant text of the Final SEIS has been edited to replace "7 feet thick" with "a minimum of five feet thick, although the depth of gravel will vary depending on the hydrology and topography of the area."

[19-080]
The relevant text of the Final SEIS has been edited to say: "There is a potential for a few terrestrial mammals to be involved in collisions with vehicles each year, ..." Although this is rare, the potential remains.

[19-081]
GMT1 drill site is centrally located in order to develop what eventually will be three different Unit Participating Areas. This is partly why the GMT1 drill site is not located directly above the Lookout Participating Area, and is located instead within reach of each pool. The Lookout Participating Area is the first proposed stage of three individual development phases from GMT1 drill site, for which the first 8 well slots are dedicated. The remaining 2 Participating Areas are Mitre Participating Area and Flat Top Participating Area. Until these Participating Areas are formally established in GMTU, the exact acreage of each lease dedicated to each Participating Area is unknown, which means the exact percentage of ASRC vs BLM royalty in each Participating Area has yet to be determined although estimates were known at the time of Unit approval based on the reservoir and geophysical information available at the time. The Flat Top Participating Area was not included in the GMTU area and no exploration activity had occurred in that region to the southeast of GMT1. When technically able, CPAI will work with ASRC to establish these Participating Area boundaries and BLM will either authorize them or request they be altered to the satisfaction of the Authorized Officer. The terms of the Unit Agreement explicitly cover this process and it must be implemented no less than 6 months prior to first production. ASRC's comments imply they believe GMT1 drill site is designed only to develop the Lookout Participating Area. This is not the case. ASRC's estimated mineral interest in Lookout Participating Area is upwards of 90% and they also have a lot of selected or conveyed acreage in Mitre PA Participating Area, meaning a large portion of the GMT1 production will be ASRC royalty bearing. Flat Top Participating Area is expected to be entirely BLM.

[19-082]
The relevant portion of the Final SEIS has been revised to note the opportunities that exist for local residents and to cite the CD5 example.

[19-083]
The relevant portion of the Final SEIS has been edited to eliminate confusion re: benefits to the Native Village of Nuiqsut.

[19-084]
Countervailing impacts are identified. Several aspects of the proposed project are of a complexity that they would likely result in a mixture of positive and negative impacts.

[19-085]
The revised subsistence section in the Final SEIS clearly delineates between the anticipated results of each Alternative. Both the Sociocultural Systems and Subsistence section now describe much more precisely how and why Alternatives D1 and D2 would be likely to result in substantial higher degrees of negative impacts.

[19-086]
The revised Subsistence section in the Final SEIS clearly delineates between the anticipated results of each Alternative. Both the Sociocultural Systems and Subsistence section now describe much more precisely how and why Alternatives D1 and D2 would be likely to result in substantial higher degrees of negative impacts.

[19-087]
The range of benefits associated with facilitated access and the negative or restricted benefits or ice roads are more clearly explained in the Final SEIS.

[19-088]
The Final SEIS has been updated to reflect the suggested edit.

[19-089]
Based on the impact criteria and available literature, a rating of low under Alternatives D1 and D2 is appropriate. Johnson et al. (2003), along with three other impact criteria, other provides reasoning to assign an overall low/minor impacts from Alternatives D1 and D2.

[19-090]
The revised Sociocultural Systems section describes in detail the benefits to Nuiqsut residents that would be likely from the ability to commute to work.

[19-091]
This is based that on the assumption that planning and permitting will take several years.

[19-092]
The Final SEIS has been updated to reflect the suggested edit.

[19-093]
The requested addition, with caveats, has been included in the revised Final SEIS Cumulative Effects analysis.

[19-094]
The Final SEIS has been updated to reflect the suggested edit.

April 15, 2014
P.O. Box 89008
Nuiqsut, AK 99789

Bridget Psarianos, Project Manager
GMT1 Draft SEIS Comments
222 West 7th Avenue, Stop #13
Anchorage, AK 99513

Re: Comments on Draft Supplemental Environmental Impact Statement, Greater Mooses Tooth 1

Dear Ms. Psarianos,

I am a Nuiqsut hunter and whaling captain. My family camps and hunts by Fish Creek every year. I am concerned that BLM is not considering impacts on subsistence enough. More winter exploration in this area will lead to more development. **[20-001]** If there is a road, there will be road after road to other reservoirs beyond GMT2 and then the area will look like Meltwater. GMT1 could be roadless. **[20-002]** Also, if there is a road, caribou may come to the road for insect relief. This would affect subsistence because of rules limiting our ability to shoot caribou from roads.

[20-003] I am also concerned about how noise from the project will affect caribou to the west of Nuiqsut, especially noise from gravel hauling. This past winter there were many caribou near Rendezvous-3, Flattop-1, and Fish Creek. Will they come back next winter? **[20-004]** Noise needs to be minimized around insect relief areas and migration areas. **[20-005]** Summer studies and stickpicking can be postponed until fall when caribou go inland.

[20-006] A road or boat launch to Fish Creek is not a good mitigation measure, since it is too shallow to launch a boat there.

Local people should be consulted to get more accurate representation of the plants and animals (including endangered species) in the area. Not all the vegetation in the area (such as lichen) is listed in the EIS. **[20-007]** Also, the EIS does not mention that there are peregrine falcon and bald eagles nesting at Fish Creek. **[20-008]** We are concerned about contamination of plants and animals by industrial activity.

[20-009] We have heard that Alternative C is no longer an option although it would make the most sense to have Nuiqsut as a hub, provided measures are taken to limit alcohol and drugs in town. The Kuukpik main camp is already here and hooked up to North Slope utility system.

[20-010] Another concern is air pollution, which will increase. Already there is lots of flaring with Rendezvous-3, which can be seen-from town. Respiratory problems could increase. We don't know if the air quality monitoring is going to work.

Thank you for your consideration.

Sincerely,

Edward Nukapigak
Nuiqsut Whaling Captain

[20-001]
BLM is analyzing the impacts of road development cumulatively.

[20-002]
The potential benefits and negative impacts of a road are discussed in greater detail in the Final SEIS

[20-003]
The potential benefits and negative impacts of a road are discussed in greater detail in the Final SEIS

[20-004]
The potential benefits and negative impacts of a road are discussed in greater detail in the Final SEIS

[20-005]
BLM is analyzing the impacts of road development cumulatively mitigation measures in the Final SEIS which would decrease the impacts of stick picking and associated helicopter flights.

[20-006]
A proposed potential mitigation measure is included for a boat launch on the Tiŋmiaqsiġvik River (Ublutuoch River). The description of the measure explains that the launch would not be particularly relevant for subsistence hunters insofar as launching boats, but that it could be used to reduce the number of helicopter flights needed for research and monitoring as many of those types of activities could be or are conducted with shallow draft, Zodiac-like boats. The boat launch would also facilitate cleanup of an oil spill.

[20-007]
There are no nesting records of bald eagle or peregrine falcons along Fish Creek. It is highly unlikely that either species would nest along the creek and then only on the steep bluffs along the upper reaches - far from the project study area. The discussion of raptors has been revised and site-specific data for GMT1 is provided in the Final SEIS.

[20-008]
BLM and CPAI are currently working out a plan for subsistence foods contaminants study to be conducted by CPAI. This was required as part of the 2013 NPR-A ROD.

[20-009]
The Final SEIS recognizes that Kuukpik Corporation, as the landowner of the Spur Road, has stated its opposition to widening the Spur Road. Thus, BLM is not able to select it as a practicable alternative to the proposed action.

[20-010]
Ambient air quality monitoring has occurred at Nuiqsut on a continuous basis since April 1999 . The monitoring results have shown compliance with both Federal and State of Alaska Ambient Air Quality Standards.

Flaring: Any additional flared volume of gas associated with the project would likely be negligible compared to existing flaring events, barring any significant process design flaws that may work themselves out as volumes are increased. There is no current regulation that prevents CPAI from flaring in non-emergency cases without approval, however, the BLM has

the discretion to limit these events to those determined to be absolutely necessary for safe production handling.

[redacted]

From: ACS, General Manager [gm@AlaskaCleanSeas.org]
Sent: March 24, 2014 2:01 PM
To: GMT1 Comments
Subject: COMMENTS FOR THE RECORD
Attachments: COMMENTS FOR THE RECORD.docx

Good Afternoon Bridget,

Attached are my comments for the record regarding the proposed Greater Moose's Tooth Oil and Gas Development in NPR-A draft supplemental environmental impact statement.

Additionally, I support not extending the deadline.

Thank you,

C. Barkley Lloyd
President and General Manager

907.644.2604 Anchorage
907.659.3220 Prudhoe
907.317.0915 mobile
gm@alaskacleanseas.org

ALASKA CLEAN SEAS

COMMENTS FOR THE RECORD

Thank you for the opportunity to present comments on the Proposed Alternatives for the Greater Moose's Tooth Oil and Gas Development in NPR-A.

While I lack expertise on the topics within the Draft Supplemental Environmental Impact Statement (DSEIS) such as wildlife impact or anthropological factors, I am able to address the topic of response operations.

Prior to my present position as President and General Manager of Alaska Clean Seas, I served as the Alaska Chief of Response for the Coast Guard where I was responsible for emergency response covering 3.8 million square miles of ocean and 44,000 miles of coastline, including some of the most treacherous waters in the world. Aircraft, vessels, vehicles, and people were key to preventing loss of life and protecting the environment. Similarly, Alaska Clean Seas uses similar assets and has for 35 years to provide world class environmental and emergency response services in the Arctic as a not-for-profit cooperative.

Alternatives that include a road to GMT1, from the response perspective, are clearly the most logical from a variety of perspectives. In the event on a minor spill response incident or emergency response, whether environmental or injury to personnel, being able to move response personnel and equipment to the scene is of utmost importance. Military commanders throughout history have learned this lesson, often at the cost of thousands of lives and inability to accomplish objectives. Unless your logistic lines of communication are capable and available, situations can quickly go from stable to dire resulting in unwanted and undesired consequences. **[21-001]** Alternative that include air travel such as Alternative D, based on Arctic weather, limited aircraft payload, and availability of aircraft, could likely result to personnel being placed at risk and greater damage to the environment in the unlikely event of a large spill incident. Roads that can be maintained regardless of weather, are immediately available 24X7 to emergency responders, and connect incident locations with emergency response resources are clearly the preferred option.

I support the approval of Alternative A as proposed.

Thank you for the opportunity to provide comment.

C. Barkley Lloyd
President and General Manager

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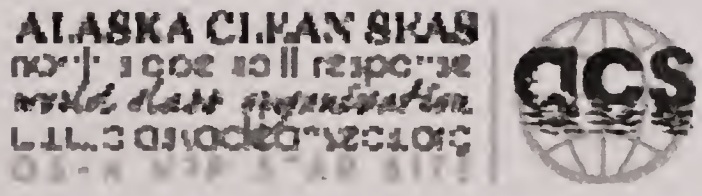
gm@alaskacleanseas.org



[21-001]
Text in the Final SEIS has been edited to expand on health and safety concerns associated with lack of road access to GMT1 as per Alternatives D1 and D2.

[redacted]

From: James Wallace [stizmark@gmail.com]
Sent: April 17, 2014 3:46 PM
To: GMT1 Comments
Subject: NPR-A comment

BLM
Alpine Development satellite plan
GMT 1 Development project

This letter of comment is in response to the draft of the BLM's supplemental environmental impact statement for the development of the Greater Moose's Tooth Unit of the NPR-A.

The advantages of alternative D deserves more consideration. Air transportation can provide increased safety during all aspects of construction. It also allows for more immediate response in a time of crises. The efforts of maintaining a extensive road system should far outreach the ability to keep a runway operational during all months of the year. **[22-001]** It also seems feasible that a joint runway / road could be built between the GMT 1 and future GMT 2 projects. This would provide the ability for satellite drilling pads to share the same runway in close proximity. Thus keeping air traffic away from the village of Nuiqsut and not disturbing subsistence hunting.

[22-002] The consideration of ice runways should also be given some merit. Along with the ice road system ice runways could be put into place for the insertion and removal of the rig equipment. This would utilize the existing lake system for temporary runways during the winter months. Ice runways have been proven efficient in the past around Alaska and leave minimal footprint. This could also combine the efforts of building a permanent runway while utilizing an ice runway / road system for the developing GMT 1.

