

Appendix H

Data Adequacy Tables



Appendix H: Data Adequacy Tables



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Contents

1.1 Data Adequacy Introduction	1
1.2 Compiled Data Adequacy Tables	2

TABLES

Table H1. Geology and Geomorphology Information Sources and Adequacy	2
Table H2. Soils Information Sources and Adequacy	4
Table H3. Meteorology and Climate Information Sources and Adequacy	8
Table H4. Air Quality Information Sources and Adequacy	9
Table H5. Physical Oceanography and Coastal Processes Information Sources and Adequacy	10
Table H6. Hydrology Information Sources and Adequacy	12
Table H7. Water Quality Information Sources and Adequacy	14
Table H8. Vegetation and Wetlands Information Sources and Adequacy	16
Table H9. Bird Information Sources and Adequacy	19
Table H10. Terrestrial Mammal Information Sources and Adequacy	25
Table H11. Marine Mammal Information Sources and Adequacy	30
Table H12. Fish and Invertebrate Information Sources and Adequacy	39
Table H13. Land Ownership, Land Use, and Land Management Information Sources and Adequacy	45
Table H14. Arctic National Wildlife Refuge Information Sources and Adequacy	47
Table H15. Socioeconomic Information Sources and Adequacy	48
Table H16. Environmental Justice Information Sources and Adequacy	51
Table H17. Transportation Information Sources and Adequacy	52
Table H18. Recreation Information Sources and Adequacy	53
Table H19. Visual and Aesthetic Information Sources and Adequacy	54
Table H20. Noise Information Sources and Adequacy	55
Table H21. Cultural Resources Information Sources and Adequacy	56
Table H22. Subsistence and Traditional Land Use Information Sources and Adequacy	60
Table H23. Health Information Sources and Adequacy	65
Table H24. Contaminated Sites and Spill History Information Sources and Adequacy	66

1.1 DATA ADEQUACY INTRODUCTION

Project subject matter experts reviewed applicable publications, reports, and data for their field of study. They evaluated each source for its relevance to the EIS and adequacy for use in evaluating the potential impacts of the proposed Point Thomson Project on the resource or topic under review. Sources of information that were used to describe the affected environment or evaluate the environmental consequences are listed in the tables below and include a statement regarding the relevance of the source to the EIS and the Point Thomson Project.

The intent of the tables is to show why the references were important to the EIS analysis. When appropriate, sources are incorporated by reference. For instance, if one source summarizes the findings of previous studies, the one source was used and includes reference to the earlier sources. In some instances, however, there are multiple small studies of a similar topic and similar location but there is no overall summary of information. In these cases each of the relevant sources is referenced.

The data adequacy tables were prepared as part of the data gap analysis process conducted during project Scoping. The data gap analysis evaluated the availability of information to describe the affected environment and analyze environmental consequences and evaluated whether technical studies were needed. The tables are included as an appendix to the EIS because, for the most part, existing information was available for evaluation in the EIS and therefore technical reports were not prepared that would have included a literature review.

1.2 COMPILED DATA ADEQUACY TABLES

Table H1. Geology and Geomorphology Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Geomorphology	BLM 1998	This Integrated Activity Plan/Environmental Impact Statement discusses the formation and evolution of coastal lakes.
	ExxonMobil 2009b	The Applicant's Environmental Report provides general information regarding the geomorphology of the Canning River Fan.
	Jorgenson and Shur 2007	This peer reviewed journal article describes the evolution of thaw lakes on the North Slope.
	Colonell and Niedoroda 1990	This document is a review of coastal oceanographic processes along the central Alaskan Beaufort Sea. The areas referenced in this review are to the west of the Point Thomson study area.
	Tedrow 1977	This book on the soils of the Arctic describes terrain features on the ACP including the study area.
	Sellman et al. 1975	This government report describes lakes on the ACP, including the project area.
	Wahrhaftig 1965	This document describes the physiographic regions of Alaska, including the ACP, which encompasses the study area.
Surficial Geology	ACIA 2005	This report discusses climate change issues facing the Arctic including permafrost thawing. The report area covers the entire Arctic, not just the Point Thomson study area.
	Bruggers and England 1982	This report by Harding Lawson Associates for ExxonMobil, describes the types of ice in the near surface sediments within the study area.
	Ferrians 1965	This map displays the permafrost map of Alaska, including the study area.
	NRC 2003a	This report covers the gravel use on the North Slope from the Canning River to the Colville River throughout the past few decades.
	Péwé 1975	This professional paper published by the USGS discusses Quaternary geology in Alaska.
	Rawlinson 1990	This report by the Alaska Division of Geology and Geophysical Surveys describes the surficial geology and morphology of the Alaskan central ACP, including the study area.
	Rawlinson 1993	This report by the Alaska Division of Geology and Geophysical Surveys describes surficial geology and morphology of the central ACP, including the study area.
General Geology	ADNR 2006	This application for a pipeline ROW lease for the Eastern North Slope Gas Pipeline contains information regarding soils in the area of the export pipeline route and regional seismicity.
	ADNR 2010b	Alaska Oil and Gas Report contains forecasts for oil and gas production on the North Slope.
	EPA 2010a	This EPA fact sheet is specific to the Point Thomson study area and describes the geologic setting.
	Molenaar et al. 1986	This is a geologic map showing correlation of geologic units across the North Slope of Alaska.
	Plafker and Berg 1994	This book on the geology of North America describes the geology of northern Alaska, including the study area.

Table H1. Geology and Geomorphology Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Geological Hazards	Combellick 1994	This report published by the Alaska Division of Geology and Geophysical Surveys describes the geological hazards near the study area.
	Grantz et al. 1983	This document by the USGS describes faults on the Alaskan Beaufort Shelf.
	Hall et al. 2003	This peer reviewed journal article documents the performance of the Trans Alaska Pipeline System after an earthquake, which occurred outside of the study area.
	McDonough and Strand 2002	This ASCE Technical Council on Lifeline Earthquake Engineering Monograph details the effects of the magnitude 6.8 Nisqually, Washington, earthquake of February 28, 2001, Chapter 7 describes gas and liquid fuels, including pipeline performance.
	O'Rourke and Palmer 1996	This Earthquake Engineering Research Institute publication reviews over 61 years of earthquake performance of a steel transmission and distribution supply pipelines system, including 11 major earthquakes with ML \geq 5.8. The database represents one of the most comprehensive and detailed records of seismic response in a large, complex gas transmission system
	Page et al. 1991	This chapter in a volume published by the Geological Society of America describes seismicity in Alaska, including areas east of the study area.
	Pinney and Combellick 2000	This report published by the Alaska Division of Geology and Geophysical Surveys describes the geological hazards to the south and west of the study area.
	USGS 2010a	A search was conducted on this website examining earthquakes within the Point Thomson study area.
	Wesson et al. 2007	This report published by the USGS examines seismic hazard maps for Alaska.
	Wolf et al. 1985	This report published by the USGS reviews seismic stratigraphy between Prudhoe Bay and the Canning River, including the study area.
Paleontology	APD 2009	This database informs that invertebrate fossils were discovered on the barrier islands in several locations (e.g. – Flaxman Island).
	BLM 2002a	This Environmental Impact Statement for the renewal of the right of way for the Trans-Alaska Pipeline System discusses paleontology on the North Slope. The TAPS ROW is located outside of the study area.

Table H2. Soils Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Climate Change	Atkinson et al. 2006	This peer reviewed journal article reviews the impacts of an unusually warm summer on the Canadian Arctic, outside of the study area.
	Chapman and Walsh 1993	This peer reviewed journal article examines the climate change impacts on sea ice and air temperatures in the Arctic and Antarctic.
	Curry et al. 1995	This peer reviewed journal article examines the impacts of increased albedo on the Arctic, outside of the study area.
	IPCC 2007	This book documents the increase in temperatures in the arctic and subarctic regions.
	Morison et al. 2000	This peer reviewed journal article reviews environmental changes in the Arctic due to climate change, outside of the study area.
	Serreze et al. 2003	This peer reviewed journal article documents the decreasing extent of arctic sea ice in September 2002.
Snow Extent	Brodzik et al. 2006	This poster prepared for the American Geophysical Union by the National Snow and Ice Data Center examines snow extent in the Northern Hemisphere.
	Ramsay 1998	This peer reviewed journal article examines the extent of snow cover in the Northern Hemisphere.
	Frei and Robinson 1999	This peer reviewed journal article examines snow cover in the Northern Hemisphere from 1972 – 1994.
	Robinson and Frei 2000	This peer reviewed journal article examines snow cover in the Northern Hemisphere from 1972 – 1999.
Soils	BLM 2002a	This EIS for TAPS discusses soils along the TAPS corridor, outside of the study area.
	Bockheim and Tarnocai 1998	This peer reviewed journal article examines cryoturbation in arctic soils, outside of the study area.
	Carter 1988	This conference proceeding from the 5th International Conference on Permafrost contains an article on silt in the central Alaskan ACP, outside of the Point Thomson study area,
	Everett 1975	This article appeared in a book published by the University of Alaska Fairbanks examines the relationship between soils and topography in Prudhoe Bay, outside of the Point Thomson study area.
	Everett 1979	This peer reviewed journal article examines soil evolution at Atkasook, Alaska, outside of the study area.
	Everett and Brown 1982	This peer reviewed journal article reviews soil formation and characteristics on the Alaskan North Slope, outside of the Point Thomson study area.
	Kade et al. 2006	This peer reviewed journal article examines active layers in soils in arctic Alaska, along the Dalton Highway, outside of the study area.
	Ovenden 1990	This peer reviewed journal article examines peat accumulation in northern Canadian wetlands.
	Pavlov and Moskalenko 2002	This peer reviewed journal article examines the thermal regime of soils in western Siberia, outside of the study area.