I live and work in Alaska and encourage the development of our natural resources efficiently.

Thank you,

James Wallace
907-301-2286
stizmark@gmail.com

Sent from my iPad

[22-001]
At this time CPAI is unable to commit project planning efforts for a GMT2 development scenario so BLM has no project proposal to analyze. GMT2 is discussed in this document as a conceptual drill site area only since CPAI has yet to determine a location based on reservoir characteristics.

Although a shared runway midway between GMT1 and GMT2 could have a slight benefit to the Village of Nuiqsut in greater distance from the airstrip, no reduction in flights or road traffic would be seen whether an airstrip is shared based at GMT1, GMT2, or midway between, and impacts to subsistence would likely be marginal as the locations are not separated by a great distance.

In the event a GMT2 development scenario is proposed, an appropriate NEPA document will be prepared analyzing the effects of any additional air traffic on subsistence in the Nuiqsut area.

[22-002]
The comment applies only to Alternative D. Ice airstrips are not practical for year-round drilling. It is agreed that ice roads are a proven means for winter access but in a year round development scenario, permanent ingress and egress is necessary by maintained road or airstrip. A revised Alternative D with D1 (year-round, no CD5-GMT1 road) and D2 (seasonal, no CD5-GMT1 road) has been analyzed in the Final SEIS.

In Alternative D2, CPAI insists a 5,000-foot gravel airstrip is necessary for a relief rig to be hauled in via Hercules. Constructing an ice airstrip each year at GMT1 in place of a gravel airstrip would cut many weeks off the already short drilling season, resulting in fewer wells drilled each year and longer overall project length. It would also drastically limit site access during summer months and shoulder seasons when crews must remain present for well workovers and maintenance of production facilities.

[AKP-001]
Thomas Rulland, representing himself
Summary- Expressed concerns about impacts to caribou and how deflection of caribou could impact their availability for subsistence users.

Response:
Section 4.6, Cumulative Effects analyzes the impacts of potential future projects, including a road to Umiat. It was estimated that the potential impacts of those projects could have significant impacts to Anaktuvuk Pass, Point Lay, Atqasuk, Barrow, Nuiqsut, and Wainwright.

[AKP-002]
James Nageak, City of Anaktuvuk Pass
So if the Nuiqsut people are able to use the road, would one of the mitigations be that only the residents in that area would have access to that road for subsistence use?
[BLM response provided on pg 70 of transcript]

Response:
A mitigation measure is proposed or the Final SEIS that would require the applicant to provide a legally-binding Right of Access Agreement to oil field roads for Nuiqsut residents. This Agreement would clearly define hunting rights and restrictions on a GMT1 road. Hunting directly from roads is illegal throughout the State of Alaska.

[AKP-003]
James Nageak, City of Anaktuvuk Pass
So the Dalton Highway had that same restriction, but in the later years, then that opened up. Wouldn't that be the same situation with that particular road (indiscernible - speaking simultaneously)...that in the -- how long, 20 years, that road was opened up for the public use?
[BLM response provided on pg 71-72 of transcript]

Response:
The potential GMT1 road will not be open to the public because it would not be connected to the Dalton Highway via a permanent or public road. It would only be connected to the Dalton seasonally via an ice road. Use of that ice road is restricted to oil industry personnel and NSB residents, and all travelers must pass through a security checkpoint to access the road. Residents of Nuiqsut would be able to use a GMT1 road year round and access it via the Kuukpik Spur Road. A potential mitigation measure to have the Applicant provide a legally binding Right of Access Agreement is proposed in Section 4.4 of the Final SEIS.

[AKP-004]
Anna Nageak, Nunamiut Tribal Corporation
We feel -- we feel their [Native Village of Nuiqsuit] negative impacts somehow. We also feel their positive impacts sometimes, but the impacts are the things that we hate to face sometimes. The impacts socially -- social impacts are the worst kinds and the impacts on our very livelihood, such as caribou for us, even though we're far away from them guys, sometimes we feel it.

Response:
These impacts are discussed in Section 4.4.2, Sociocultural Systems and Section 4.4.6, Subsistence and several mitigation measures are proposed.

[AKP-005]
Anna Nageak, Nunamiut Tribal Corporation
We feel the impacts when the caribou are being diverted because caribou is our main bloodline. Sometime ago, maybe three years ago, when they were doing the whatever (sic) down there, we didn't get any fish.
Response:
These impacts are discussed in Section 4.4.2, Sociocultural Systems and Section 4.4.6., Subsistence and several mitigation measures are proposed.

[AKP-006]
Esther Hugo, City of Anaktuvuk Pass
what will happen to our caribou and we may not -- not see as many as we used to, which we haven't in years and since we got our caribou expert here and we are the people of the caribou, we've been -- we'll always be, I don't see why you don't do studies on our sport hunters.

Response:
Section 4.6, Cumulative Effects analyzes the impacts of potential future projects, including a road to Umiat. It was estimated that the potential impacts of those projects could have significant impacts to Anaktuvuk Pass, Point Lay, Atqasuk, Barrow, Nuiqsut, and Wainwright.

[AKP-007]
Esther Hugo, City of Anaktuvuk Pass
We've been promised on the Dalton Highway that it was never going to be open to the public, but shoot years later, they forgot all about what they promised and you know, right now you're telling us it's going to be just for industrial up north, but hey, they'll be a guy, somebody from Georgia or Wisconsin, "We're going to change this."

Response:
Section 4.6, Cumulative Effects analyzes the impacts of potential future projects, including a road to Umiat. It was estimated that the potential impacts of those projects could have significant impacts to Anaktuvuk Pass, Point Lay, Atqasuk, Barrow, Nuiqsut, and Wainwright.

[AKP-008]
Esther Hugo, City of Anaktuvuk Pass
As to rumors about if they open the wells or oil out in the Chukchi Sea, they're talking about cutting right through the foothills, sorry, I almost spilled my coffee. I don't think we'll go for that one darn bit. Either you guys see us fighting you, you guys aren't going to walk all over us just for oil and just for what they want. You guys are going to build a pipeline cutting through us and here, we still -- we don't even have natural gas or our prices are so high, just like what you guys are going to do with the Dalton Highway.

Response:
Impacts of the Umiat Road (also known as the Foothills West project), including public access, is discussed in the Final SEIS.

[AKP-009]
James Nageak, City of Anaktuvuk Pass
There's some additional concerns, like the Arctic Slope Regional Corporation, when did they inform the people of Anaktuvuk Pass that they are going to blast, you know, use dynamite to loosen the -- the gravel pits so that the road could be built for this project?
We -- I, myself, had not heard about it, but it impacted, like Anna told you, that the explosion so close to the Colville River is going to have some impact on the fishing, the fish population in our area because Colville River is the main channel in which the fish come up from -- from that -- from the ocean into our area

Response:
Potential impacts to fish from blasting activity are analyzed in Section 4.3.2.1, Fish (Construction) and 4.2.3.3, Noise of the Final SEIS.

[ANC-001]
Barrett Ristroph, The Wilderness Society
We want to make sure it's implemented as intended to avoid putting infrastructure in sensitive areas, especially Fish Creek and areas that are important for subsistence, caribou calving, insect relief, bird nesting and/or molting.

Response:
The GMT1 drill site and some of the access road have been removed from the setback areas as a result of agency and village/village-corporation concerns but some access road and pipeline remain in the Fish Creek setback under Alternative A. Sensitive areas including setbacks are included in the FSEIS discussion and an Alternative B was created to analyze the impact differences between some and no infrastructure within these sensitive areas.

[ANC-002]
Barrett Ristroph, The Wilderness Society
We'd like to see more information. We believe more information is needed to select the option with the smallest cumulative footprint and impacts in NPR-A, so just some questions that we raised looking through the document. How would the CD5 GMT1 road contribute to the larger NPR-A footprint beyond just GMT1?
Response:
Development beyond GMT is speculative. The NPR-A IAP EIS analyzed scenarios that include long-term development beyond GMT. If other fields are developed, additional analysis will be conducted during the planning phase

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[ANC-003]
Barrett Ristroph, The Wilderness Society
Another question; what facilities would be required for GMT2 and the other developments that are in the GMT unit under both the road and the road-less alternatives? Would these other developments use facilities at GMT1 or facilities at Alpine?

Response:
The FSEIS includes additional information on GMT2 and Bear Tooth Unit. For purposes of the cumulative effects analysis, BLM assumes that for Alternatives D1 and D2, there would be no road connection between CD5, GMT1 and/or GMT2.

[ANC-004]
Barrett Ristroph, The Wilderness Society
So what air emissions would be associated with GMT2, because right now, the analysis just looks are air emissions with GMT1. So what air emissions would be associated with GMT2 and other developments under both the road and the road-less alternatives?

Response:
The FSEIS includes additional information on GMT2 and Beartooth Units, and the analysis tiers to the scenarios described in the 2012 IAP/EIS for NPR-A.

[ANC-005]
Barrett Ristroph, The Wilderness Society
Could the impacts be reduced by conducting seasonal drilling, even if there is a road option, to avoid disturbing nesting birds during the summer?

Response:
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft.

[ANC-006]
Barrett Ristroph, The Wilderness Society
I also feel like we still don't have a handle on the impacts, the differences in the impacts between roads and aircraft on both animal migration and subsistence use. So we would recommend that BLM calculate the number of flights by season, and correlate the flights with the life stages, such as migration, molting and calving and subsistence activity periods.

Response:
Traffic in the project area has been analyzed by month, and impacts analyses correlated to resources has been included in the FSEIS.

[ANC-007]
Barrett Ristroph, The Wilderness Society
I also feel like we still don't have a handle on the impacts, the differences in the impacts between roads and aircraft on both animal migration and subsistence use. So we would recommend that BLM calculate the number of flights by season, and correlate the flights with the life stages, such as migration, molting and calving and subsistence activity periods.

Response:
Additional analysis of the road impacts on caribou during fall migration is included in Section 4.3.4.1, Terrestrial Mammals of the FSEIS

[ANC-008]
Barrett Ristroph, The Wilderness Society
we would ask BLM to consider how monitoring can be structured to minimize overflights.

Response:
BLM is considering ways in which surveying and monitoring activities in the area can be done with reduced aircraft.

[ANC-009]
Barrett Ristroph, The Wilderness Society

what could be used to help minimize -- mitigate some of the impacts associated with this project.

Response:
BLM is considering various project-specific mitigation measures, including increased use of electricity which would reduce noise and emissions as well as pipeline and spill response measures.

[ANC-010]
Lanston Chinn, Kuukpik Corporation
With the discovery of Alpine in 1994, the community of Nuiqsut knew there's a proper balance between the traditional subsistence hunting and fishing interests and those of oil and gas development would be critical to achieving mutual success, okay. As a result, Kuukpik entered into service use agreement negotiations with Arco Alaska, okay, the predecessor of today's ConocoPhillips Alaska, okay. Provisions included, okay, providing for priority in terms of jobs, training, contracting opportunities and protections for the land and resources of Kuukpik Corporation. Moreover, a consent agreement based on Section 1431(o) of ANILCA, okay. It was executed at the Arctic Slope Regional Corporation. These landmark agreements were achieved through dedication and commitment by all parties and allowed production at Alpine to begin in 2000, but that was 14 years ago.

Response:
These issues are discussed in detail in the Sections 4.4.2 (Sociocultural Systems), 4.4.3 (Economy), and 4.4.6 (Subsistence). BLM recognizes the tradeoffs and benefits of development but is obliged to fully disclose and discuss any negative impacts.

[ANC-011]
William Muldoon, CPAI
Point five, seasonal drilling is not practical for GMT1.

Response:
Practicality of seasonal drilling at GMT1 has been analyzed in Alternative D-2 in the FSEIS.

[ANC-012]
William Muldoon, CPAI
timing is critical for success. ConocoPhillips initiated the permitting discussion for GMT1 with agency preapplication meetings in April 2013, and submitted the permit request to the agencies in July 2013.
Preparation of this draft SEIS has taken several months longer than envisioned due to government furloughs and protracted agency endorsement processes. We urge the BLM and its cooperating agencies to maintain the agreed upon project schedule from this point forward, and discourage any extension of the public comment period, which is already longer than required under governing law.