Table H2. Soils Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Soils (Continued)	Ping et al. 2008	This peer reviewed article highlights the arctic soil formation process; however, the study sites were all located outside the study area and some were outside of the ACP.
	Raynolds et al. 2006	This map portrays the arctic soil types including the study area.
	Shur and Jorgenson 2007	This peer reviewed journal article examines permafrost formation and degradation in Alaska, including the North Slope, but outside of the Point Thomson study area.
	Tedrow 1977	Tedrow reviewed permafrost, ground patterned and cryogenic processes, and soils in his book on arctic soils. This review is general to the Arctic.
	Walker et al. 2003	This article synthesized information from Arctic Transitions in the Land-Atmosphere System studies, focusing on the interaction between vegetation, active layers, and soils. The studies did not occur within the Point Thomson study area; however, some of them did occur on the ACP.
Geomorphology/ Geology	Bruggers and England 1982	This document prepared by Harding Lawson Associates investigates winter soil conditions within the Point Thomson study area.
	Jorgenson et al. 1996	This document prepared for Arco Alaska examines flooding on the Colville River delta on the North Slope, outside of the study area.
	Mull and Adams 1985	This introduction to the Dalton Highway Guidebook provides information on the geology, precipitation, climate, temperature, and permafrost from the Yukon River to Prudhoe Bay, outside of the study area.
	Nelson et al. 1998	This peer reviewed journal article examines active layer thickness in the ACP and AF, outside of the study area.
	Péwé 1975	This professional paper published by the USGS details the geology of Alaska through the previous 2 million years. While the paper focuses on the state as a whole, some of the contents are specific to the North Slope.
	Pullman et al. 2007	This peer reviewed journal article examines changes in the active layer due to disturbances either anthropogenic or natural on the central Alaskan North Slope, outside of the study area.
	Rawlinson 1993	This report of investigations published by ADR Division of Geological and Geophysical Surveys examines surficial geology on the central Alaskan ACP, including the study area.
	Sellman et al. 1975	This government document published by the US Army Corp of Engineers describes the formation and evolution of thaw lakes on the Alaskan ACP, not specific to the Point Thomson study area.
Permafrost	Brewer and Jin 2008	This article from the 9th International Conference on Permafrost examines changes in permafrost from Barrow, Alaska, outside of the study area.
	Brown et al. 1984	This report prepared for Alaska Department of Transportation and Public Facilities discusses the interactions of gravel fill, surface drainage, and culverts with permafrost on the North Slope, outside of the study area.
	Couture et al. 2003	This peer reviewed journal article examines the impact of infrastructure on the permafrost in Canada.
	Jorgenson et al. 2001	This peer reviewed journal article examines permafrost degradation on the Tanana Flats, outside of the study area and its impact on the vegetation.

Table H2. Soils Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Permafrost (Continued)	Jorgenson and Brown 2005	This peer reviewed journal article examines coastal erosion along the Alaskan Beaufort Sea, including the study area.
	Jorgenson et al. 2006	This peer reviewed article describes the arctic permafrost degradation occurring on the North Slope. The study sites were located to the west and south of the Colville River, outside of the Point Thomson study area.
	Lantuit et al. 2008	This article from the 9th International Conference on Permafrost examines coastal erosion rates based on permafrost changes in the Arctic, outside of the study area.
	NRC 2003a	This book published by the National Resource Council describes the consequences of gravel mining on the North Slope on permafrost.
	Osterkamp 2003	This peer reviewed journal article examines the thermal history of permafrost in northern Alaska, outside of the study area.
	Osterkamp 2005	This peer reviewed journal article focuses on permafrost warming from the North Slope (outside the study area) to Glennallen, Alaska.
	Osterkamp and Romanovsky 1999	This peer reviewed journal article examines warming and thawing of permafrost in Alaska, outside of the study area.
	Pavlov 1994	This peer reviewed journal article examines the change in soil temperatures in arctic Russia and thus impacts on permafrost.
	Ping et al. 2004	This book chapter describes permafrost across Alaska, including the ACP.
	Romanovsky et al. 2002	This peer reviewed journal article examines temperature trends of arctic permafrost, outside of the study area.
	Romanovsky et al. 2003	This peer reviewed article describes the arctic permafrost temperatures at long-term observatories in northern Alaska. This study occurred outside of the Point Thomson study area.
	Smith et al. 2005	This peer reviewed journal article examines the warming of permafrost in Canada.
	Washburn 1980	This book focuses on the study of permafrost in Asia, outside of the study area.
	Woo et al. 2008	This peer reviewed journal article examines advances in the permafrost hydrological studies in the Arctic, outside of the study area.
Disturbance	Auerbach 1997	This peer reviewed journal article examines the effects of roadside disturbance on arctic tundra, along the Dalton Highway, outside of the study area.
	Everett 1980	This government document chapter describes the distance road dust from the Dalton Highway travels and its impacts. The Dalton Highway is outside of the study area.
	Guyer and Keating 2005	This BLM document examines the impacts of single season ice roads and pads on permafrost and vegetation on the North Slope, outside of the study area.
	Klinger et al. 1983	This article from the 4th International Conference on permafrost discusses the impacts gravel roads on the North Slope have on tundra in Prudhoe Bay, outside of the study area.

Table H2. Soils Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Disturbance (Continued)	McDonald 1994	This document prepared for BP Exploration and the Alaska Department of Environmental Conservation details the specifics on road crossings of fish bearing streams on the North Slope.
	Walker and Everett 1987	This peer reviewed journal article examines the impact of road dust on the Alaskan taiga and tundra along the Dalton Highway, outside of the study area.
	Walker et al. 1987a	This document reviewed literature on disturbance and recovery of arctic Alaskan tundra. Most of the studies reviewed were from NPR-A region of the North Slope.

Table H3. Meteorology and Climate Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Climate	ACIA 2005	This document addresses climate change impacts in the Arctic.
	HCG 2010	This report contains meteorological data collected at the Point Thomson site September 1, 2009 through August 31, 2010.
	WRCC 2010	Climatologic data for Kuparuk, Prudhoe Bay, and Barter Island
Meteorology	Veltcamp and Wilcox 2007	This report examines meteorological data from five BOEMRE (formerly MMS) sites along the North Slope, with 29 supplemental sites from Barrow to Hershel Island.
	Kane et al. 2009	This document prepared for ADOT&PF examined meteorological data on the North Slope from 2006 to 2008.
	NCDC 2009	Meteorologic data from the National Climactic Data Center for the Deadhorse airport from 2001 to 2006.
	Benson 1982 NRCS 2010	The NRCS provides monthly average precipitation data for three sites on the North Slope from 1971 to 2000.
	Kane et al. 2006; Berezovskaya et al. 2007, 2008, 2010	These reports examine snow survey data for each year from the Sagavanirktok River to Bullen Point, on the North Slope.
	Sloan 1987	This review examines precipitation on the North Slope.

Table H4. Air Quality Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Air Quality	ADEC 2006	This ADEC policy and procedure document describes construction phase air emissions at oil fields.
	ADEC 2010a	This ADEC document describes air quality control regulations.
	ENSR 2000 , 1999a , 1999b , 1999c	Ambient air quality data for Badami Development Facility
	ENSR 2008	Ambient air quality data for Prudhoe Bay Facility.
	EPA 2010b	This website provides information on the impacts of particle pollution on air quality. This information is applicable to the entire nation.
	EPA 2010c	This website provides the EPA attainment status for all pollutants in the study area.
	EPA 2012	2008 National Emissions Inventory Database
	Frossard et al. 2011	This paper in the Journal of Geophysical Research provides information on the source of arctic haze.
	HCG 2008	Ambient air quality data for the Liberty Project at the Endicott Production Facility.
	HCG 2010	This document provides the 2009 – 2010 annual data for the Point Thomson ambient air and meteorological monitoring.
	NADP 2012	This National Atmospheric Deposition Program website was used for nitrate data.
	NSIDC 2011	This National Snow and Ice Data Center website defines arctic haze.
	Rozell 1996 and 2009	These papers provide information on arctic haze and its source.
	SLR 2011a	This study provides an ambient air quality analysis of the project area to demonstrate compliance with all applicable national and Alaskan Ambient Air Quality Standards and PSD Class II increment levels.
	SLR 2011b	Application for a Prevention of Significant Deterioration Air Quality Construction Permit for the Point Thomson Project contains emissions data.
Climate Change	USGCRP 2009	This report highlights climate change impacts occurring in Alaska.
	CENRNTC 2008	This report describes the impacts of climate change on the United States

Table H5. Physical Oceanography and Coastal Processes Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Physical Oceanography	Berry and Colonell 1985	This document provides information on physical oceanographic conditions to the west of the Point Thomson study area. The study was conducted in Prudhoe Bay for the seawater effluent treatment dispersion study.
	KLI 1983	This report provides baseline oceanographic information for use in the engineering design. The study was conducted within the Point Thomson study area.
	URS 1999	This report provides baseline data for physical oceanographic processes. The study was conducted within the Point Thomson study area during 1997 and 1998.
	Colonell and Niedoroda 1990	This document is a review of coastal oceanographic processes along the central Alaskan Beaufort Sea. The areas referenced in this review are to the west of the Point Thomson study area.
	Harper 1990	This peer reviewed journal article studied coastal erosion of the Canadian Beaufort Sea.
	Jones et al. 2009	This peer reviewed journal article examined the rate increase of coastal erosion in the arctic Alaska.
	PND 2009a	This report provides information on a coastal engineering study conducted within the Point Thomson study area.
	Solomon 2005	This peer reviewed journal article examined coastal erosion in the Mackenzie River Delta, Canada (east of the Point Thomson study area).
	Solomon and Covill 1995	This peer reviewed journal article documented events in the Canadian Beaufort Sea (east of the study area) that lead to greater than average coastal erosion.
	Tekmarine 1983	This report provides baseline information on coastal processes within the Point Thomson study area.
	Jorgenson and Brown 2005	This peer reviewed journal article examined coastal erosion across the Alaskan Beaufort Sea; including several sites within the Point Thomson study area.
	Reimnitz et al. 1988	This poster provides an analysis of 30 years of coastal erosion, sediment flux, shoreline evolution, and the erosional shelf profile. This study occurred to the west of the Point Thomson study area.
	Vasiliev et al. 2005	This peer reviewed journal article examined coastal erosion in the Barents and Kara Seas, Russia.
Sea Level Rise	ACIA 2005	This report details many aspects of the potential impacts of climate change on the Arctic. This report is general to the whole circumpolar Arctic and the numbers are based on modeling.
	Hopkins and Hartz 1978	This open-file USGS report addresses erosion rates on both Beaufort and Chukchi Sea coasts, thus providing a comparison that is based on the energetics and materials of each coast.
	FOC 2010	This website provides data on sea level changes in the Canadian Beaufort Sea (east of the study area) from 1961 – 2009 with some multiyear gaps.
	Coastal Frontiers 2003	This document describes bluff erosion analysis for the Point Thomson area.
	Hume and Schalk 1967	This peer reviewed journal article describes shoreline processes near Barrow, AK, outside of the project area.

Table H5. Physical Oceanography and Coastal Processes Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Sea Level Rise (Continued)	Jones et al. 2009	This peer reviewed journal article describes shoreline erosion in arctic Alaska.
	Niedoroda and Colonell 1990	This conference proceeding describes Arctic Ocean engineering and coastal processes.
	OCS 1996	This NOAA chart displays the project area coast line from Bullen Point to Brownlow Point
	Proshutinsky et al. 2001	This peer reviewed journal article documented sea level rise on the Russian arctic coast.
	Proshutinsky et al. 2004	This peer reviewed journal article documented sea level rise in the Russian arctic coast.
	Reimnitz and Maurer 1978	This USGS report documents storm surges in the Alaskan Beaufort Sea.
	Reimnitz and Kempena 1987	This peer reviewed journal article discusses freeze up observations in the arctic coastal waters.
	Sultan et al. 2010	This document analyzes 17 years of tide gage data from Prudhoe Bay on the North Slope.
Dredging	ExxonMobil 2011a	This report by ExxonMobil describes the dredging plans for all alternatives.
	HDR 2011d	These meeting notes clarify the dredging options for all project alternatives.