Response:
Comment is noted. BLM understands that timing of the project is important to the applicant's internal deadlines and schedule.

[ANC-013]
Keith Silver, representing himself
I recommend a component be included for village hire and I have not had an opportunity to read the whole thing and it's probably there already, but if it's not, I recommend they do something specific for the village hire for the Village of Nuiqsut.

Response:
This will be considered as possible mitigation for Environmental Justice impacts if not already included.

[ANC-014]
Lindsey Hajduk, Sierra Club
There are also cumulative impacts of this and other projects that are analyzed throughout the Reserve. So GMT1 project should not be considered on its own. The GMT2 project, the Bear Tooth Units should be addressed as cumulative impacts and this should include what that road and pipeline network (indiscernible- coughing), as well as impacts from research and other baseline studies for things like the OCS pipeline route and other possible development.

Response:
The GMT1 Section 4.6, Cumulative Effects considers foreseeable development and the analysis includes development such as pipelines and roads as well as activities such as research and baseline studies.

[ANC-015]
Lindsey Hajduk, Sierra Club
The analysis of aircraft traffic and ground traffic isn't sufficient to evaluate the impacts of each alternative.

Response:
The FSEIS will include revised information on flights. The respective sections of the FSEIS, Sections 4.3.3 Birds, 4.3.4.4 Mammals, 4.3.5 Threatened and Endangered Species, 4.4.6 (Subsistence), and 4.4.5.3 (Recreation) consider direct, indirect, and cumulative impacts from aircraft and noise.

[ANC-016]
Lindsey Hajduk, Sierra Club
There should be a much needed analysis of the cumulative air impacts, the air quality impacts from existing operations and future operations -- operations, especially through gas flaring

Response:
Air quality information and analysis is presented in Section 4.6.3.

[ANC-017]
Lindsey Hajduk, Sierra Club
There should be an analysis of seasonal drilling and operations such -- and -- excuse me, seasonal drilling in the alternatives as is done with C -- or excuse me, as was done with Alpine CD3 site, for example, which could reduce risks from blowouts and things from Fish Creek.

Response:
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft.

[ANC-018]
Lois Epstein, The Wilderness Society
one concern I have as an analyst looking at the EIS is that we need to better understand the sensitivity of the numbers that are in there, particularly for the special studies that are done and the -- the need for overflights, helicopter flights to go out and do the hydrological sampling, because that does have -- essentially, there are hundreds of extra flights that are listed under Alternative D and so if those numbers can be cut down, given that it's roughly an eight-mile distance between GMT1 and CD5 with a pipeline right-of-way that could be traveled, potentially, not -- not only by flying, and I recognize that some of the -- some of the sampling would take place a little further from the road (sic), but that would be true even if you have a road, as well, so -- so that's -- that's my -- my point, maybe there should be some additional examination about whether that number can be cut down dramatically and what that would do for meeting air quality standards and reducing noise and reducing impact.

Response:
BLM is considering adding mitigation to analyze aircraft impacts to subsistence use and resources.

[ANC-019]
Teresa Imm, ASRC
I would also like to point out that while the development or the pad is on a federal lease, the resources to be developed are on Arctic Slope Regional Corporation subsurface and that's not made very clear in the SEIS document, nor in the presentations that I've experienced and have sat through. So it's very important for people to understand that this is an Alaska Native resource. It's a resource that we received through our entitlement under ANSCA and the promise of ANSCA was that we could develop the resources to benefit and provide economic freedoms to our shareholders and so that's a very important aspect to this project and to the continued projects in this area.

Response:
The FSEIS has been updated to reflect the suggested edit.

[ATK-001]
Paul Bodfish, Sr., ASRC
Well, I said that in the past that when BLM personnel named Isaac-- I don't know who else was here, but they did come and they asked us a bunch of questions and you know, we gave them where we hunt and which routes the caribou take.... and all of that has been recorded and I'm just saying, "How come they're not using that information (indiscernible - speaking simultaneously)?"
[BLM Response provided on pg 52 of transcript]

Response:
BLM incorporates comments received through consultation and the NEPA process in an ongoing manner; however, NEPA requires additional public participation for new projects which BLM is analyzing. Seeking additional public comments does not mean that BLM is disregarding comments from earlier EIS's

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[ATK-002]
Paul Bodfish, Sr., ASRC
Several years of studies that they've done here, it has greatly impacted us and we've felt that and that was just a little traffic...
We've had mad hunters go home because of it.

Response:
BLM is working with its permittees when giving out study permits to reduce impacts on subsistence users in study areas. BLM also uses its Subsistence Advisory Panel to consult with subsistence users to get feedback on ways to make studies and camps less impactful. These actions are done separately from the SEIS analysis.

[ATK-003]
Paul Bodfish, Sr., ASRC
Well, you know, there are people, you know, like we've got people from Cincinnati that come up here every year. Why not gather some of their data because where they're doing their study, caribou goes right by them. What is it, a mile-and-a-half? Every year. We've asked for -- we've asked them to come and give us the type of information that they've gotten and I know they do key our fish and do they studies and not just the plants there, because there's a creek right -- that fish bearing right in that area, salmon berries and they've been doing a lot of studies on vegetation and all the fish that run through that creek.
[BLM response provided on pg 56 of transcript]

Response:
BLM is working with its permittees when giving out study permits to reduce impacts on subsistence users in study areas. BLM also uses its Subsistence Advisory Panel to consult with subsistence users to get feedback on ways to make studies and camps less impactful. These actions are done separately from the SEIS analysis.

[ATK-004]
Kate Aiken, representing herself
[Translated by Roy Nageak] She says that she's glad we are here and that the alternatives are available, especially for the buffers for the rivers, the larger buffer for the larger, more subsistence area and the smaller buffer for the ones that are being utilized a lot, but still there's graylings because we've seen that in one of those studies and like you say, the final (speaking Inupiaq) like you say different things from Alternative A, B, C, D and make it with the comments that are being received. And this is -- this is still a living document (translating into Inupiaq), especially in Nuiqsut because they will be the most impacted and ASRC, if they've got comments and they will have input and those are -- that's what's needed.

Response:
BLM is analyzing the impacts to fish and water resources, and appreciates the importance of buffer areas to subsistence resources.

[ATK-005]
Mary Ellen Ahmaogak, ASRC
ASRC owns most of the subsurface of the GMT1 development and will receive significant royalty revenue through the development. GMT1 is a project of ConocoPhillips that will produce oil from ASRC's ubsurface, a right given to us through ANCSA to support our shareholders and through the sharing provisions, benefit Alaska Natives across the state. It's through development like GMT1 and the revenue ASRC receives through its royalty ownership that keeps its dividend policy strong. GMT1 is an essential project to maintain North Slope production and the economic benefits that it brings to the North Slope oil through its tax based that supports the infrastructure of the North Slope communities, such as our community of Atqasuk.

Response:
Comment is noted.

[ATK-006]
Mary Ellen Ahmaogak, ASRC
Communities of the North Slope and within NPR-A would like to have the benefit of the same amenities that non-rural communities have with respect to roads to provide connections between communities to larger cities and to allow fast, reliable telecommunications and internet services and to assist in lowering the cost of energy.

Response:
The NPR-A Working Group's document, Principles on Development of Infrastructure in Northern Alaska, also makes this point clearly. That document is included as an appendix in the Final SEIS and is described in the analysis.

[ATK-007]
Mary Ellen Ahmaogak, ASRC
We would also like to see the gravel remain in place after oil and gas activity to allow residents to have continued long-term access to subsistence resources. Gravel is a very valuable

commodity on the North Slope, so to have the companies pick it up and haul it away after they are done with producing oil would be bad for our villages and our villages would have the opportunity to use the gravel in ways that benefit them.

Response:
Section 4.2.1.1 (Terrestrial Environment) Construction of the Final SEIS discusses leaving the gravel roads and pads after the project is completed. The community needs and the environmental impacts will be reviewed at time of abandonment of the well to determine what infrastructure should be left behind and what should be reclaimed. No final decisions have been made at this time.

[BRW-001]
George Olemann, representing himself
I'll just mention that Kuupik land has trust and responsibility for the tribes and the subsistence users, but also ask about or mention about what we've done with outlying villages with sensitive areas, subsistence areas that we've started with ICAS and they do it -- if you're going to look at the whole scope or plan to -- then we should -- ICAS should be part of that, because we need to look at and consider the villages.

Response:
BLM has ongoing government-to-government consultation with the Native Village of Nuiqsut and sporadically with Inupiat Community of the Arctic Slope (ICAS) but welcomes ICAS input on sensitive areas.

[BRW-002]
Forrest Olemann, representing himself
just when you think you have the science down, something different happens and so it always occurs to me that hunger knows no fear. If the food is there, the animals are going to go where the food is at, unless it's altered by some heavy activity

Response:
BLM uses the best science available at the time EIS's are drafted, and develops mitigation measures to try to lessen the impacts to caribou and subsistence users.

[BRW-003]
Forrest Olemann, representing himself
I go back to thinking that in my lifetime, you know, we've gone three generations reliant on motorized hunting activity and so the thing that -- when we talk about impacts to terrestrial animals, there never seems to be an attempt to correlate social impacts accordingly. I think, you know, there are three villages that come to my mind that are heavily impacted and affected regardless of what these studies may show and so if this is an attempt to open the gateways to allow more activity then the question that I'd like to know for future reference is what's the alternative for those that are reliant on the subsistence resource?

Response:
The Final SEIS Section 4.4.2, Sociocultural Systems and Section 4.4.6, Subsistence describe these concerns adequately.

[BRW-004]
Thomas Brower, III, NSB
your data collection here, doesn't state the type of season it was, either it was wet, dry, light snow, heavy snow, (indiscernible) every year where it's allways different. That is where your data is lacking here, even though you made a good attempt to do it like (indiscernible). Let's say 2005, probably the most heaviest snow season along with the least amount of area where they hang around because they -- they migrated to where there was less snow where they can have

access to the feeding grounds and also there are some seasons where, in the late season, it could start freezing of the rain and there's a heavy cover of ice where their feeding ground. That's where this pattern here where your data is lacking, the type of winter, the type of season, this data that's collected and either it's super dry or it's super wet, was there hardly any snow, was it all iced up or ice melts, that's where the type season.
[BLM response provided on pg 44 of transcript]

Response:
Although weather varies somewhat from winter to winter, our knowledge of caribou use of the area comes from location data collected over 25 years, i.e. the data span, and account for, the variation inherent in weather.

[BRW-005]
Forrest Olemann, representing himself
[in repsonse to determining impacts on terrestrial mammals/caribou] we're always trying to find ways why we can't do this, rather than using the traditional and cultural application as to how we can do this, using the science that may have been -- and the data that has been put together for the last 20 years. [BLM response provided on pg 57 of transcript]

Response:
BLM's analysis includes both western science as well as Traditional Ecological Knowledge.

[BRW-006]
Thomas Brower, III, NSB
I'm starting to see from my knowledge to be competitive subsistence hunter here in Barrow. They have to compete with all of the other folks that are -- that have ATVs, that have boats to be out there in the forefront. This is what's going to happen. That's just Barrow. It's going to happen at Nuiqsut, to every village, as they develop more and more, but right now, the caribou is starting to decline.

Response:
The 2012 NPR-A IAP/EIS to which this Final SEIS is tiered notes the declining numbers of TCH caribou. There is no evidence, however, for a single overarching cause for this decline, and certainly none indicating that harvest by humans is the primary cause. However, with the decline continuing, harvest by humans can become a significant factor and must be addressed in population management.

[BRW-007]
Thomas Brower, III, NSB
The thing about -- talking about caribou, I really do (indiscernible)
here and it's going to be (indiscernible) the individual for economic needs to sustain ourselves and if we're relying on subsistence, but we have to rely on other stuff. So we are (indiscernible) we are educated (indiscernible) oil and gas lines. We can't go back. We'll never go back.