Table H6. Hydrology Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Hydrology	ADNR 2007	This GIS dataset was used to determine streams within the study area.
	Berezovskaya et al. 2008	This report examines snow water equivalent data between the Canning and the Kuparuk Rivers.
	Curran et al. 2003	This report develops equations for estimating peak streamflow on ungaged streams throughout Alaska and Canada.
	HEL 1982	This report examines prebreakup, breakup, and postbreakup conditions in a few streams in the western study area.
	MBJ 1998	This report provides useful baseline information regarding the natural state of streams in the study area.
	PND 2009b	Baseline stream hydrology surveys were conducted for a portion of the proposed study area (Streams 1 to 27). This report provides useful baseline information regarding the natural state of streams in the study area.
	PND 2009c	Hydrologic and Hydraulic Report, Bullen Point Road Project by PND, February 2009.
	Sloan 1987	This report reviewed available information on lakes, streams, springs, snow, ice, and groundwater. This review covers the entire North Slope and as such some information may not be applicable to the study area.
	URS 2003a	This report provides the baseline hydrologic setting for Streams 1 to 24 located within the study area.
	USGS 2010	This website provides daily water discharges for rivers gaged by the USGS in the United States.
	Wahrhaftig 1965	This report describes the physiographic divisions of Alaska, including the study area.
	Whitman 2010	ADF&G and BLM studies document blockage of streamflow and increased stream stage during spring break-up due to ice roads that were not adequately slotted or breached.
	WorleyParsons and PND 2010	This report provides baseline information on stream hydrology for Streams 1 to 27, focusing on potential road and pipeline crossings.
	WorleyParsons and PND 2011	This report provides information on stream hydraulics and modeling in the study area in conjunction with bridges, culverts, and airstrip.
Surficial Geology and Morphology	Rawlinson 1993	This report, produced by the DNR Division of Geological and Geophysical Surveys, examines surficial geology between the Colville and Canning Rivers on the ACP.
	Gyrc 1988	This USGS professional paper examines the geology of the NPRA.
Climate Change	ACIA 2005	This document examines the impacts of climate change on the arctic environment. It deals with the whole arctic, not just the study area.
	Frey and Smith 2003	This peer reviewed journal article examines temperature and precipitation increases in Siberia.
	Smith et al. 2005	This peer reviewed journal article discusses the impacts of climate change on arctic lakes.
Sediment Transport	Hodel 1986	This open file report published by the USGS examines sediment transport on the Sagavanirktok River, south of the study area.

Table H6. Hydrology Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Sediment Transport (Continued)	McNamara et al. 2008	This peer reviewed journal article examines sediment transport during summer flood events and spring snow melt events on the North Slope, outside of the study area.
Engineering	ADNR 2006	This document provides the basis for the design of the Eastern North Slope Gas Pipeline supporting the Pipeline Right-of-Way Lease Application.
	CH2MHILL 2005	This report examines is a reconnaissance level engineering report on the feasibility of constructing the Bullen Point Road. It describes the major watersheds within the Point Thomson study area.
	Patil et al. 2008	This document discusses new technology for oil drilling on the North Slope. It provides mitigation measures for hydrology.
Lacustrine	AIC 2002	This document investigated 21 lakes in the study area as potential water withdraw source lakes.
	Hinzman et al. 2006	This report examines the impacts of over winter pumping of lakes on the North Slope, outside of the study area.
	MBJ 2002	This document examines lake recharge events in the NPRA, located outside of the study area.
	Sibley et al. 2008	This peer reviewed journal article deals with water withdrawal from arctic lakes on the North Slope.
	Trawicki et al. 1991	This report examines lakes within the Arctic Refuge, which borders the study area.
	White et al. 2006; Myerchin et al. 2008	Two years of winter lake survey data between the Sagavanirktok River and Bullen Point, providing characteristics for lakes in the study area to help determine which lakes would be suitable for winter water withdrawal.
	White et al. 2008	This peer reviewed journal article examines the use of synthetic aperture radar for determining lakes with water under the ice surface on the North Slope, including the study area.
Ice	Brewer 1987	This USGS document describes ice onshore ice processes on the ACP.
Alternatives	ExxonMobil 2011a	This document describes the practicability of all the proposed action alternatives.

Table H7. Water Quality Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Water Quality Surveys	URS 1999	Baseline marine water quality surveys were conducted in conjunction with oceanography and meteorology studies within the study area. This report provides ambient marine water quality (salinity and temperature) data.
	URS 2002	Baseline freshwater quality surveys were conducted within the study area for one summer for NPDES surface water sampling. This report provides information on ambient water quality of surface waters in the study area.
	Winters and Morris 2004	Baseline freshwater quality surveys were conducted in conjunction with fisheries sampling for two summers within the study area. This report provides information on natural water quality in certain streams in the eastern portion of the study area.
Soils	Ping et al. 1998	This peer reviewed journal article examines morphological, chemical, and physical properties of arctic tundra soils on the ACP, outside of the study area.
Water Resources	ACIA 2005	This document reviews the potential impacts of climate change on freshwater resources in the Arctic.
	Chambers et al. 2008	This peer reviewed journal article examines water chemistry of five lakes on the North Slope, outside of the study area.
	Craig 1984	This peer reviewed journal article reviews fish use of coastal waters, but he also describes coastal water temperatures in the Beaufort Sea.
	Hobbie 1980	This document examines tundra pond limnology in which the ponds were located near Barrow.
	MBJ 1998	This report examined spring breakup within the study area.
	Montgomery Watson 1998	This reports prepared for BP Exploration examines marine water quality in Foggy Island Bay, located within the study area.
	Myerchin et al. 2007	This document prepared for ADOT&PF examines under ice water quality in lakes located within the study area between the Sagavanirktok River and Bullen Point.
	Prentki et al. 1980	This document examined lake chemistry in tundra ponds near Barrow.
	Sloan 1987	This document reviews water resources on the North Slope. It provides documentation of the lack of groundwater influence in streams.
	URS 2000	This report prepared for BP Amoco and the Point Thomson Unit owners examines nearshore oceanography in the study area.
	Weingartner et al. 2005	This report prepared for BOEMRE (formerly MMS) describes nearshore ice processes within the Alaskan Beaufort Sea.
	Weingartner 2009	This abstract from a conference proceeding prepared for BOEMRE (formerly MMS) describes nearshore ice processes within the Alaskan Beaufort Sea.
Water Quality Parameters and Standards	ADEC 2010	This document from the Alaska Department of Environmental Conservation listed impaired waters within Alaska.
	ADEC n.d.	This document suggests all drinking water in Alaska be treated.
	Brooks et al. 2003	This textbook defines and examines water quality characteristics, not specific to the study area.
	Dodds 2002	This textbook examines the relationship between water quality parameters, not specific to the study area.

Table H7. Water Quality Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Water Quality Parameters and Standards (Continued)	MMS 1996	This EIS prepared by BOEMRE (formerly MMS) describes turbidity and TSS in the marine environment of the Alaskan Beaufort Sea, including the study area.
	BPXA and Conoco Phillips 2005	This handbook provides a general overview of environmental regulations applicable to the North Slope oil fields.
	Rember and Trefry 2004	This peer reviewed journal article examined TSS loads in three North Slope rivers, one being the Sagavanirktok, in 2001.
	Trefry et al. 2009	This document prepared for BOEMRE (formerly MMS) examines the concentrations of TSS and DOC in three large rivers on the North Slope, including the Sagavanirktok River.
Hydrocarbons	Steinhauer and Boehm 1992	This peer reviewed journal article examines natural sources of hydrocarbons along the Alaskan Beaufort Sea, including areas within the study area.

Table H8. Vegetation and Wetlands Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Endangered Species Act Listed Plants	USFWS 2011	Animal and plant species listed as threatened or endangered under the Endangered Species Act that occur in Alaska.
Rare Plants	AKNHP 2008	Alaska Natural Heritage Program list of rare vascular plant species used to identify critically imperiled (S1) and imperiled (S2) vascular plant species that could occur in the project area.
	Carlson et al. 2006	Alaska Natural Heritage Program report on 33 rare vascular plant species of the North Slope used to provide information on taxonomy, distribution, and ecology of rare species.
	Lipkin 2010	Identification of Alaska Natural Heritage Program S1 and S2 plant species likely to occur in the Point Thomson study area.
Wetland Definition	51 FR 41251	U.S. Army Corps of Engineers definition of “wetlands.”
Vegetation and Wetland Classification and Mapping	Cowardin et al. 1979	Cowardin classification system used to classify wetlands and deepwater habitats of the United States.
	ExxonMobil 2009b	Cowardin classification of wetlands provided in the Environmental Report.
	Gallant 1995	Used to provide general characterization/description of ACP vegetation.
	Schick and Noel 1995 Noel and Funk 1998, 1999, 2001 Oasis 2009, 2010 HDR Alaska 2011i	Vegetation/wetland mapping efforts conducted specifically for the proposed project.
	Walker 1983	Hierarchical tundra vegetation classification scheme designed specifically for Northern Alaska used to classify vegetation within the Project Area.
	Raynolds et al. 2006	Identifies general location of acidic, neutral, and non-acidic tundra.
	Jorgenson et al. 2006	Effects of thermokarst on surface and subsurface water drainage and thermo-erosion.
Tundra Disturbance or Recovery	NRC 2003	Effects of gravel fill on tundra vegetation.
	Jorgenson and Joyce 1994	Restoration timeframe of tundra wetland plant communities after removal of gravel fill. Effects of impoundments on tundra vegetation.
Tundra Disturbance Related to Gravel Fill	Walker and Everett 1987	Distribution and effects of road dust on tundra vegetation. Effects of altered snow distribution on tundra vegetation.
	Walker et al. 1987a	Distribution and effects of road dust on tundra vegetation in Prudhoe Bay. Effects of prolonged inundation on tundra vegetation. Distribution of thermokarst features associated with gravel roads and pads in Prudhoe Bay. Effects of ice road construction and maintenance on tundra vegetation. Effects of ice road construction on soil thermal regime and compaction. Effects of off road tundra travel on vegetation and recovery periods.
	Everett 1980	Effects of road dust on tundra vegetation.
	Auerbach 1997	Effects of road dust on tundra vegetation and soil pH. Dust induced changes in albedo and effects on accumulated snow near gravel roads and pads.