Response:
The Economy Sections in Chapters 3 and 4 of the Final SEIS describe the economic benefits of development.

[BRW-008]
Bart Ahsogeak, representing himself
I guess what's missing in here is we've got nothing but biologists, all the study groups, yet there is no enforcement personnel here that's going to tell us that you cannot hunt along the pipeline. So that's a question that the locals always want to know, because those guys come around at the peak hunt and try enforce it. Thank you.

Response:
A new potential mitigation measured would require the Applicant to provide a legally binding Right of Access Agreement for Nuiqsut residents' use of a GMT1 road.

[BRW-009]
Billy Adams, representing himself
We use the roads to go hunting off of, but you know it's, I hear – the mitigation – mitigating measures that you mentioned earlier, they're the ones that really need to have use - access for those roads and I'm glad you mentioned...I give those residents of Nuiqsut to use these roads for their purposes and be able to hunt from those roads.

Response:
A mitigation measure is proposed in the Final SEIS that would require the applicant to provide a legally-binding Right of Access Agreement to oil field roads for Nuiqsut residents. This Agreement would clearly define hunting rights and restrictions on a GMT1 road. Hunting directly from roads is illegal throughout the State of Alaska.

[BRW-010]
Thomas Brower, III, NSB
As you saw earlier, Conoco plans to dig a mine site called Clover Mine Site and also, there's an existing mine site the ASRC Mine Site, across the street from Nuiqsut on the other side of Kuukpik River or the Colville River.
The North Slope Borough had policies on consolidation usage of its existing resources. One of them will be a gravel mine site to – the maximum allowable to maximum use of an existing source, which is the gravel source and come to the point to where the existing mine pad has come to the end of its life should BLM on federal lands open -- open up a new mine site where it's the least amount of impact -- when you open a new mine site versus opening another large-scale mine site, even if they have access to it only in the wintertime because it's going to be another big hole out there, if you -- if they shut down the ASRC Mine Site.
The mine site has the potential to support the majority of this project, but at the end of the GMT1, ASRC won't have that potentially. The area will be-- Gravel will be excavated to its maximum allowable. So take that into consideration when you put your final EIS together -- is that gravel source going to create a bunch of holes out there, but the maximum use of existing resources of the mine site.

Response:
If the ASRC Mine Site does not have sufficient material, the Clover site would be developed. However, ASRC has communicated to BLM that the mine site is still viable for an additional 15 million yards of material.

[BRW-011]
Forrest Olemann, representing himself
I think it would serve the people better that are most impacted if all this was put in layman's terms, something that's very understandable for the regular subsistence user that doesn't make it an effort to fully understand what this whole presentation is all about, that they have some assurance that there wellbeing is being looked after.

Response:
BLM has tried to provide a document that is written in clear and concise, non-technical language.

[BRW-012]
Rosemary Ahtunangaruak, representing herself
This stuff is really important, but it's the division of our region that has been the most painful, the most stressful, the most hurtful to all of our families. It's the changes that have happened to our families that are feeding our families from the fruits and lands of this beautiful place on the horizon that Nuiqsut is. It's the changes that have happened to the leadership. When we first went to the village, our whole village was united on protecting our way of life. Now, costs and profits changed the view. The divisions amongst our people hurt when brothers and sisters and uncles and nephews are against each other.
Response:
These impacts are discussed in greater detail in the Final SEIS and are part of the justification for findings of major impacts to sociocultural systems.

[BRW-013]
Rosemary Ahtunangaruak, representing herself
you have those young men commit suicide because they can't find a way to understand the changes to our lands and the changes to our way of life and the value they are felt (sic) as hunters to our village, it's a big problem for our whole community. When our young hunters see the infrastructure and they can make the logical decision that it's not logical to try and go out into traditional lands because you can't harvest in the way that our elders have taught us to. That's tremendous impacts.

Response:
These impacts are discussed in greater detail in the Final SEIS and are part of the justification for findings of major impacts to sociocultural systems.

[BRW-014]
Rosemary Ahtunangaruak, representing herself
It's tremendous for the agencies that have led this process for the organizations that are pushing for these changes, but it's our people that are bearing these losses for our traditional foods and the nourishment for our bodies, for our minds, for the unity in our families, for the unity in our region.

Response:
These impacts are discussed in greater detail in the Final SEIS and are part of the justification for findings of major impacts to sociocultural systems.

[BRW-015]
Rosemary Ahtunangaruak, representing herself
we still have many, many people with breathing problems and the tremendous impact it takes when you take and tell a family, "You're too sick. You can't live in the village anymore." That's a tremendous impact, but I've heard multiple families being told that same story and yet, we don't have restrictions to flaring of gas during [temperature] inversions and yet, we don't have enforcements to restricting the way that industry is using their vehicles and running them 24/7 throughout the industrial season. We don't have support to restrict the traffic to reduce the amount of dust that's being accumulated.

Response:
Flaring is used as intermittent health and safety measure under certain conditions, and thus setting restrictions based on weather could be a safety hazard. Flaring will be addressed in the Final SEIS. Prohibition of undue idling of vehicles may be analyzed in the Final SEIS as a Potential New Mitigation Measure for Public Health. The permittee will implement a plan approved by the Authorized Officer for limiting Fugitive Dust - the Final SEIS assumes fugitive dust be controlled by 75%.

[BRW-016]
Rosemary Ahtunangaruak, representing herself
All of these things can help us in these issues, yet in our documents and decades of process, we put in many recommendations to what we should be doing, but each one of these documents have come back and told us we can't do that and told us that it cost too much and told us that we don't have support in our state because our bid is for oil and gas development.

Response:
BLM considers all recommendations for potential new mitigation measures. The decision whether or not to adopt these will be in the ROD - those not adopted will include a rationale.

[BRW-017]
Rosemary Ahtunangaruak, representing herself
All of our efforts to communicate have demonstrated that, but yet, we're at a drawing line in this process. Where's the restoration of what has already been done? Where is the accurate and fully -- assessment of things that have already been changed with the reinjections and the dumping of things that are -- come with this process? We don't have adequate information to even go out there and track it, let alone the transparency to say that the words you're putting on paper and the enforcement that is being done by regulatory process or by industry controlled process is even being done.

Response:
BLM and the Corps may consider restoration of abandoned oil and gas sites on the North Slope as mitigation measures associated with this project. Additionally, BLM will require monitoring of

its mitigation measures to ensure that such measures are working and being carried out properly.

[BRW-018]
Rosemary Ahtunangaruak, representing herself
We want safety for our lives and our families. It's not about putting lines on this paper and putting boxes and saying things are going to happen. It's about keeping our families healthy with the changes you're bringing to us, allowing us to continue our way of life into the future, in spite of the changes you're bringing to us.

Response:
Safety for residents is addressed via multiple lease stipulations and BMPs. New potential mitigation measures address safety by requiring studies of contaminants in subsistence foods and by requiring the establishment of an disaster/evacuation plan for the community of Nuiqsut.

[BRW-019]
Rosemary Ahtunangaruak, representing herself
We know that we have now a new document on the National Child Environmental Health that talks about health issues that are changing in environments where there are changes. This needs to be brought into our process. We need it engaged with our Health Impact Assessment, because our data is not there. We don't have the data sets to look at what's the issues.

Response:
Attempts to locate this document in order to review and include it as a reference were unsuccessful.

[BRW-020]
Rosemary Ahtunangaruak, representing herself
So we don't have good data sets to know what are all these things, but I know we have a tremendous amount of asthma. We have a tremendous amount of diabetes. We have a tremendous amount of heart disease. We have a tremendous amount of obesity. We have a tremendous amount of thyroid disease. These are all different things that are happening to our people, without the studies to assess what's going on, but we have only one industry that are contributing tons of emissions to the air that we breathe, the animals that we depend on, to the waters that we feed our families from and that we feed our -- we give to our families to drink, to bathe, to hunt, to fish in.

Response:
The Baseline Health Community Health Assessment prepared by the North Slope Borough (2012) as well as the analysis of Public Health in the NPR-A IAP/EIS (BLM 2012) consist of the most current and complete synthesis of information regarding the impacts of oil and gas development such as the GMT1 project on Public Health for the community of Nuiqsut, and can be used as a baseline from which to compare future monitoring of Public Health in Nuiqsut. A new potential mitigation measure requires the operator of GMT1 to put in place a plan to monitor relevant Public Health parameters that could be affected by the operation of GMT1.

[BRW-021]
Rosemary Ahtunangaruak, representing herself
We asked that we get some support to restrict some of the emissions that are occurring, but yet, when they expanded Alpine, we watched the biggest flare, 23 days, flaring right next to the village. There was no support, even though the document said you're supposed to shut off the flare every few hours to allow the particulates to disperse and decrease our exposure. There was no support to shut that off. How many more nonsupportive understandings (sic)?

Response:
Any additional flared volume of gas associated with the project would likely be negligible compared to existing flaring events, barring any significant process design flaws that may work themselves out as volumes are increased. There is no current regulation that prevents CPAI from flaring in non-emergency cases without approval, however, the BLM has the discretion to limit these events to those determined to be absolutely necessary for safe production handling.

[BRW-022]
Rosemary Ahtunangaruak, representing herself
This data isn't even there to fully assess how much our exposure is, because the data sets are mixed into a very difficult assessment process where you have to know who the people are, where you're reading it from, to know where to get the data sets from. Some of our information might be in the village, some of it might be in Barrow, some of it might be in Fairbanks, some of it might be in Anchorage, some of it is nonexistent
Response:
The Baseline Health Community Health Assessment prepared by the North Slope Borough (2012) as well as the analysis of Public Health in the NPR-A IAP (BLM 2012) consist of the most current and complete synthesis of information regarding the impacts of oil and gas development such as the GMT1 project on Public Health for the community of Nuiqsut, and can be used as a baseline from which to compare future monitoring of Public Health in Nuiqsut. New Potential Mitigation Measure # requires the operator of GMT1 to put in place a plan to monitor relevant Public Health parameters that could be affected by the operation of GMT1.

[BRW-023]
John Hopson, representing himself
We have to move forward and continue to responsibly develop our lands and our oceans in order to continue to sustain, if not better, our lives within our own selves, our own communities and our region.

Response:
Widespread support for responsible development and the economic security it provides the NSB is highlighted in the Final SEIS.

[BRW-024]
John Hopson, representing himself
The North Slope Borough's budget has been in decline for many years and with that decline, we're always having to decide on what services do we cut, what services do we continue and how far do we go along? Eighty percent of our whalers have North Slope Borough jobs. Where

does the budget come from, from the North Slope Borough? How many percent -- who can tell me how many percent of the tax base dollars is from oil and gas for the North Slope Borough? What was it, at 85, 90%? 98% of the North Slope Borough's funding that funds our school, that funds our college, that funds our clinic, our fire department, our police department comes from tax base from oil and gas and that's jobs.

Response:
Comment is noted.

[BRW-025]
John Hopson, ASRC
Communities on the North Slope and within the NPR-A would like to have the benefit of the same amenities that non-rural communities have with respect to roads to provide connections between communities and larger cities to allow for fast reliable telecommunications and internet services and to assist in lowering the cost of energy, which road infrastructure can assist with.

Response:
The NPR-A Working Group's document, Principles on Development of Infrastructure in Northern Alaska, also makes this point clearly. That document is included as an appendix in the Final SEIS and is described in the analysis.

[BRW-026]
John Hopson, ASRC
We would also like to see the gravel remain in place after the oil and gas activity to allow residents to have continued long-term access to subsistence resources. Gravel is a very valuable commodity on the North Slope, so to have the companies pick it up and haul it away when they are done with producing oil would be bad for our villages. Our villages should have the opportunity to use the gravel in ways that benefit them. Thank you.

Response:
The Final SEIS discusses the thought being given to leaving the gravel roads and pads after the project is completed. The community needs and the environmental impacts will be reviewed at time of abandonment of the well to determine what infrastructure should be left behind and what should be reclaimed. No final decisions have been made at this time.