Table H8. Vegetation and Wetlands Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Tundra Disturbance Related to Gravel Fill (Continued)	Klinger et al. 1983	Dust induced changes in albedo and effects on accumulated snow near gravel roads and pads. Reference to culverts in gravel roads becoming clogged with snow and ice during snow melt, increasing flooding potential.
	Hettinger 1992	Area of tundra vegetation affected by indirect impacts (snow accumulation, increased moisture, increased thaw depth, dust deposition) from gravel roads in Prudhoe Bay.
	Brown et al. 1984	Effects of early melting of accumulated snow on local soil moisture levels.
	Murphy and Anderson 1993	Effects of early green-up of vegetation adjacent to gravel roads and pads on birds.
	Kertell 1994, 2000 Noel et al. 1996	Effects of road side impoundments on nesting bird habitat.
	BLM and MMS 1998	Northeast NPR-A Integrated Activities Plan and EIS. Discusses the cumulative proportion of wetlands and vegetation loss from oil and gas development.
Tundra Disturbance –Ice Roads and Pads	Guyer and Keating 2005	Impacts of ice roads and ice pads on tundra vegetation in the National Petroleum Reserve – Alaska. Recovery period of vegetation impacted by ice road construction.
	Yokel et al. 2007	Comparison of impacts to tundra vegetation from offsetting versus overlapping ice road routes from year to year. Effects of ice road construction on soil thermal regime and compaction.
	BLM 2002	Effects of ice road construction on soil thermal regime and compaction.
	Felix and Reynolds 1989	Effects of ice road construction on tundra vegetation.
	Whitman 2010	Ice road stream crossings and effects on fish.
	BPXA 1996 Noel and Pollard 1996 ABR 2007	Monitoring report describing the effects of the Yukon Gold multi-season ice pad (over 1 summer) on tundra vegetation.
Tundra Disturbance – Off Road Travel	Abele et al. 1972 Ebersole 1985 Everett 1983	Thermal balance and vegetation composition recovery period of wet tundra impacted by off road tundra travel.
	Roth et al. 2004	Effects of winter off road tundra travel on tundra vegetation in the northeastern National Petroleum Reserve – Alaska.
	Abele et al. 1984	Recovery period of tundra vegetation from off road travel in reference to intact soil organic mat.
	Walker et al. 1977	Effects of off road tundra travel on tundra vegetation.
	ADEC 2010	Alaska Department of Environmental Conservation Tundra Treatment Guidelines. Stipulations on off-road tundra travel.
Climate Change	Callaghan 2005	Studies of climate change in the Arctic under the current conditions have shown that warming temperatures affect the distributions and growth rates of plant species, resulting in a northward expansion of the range of shrubs and other plants.
	Hintzman et al. 2005	Effects of climate change on growth rates of shrubs and graminoids; cover of mosses and lichens. Effects of climate change on moisture regime.

Table H8. Vegetation and Wetlands Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Climate Change (Continued)	GCA 2008	Establishment of non-native plant species in the Arctic due to climate change.
	Bella 2009	Bioclimatic modeling of non-native plant species establishment throughout Alaska.
North Slope Trenching Methods	BPXA 2005	Oil and gas industry standard methods for digging and rehabilitating trenches on the North Slope.

Table H9. Bird Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
General Reference	AOU 2009	North American resource for bird naming conventions.
	Audubon Alaska 2010	Describes IBAs on the North Slope, including the Eastern Beaufort Sea Lagoons and Barrier Islands IBA.
	ExxonMobil Corporation 2009	Environmental Report prepared specifically for the proposed project.
	NABCI 2010	Presents the ACP as a bird conservation region for North America.
	Truett and Johnson 2000	The Natural History of an Arctic Oil Field, an industry-sponsored synthesis of available information on species present and possible effects of development.
	BLM and MMS 1998	Northeast NPR-A Integrated Activities Plan and EIS. Discusses the cumulative effects of oil and gas development on the North Slope on birds.
General North Slope Birds	Johnson and Herter 1989	Summarizes relevant knowledge of all bird species that have been reported in the Beaufort Sea region of Canada and Alaska.
	Kessel and Gibson 1978	General resource on the status and distribution of birds in Alaska.
	Martin et al. 2009	Provides an evaluation of potential impacts to wildlife (including birds) from climate change.
	USFWS 2010	Draft report categorizing high value wetland habitats for birds on the North Slope.
Disturbance Distances	Klein et al. 1995 Rodgers and Smith 1997	Peer-reviewed studies of disturbance and displacement distances of birds because of human activity.
Cumulative Impacts	NRC 2003	Government review identifying effects on birds from past, present, and future developments on the North Slope, including changes in nesting distribution, predator populations, and predation. Possible effects on raptors and molting waterfowl are also identified.
Species Specific Information	Bechard and Swem 2002	Species specific information for rough-legged hawk published as part of the birds of North America series.
	Day et al. 2001	Species specific information for Sabine's gulls published as part of the birds of North America series.
	Day et al. 1995 Schick et al. 2004	Breeding season observations of spectacled eiders
	Derksen et al. 1981, Warnock and Troy 1992, Anderson et al. 1996	Published and unpublished reports describing nesting and brood-rearing habitats used by spectacled eiders.
	Earnst 2004	Status assessment and conservation plan for the yellow-billed loon prepared by the U.S. Geological Survey.
	Earnst et al. 2005	Peer-reviewed publication providing information on the population size and trend of yellow-billed loons in northern Alaska.
	Gilchrist 2001	Species specific information for glaucous gulls published as part of the birds of North America series.
	Hannon, Eason, and Martin et al. 1998	Species specific information for willow ptarmigan published as part of the birds of North America series.

Table H9. Bird Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Species Specific Information (Continued)	Hussell and Montgomerie 2002	Species specific information for Lapland longspurs published as part of the birds of North America series.
	Johnson 2000b	Summary of Pacific eiders (subspecies of common eider) on the North Slope and influences of the oil field region on the Pacific eider population, published as a chapter in The Natural History of an Arctic Oil Field (Truett and Johnson 2000).
	Johnson 2000a	Summary of lesser snow geese on the North Slope and influences of the oil field region on the lesser snow goose population, published as a chapter in The Natural History of an Arctic Oil Field (Truett and Johnson 2000).
	Kertell 2000	Summary of Pacific loons on the North Slope and influences of the oil field region on the Pacific loon population, published as a chapter in The Natural History of an Arctic Oil Field (Truett and Johnson 2000).
	Limpert and Earnest 1994	Species specific information for tundra swans published as part of the birds of North America series.
	Macwhirter and Bildstein 1996	Species specific information for northern harrier published as part of the birds of North America series.
	Monda 1991	Doctoral dissertation on reproductive ecology of tundra swans on the Arctic Refuge.
	Montgomerie and Holder 2008	Species specific information for rock ptarmigan published as part of the birds of North America series.
	Morrison et al. 2006	Most recent available population estimates for North American shorebirds.
	Noel and Cunningham 2003	Unpublished report documenting golden eagle observations in the Point Thomson region in June during caribou calving.
	North 1994	Species specific information for yellow-billed loons published as part of the birds of North America series.
	Powell and Backensto 2009	Study of raven nesting in Alaska North Slope oil fields funded by MMS (now BOEMRE) and conducted by UAF.
	Quakenbush et al. 2002	Peer reviewed publication of historical and present breeding season distribution of Steller's eiders in Alaska, including the ACP.
	Reed et al. 1998	Species specific information for brant published as part of the birds of North America series.
	Ritchie and King 2000	Species specific information for tundra swan, published as a chapter in The Natural History of an Arctic Oil Field (Truett and Johnson 2000).
	Sea Duck Joint Venture 2004	Life history summary for the spectacled eider.
	Sedinger and Stickney 2000	Species specific information for black brant, published as a chapter in The Natural History of an Arctic Oil Field (Truett and Johnson 2000).
	USFWS 1996	Spectacled eider recovery plan.
	USFWS 2002b	Steller's eider recovery plan.
	White et al. 2002	Species specific information for peregrine falcon published as part of the birds of North America series.
	Brown et al. 2007	Peer reviewed publication documenting shorebird abundance and distribution on the Arctic Refuge coastal plain.

Table H9. Bird Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
North Slope Aerial Surveys for Birds	Day and Rose 2000 Ritchie et al. 2003y	Eider surveys and habitat mapping at U.S. Air Force radar sites in Northern Alaska in 2000 and 2002.
	Dau and Bollinger 2009	Annual report of aerial population surveys for common eiders and other waterbirds in nearshore waters and along barrier islands of the ACP conducted by USFWS. This report includes reference to previous annual reports, and those reports are incorporated by reference.
	Fischer and Larned 2004	Peer reviewed publication assessing the summer distribution of marine birds in the western Beaufort Sea based on aerial survey data.
	Johnson et al. 2005	Published study of aerial monitoring of marine waterfowl in the Alaskan Beaufort Sea.
	Fischer, Tiplady, and Larned 2002	Report by USFWS on aerial surveys for monitoring Beaufort Sea waterfowl and marine birds.
	Larned et al. 2003 and 2010	Multi-year summaries of annual aerial population surveys for nesting eiders and other waterfowl on the ACP conducted by USFWS.
	Noel et al. 2003b	Review of existing information and analysis of historical aerial survey data during 1978-2001 from the Prudhoe Bay region to characterize changes in numbers and distribution of glaucous gulls, associations with human activity, and confounding relationships with environmental variables.
	Ritchie 2001	Aerial surveys for brant and snow geese between Barrow and Fish Creek delta.
	Ritchie et al. 2003x	Aerial surveys of cliff-nesting raptors in NPR-A.
Conservation Birds of Concern	ADF&G 2006	Wildlife Action Plan published by ADF&G to provide a common strategic framework to aid in the conservation of Alaska's aquatic and terrestrial wildlife. The plan focuses on species of greatest conservation needs and list of featured species and groups.
	AKNHP 2011	The Alaska Natural Heritage Program's zoology program maintains updated conservation status ranks for bird species. Bird status for species of greatest conservation concern is assessed at global and state levels based on about a dozen factors, including population number and size, trends, and threats.
	Alaska Shorebird Group 2008	The Alaska Shorebird Conservation Plan published by the Alaska Shorebird Group. The Alaska Shorebird Group is a mix of academic and private researchers, federal and state agency staff, conservation organizations, and shorebird enthusiasts with a goal to achieve consensus on needed conservation actions for shorebirds in Alaska. The plan contains updated conservation objectives and priorities based on the latest information on Alaskan shorebirds.
	Kirchoff and Padula 2010	Technical report (The Watchlist) prepared by Audubon Alaska, a nonprofit group, to identify and focus conservation attention on vulnerable and declining bird species in Alaska. The Watchlist is updated every three to five years.
	Rosenberg 2004	Partners in Flight landbird continental priorities and objectives defined for Alaska.
	Rich et al. 2004	Landbird conservation plan prepared by Partners in Flight to provide a North American continental synthesis of priorities and objectives to guide landbird conservation actions at national and international scales.