[BRW-027]
Rosemary Ahtunangaruak, representing herself
we started with promises that were given from Arco saying they would do some research and then we were -- there were some changes with the company and now we have ConocoPhillips. Those promises should have followed the leases when you all took them over. There were some studies on sociocultural impacts that were never released that have not been updated that really needs the information brought into them in a good way. I hope that -- that the promises that were given to start the development with supporting some of the research and monitoring that our village wants to help us assess some of the issues will get supported in this process if you have to go forward, because there's been so many requests that we've put forward that are still unanswered and there's a lot more broken promises from generations of this process.

Response:
BLM believes that what is being referred to is associated with agreements made as part of the Alpine development (note: NOT the Alpine Satellite Development Plan), which is on State land. ARCO was the company who initiated Alpine (along with Anadarko and Union Texas), and then eventually sold to CPAI. Any commitments made by BLM as part of this NEPA process will be carried forward through BLM's oversight and effectiveness monitoring.

[FAI-001]
Pamela Miller, Northern Alaska Environmental Center
We are most concerned that a sensible road-less alternative has not been evaluated and perhaps more importantly, that seasonal production drilling is not addressed by any of the alternatives.

Response:
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft.

[FAI-002]
Pamela Miller, Northern Alaska Environmental Center
Furthermore, the analysis of aircraft and ground traffic is insufficient to completely compare the impacts of each alternative. I was looking for a specific chart of the amount of ground travel requirements, such as; truck traffic, construction, loads of gravel, exactly when it would take place, and things like that, I could not find that, and the development, drilling waste hauling, crew travel, all those things of ground traffic should be evaluated for their impacts.

Response:
The FEIS includes additional information on aircraft and vehicle traffic.

[FAI-003]
Pamela Miller, Northern Alaska Environmental Center
I find it interesting that the proposed Alternative A, the project, involves more than double the number of aircraft flights in the summer than during the winter, even though that alternative has connecting roads. The proposed project, Alternative A, is projected to involved 3,688 flights in 2016, including the baseline, which I presume is the existing Alpine operations.

Response:
In Alternatives A,B, and C construction could occur during the summer. Flights are used to support the transportation of gravel working crews. The construction schedule would remain the same across all action alternatives. The Final SEIS includes updated information on flight traffic.

[FAI-004]
Pamela Miller, Northern Alaska Environmental Center
There are also flight estimates for 2017 and '18, but not for '19,
except for Alternative D, and it does not take into account flights in the future years when there will potentially be additional development from the next construction project down the road for further development (sic).

Response:
Operations flights would continue beyond 2019 if no gravel road is constructed between GMT1 and CD5, and flights for studies would continue under alternatives with a road, as described in

the Final SEIS. While Section 4.6, Cumulative Effects is able to qualitatively discuss that flights will occur in future years due to westward development, the number of flights would be speculative.

[FAI-005]
Pamela Miller, Northern Alaska Environmental Center
I will note that for Alternative D, it seems like the analysis of the impacts of aircraft is flawed because looking at the charts, it has twice as many helicopter flights for special studies, hydrology and biological studies, than for all of the other alternatives. I don't understand why more of those special studies would be needed.

Response:
The FEIS will include additional information on aircraft and vehicle traffic.

[FAI-006]
Pamela Miller, Northern Alaska Environmental Center
With my last time, I will note that cumulative impacts for the –
there's no amount of any of the future projects in this EIS that I could find in my preliminary review, whether it be GMT2, which has been on the table since 2002, the potential Fjord West Site that has been talked about for quite a long time, much less the entire Greater Mooses Tooth Unit and the Bear Tooth Unit. A map is really critical for assessing the potential impacts to caribou, birds and other factors.

Response:
The FEIS includes additional information on GMT2 and Beartooth Units, and the analysis tiers to the scenarios described in the 2012 IAP/EIS for NPR-A.

[FAI-007]
Pamela Miller, Northern Alaska Environmental Center
A map is really critical for assessing the potential impacts to caribou, birds and other factors.

Response:
More features mentioned by the commenter will be added to map in the cumulative analysis section for the Final SEIS. In particular, GMT2 has been added to Figure 4.6-1. Also, figures depicting caribou migration in relation to all existing oil and gas infrastructure have been included in the Final SEIS.

[FAI-008]
John Hopson, ASRC
We feel the SEIS is flawed because the document does not clearly identify the primary purpose of the development to this developed ASRC material -- minerals. While we acknowledge that the surface location is on federal land and the lease is on -- is in Alaska Native minerals that will be divvied up, the only real description of this figure is 1.1-1, in the figure. In fact, ASRC owns more than 90% of the surface that will be developed through the GMT1 project. In Section 4.4.3 Economy, the SEIS does not even mention the royalty revenue to ASRC as a primary economic effect, while

Response:
The Final SEIS has been updated to reflect the suggested edit.

[FAI-009]
John Hopson, ASRC
there's no description of the economic and revenue impact to ASRC resulting from the project. In the next paragraph, the SEIS does state the estimated royalties from GMT1 would amount to over 2.9 million of (sic) the life of the project. It does not state who those royalties would be paid to. We, ASRC, have to assume that $2.9 million would be paid to BLM and that does not include the entire royalty system stream.

Response:
The Final SEIS has been updated to reflect the suggested edit.

[FAI-010]
John Hopson, ASRC
the price information on the SEIS, the total estimated royalty
to ASRC from GMT1 would be $950 million. At this point, ASRC cannot say that these numbers are correct. However, by using the information that is provided in the SEIS, this is the revenue to ASRC, assuming we own 90% of the revenue. As presented in the SEIS, to receive a total royalty of 2.9 million would mean that BLM owns less than .3% of GMT1 resource by their own calculation. Not identifying ASRC's potential royalty and revenue, it is very misleading and irresponsible of BLM...

Response:
The Final SEIS has been updated to reflect the suggested edit.

[FAI-011]
John Hopson, ASRC
There is (sic) also errors in the document with respect to ASRC's
gravel mine site and its potential. There is public information with respect that (sic) the estimated reserves at the mine site that BLM fails to use. ASRC will not address these flaws in this information at this time, but we will provide more on the written statement before the close of the deadline.

Response:
The Final SEIS has been updated to reflect the suggested edit.

[FAI-012]
John Hopson, ASRC
We would also like to see the gravel remain in place after oil and gas activity to allow residents to have continued long-term access for subsistence resources. Gravel is a very valuable commodity on the North Slope. So to have companies pick it up and haul it away after they are done with producing oil would be bad for our villages. Our villages should have the opportunity to use the gravel in ways that benefit them.

Response:
Section 4.2.1.1 of the Final SEIS discuses leaving the gravel roads and pads after the project is completed. The community needs and the environmental impacts will be reviewed at time of abandonment of the well to determine what infrastructure should be left behind and what should be reclaimed. No final decisions have been made at this time.

[FAI-013]
Darcie Warden, Alaska Wilderness League
I just want to continue to encourage BLM to really, seriously consider mitigation measures that they [village of Nuiqsut] proposed to BLM and -- and just continue the good work that you guys are doing, but to try and just really create that meaningful dialogue...

Response:
Comment is noted. BLM is working with residents of Nuiqsut to have an ongoing dialogue and develop useful mitigation measures.

[FAI-014]
Darcie Warden, Alaska Wilderness League
there's the Colville River special area, the Teshekpuk Lake special area and just managing the area to maintain those special qualities and -- and also those areas around Fish Creek and the high use subsistence and really, I think, the thing that's most impacted in this plan are the subsistence use resources. So those are the things that need to be considered most heavily and maybe weigh in, you know, as you take all this into consideration, weigh

Response:
The cultural and subsistence-based importance of Fish Creek and the Colville River are described in the Final SEIS. The importance of these areas underlie some of the findings made and one of the potential mitigation measures proposed.

[FAI-015]
Pamela Miller, Northern Alaska Environmental Center
I'll address in a little more detail concerns about seasonal production drilling not being considered in any of the alternatives and this was done at Alpine's CD3 site, which is not connected by a road and also with the Northstar field and perhaps some others. At the very least, it should be evaluated so we understand what the difference might be, since it is assumed by many people that operations occur only in the winter on the North Slope.

Response:
If a gravel access road connecting GMT1 to the CPF is not permitted, then a gravel airstrip of at least 5,000 feet in length is required to provide spill response support by a Hercules C-130 aircraft.

[FAI-016]
Pamela Miller, Northern Alaska Environmental Center
GMT1 aircraft transportation plan in Appendix J is three pages. It doesn't include specific numbers of ground vehicle trips or very specific information. So how the information that was

created in the various tables that I spoke about earlier that compare the alternatives, there's a big technical gap there and I think it would improve BLM's management to better understand these issues.

Response:
The Final SEIS will include additional information on aircraft and vehicle traffic.

[FAI-017]
Pamela Miller, Northern Alaska Environmental Center
Studies have been done on human health effects from chronic exposure to repeated flaring for living -- people living or working near flaring in Canada and from offshore development near Los Angeles, and according to one Canadian study, adverse impacts may occur at distances from .2 to 35 kilometers from the flaring. So this is a significant area and I urge that greater scrutiny be done by BLM for that aspect of the work.

Response:
Discussion regarding flaring has been added to 4.4.2 Sociocultural Systems of the Final SEIS.

[FAI-018]
Pamela Miller, Northern Alaska Environmental Center
Because of the lack of cumulative impact analysis in any specificity geographically, this is clearly an EIS that will be good for this one project, if the questions that people have are addressed, but as for
the further development of these two existing units, I think that's in doubt due to the lack of specificity and the kind of very general analysis that's been done, and it wasn't done in the area-wide EIS because that wasn't the site specific look at oil and gas development.

Response:
The Final SEIS includes additional information on GMT2 and Beartooth Units, and the analysis tiers to the scenarios described in the 2012 IAP/EIS for NPR-A.

[FAI-019]
Pamela Miller, Northern Alaska Environmental Center
Finally, an issue that I'm not seeing in the plan at all is addressing
flaring and how this new production may affect flaring levels at the
production site. It's -- I think it's my understanding that this is just initial separation at the GMT1 and the actual production will be at Alpine, but I know in the initial Alpine oil field operations, they had more flaring releases than all the other oil fields on the whole North Slope combined in that year and I would expect in the new operations that there will be increased flaring and whether flaring was considered at all in the air emissions modeling...

Response:
Flaring is not part of the GMT1 project design, nor will there be an increase in flaring at the Alpine CPF as a result of GMT1; therefore, emissions from flaring were not documented and mitigation measures do not need to be considered.

[NUI-001]
Eli Nukapigak, Native Village of Nuiqsut
[In reference to discussion/figures showing collared caribou movements] These are the outdated data that you've been sharing and the caribou movement each year is different and also, when industrial activity in one area that is heavily used by industry, it causes change of the migration. Have you considered some of these kinds of issues that are out there?

Response:
Although caribou movements do vary somewhat from year to year, our knowledge of caribou use of the area presented in the Draft SEIS comes from location data collected over 25 years, i.e. the data span the variation inherent in annual movements and account for it. The SEIS includes a discussion on the effects to migration.

[NUI-002]
Dora Leavitt, representing herself
My name is Dora Leavitt for the record. My question is have you compared these data with other agencies that have collected the caribou studies over the years too, along with ABR and the North Slope Borough? I know they've -- they've done a lot of studies too, with the caribou. [BLM response provided on pg 38-39 of transcript]

Response:
This comment was answered immediately at the Nuiqsut public meeting:
We have all worked cooperatively, the North Slope Borough, Alaska Department of Fish & Game, the Bureau of Land Management, ABR, and ConocoPhillips have all worked together to collect these data. These data represent efforts by all of those combined.

[NUI-003]
Dora Leavitt, representing herself
when we first had meetings with industry coming to us, we had asked as a community to collect studies. These are the data that we've been looking for. So I just want to kind of point that out to all of you that we've asked for studies. They've done their studies.
There's 22 years of studies. They have combined the studies and this is the data. You know, it might -- now we're asking for more up-to-date, you know, this is something that we've been looking for and asking for at all the meetings I remember going to

Response:
BLM has incorporated the most up-to-date studies in the Final SEIS.