Table H9. Bird Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Conservation Birds of Concern (Continued)	USFWS 2008	Report prepared by the USFWS to identify birds of conservation concern in compliance with the Fish and Wildlife Conservation Act. The report identifies species, subspecies, and populations of all migratory and nongame birds within the United States that, without additional conservation actions, are likely to become candidates for listing under the ESA.
Federal Register Notices for ESA Species	58 FR 27474	Final rule to list spectacled eiders as threatened under ESA.
	62 FR 31748	Final rule to list the Alaska breeding population of Steller's eiders as threatened under ESA.
	65 FR 6114	Proposed designation of critical habitat for the spectacled eider.
	66 FR 8850	Final determination of critical habitat for Alaska breeding population of Steller's eiders.
	66 FR 9146	Final determination of critical habitat for spectacled eiders.
	74 FR 12932	12-Month Finding on a Petition To List the Yellow-Billed Loon as Threatened or Endangered. Listing the yellow-billed loon rangewide under ESA is warranted but precluded by other higher priority listing actions.
Study Area-Specific Field Studies	Anderson et al. 2009	Summary of long-term monitoring of the distribution, abundance, and productivity of selected waterfowl populations in 2008 conducted for ConocoPhillips Alaska, Inc. at the Kuparuk Oilfield. Primary species of study included spectacled eider, tundra swan, and brant.
	Frost et al. 2007	Unpublished report documenting Steller's and spectacled eider surveys of U.S. Air Force radar sites in northern Alaska, including Bullen Point.
	Kendall et al. 2007	Unpublished USFWS report documenting the nesting ecology of tundra birds at the Canning River delta in the Arctic Refuge during 2006.
	Liebezeit and Zack 2008 and 2010 Liebezeit et al. 2009	Published and unpublished reports evaluating the influence of human development on the ACP on predator abundance and the influence of predator abundance on nest survival of tundra birds.
	McKendrick et al. 2008	Unpublished report of snow goose and brant nest monitoring at Howe Island in the Saganvanirktok River delta.
	Noel et al. 1999, 2000, 2002a, b, c	Unpublished reports documenting aerial surveys of molting waterfowl in the barrier island-lagoon system between the Spy Islands and Brownlow Point in 1998, 1999, 2000, 2001, and 2002.
	Noel et al. 2003a	Atlas of marine birds, waterfowl, and human activities in the barrier island-lagoon systems between Spy Island and Brownlow Point from 1998 to 2002 developed for BP Exploration.
	Noel et al. 2004	Published study of snow goose nesting and brood-rearing distributions in the Saganvanirktok River delta, Alaska from 1980 to 2002." 2004, 388-395.
	Noel et al. 2005	Published report documenting distributions of long-tailed ducks, eiders, and scoters in central Beaufort Sea lagoons.
	Noel et al. 2006	Published report documenting long-term and current common eider nesting and predation on Beaufort Sea barrier islands.
	OASIS Environmental Inc. 2008	Unpublished report of ground surveys for spectacled and Steller's eider nests at six U.S. Air Force radar sites in northern Alaska, including Bullen Point.

Table H9. Bird Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Study Area-Specific Field Studies (Continued)	Rodrigues 2002a; Rodrigues 2002b	Unpublished reports documenting nest density, nest survival, and habitat use of tundra-nesting birds at Point Thomson in 2001 and 2002. Data from these studies were published in Liebezeit et al. (2009).
	TERA 1995	Preliminary characterization of summer bird use of the Badami Development area in 1995.
	TERA 2000, 2002	Unpublished field study reports of the distribution of spectacled eiders in the vicinity of the Point Thomson Unit from 1998 to 2001.
	WCC and ABR 1983	Unpublished summary report of terrestrial environment studies conducted for the Point Thomson Development Project in the early 1980s.
	Johnson et al. 2011	Report on aerial surveys for eiders and loons in the Point Thomson survey area.
Effects of Disturbance	Anderson et al. 1992, Anderson 1992,	Studies assessing effects from construction and drilling noise on abundance and behavior of brood-rearing Brant and nesting Canada geese in Prudhoe Bay.
	Day et al. 2003, Day et al. 2005	Studies of eider migration and collision potential at Northstar Island using ornithological radar and visual observation.
	Day et al. 2007	Summary document reviewing studies of bird mortalities from striking powerlines on the North Slope, best methods for studying this phenomenon, data gaps, and suggested studies. Annotated bibliography included.
	Hampton and Joyce 1985,	Study of effects of noise on bird habitat use and behavior in wetlands adjacent to CPF-3 at Kuparuk.
	Johnson et al. 2003	Synthesis report of Alpine avian monitoring program, from 1996–2001, which evaluated effects of aircraft and other sources of disturbance on the avian community during the breeding season.
	Murphy and Anderson 1993	Synthesis document examining whether development-related disturbance and habitat loss caused changes in the extent and nature of use of the Lisburne Development Area by geese and swans. Report synthesizes study results from pre-construction, construction, and post-construction, 1983-1989.
	Petersen et al. 1999	Annual progress report of aerial and ground-based field surveys dated July to September, 1999. The primary focus of the aerial studies was to describe abundance and distribution of long-tailed ducks; additional surveys were conducted for abundance and distribution of seabirds.
	Pollard et al. 1990	Study of wildlife use of disturbed habitats in the Prudhoe Bay region in order to assess impacts of gravel fill and man-made impoundments on the wildlife community and collect information useful for rehabilitating habitats affected by disturbance.
	Russell 2005	Study of birds at offshore oil platforms in the Gulf of Mexico, including an evaluation of the response of birds to lighting and weather conditions.
	Reijnen and Foppen 1994	A peer-reviewed study of effects of traffic noise from a highway with dense traffic on habitat quality, density of territorial males, nest success of willow warblers in the Netherlands.
	Troy 1986	Study examining bird species composition, distribution, habitat use, time of nest initiation, nest density, and nest success in disturbed and undisturbed areas of the Prudhoe Bay area.

Table H9. Bird Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Effects of Disturbance (Continued)	Troy and Carpenter 1990	Study examining displacement of birds due to placement of gravel pads in the Prudhoe Bay region.
	USFWS 2003	Proceedings of a workshop on human influences on predators of nesting birds on the North Slope of Alaska. There were 16 presentations by 14 researchers, scientists, and managers regarding concern that human influences on the North Slope of Alaska have increased densities of predators (such as foxes, ravens, and gulls) that prey on eggs and young of ground-nesting birds.

Table H10. Terrestrial Mammal Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
General Reference	ADF&G 2006	Alaska's comprehensive wildlife conservation plan describes ecosystems and identifies priority species.
	ADF&G 2009a ADF&G 2009b	Alaska's hunting and trapping regulations.
	MacDonald and Cook 2009	Taxonomy, ecology, and distribution of Alaska mammals.
	Martin et al. 2009	Wildlife response to environmental arctic change, general ecology summary and predicted responses by species to predicted climate warming.
	McMahon 2008	Graduate research paper on the impacts of climate change on arctic wildlife.
	NRC 2003	Evaluation of cumulative impacts to wildlife from oil field development in the Alaskan arctic.
	NatureServe 2009	Web-based database of natural history, distribution of animals in North America.
	Pollard et al. 1990	Industry sponsored study of wildlife use of disturbed habitats in arctic Alaska.
	Raynolds et al. 2010	Web-based arctic atlas of vegetation cover including spatially explicit estimates of photobiomass used to calculate forage loss due to habitat loss or alteration.
	Yokel et al. 2007	Agency sponsored report describing ice roads and effects of overlapping and offsetting routes used annually.
	Hettinger 1992	Area of tundra vegetation affected by indirect impacts (snow accumulation, increased moisture, increased thaw depth, dust deposition) from gravel roads in Prudhoe Bay.
Small Mammals	Babcock 1985	Rodent population study in Arctic National Wildlife Refuge.
	Batzli and Sobaski 1980	Peer reviewed study on arctic ground squirrel ecology near Atkasook, Alaska.
	Eddingsaas et al. 2004	Peer reviewed publication on arctic ground squirrel taxonomy, evolutionary history of distributions.
Caribou	Arthur 2002 Griffith 2002 ADF&G 2003 ADF&G 2009c	Agency sponsored caribou telemetry data for photocensus groups and calving locations and movements.
	Arthur 2002	Agency sponsored radio-telemetry study of the Central Arctic Herd east of the Sagavanirktok River during the calving season.
	Arthur and Del Vecchio 2009	Agency sponsored study and report on oil field effects on caribou calf growth, survival and caribou productivity.
	Ballard et al. 2000	Natural history and interactions of caribou with the North Slope oil fields.
	Dau 2007 Caikoski 2009a Lenart 2009a Parrett 2009	Agency sponsored caribou management reports for the Western Arctic, Teshekpuk, Central Arctic, and Porcupine caribou herds.

Table H10. Terrestrial Mammal Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Caribou (Continued)	Dau and Cameron 1986 Cameron et al. 1995 Cameron et al. 1992 Cameron et al. 2005	Agency sponsored, peer reviewed studies of oil field effects on caribou in the Prudhoe Bay oil fields.
	Cronin et al. 1994	Agency and Industry sponsored review of oil field and transportation corridor effects on caribou with development of mitigation measures for caribou.
	Curatolo and Murphy 1986b	Industry sponsored, peer reviewed publication on effects of pipelines, roads, and traffic on caribou movements.
	Government of Yukon 2010	Agency sponsored web site illustrating movements of satellite collared caribou from the Porcupine Caribou Herd.
	Griffith et al. 2002	Agency sponsored study of the Porcupine Caribou Herd in the Arctic Refuge, describes ecology and movements.
	Haskell et al. 2006 Haskell and Ballard 2008	Peer reviewed publications of caribou surveys in the Kuparuk oil field based on industry sponsored graduate research.
	Hinkes et al. 2005	Agency sponsored, peer reviewed publication on caribou herd identity, calving ground fidelity, and behavior as influenced by population growth.
	Pollard and Noel 1995 Noel 1998a Noel 1998b Noel 1998c Noel 1998d Noel and Olson 1999a Noel and Olson 1999b Noel and King 2000a Noel and King 2000b Noel and Olson 2001a Noel and Olson 2001b Jensen and Noel 2002 Jensen et al. 2003 Noel and Cunningham 2003 Noel et al. 2004	Industry sponsored large mammal surveys (caribou, muskoxen, brown bear) of the Badami and Point Thomson areas 1997 to 2003.
	Lawhead et al. 2006	Agency sponsored literature review on pipeline height mitigation for caribou in the North Slope oil fields.
	Lawhead et al. 2004	Industry sponsored study on mitigation for caribou during calving for the Meltwater project.