[NUI-004]
Bernice Kaigelak, Kuukpik Corporation
I've noticed over the years, you know, we were taught by our elders to let the first herd go, the first bunch needs to go to make the path. Nowadays, once they hear about caribou, boats go out and they shoot whatever comes through. So we're kind of losing our -- what our elders have taught us to do. Some of our young hunters aren't allowing the herds to go through like they're

supposed to and we can't force them. We can only tell them, but I've seen that happen, too, but what bugs me the most is the air traffic and you guys were out there, too.

Response:
The Final SEIS discusses Traditional Ecological Knowledge regarding impacts of aircraft of wildlife. Hunting practices of local hunters is outside the scope of this SEIS.

[NUI-005]
Bernice Kaigelak, Kuukpik Corporation
I -- so I really would discourage any air traffic during hunting, late July, August and I hope you guys will listen to that, because we have to get our caribou late July, August when they're fat and that was way too much air traffic last -- last fall.

Response:
BLM is considering a potential new mitigation measure which would suspend non-essential helicopter traffic during peak caribou hunting season, associated with GMT1. BLM could not suspend all air traffic in the area during these times, as it does not have authority over flights on state or private lands.

[NUI-006]
Isaac Nukapigak, Kuukpik Corporation
I fully agree with Bernice's statement [comments NUI-007 A through C]. I have stated that in -- I do live in the Point Lay area, duplicates of studies that are going on in NPR-A, whether it's funded by the University through the Natural Science Foundation, would cause chaos of traffic, diversify the migration.

Response:
Comment is noted.

[NUI-007]
Isaac Nukapigak, Kuukpik Corporation
Every organization that's out there, BLM, you have every other
agency besides BLM gathering the same data. I don't see why -- why the agencies can't share these data, you know. I fully agree with Bernice, what she said, and people get frustrated because there's too much air traffic going after the same data that they're trying to gather.

Response:
BLM works with its permittees when giving out study permits to reduce impacts on subsistence users in study areas. BLM also uses its Subsistence Advisory Panel to consult with subsistence users to get feedback on ways to make studies and camps less impactful. These actions are done separately from the SEIS analysis.

[NUI-008]
Joseph Nukapigak, Kuukpik Corporation
whoever is studying these caribou, probably should come camp for a couple of weeks and count these animals or fish study or whatever or what have you that we have (indiscernible) of doing

some studies within that proposed project, whether it be GMT1 or future projects within the NPR-A or even most (indiscernible) for that matter.

Response:
Studies of fish and wildlife in the project area are ongoing. Recent data from these studies has been incorporated into the GMT1 SEIS, and will continue to be gathered and used to analyze future development proposals.

[NUI-009]
Gordon Brower, NSB
I hunt out of Barrow about 70 miles southeast in NPR-A, a lot of aircraft and other things, small helicopters, too, and camping of scientists during critical movement times, but the thing I observe the most is using the wrong colors of things, the very bright -- bright orange tents and it's -- it can be seen from a long ways.
...if the scientists collecting information camping out, try to do the same way like the regular hunters do, be -- be inconspicuous, you know, don't be -- don't be so brazen out there, is my concern

Response:
BLM works with its permittees when giving out study permits to reduce impacts on subsistence users in study areas. BLM also uses its Subsistence Advisory Panel to consult with subsistence users to get feedback on ways to make studies and camps less impactful. These actions are done separately from the SEIS analysis.

[NUI-010]
Annie Lampe [with Roy Nageak translating], representing herself
there was plenty of animals when they first moved because hardly -- the oil companies hadn't gone this far west and they were mostly out on the Prudhoe Bay area and there was a lot of caribou and the fish were fat in the Colville River.
...and things have changed and she talked about the glass - another thing that came from the gravel pit preparing for expansion of the industry and it was interruptions like then with the industry coming closer to Nuiqsut and now, come closer, they're catching fewer caribou.

Response:
BLM recognized the potential for impacts to other North Slope communities and held ANILCA 810 subsistence hearings in those communities and part of the SEIS process.

[NUI-011]
Annie Lampe [with Roy Nageak translating], representing herself
In a sense, they feel like the oil companies are coming freely without rules or regulations guiding them, in a sense. These are things that were happening in state lands and

Response:
BLM is engaging in the NEPA process, along with cooperating agencies who will also issue permits for this project, in order to fully analyze and evaluate potential environmental impacts. There are many rules and regulations in place which CPAI and other companies must follow when operating in NPR-A.

[NUI-012]
Annie Lampe [with Roy Nageak translating], representing herself
She used to live in Atqasuk, almost right in the middle--middle area of NPR-A and that's her concern is that what's happening in Nuiqsut might happen in Atqasuk, her hometown and what they are doing now, what -- the way of life and fishing, that has changed.

Response:
BLM is engaging in the NEPA process, along with cooperating agencies who will also issue permits for this project, in order to fully analyze and evaluate potential environmental impacts. There are many rules and regulations in place which CPAI and other companies must follow when operating in NPR-A.

[NUI-013]
Bart Ahsogeak, representing himself
I was told to investigate who's flying around in the chopper, real low flying, scaring all the caribou and then after we found out that -- whose aircraft it was, we found out they went over there investigating and then they found out that these guys were telling us that they would need a permit because they're under BLM and for future development, I think, any kind of studies up here should have a permit from the Borough, from the local government. It's -- that way, the locals would know who's coming in or who's coming out.

Response:
Comment is noted.

[NUI-014]
Isaac Nukapigak, Kuukpik Corporation
Under the land use agreement that we have, there's a provision in there where there is no restriction access to any residents of Nuiqsut to hunt in the Kuukpik [Corporation-owned lands]--and when in the withdrawal area.
.... I want to make sure they clarify that and no restriction at all.

Response:
The agreement that the Kuukpik Corporation has with the oil company does not involve the BLM.

[NUI-015]
Charlotte Brower, NSB
Lastly, BLM states on page 177 of the SEIS that, "BLM will determine whether or not to remove the roads upon abandonment and reclamation." The North Slope Borough and other stakeholders should have input on these kinds of decisions and the BLM should utilize a mechanism, such as the NPR-A Working Group before making decisions unilaterally.

Response:
Section 4.2.1.1 of the Final SEIS discuses leaving the gravel roads and pads after the project is completed. The community needs and the environmental impacts will be reviewed at time of

abandonment of the well to determine what infrastructure should be left behind and what should be reclaimed. No final decisions have been made at this time.

[NUI-016]
Bernice Kaigelak, Kuukpik Corporation
So I would like to charge that ConocoPhillips and all the other
industry do their best to reduce emissions, do their best to reduce noise, if you want to be good neighbors, especially during our subsistence time and I would like for that to be put on record.

Response:
Please see the Section 4.7, Mitigation Section of the Final SEIS, Table 4.7-1 for Air Quality and Noise mitigation measures.

[NUI-017]
Martha Itta, Native Village of Nuiqsut
I just wanted to concern (sic) on what the President and ASRC was saying about our community being on the same page for the alternatives that they've chosen. I disagree with that because not a lot of our community members go what's going on in our village on the west side.

Response:
BLM has been conducting community outreach efforts in Nuiqsut, in addition to tribal consultation and working with Native Village of Nuiqsut as a cooperating agency. This outreach includes sending staff to the community for two separate weeks to meet with community members about the SEIS.

[NUI-018]
Eli Nukapigak, Native Village of Nuiqsut
I'm a hardcore subsistence hunter about the land, the ocean, sea and the waters around us. I am the one that will be mostly affected, even though I'm a shareholder of Kuukpik and ASRC. My -- (speaking Inupiaq) has shrank so much. How much more is it going to shrink? How much more am I going to suffer and how much more are my loved ones going to suffer in the long-run?

Response:
Although most of the mitigation measures proposed to address sociocultural impacts are outside BLM's authority, BLM does recognize these major impacts in its analysis more clearly in the Final SEIS and proposes several new mitigation measures to address them.

[NUI-019]
Eli Nukapigak, Native Village of Nuiqsut
Cumulative impacts have been going on for years and years. What will happen now, since the last blow out that we had, nobody wants -- no one needs to help the village out. Another blow out that -- that come out with (indiscernible) from hunters on our land that will kill off everything.

Response:
Although most of the mitigation measures proposed to address sociocultural impacts are

outside BLM's authority, BLM does recognize these major impacts in its analysis more clearly in the Final SEIS and proposes several new mitigation measures to address them.

[NUI-020]
Eli Nukapigak, Native Village of Nuiqsut
My identity as Inupiaq shrink, my subsistence way of life to the land I used to hunt shrink. What are we going to do when it happens? Who's got answers to some of these stuff that will be happening?

Response:
Although most of the mitigation measures proposed to address sociocultural impacts are outside BLM's authority, BLM does recognize these major impacts in its analysis more clearly in the Final SEIS and proposes several new mitigation measures to address them.

[NUI-021]
Gordon Brower, NSB
Again, there, the North Slope Borough will work with the community. There will be additional public hearings. So once an EIS is done, I think the work is just beginning to try to move forward and I'd like - - I just wanted to offer those comments. The North Slope Borough will have to rezone the GMT1 to its new location. In the past, in the Alpine satellite, CD6 was deleted until such time that there was a better consensus to develop it and I think these are the efforts from that period of time when CD6 was deleted from the lease zone to try to incorporate that.

Response:
The NSB is a cooperating agency on the GMT1 SEIS, and its rezoning permit authority is recognized in Section 1.4.2.1 of the Final SEIS. A discussion of public hearings is included in Chapter 5 in the Final SEIS.

[NUI-022]
Joseph Nukapigak, Kuukpik Corporation
Access to the land is very important because we don't know no boundaries when we go out hunting. Am I on BLM land or what? Well, I
go there. These are the concerns that have been brought up time and time again. Access is the most important component if we have (indiscernible) or separation that will allow our villages to have access to those lands for subsistence use.

Response:
The importance of and impacts to access are recognized in the analysis of GMT1.

[NUI-023]
Thomas Nukapigak, City of Nuiqsut
I think that you guys should really make strong considerations to make the best possible way to develop on the west side of us without doing so much harm to our environment. Everybody is still hunting out there, but the question is will our food still be the same? Will it still be edible? ...this is the first time that we've been changed up this way—being affected and the other scientists doesn't quite agree with the findings that they have. The other scientists from other

niversities, you know, they don't really agree with that water hole. There's something out there that is, you know, contaminating them

Response:
BLM has required a study of contaminants in subsistence foods for future development and has a potential mitigation measure in the Final SEIS that would expand that project to include a system whereby hunters and fishers submit samples of harvested resources for testing.

[NUI-024]
Bernice Kaigelak, Kuukpik Corporation
We're faced with climate change and global warming and the permafrost is melting and I read in that report that possibly there was methane leaking on the edge, on the coast due to the permafrost melting. These are lots of things to consider and often times it's real easy to blame someone because you see them right in front of you, which is the industry, for things that are happening in our land and that's why I really would like for all of us to reduce emissions, all of us, even in the community. The whole state needs to reduce emissions.

Response:
Permafrost leaks from methane are discussed in Section 3.2.4.2 of the Final SEIS. The remainder of the comment is outside the scope of the SEIS.

[NUI-025]
Dora Leavitt, representing herself
we're concerned about the impacts that are coming to us and we are mitigating subsistence. We mitigate little, very little, which in turn, turns to social impacts.
For one, gas vouchers, what little we're going to get, it turns into a fighting. How do we define a subsistence hunter, you know, when these vouchers are passed out to everybody?

Response:
The Final SEIS recognizes major impacts to sociocultural systems and proposes mitigation measures to address them.

[NUI-026]
Dora Leavitt, representing herself
we talked about our future generation today in this community and other communities. I don't see any structured programs that are going to offset these impacts for our generations to come, you know.

Response:
The Final SEIS recognizes major impacts to sociocultural systems and proposes mitigation measures to address them.

[NUI-027]
Dora Leavitt, representing herself
The BLM, the permitters should implement this in the EIS. I know you won't implement this because it's -- it costs so much, but yet, ConocoPhillips, Repsol, BP, they go back home and

bring their billions of dollars, extracting from underneath us, from around us and that's my number one concern is that more development comes, you know, we're always having a lot of meetings and -- and these kids, we call them our future leaders. We're not -- we're not taking good care of them when we don't see any structured programs for our people, for our kids.

Response:
Generally, agencies are not required to adopt mitigation. The standard BLM must follow regarding what new potential mitigation measures must be considered and evaluated in an EIS is found in the BLM NEPA Handbook Q&A, number 19(b). This provides that all relevant and reasonable mitigation measures that could improve the project should be identified if they are within jurisdiction of the agency. If the potential mitigation measure passes the screening process as being reasonable and relevant, BLM must give it due consideration in the EIS. While social programs for youth are valuable for the community, it is not relevant to the proposed project - to construct and maintain a drill site. BLM cannot require the project applicant to fund such a program, however, BLM will make CPAI aware of these requests in the event CPAI would like to voluntarily contribute to such programs.

[NUI-028]
Annie Lampe [with Roy Nageak translating], representing herself
When they are alone as a village, basically, and with their limited English and what she hears sometimes, comments like you can't really access this area for hunting and once it's developed, it will be off limits when they try to hunt in winter and summertime.
It might not be coming from the heads of the oil companies, but with workers, basically the people that work out in the field and they make these comments in the sense reflecting of the sense of how development and the oil what I'm hearing is from the lower ranking people that do -- that are the front people in the development area and comments, with their limited English, that these people shouldn't be hunting around here or whatever.

Response:
A mitigation measure is proposed in the Final SEIS that would require the applicant to provide a legally-binding Right of Access Agreement to oil field roads for Nuiqsut residents. This Agreement would clearly define hunting rights and restrictions on a GMT1 road. Hunting directly from roads is illegal throughout the State of Alaska.

[NUI-029]
Eli Nukapigak, representing himself
I'd like to add on -- on mitigation measures on the subsistence way of life. We've been trying to build that access road to go to that river for subsistence purpose for the last 20 years, what our elders have tried to put and we've just got an invitation at this time.

Response:
BLM will evaluate if a potential mitigation measure requiring the permittee to provide for financial and technical assistance in permitting the Colville River Access Road should be included in the Final SEIS.

[NUI-030]
Isaac Nukapigak, Kuukpik Corporation
If GMT1 is built, Kuukpik would receive a share of the overriding
royalty or a consent agreement with our mother/parent corporation and Nuiqsut and the other villages throughout the Slope will enjoy the benefit from the taxes that the North Slope Borough, through its taxation power that will provide -- continue providing services such as healthcare, fire protection, water/sewer services and this list goes on. These services cost money.

Response:
The Final SEIS has been updated to reflect the suggested edit.

[PIZ-001]
Isaac Nukapigak, Kuukpik Corporation
And for the record, I disagree with your medium on the disturbance because air traffic causes more impact, diversifing caribou from their migration routes.... They diversify the -- divert the caribou from going their normal migration. So I just disagree with the medium. It should be higher.
Response:
The question of relative impacts of road versus air traffic is subject to debate, without enough data on aircraft effects to resolve the debate in the Draft SEIS analysis. Western science, although with little data for aircraft effects, tends to lean toward roads having a greater effect, especially if heavy traffic is present. A proposed mitigation measure for effects of traffic may be included in the Final SEIS. Traditional Ecological Knowledge on the other hand suggests that aircraft are the greater disturbance factor. Table 4.3-18 of the Draft SEIS rates the intensity of disturbance for Alternative D ("roadless," more air traffic) as "medium" rather than "low" as for Alternatives A, B and C. This is in line with the commenter's beliefs, and also in line with the criteria in Table 4.3-13 of the Final SEIS for a rating of medium versus either high or low.

[PIZ-002]
Willard Neakok, Native Village of Point Lay
I agree [with Isaac Nukapigak in comment PIZ-001A] that should be a little higher because we experienced four years of no caribou with -- because of aircraft noise, mostly with helicopters and our migration - Western Arctic Herd that came from the south was diverted inland to where for four years, we had basically no caribou and the caribou that we had were -- they were real... real skinny, no fat caribou

Response:
The question of relative impacts of road versus air traffic is subject to debate, without enough data on aircraft effects to resolve the debate in the Draft SEIS analysis. Western science, although with little data for aircraft effects, tends to lean toward roads having a greater effect, especially if heavy traffic is present. A proposed mitigation measure for effects of traffic may be included in the Final SEIS. Traditional Ecological Knowledge on the other hand suggests that aircraft are the greater disturbance factor. Table 4.3-18 of the Draft SEIS rates the intensity of disturbance for Alternative D ("roadless," more air traffic) as "medium" rather than "low" as for Alternatives A, B and C. This is in line with the commenter's beliefs, and also in line with the criteria in Table 4.3-13 of the Final SEIS for a rating of medium versus either high or low.

[PIZ-003]
Isaac Nukapigak, Kuukpik Corporation
And for the record, Traditional Knowledge can go side-by-side with science when it comes to studies. Are they -- I don't think -- I don't understand why the federal government avoids to utilize Traditional Knowledge because they can coincide the work together.

Response:
The Draft SEIS and Final SEIS include many impacts that are a result of Traditional Ecological Knowledge gained from government to government consultations and public meetings, both from this and previous NEPA documents.

[PIZ-004]
Willard Neakok, Native Village of Point Lay
And yeah (affirmative), Willard Neakok for the record too, even though we did introduce Traditional Knowledge, we were still -- we were overlooked (indiscernible)

Response:
The Draft SEIS and Final SEIS include many impacts that are a result of Traditional Ecological Knowledge gained from government to government consultations and public meetings, both from this and previous NEPA documents.

[PIZ-005]
Willard Neakok, Native Village of Point Lay
what happened back in 2009 to -- 2008 to 2012, the effects of the aircraft that we allowed to have fly, but then even though we designated routes to go down and back with helicopters, you know, it still was affecting the caribou herd. They diverted east.

Response:
The Draft SEIS acknowledges that aircraft can disturb caribou, and rates the intensity of disturbance one level higher for Alternative D ("Roadless," more aircraft) than for the other three alternatives. Additional information about aircraft has been included in the Final SEIS.

[PIZ-006]
Marty Awalin, Cully Corporation
For Traditional Knowledge, one of the things it covers one of the elders told me was that when you disturb the first herd of the caribou that's migrating through, it changes the path of the caribou for years to come. Sometimes in three years, four years, they'll come back again on that same route, maybe, but when you disturb that, you know, that really impacts -- that really puts an impact on the traveling of the herd.

Response:
The Draft SEIS and Final SEIS include many impacts that are a result of Traditional Ecological Knowledge gained from government to government consultations and public meetings, both from this and previous NEPA documents.

[PIZ-007]
Marty Awalin, Cully Corporation
we were flying out of San Diego, they have that no fly zone where you go up, they go up to a certain air mile and then they go over this certain area, they have to turn their engines off and I thought, "Whoa," you know that's because it does has an impact and I said, "Wow." You so, you know, that scared me because they have to turn their engines off for certain areas and certain areas of miles on -- on low -- low noise sound and I thought, "Wow, they have that -- they have that type of, you know, flying -- no fly zone or no -- you turn your engines off right through the area," and I was like, "My goodness, how -- when did they start this," and they said they've always had that and I thought, "Wow, that's something -- that's something we should look into probably."

Response:
Comment is noted.

[PIZ-008]
Marie Tracey, NSB
Marie Tracey for the record. We have had complaints from AKP [Anaktuvuk Pass] and they have been here and they said there's a lot of sport hunters that go in there and they just take the antlers. We don't know what they do with the carcasses, but they take a lot of antlers out of the (indiscernible - speaking simultaneously)...There's -- yeah (affirmative), trophy hunters.

Response:
The BLM does permit 3-6 guided hunts in the NPR-A every year. In 2013, BLM hired a pilot ranger who has worked with Anaktuvuk Pass on these issues for many years and is intimately familiar with the area, land status, outfitters operating in the area, and measures that other areas (i.e., NANA region) has taken to address similar issues. Guides and assistant guides must note the coordinates of each kill and must salvage all meat and deliver it to a village if the clients do not want it.

[PIZ-009]
Willard Neakok, Native Village of Point Lay
Willard Neakok for the record. Yeah (affirmative), I can agree with Marie too -- and at Anaktuvuk Pass because there's like -- the last count we had with the [NSB] Planning Commissioner was like three outfitters that fly out of Fairbanks to go to different camps, Umiat and into Inogak [Airfield in NPR-A] a couple of -- a couple of other places that in the past, you know, they'd just trophy hunters would just take the antlers, and you know, to put on their wall.

Response:
The BLM does permit 3-6 guided hunts in the NPR-A every year. In 2013, BLM hired a pilot ranger who has worked with Anaktuvuk Pass on these issues for many years and is intimately familiar with the area, land status, outfitters operating in the area, and measures that other areas (i.e., NANA region) has taken to address similar issues. Guides and assistant guides must note the coordinates of each kill and must salvage all meat and deliver it to a village if the clients do not want it.

[PIZ-010]
Isaac Nukapigak, Kuukpik Corporation
Stacey, there's too much [in reference to air traffic/helicopters]. It's not only the industry that has studies. You have BLM... You have state. You have various agencies....That during their normal summers, that is whether it's hydrology or subsistence or anything that relates to the environment, the problem that we see of those impacts, because of the aerial survey air traffic, there is no coordination from the federal government or the state that during these normal studies that cause frustration in the community. It diverts the caribou. It has impact to our trying to the short window period to trying to harvest.

Response:
BLM is working with its permittees when giving out study permits to reduce impacts on subsistence users in study areas. BLM also uses its Subsistence Advisory Panel to consult with subsistence users to get feedback on ways to make studies and camps less impactful. These actions are done separately from the SEIS analysis.

[PIZ-011]
Isaac Nukapigak, Kuukpik Corporation
If BLM can start working with the community and say, "Hey, we want to do this and this," okay. ConocoPhillips does that with us, the community, they utilized the Subsistence Oversight Panel [KSOP]. When these studies are mandated by the stipulations to do these types of studies... [BLM Reponse provided on pg 91-93 of transcript]

Response:
BLM's BMPs require industry to consult with BLM's Subsistence Advisory Panel. The Subsistence Advisory Panel has expanded its purview to include scientific studies. Additionally, BLM and other agencies coordinate to share data and minimize duplicative studies.

[PIZ-012]
Isaac Nukapigak, Kuukpik Corporation
Yeah (affirmative), that's because we have so much agencies that are funding projects that relate to climate change or studies that have so much traffic. Any -- every agency or every university is trying to compile the same study.... Which has been studied in the past that can -- that can be utilized.

Response:
BLM's BMPs require industry to consult with BLM's Subsistence Advisory Panel. The Subsistence Advisory Panel has expanded its purview to include scientific studies. Additionally, BLM and other agencies coordinate to share data and minimize duplicative studies.

[PIZ-013]
Crawford Patkotak, ASRC
I recommend moving forward for BLM to play a key role in finding ways to lessen the impacts, do a cumulative impact study on the cumulative impacts studies

Response:
BLM includes a discussion of cumulative impacts of scientific studies in the 2012 NPR-A IAP/FEIS for each resource.

[PIZ-014]
Crawford Patkotak, ASRC
They've got to be more responsible and efficient and less -- they've got to work with the locals and the Traditional Knowledge is so important that they have to -- they have to take that into consideration, find another way to do these types of studies, on top of like Isaac was saying, utilize what's already out there.

Response:
BLM's BMPs require industry to consult with BLM's Subsistence Advisory Panel. The Subsistence Advisory Panel expanded its purview to include scientific studies. Additionally, BLM and other agencies coordinate to share data and minimize duplicative studies.

[PIZ-015]
Willard Neakok, Native Village of Point Lay
I don't see why people who want to do another study on the same species or a different species, you know, come to the village and as the residents, you know, has there been any change in migration routes? Has there been any change in the number of certain species, you know, rather than go out there with their helicopters over and over and over again, just to do the same thing. They just have to come to the village, ask for Traditional Knowledge of the people who have been here, has there been any change in the numbers? Has there been any change in the migration, you know, the residents live in these respective villages and they know -- they know from different hunters, they know who hunts different types and different hunting spots that they go to and if they ask a certain hunter, okay, you've been out there before, you know, has there been any change or anything of that nature to help with that study even though it's all been recorded 10 years ago, five years ago, last year. You know, I don't see why they can't do that rather than go out there again with the helicopter just to make sure.
[BLM Reponse provided on pg 97-98 of transcript]

Response:
BLM's BMPs require industry to consult with BLM's Subsistence Advisory Panel. The Subsistence Advisory Panel expanded its purview to include scientific studies. Additionally, BLM and other agencies coordinate to share data and minimize duplicative studies. The Draft SEIS and Final SEIS include many impacts that are a result of Traditional Ecological Knowledge gained from government to government consultations and public meetings, both from this and previous NEPA documents.