Table H10. Terrestrial Mammal Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Caribou (Continued)	Murphy and Curatolo 1987 Murphy and Lawhead 2000 Murphy et al. 2000	Industry and agency sponsored publications of studies on energetic of interactions of caribou with oil field infrastructure.
	WCC and ABR 1983 Noel et al. 1998 Pollard et al. 1996a Pollard et al. 1996b Noel et al. 2004	Industry sponsored, peer review publications of studies of caribou in North Slope Alaska oil fields.
	Palmer 1944	Peer reviewed publication of Alaska animal food requirements.
	Person et al. 2007	Agency sponsored peer-reviewed publication on distribution and satellite-telemetry movements of Teshekpuk Herd caribou.
	Skoog 1968	Dissertation on caribou ecology in arctic Alaska including description used to distinguish caribou herds in Alaska.
	Kelleyhouse 2001	Graduate study of Teshekpuk Lakd and Western Arctic caribou herd calving ground selection.
	Wolfe et al. 2000 Vistnes and Nellemann 2008	Agency sponsored, peer-reviewed publications on interactions of humans and human developments on reindeer and caribou.
	USFWS 2008i	Description of annual caribou movements and activities.
	Wolfe 2000	Graduate research based on telemetry and remote sensing of habitats used during calving by Central Arctic Herd caribou.
Muskoxen	Lenart 2009b	Agency sponsored muskoxen management reports.
	Reynolds 1998 Reynolds et al. 2002 Reynolds 2003	Agency sponsored muskoxen survey data, ecology in the Arctic Refuge.
Foxes	Ballard et al. 2000a Ballard et al. 2000b	Peer reviewed publications on arctic fox life history and den densities in the North Slope oil fields.
	Burgess 1984	Dissertation on behavioral ecology of arctic foxes describing interactions with nesting birds and small mammals.
	Burgess et al. 1993 Burgess 2000	Industry sponsored publications on arctic fox ecology in the North Slope oil fields.
	Perham 2000 Perham 2001	Industry sponsored Point Thomson area arctic fox den studies.
	Eberhardt et al. 1983	Peer reviewed publication on arctic fox den use and ecology in northern Alaska.
	Macpherson 1969	Agency sponsored publication on arctic fox population dynamics and den ecology.
	Pamperin et al. 2006 Pamperin 2008 Pamperin et al. 2008	MS Thesis and peer reviewed publications from a satellite telemetry-based and observational study of arctic foxes on Alaska's North Slope, with interactions between arctic foxes and red foxes.

Table H10. Terrestrial Mammal Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Foxes (Continued)	Rodrigues 2002	Industry sponsored bird study in the Point Thomson region with arctic fox den location and observations.
	Streever et al. 2006 Streever et al. 2007 Sanzone et al. 2008 Sanzone et al. 2009	Industry sponsored monitoring reports of various animals including arctic fox observations and interactions with oil field personnel.
	Stephenson and Hocker 2008	Agency sponsored web resource describing the ecology of the arctic fox in Alaska.
	USFWS 2003	Agency sponsored workshop and publication on nest predators on Alaska's North Slope including information on arctic fox and brown bears.
Brown Bear References	Lenart 2007	Agency sponsored brown bear management report.
	Linnell et al. 2000	Peer reviewed publication on vulnerability of denning bears to disturbance.
	Shideler and Hechtel 1993 Shideler and Hechtel 1995a Shideler and Hechtel 1995b Shideler 1998 Shideler 1999 Shideler and Hechtel 2000	Industry supported agency telemetry studies of brown bears and industry sponsored publication on ecology of brown bears in the Prudhoe Bay region including den habitat descriptions.
	Peltier 2005 Peltier and Scott 2003 Scott and Kephart 2002 Blejwas 2006 Blejwas 2007	Agency sponsored survey of trappers, describes harvest and abundance trends based on trapper supplied information.
	Caikoski 2009b	Agency sponsored wolf management report.
	Durner et al. 2001 Durner et al. 2006	Topographic based spatial model of polar bear den habitat for the Arctic Coastal Plain – used to estimate suitable brown bear den habitat.
Other Terrestrial Mammal References	Lenart 2008	Agency sponsored moose management report.
	Stephenson and Boertje 2008	Agency sponsored web resource describing the ecology of the wolf in Alaska.
	Szepanski 2007	Agency sponsored fur bearer management report.
	Taylor and Gardner 2008	Agency sponsored web resource describing the ecology of the wolverine in Alaska.
	Young et al. 2002	Agency sponsored publication on mammalian predators in the Arctic National Wildlife Refuge describing distribution, movements and general ecology.

Table H10. Terrestrial Mammal Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Tundra Disturbance – Indirect Impacts from Gravel Fill	Hettinger 1992	Area of tundra vegetation affected by indirect impacts (snow accumulation, increased moisture, increased thaw depth, dust deposition) from gravel roads in Prudhoe Bay.

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
General Marine Mammal Reference	Smultea et al. 2011	Comprehensive assessment of all bowhead whale survey efforts (i.e., tagging, aerial, acoustic) in the U.S. Beaufort Sea, prepared for the NMFS as part of the Bowhead Whale Feeding Ecology Study study.
	Funk et al. 2010	Marine mammal monitoring, mitigation, and research program results for Shell Offshore, Inc. for 2006-2008 in Beaufort and Chukchi seas. Data on relative abundance and distribution for marine mammals. Assesses potential impacts of oil/gas exploration activities and seismic surveys on marine mammals in this region.
	Richardson 2011	Marine mammal monitoring results for Northstar Oil Development for 2010.
	Aerts et al. 2008	Marine mammal monitoring and mitigation during BP Liberty OBC seismic survey in Foggy Island Bay, Beaufort Sea, July-August 2008; provides information on beluga whale occurrence.
	Blackwell et al. 2007	The westward migration of bowhead whales studied during autumn 2001–04 using array of Directional Autonomous Seafloor Acoustic Recorders (DASARs) deployed northeast of the Northstar oil production island. The DASAR methodology provides detailed information on the temporal and spatial distribution of calling whales and on their acoustic repertoire.
	Blackwell et al. 2009	Beaufort Sea acoustic monitoring program conducted during open-water seasons of 2006 and 2007. Report section within report of joint monitoring program conducted for Shell Offshore, Inc. and ConocoPhillips Alaska, Inc. in the Beaufort and Chukchi seas.
	Durner et al. 2010	Presents data on the approximate locations and methods of discovery of 392 polar bear maternal dens found in the Beaufort Sea and neighboring regions between 1910 and 2010. Discusses history of maternal den location research.
	Perham 2005	Proceedings of a USFWS workshop to identify components for the development of a comprehensive, long-term polar bear monitoring program in association with the oil and gas industry in Alaska.
	Schliebe et al. 2001 Kalxdorff et al. 2002 Schliebe et al. 2006b	Results of coastal aerial surveys in Alaska conducted for polar bears.
	Monnett and Gleason 2006	Polar bear sightings made during MMS-funded Bowhead Whale Aerial Survey Project surveys.
	Amstrup et al. 2004	Polar bear den detection methodology used by polar bear biologists working in conjunction the with oil andgas industry.
Marine Mammal Habitat Use, Behavior, Life History	Jefferson et al. 2008	Definitive information source on marine mammals. Species accounts include distribution, ecology and behavior, feeding and prey, amongst other information.
	George and Sheffield 2009	Section in Bowhead Whale Feeding Ecology Study 2009 annual report prepared by North Slope Borough; documents bowhead whale prey amounts and types in the stomachs of whales landed during the subsistence hunt of bowhead whales at Barrow and Kaktovik.
	Perrin et al. 2008	This encyclopedia is a complete source of information on the subject of marine mammals, that covers individual species as well as specific topics of behavior and life history, ecology and population biology, and human effects and interactions

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Marine Mammal Habitat Use, Behavior, Life History (Continued)	Bentzen et al. 2007	Isotope analysis indicates polar bear feeding on low trophic level foods (such as bowhead whale), important indicators of food scavenging.
	Hammill 2008	This chapter in the Encyclopedia of Marine Mammals presents known information on ringed seal life history, habitat preferences, and prey preferences. Discusses possible impact of climate change on the species.
	Moore and Reeves 1993	Review of available information on bowhead whale distribution and movement patterns; chapter in The Bowhead Whale, a definitive source of information on the species.
	Rugh and Shelden 2008	This chapter in the Encyclopedia of Marine Mammals presents bowhead whale, reviews distribution, life history, feeding habitats, behavior, and ecology of the species.
	Rice and Wolman 1971	Review of gray whale life history, behavior, and ecology.
	Burns 1981a	Life history details for ringed seals including seasonal movements, habitat preferences and reproductive parameters.
	Burns 1981b	Life history details for ringed seals including seasonal movements, habitat preferences and reproductive parameters.
	Kelly 1998a	Prepared for Marine Mammal Commission, reviews ringed seal information for Alaska.
	Kelly 1988b	Prepared for Marine Mammal Commission, reviews bearded seal information for Alaska.
	Moulton et al. 2002	Investigates how local abundance of ringed seals on landfast ice of the central Alaskan Beaufort Sea is related to habitat factors and how the haulout behavior of seals is influenced by temporal and weather factors.
	Hazard 1988	Prepared for Marine Mammal Commission, reviews beluga whale information for Alaska.
	Lowry 1993	Review of available information on bowhead whale prey and feeding behavior; book chapter in The Bowhead Whale, a definitive source of information on the species.
	Boveng et al. 2009	Status review is a compilation of information concerning spotted seals including the past, present, and future threats to this species. Compiled by NOAA in response to petition to list spotted seals under the ESA due to concerns regarding potential impacts of climate change on the species.
	Frost et al. 1993	Notes spotted seal distribution is more in Chukchi Sea than in Beaufort Sea.
	Cameron et al. 2010	Status review is a compilation of information concerning bearded seals including the past, present, and future threats to this species. Compiled by NOAA in response to petition to list bearded seals under the ESA due to concerns regarding potential impacts of climate change on the species.
	Kelly et al. 2010	Status review is a compilation of information concerning ringed seals including the past, present, and future threats to this species. Compiled by NOAA in response to petition to list ringed seals under the ESA due to concerns regarding potential impacts of climate change on the species.
	Frost et al. 2002	This report presents data on the distribution and abundance of ringed seals in Northern Alaska.

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Marine Mammal Habitat Use, Behavior, Life History (Continued)	Richard et al. 2001	Beluga whales of the eastern Beaufort Sea stock were tagged with satellite-linked time-depth recorders and tracked during summer and autumn in 1993, 1995, and 1997 providing information on migration patterns of the stock.
	Suydam et al. 2001 Suydam et al. 2005	Satellite tracking of eastern Chukchi Sea beluga whales, demonstrating movement of some individuals into Beaufort Sea.
	Treacy et al. 2006	Nineteen years (1982-2000) of sighting data from MMS fall aerial surveys of bowhead whales in the Alaskan Beaufort Sea were analyzed to determine how patterns in the distribution of migrating bowhead whales relate to annual sea-ice conditions.
	Moulton and Lawson 2002	This study investigated how the abundance of ringed seals on landfast ice of the central Beaufort Sea is related to habitat factors and how the haulout behavior of seals is influenced by temporal and weather factors.
	Burns 1970	Reviews information on the walrus and ringed, ribbon, harbor, and bearded seals. It also discusses differences in body structure, ecological adaptation, and behavior in relation to distribution of the five species.
	Rugh et al. 1997	Reviews spotted seal taxonomy, distribution, habitat, behavior and prey preferences as well as available survey data for the species at time of publication.
	Rugh et al. 2003	Reviews information for different stocks of bowhead whales, including movement patterns.
	Rode et al. 2010	Discusses the association between declining sea ice and nutritional limitations that reduced body size and reproduction in the SBS stock of polar bears.
	Amstrup 2003	Reviews available information on denning behavior, life history, habitat preferences for polar bears.
	Miller et al. 2006	MMS-funded study for USFWS to conduct a study of polar bears feeding on bowhead whale carcasses along the Beaufort Sea coast of Alaska. The primary purpose of this study was to increase understanding of foraging and carcass utilization by polar bears using the nearshore environment.
	Stirling 1988	Discusses polar bear attraction to petroleum activity sites, which are located within preferred habitat for the species.
	Durner et al. 2004	Habitat selection by female polar bears in the Beaufort Sea.
	Smith 1980	Availability and abundance of ringed and bearded seals associated with seasonal sea ice is considered the primary factor influencing habitat use by polar bears.
	Ferguson et al. 2000	Influence of sea ice dynamics on habitat selection by polar bears.
	Mauritzen et al. 2003	Polar bear habitat use may be both a function of prey availability and ice conditions.
	Durner et al. 2001, 2003, 2006	USGS' characterization and mapping of potential denning habitat along the Alaska Beaufort Sea coast between the Colville River and the Canadian border, including the Arctic Refuge.
	Lentfer and Hensel 1980	Polar bear denning information.
	Smith et al. 2010	Includes information on terrestrial sources of food for polar bears.

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Marine Mammal Habitat Use, Behavior, Life History (Continued)	Smith et al. 2007	Polar bear post-den emergence behavior.
Physical Environment and Climate Change Impacts on Habitat Use	Moore and Huntington 2008	Discusses potential impacts of climate change on ice-dependent marine mammals in the arctic region. Published in a special issue of Ecological Applications focused on arctic marine mammals and climate change.
	Serreze et al. 2007	Presents details on declines in sea ice in the arctic region. This is an important source of information used by USFWS in their determination of critical habitat for the polar bear and NMFS/USFWS consideration of status of ice-associated marine mammals.
	Ragen et al. 2008	Addresses actions that can be taken to prevent, minimize, or mitigate human impacts on Arctic ecosystem components and processes. Reviews climate change impact concerns for marine mammals.
	Arctic Climate Impact Assessment 2005	Comprehensive evaluation of arctic climate change, including definition of different types of ice.
	Walsh 2008	A review of the Arctic marine environment. This is an important source of information used by USFWS in their determination of critical habitat for the polar bear and NMFS/USFWS consideration of status of ice-associated marine mammals. Published in a special issue of Ecological Applications focused on arctic marine mammals and climate change.
	Durner et al. 2009	Modeled projections of polar bear sea ice habitat distribution in the polar basin during the 21st century were developed to understand the consequences of anticipated sea ice reductions on polar bear populations. This was key to development of critical habitat designation for the species.
Abundance Estimates	Allen and Angliss 2010	NOAA marine mammal stock assessment reports for the Alaska region. Includes abundance estimates, distribution, and mortality information for 2009.
	Bengston et al. 2000, 2005	This study presents results from aerial surveys conducted in 1999 and 2000 to estimate the densities of ringed and bearded seals in the eastern Chukchi Sea.
	Burns and Harbo 1972	This study presents results from a base-line aerial study of ringed seals in areas of land-fast ice extending along the Alaskan coast from Point Lay to Barter Island in June 1970. Bearded seals were also documented in the study area.
	Frost et al. 1988	This report includes data from two sets of aerial surveys for ringed seals in the Alaskan Beaufort Sea conducted in 1985-1987 and 1996. Results indicate that ringed seals are abundant in the Beaufort Sea and are widely distributed.
	Rugh et al. 1993	Aerial survey in 1992 and 1993 to estimate spotted seal abundance at haulouts in Alaska.
	Laidre et al. 2008	Review arctic marine mammal species, their habitat requirements, and evidence for biological and demographic responses to climate change. Includes relative abundance for bearded seal relative to ringed seal.

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Abundance Estimates (Continued)	Frost et al 2004	This study presents data from aerial surveys conducted in May and June 1996–99 in the central Beaufort Sea. It also quantifies and models the effects of environmental factors on ringed seal counts and provides density estimates useful for evaluating trends in seal abundance.
	Link et al. 1999	Ringed seal distribution and abundance during Spring 1998 near potential oil development sites in the central Alaskan Beaufort Sea.
	Rugh et al. 2005	Estimates of abundance of the eastern North Pacific stock of gray whales during 1997-2002.
	Regehr et al. 2010	Documents declines in polar bear reproduction and survival associated with increasing duration of the ice-free period; provides abundance estimate.
	USFWS 2010	Stock assessment report revised in 2010 for Southern Beaufort Sea stock of polar bear, includes abundance estimate and distribution information.
Marine Mammal Distribution	Christie et al. 2010	Aerial monitoring programs for marine mammals in the Alaskan Beaufort Sea conducted during the open-water seasons of 2006, 2007, and 2008 in support of seismic exploration activities by Shell Offshore, Inc., Eni US Operating Company Inc., and production activities by Pioneer Natural Resources Alaska, Inc. Chapter in Funk et al. (2010) report. Information on beluga distribution.
	Lowry et al 1998	Presents data from satellite-tagged spotted seals in the eastern Chukchi Sea during August 1991 and 1993. Results showed large seasonal migrations and habitat preferences throughout the year.
	Miller et al. 1999	Bowhead and gray whale sightings documented in during marine mammal and acoustical monitoring associated with Western Geophysical's Open-water Seismic Program in the Alaskan Beaufort Sea during 1997 and 1998. Chapters in reports edited by W.J. Richardson of LGL.
	Miller et al. 1996	Presents data on marine mammal distribution and movements from the 1995 Northstar marine mammal monitoring program.
	Treacy 2000	MMS aerial surveys of endangered whales in the Beaufort Sea during fall 1998-1999; documented gray whale sightings.
	Rugh and Fraker 1981	Gray whale sightings in the Canadian Beaufort Sea.
	Brueggeman et al. 1992; Clarke et al. 1989	1991 marine mammal monitoring program (seals and whales) for the Crackerjack and Diamond prospects, Chukchi Sea; provides information on closest feeding location (in Chukchi) closest to Beaufort Sea.
	Amstrup 2002	Polar bear occurrence on the North Slope.
	LGL and Greeneridge 1996	Baseline marine mammal monitoring surveys in 1995 for the Northstar project, documents nearshore occurrence of beluga whale.
	Frost et al. 1986	Reviews beluga whale occurrence in the Beaufort Sea.
	Richardson et al. 1995	Study of acoustic effects of oil production activities on bowhead and white whales visible during spring migration near Pt. Barrow, Alaska, 1991 and 1994; aerial surveys provide details on beluga whale migration.
	Harwood et al. 1996	Distribution and abundance of beluga whales in the southeastern Beaufort Sea, and where belugas might be found throughout the year.

Table H11. Marine Mammal Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Marine Mammal Distribution (Continued)	Williams and Coltrane 2002	Results of marine mammal and acoustical monitoring of the Alaska gas producers pipeline team's open water pipeline route survey and shallow hazards program in the Alaskan Beaufort Sea during 2001. Documented gray whale occurrence near the Northstar Production Island.
	Harwood et al. 2005	This study documented presence and distribution of birds and marine mammals in the Canada Basin, Beaufort Sea and Chukchi Sea during 2002. A total of 74 marine or marine-associated mammals were recorded, representing seven species.
	MMS 2006	Biological evaluation prepared by MMS to assist NMFS with in preparation of their Biological Opinion as to whether proposed oil and gas leasing activities in the Beaufort and Chukchi seas are likely to jeopardize the continued existence of endangered bowhead, fin, and humpback whales. Reviewed existing information on distribution of those ESA-listed species.
	MMS 2008	Draft EIS for MMS' Beaufort and Chukchi Sea Planning Areas - Oil and Gas Lease Sales 209, 212, 217, and 221. Includes a review of available distributional data for Beaufort Sea bowhead whales.
	Moore 2000	Ten years (1982-91) of autumn sighting data from aerial surveys offshore northern Alaska were analyzed to investigate variability in cetacean (including bowhead whale) distribution and habitat selection in Alaskan Beaufort Sea.
	Quakenbush et al. 2010	Movements of satellite-tracked bowhead whales in the Arctic
	Rugh 2008; Rugh et al. 2010; Goetz et al. 2009	Findings of the Bowhead Whale Feeding Ecology Study, a multi-year MMS-funded study started in 2007, that focus on late summer oceanography and prey densities relative to whale distribution over continental shelf waters within 100 miles north and east of Point Barrow, Alaska.
	Haley et al. 2010	USCG environmental assessment prepared by LGL for geophysical mapping of sections of the Arctic. Provides personal communication with Native whalers that bowheads have apparently reached the Cross Island area earlier in recent years.
	Schliebe et al. 2006a	Status review for polar bear.
	Gleason and Rode 2009	Changes in polar bear distribution and habitat association (i.e., range contraction) appear to reflect a behavioral response by polar bears to changes in ice (type and percent cover) and in the timing of ice formation.
	Amstrup et al. 2000	Movement data from satellite-tagged polar bears between 1985 and 1995; data were used to determine boundary delineations for the SBS stock.
	Amstrup and Gardner 1994	Study of the temporal and spatial distribution of polar bear denning in the Beaufort Sea region.
	Fischbach et al. 2007	Evaluated changes in the distribution of polar bear maternal dens; less denning in recent years on sea-ice.
	Amstrup and DeMaster 1988	Reviews available information for the polar bears in Alaska, including life history, behavior, distribution.