[PIZ-016]
Crawford Patkotak, ASRC
BLM could really take a need on as a -- as a federal agency that has to do with a lot of the land all across the Slope is start utilizing and contracting locals in all the villages, small impact -- small environmental impacts throughout the year, huge benefits...
If you start looking at how can you -- huge -- one big challenge for all of us is cost of living. How can you positively impact folks in the community it only takes one, take one person at a time working in the community, putting somebody to work, works with the contractor that's going to -- make it a stipulation in the contract that they've got to go into the village and it doesn't have to be all -- of course in the summertime, let them work all winter, all different seasons with the locals on the ground and that's -- that's going to be a huge impact in the local economy, lives of the -- lives of the family and the local residents and that's something that's positive.

Response:
BLM and the community can encourage CPAI to adopt practices which make it easier for local residents to become employed in local industry, for example, implementing subsistence leave policies. However, BLM does not have authority to require CPAI to increase local hire or adopt such practices.

[PIZ-017]
Marie Tracey, NSB
So with Willard, too, when they do these studies like Stephen
Braund and other entities want to do their own, but we tell them, well, we did that already and then, no, they want their own. So these guys would come anyway and map out what they, you know, where they went, what they got and what they saw and do that over, and then somebody else would come and want that from them. So they would come and do that again. So it's like over and over, but they still come around just to, you know, help us as our -- as our community and as our Inupiat knowledge on everything.

Response:
BLM's BMPs require industry to consult with BLM's Subsistence Advisory Panel. The Subsistence Advisory Panel expanded its purview to include scientific studies. Additionally, BLM and other agencies coordinate to share data and minimize duplicative studies. The Draft SEIS and Final SEIS include many impacts that are a result of Traditional Ecological Knowledge gained from government to government consultations and public meetings, both from this and previous NEPA documents.

[PIZ-018]
Marty Awalin, Cully Corporation
One thing is, you know, we get blamed a lot sometimes for things we don't know about, because there's studies being done out on our lands and the assumptions from the communities that they're working with the corporations when, in fact, we don't know anything about it, like he says.

We -- we have your information in regards to all of these studies and it puts us -- it actually, you know, it puts a blame on where it shouldn't be. One thing about this advisory -- their Subsistence Advisory that you would depend on when somewhere, somehow, you've got to include these corporations, these land owners, because they don't speak for -- on our behalf...Right, and so therefore, as land owners, you know, you guys got to take into consideration this, because it does put, you know, a little burden on us or it really impacts us because we don't know what's going on and it makes us look like we don't know what's going on in our land.

Response:
The BLM encourages government-to-government consultation with Alaska Native corporations and has consulted with them on the GMT1 project. The purpose of the NPR-A Working Group, established by the 2013 NPR-A IAP ROD, is to give Native Corporations and other entities more input into decision making in the NPR-A.

[AIN-001]
Terry Tagarook, representing himself
Way before these structures were built, way before Nuiqsut ever came -- went back, our people were nomadic from the east and to the west and they'd pass down information where all these fish-bearing lakes were. It's all up here in the information. We didn't have no papers, but they had it up there and they passed down the information where all of the fish-bearing lakes are and where all the fish go in to spawn and these are some things that -- and I can notice that you're looking for where are the fish-bearing lakes, but our people knew it up here in their -- in their heads and passed that information from people from the east to the west and if you are thinking about making roads, you better come and talk with the people that are going to be affected because they know where the fish-bearing lakes are.

Response:
The FSEIS uses survey data from ABR to determine fish-bearing lakes in the project area. BLM has also incorporated Traditional Ecological Knowledge throughout its NEPA analysis.

[AIN-002]
Terry Tagarook, representing himself
one year, we went to Nuiqsut and then they took us for a ride and -- and we -- they said they were getting water to make the ice road, but when we stopped, we saw little small frys on the ice road, then I think you need to watch out for those fish-bearing lakes and where you get the water to make the ice roads.

Response:
Water withdrawal from lakes in the winter to build ice roads and pads is required to utilize intake screens and pump rates approved by ADF&G Habitat Division. There have been isolated incidents where small fish have ended up entrained in the removed water, despite this precaution. In a given year these incidents are typically rare to occasional.

[AIN-003]
Hugh Patkokat, Olgoonik Corporation
[Mr. Patkokat and BLM conversing about fish-bearing/subsistence waterway buffers in NPR-A; the origins of them and the rationale behind establishment of each buffer.] Okay, that's the reason I'm asking. The bigger the river, I think the setback should be a little wider and that's what i'm questioning and... [BLM provided several answers: B.Psarianos on pg 17, D.Yokel on pg 18, S.Frtiz on pg 18]

Response:
All fish-bearing lakes have a 500-foot buffer zone; see the 2013 IAP/EIS ROD. Setbacks for rivers and streams are based upon subsistence use.

[AIN-004]
Terry Tagarook, representing himself
And you remember that the fish-bearing lakes should have a much more-- buffer zone so that the fish-bearing lakes won't be affected by.... [B.Psarianos and L.Kelly provided answers on pg 21-22].

Response:
BLM's BMPs require a 500-foot buffer from fish-bearing lakes for oil and gas infrastructure.

[AIN-005]
John Hopson, City of Wainwright
But I think the idea of building roads, permanent roads would help mitigate that problem about fish-bearing lakes. Every year, they're building ice roads and they're having to use lakes from all over to build these ice roads. The more permanent roads we can put in, the less we have to deal with fresh water lakes and salt waters to deal with that.
So we will have -- and over time, less affect on fish-bearing lakes than we would today and that's, you know, that's kind of the concept there that I understand.

Response:
The FSEIS analyzes the impacts of ice roads, both short and long-term.

[AIN-006]
Terry Tagarook, representing himself
And when that do come in [referring to construction of gravel roads/ice roads] it's going to be more people coming in and messing up the fish-bearing lakes that we care about and they won't care about it.

Response:
Potential impacts from roads, including increased competition, are discussed in Section 4.4.6, Subsistence of the FSEIS.

[AIN-007]
John Hopson, City of Wainwright
[In response to T.Tagarook's comment AIN-005A] But those are -- those are part of the -- the benefits everybody's been looking for, you know, we have the high cost of freight. We have the high cost of fuel and it's because we fly everything in, except our fuel. We're always barging them, but to have permanent roads in place so we can haul stuff, it's going to be cheaper, especially on our end, the local end where it cost almost nine grand to barge a truck from Anchorage to here, 4,500 from Prudhoe to Wainwright. If we had a permanent road, you'd do it on your own dime by buying fuel and hotel stay, that's about it.

Response:
The NPR-A Working Group's document, Principles on Development of Infrastructure in Northern Alaska, also makes this point clearly.That document is included as an appendix in the FSEIS and is described in the analysis.

[AIN-008]
John Hopson, City of Wainwright
In today's day and age, we hunt with snow machines and fourwheelers and boats with outboards and all of that takes money to go hunt. There's only a handful of people in here that will raise their hand if I ask them, "Who's hunted with a dog team or skin boats on a yearly -- throughout the whole year, not just for one little season, but throughout the whole year? ... None, and there's us that have hunted with snow machines and boats and four-wheelers our whole life, even with trucks and -- and that's a life we know

Response:
The sociocultural and subsistence analyses are based on current subsistence practices.

[AIN-009]
John Hopson, City of Wainwright
the life we know also consists of a high school and the life we know consists of a fire department a clinic, but all of that takes money to continue it, you know, and the North Slope Borough takes care of all of that with the tax base dollars they have from the oil and gas companies at Prudhoe Bay.
The more infrastructure we build on the North Slope, the more money your North Slope Borough gets to continue the programs we have today, your schools, your clinics, your fire department and your public works.

Response:
The economic benefits of development and widespread support for GMT1 and other responsible development are described in detail in the FSEIS.

[AIN-010]
John Hopson, City of Wainwright
The North Slope Borough has no other income, zero, zilch. If we slow down the process of development with declining revenues, we cannot
sustain ourselves. There's no other economy that we have money from and that's scares me. We're not diversified. We rely solely on oil and gas and that's why it's so important that we, as community leaders and as concerned citizens, must continue to be willing to sit at the table with the federal government and with the operators, so that we can have responsible development and move forward so we can continue to have what we have with a growing population and declining revenues.
I don't know where we're going to go or what we're going to do, but
we need to move forward. We need to continue our progress in oil and gas. If that includes building roads, building airports, building pads, building pipelines, then so be it, because I cannot find $400 million a year for the next 40 years anywhere else. We have none.

Response:
Comment is noted.

[AIN-011]
Terry Tagarook, representing himself
...what we need to do is educate our younger people and going off to college and take jobs away from people that are being taken over by outsiders and that's something that we need to educate our young people now, because most often, the young people don't know what's happening with the federal government or the -- the state or the council or the tribe or corporation.
We need to help our young people get jobs. They're just waiting here, doing nothing and that is something -- that dependency upon other organizations, you know, and I wish these young people would -- I would encourage and push them and go -- go to vocational training, go onto the college, taking courses. If I can do it, they can do it. You know, it took me longer to get my degree, but I -- I earned it and it -- and in the long run it paid off and I need young people like him. I'm glad he's speaking up for his age group, you know, but we need to concentrate on the younger ones that are still at school. We need to encourage them to go -- higher education and that is one way of finding jobs for them, not jobs will come to Wainwright. They have to go out to find jobs nowadays. That's all I can say. Say something, guys; it's going to affect our village.

Response:
Benefits of development and employment opportunities are described in detail in the FSEIS.

[AIN-012]
Joseph Nukapigak, Kuukpik Corporation
At Nuiqsut Alpine, we have an internship program working with ConocoPhillips. Getting our young people while they're in high school, having to go to Alpine over the weekend or during the summer off when the school is out. We get these young people to take electrician, plumbing and whatnot that requires some of these technical (sic) and after that -- so we got more young people getting to the -- getting to some of those -- some of those technical work.
It has worked well for our young people over time, getting their
certification and whatnot. So it helps a lot. Encouragement for our young people is a must.

Response:
Benefits of development and employment opportunities are described in detail in the FSEIS.

[AIN-013]
Teresa Imm, ASRC
Likewise with workforce development, you know, people learn a
skill set in anticipation to go to work and then when a project gets stopped, they don't have that job at the other end and so these are things that are really important to ASRC and that's why we're traveling around to the communities, mostly to hear what individuals in the communities have (sic), but also to share that, you know, these are ASRC's resources.

Response:
The revised Sociocultural Systems and Economic sections (Sections 4.4.2 and 4.4.3) describe that no action (Alternative E) would likely have negative social and economic impacts to residents, ASRC, and other entities.

[AIN-014]
Terry Tagarook, representing himself
[In reference to fish subsistence] I'm just saying these are… the resources that we depend on. They can't say anything about them, what these people are going to do. We depend on some of these subsistence resouces and we look at Nuiqsut, it's been encompased by those oil-- oil companies that are coming in.... It used to be you could barely see Deadhorse, right. Now it's surrounded by all the oil.

Response:
Section 4.4.6, Subsistence explains the critical importance of subsistence to Inupiat and the Section 4.4.2, Sociocultural Systems, and Section 4.6, Cumulative sections describe impacts related to being largely surrounded by development.

[AIN-015]
Terry Tagarook, representing himself
[In reference to road access to the Colville River. L.Pekich (CPAI) was stating that there is not public access to the Colville from the haul road.] But it's going to happen after I'm gone, you know… Not in my lifetime, but it's going to happen in the future.
Response:
Impacts of the Umiat Road (also known as the Foothills West project), including public access, is discussed in the FSEIS.