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Marine Mammal Distribution (Continued)	Schliebe et al. 2008	Analysis of 2000-2005 aerial coastal surveys conducted during the open water period to determine the spatial and temporal distribution and abundance of polar bears using coastal habitats and barrier islands during the open water period; the relationship between sea ice conditions, food availability, and the fall distribution of polar bears in terrestrial habitats of the Southern Beaufort Sea.
	Bee and Hall 1956 DeMarban 2010	Documentation of inland occurrence of polar bears.
	Amstrup 2000	Polar bear sightings in the vicinity of onshore oil and gas facilities and observations by Native villagers.
	Lowry et al. 1994	Movements and behavior of satellite-tagged spotted seals in the Bering and Chukchi seas, including into the Beaufort Sea.
Extralimital Records for Marine Mammals	Brueggemann et al. 2009	Marine mammal surveys conducted during a multidisciplinary research program in the Chukchi Sea sponsored by ConocoPhillips Alaska, Inc. and Shell Exploration & Production during the 2008 open water season to develop baseline information on marine mammal use of the survey areas. Information on fin whale occurrence in the Chukchi Sea was included, even though no sightings were made, specifically personal communications with researchers working in the region. Habitat preferences of pinnipeds for arctic region included.
	Higdon and Ferguson 2009	Loss of arctic sea ice causing punctuated change in sightings in killer whales; extrapolated to also emphasize increase in the sightings of species not normally occurring in Beaufort Sea because of changes in sea ice.
	Suydam and George 1992	Harbor porpoise records near Point Barrow, regular use of extreme western Beaufort Sea, but rarely east of Point Barrow.
	Burns and Gavin 1980	Hooded seal records for Beaufort Sea.
	Kovacs 2008	Summarizes distribution, behavior, life history, and ecology of hooded seal.
	Hashagen et al. 2009	Humpback whale sightings in the Beaufort Sea.
	Green et al. 2007	Marine Mammal Monitoring Program FEX Barging Project, 2007; documented cow-calf pair sighting in Beaufort Sea.
	George et al. 1994	Killer whale sighting at Point Barrow in early 1990s.
	Lowry et al. 1987	Reviews killer whale occurrence in Alaska and notes no recent occurrences of species in Beaufort Sea.
	Mizroch 1991	Minke whale records in North Pacific, including Alaska.
	Baird 2001	Subsistence whaler sightings of killer whales in years past in nearshore waters of the Beaufort Sea.
	Harwood and Smith 2002	Information from subsistence hunts in the western Canadian arctic. States no takes of narwhal in recent years and reviews available information. Reviews western Canadian arctic information for species.

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Extralimital Records for Marine Mammals (Continued)	Ireland et al. 2009	Describes the results of marine mammal studies conducted by Shell Offshore, Inc., in conjunction with ConocoPhillips Alaska, Inc., during seismic activities in 2007, as well as other offshore activities that occurred in the Chukchi and Beaufort seas during the open-water period from July through November. Integrates monitoring and mitigation data collected in 2006 and 2007 to allow a more comprehensive analysis of marine mammal distribution and density in the Chukchi and Beaufort seas. Provides information on fin whale acoustic detections in Chukchi and Beaufort seas.
	Orr and Harwood 1998	Provides record of narwhal occurrence in Beaufort Sea based on tusk embedded in beluga head, found during a subsistence take in 1991 in the western Canadian arctic (off Tuktoyaktuk).
	Heide-Jørgensen 2008	Summarizes distribution, behavior, life history, and ecology of narwhal.
	Rice 1998	Detailed catalog of marine mammals that includes extralimital records; provides information for vagrant Steller sea lions in Beaufort Sea.
	Loughlin et al. 1984	Presents the distribution and abundance of Steller seal lions from surveys between 1975 and 1980 and compared to historical values. This study also presents seasonal distributions and migrations, and suggests possible causes of the population decline in the western region.
	Garlich-Miller et al. 2011	Status review is a compilation of information concerning Pacific walrus including the past, present, and future threats to this species. Compiled by USFWS in response to petition to list spotted seals under the ESA due to concerns regarding potential impacts of climate change on the species. Notes that walrus is extralimital to Beaufort Sea.
	USFWS 2011	USFWS prepared draft environmental assessment for whether issuance of regulations authorizing the incidental taking of small numbers of polar bears and Pacific walruses during oil and gas exploration activities in the Beaufort Sea is, or is not, a major Federal action. Notes that walrus is extralimital to Beaufort Sea.
Marine Mammal Hearing	Ketten 1992, 1997	Studies of marine mammal ear structure to determine marine mammal hearing.
	Nachtigall et al. 2007, Owen et al. 2010	Hearing measurements for polar bears.
	Southall et al. 2007	Proposes, for various marine mammal groups and sound types, levels above which there is a scientific basis for expecting that exposure would cause auditory injury to occur. Reviews hearing information primarily for cetaceans and pinnipeds.
Federal Register Notices – Marine Mammals	35 FR 18319	NMFS' listing of the bowhead whale as an endangered species under the ESA (1970).
	73 FR 28212-28303	USFWS' listing of the polar bear as a threatened species under the ESA (2008).
	74 FR 53683	NMFS' determination that the Alaska stock did not warrant listing under the ESA (2010).
	75 FR 76086-76137	Final rule from USFWS for designation of polar bear critical habitat (2010).

Table H11. Marine Mammal Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Federal Register Notices – Marine Mammals (Continued)	75 FR 77476	NMFS' proposed rule to list ringed seal as threatened species (2010).
	75 FR 77496	NMFS' proposed rule to list the Beringia DPS and the Okhotsk DPS of the bearded seal as threatened species (2010).

Table H12. Fish and Invertebrate Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Fish Presence— Freshwater	Adams and Cannon 1987	Overwintering study to locate areas of anadromous fish in the Sagavanirktok River and delta, and to determine the important habitat characteristics of these areas. Aerial and ground surveys were conducted during fall/early winter of 1985 and late winter/spring of 1986.
	Craig and McCart 1975	This study provides some of the only data on Dolly Varden spawning and overwintering areas for the region between the Sagavanirktok and Canning rivers, but is based on sampling of an unknown frequency and is over 38 years old.
	DFO Science 2002	Review of Dolly Varden fish stock in Big Fish River in the Yukon Territory. Discussion of stock size and trends, and results of harvest restrictions, with focus on possible impact of habitat change.
	Daigneault and Reiser 2007	Report provides results of 2006 Colville River fall fishery monitoring project that was conducted to track Arctic Cisco abundance trends and qualitatively predict future fishery performance through assessment of a single season of subsistence fishery catch rates.
	Hemming 1988 Hemming 1993 Hemming 1995 Hemming et al. 1989	Agency studies of freshwater fish habitat in North Slope oil fields, including investigations of fishery enhancement, flooded gravel mine sites, and tundra streams.
	Hemming 1996	This study provides fish distribution data and descriptions of stream habitat for the region between East Badami Creek and the Sagavanirktok River, but is based on limited sampling during one season and is over 16 years old.
	Johnson and Blanche 2011	Catalog of rivers, lakes, and streams, or parts of them, that are important for spawning, rearing, or migration of anadromous fishes.
	Reynolds 1997	Chapter of the ecological studies book <i>Freshwaters of Alaska</i> on the ecology of overwintering fishes in Alaska's freshwaters.
	PAI 2002	Industry prepared environmental evaluation document providing information on overwintering fish habitat.
	Fechhelm et al. 1992	Peer reviewed publication on the relationship between water temperature/salinity and growth rates of yearling whitefish from daily data collected in the Sagavanirktok River delta for years 1982 and 1985-1989.
	Fechhelm et al. 2002	Peer reviewed publication on the relationship between water temperature and growth rates of broad whitefish in the Sagavanirktok River delta.
	Schmidt et al. 1989	Study of deep lakes and rivers in the Sagavanirktok River delta that maintain sufficient quantities of sub-ice water and provide important overwintering habitat for anadromous fish. Survey results of winter 1985-1986 only.
	Ward and Craig 1974	Catalog of streams, lakes, and coastal areas between Prudhoe Bay and the Alaskan-Canadian border. This report compiles results from 17 sources (1962-1974), providing fish distribution and invertebrate data for the region between the Canning and the Sagavanirktok Rivers, but is based on limited sampling during one season and is at least 38 years old.
	Morris 2000	Study evaluates broad whitefish seasonal use of freshwater habitats in the Prudhoe Bay region, including documentation of overwintering habitat in the East Channel Sagavanirktok River.

Table H12. Fish and Invertebrate Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Fish Presence— Freshwater (Continued)	Winters and Morris 2004	Study provides fish distribution data for the region between Badami and the Canning Rivers, but is based on limited sampling during two seasons. Study performed in association with the Point Thomson Project by Alaska Department of Natural Resources (ADNR) Office of Habitat Management and Permitting.
	WCC and ABR 1983	This study provides fish habitat descriptions and fish presence data for selected streams between the Shaviovik and Canning Rivers, but is based on limited sampling during one season and is over 25 years old. Study performed for ExxonMobil for Point Thomson Project.
Fish Presence— Marine	Babaluk et al. 2000	Peer reviewed publication reporting on new records of sockeye, pink, and coho salmon captures in Canadian subsistence fishery site locations outside of known distribution areas for these species.
	Cannon et al. 1987 Glass et al. 1990	Two reports discussing findings of a study of fish presence, timing, and distribution for marine areas of the western study area, but data are over 25 years old. Work performed for the Corps for Endicott Environmental Monitoring Program (multiyear program to evaluate effects of the Endicott causeway on coastal fish habitat).
	Craig 1977a	Study examining the anadromous and stream-resident char collected from headwater to coastal areas. Report provides a detailed life-history of Arctic char and describes the different life history and growth patterns found within the Canning River.
	Craig 1984	A review of fish use of a relatively warm and brackish band of water that extends the length of the Beaufort Sea coast in the summer months. The area is believed to provide important feeding habitat for anadromous and marine fishes.
	Craig 1989b	Report assembles available information with goal to assess current state of knowledge about modern subsistence fisheries in North Slope communities using data from 1970-1986.
	Craig and Haldorson 1981	Results from research on the physical and biological processes in a barrier island – lagoon system on the Alaskan Beaufort coast. Primary goals were to identify processes that are more sensitive to impacts and of greater importance to native species that are of particular concern.
	Craig and Haldorson 1986	Peer reviewed publication on colonization of characteristically cold arctic rivers by only two of the five North American Pacific salmon species – pink and chum salmon.
	Fechhelm et al. 1994	Results of a one-dimensional advection model used to simulate the movement of young anadromous least cisco along the Beaufort Sea coast between the Colville River and Prudhoe Bay.
	Fechhelm et al. 2000 Wilson 2001 Williams and Burril 2011	Fish presence, timing, and distribution data for Lion Bay. Work performed for BP and ExxonMobil for Point Thomson Project.
	Fechhelm et al. 1996	Fish presence, timing, and distribution data for Mikkelson Bay, but data are over 15 years old.
	Frugé et al. 1989	Report by USFWS on fishes inhabiting Beaufort Sea coastal waters within and near the ANWR during the summer 1988 open-water season.

Table H12. Fish and Invertebrate Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Fish Presence— Marine (Continued)	Palmer and Dugan 1990	Report by USFWS on fishes inhabiting Beaufort Sea coastal waters within and near the ANWR during the summer 1989 open-water season.
	Krueger et al. 1998	Study to assess variation in stock origins of Dolly Varden collected from sites along 400km of Beaufort Sea coast, and to assess variation in stock contributions among summer months and between 1987 and 1988.
	Moulton 1980	Study conducted for ARCO Alaska on fish populations in the Kuparuk Field region from July 1980.
	Griffiths et al. 1977	Report of surveys conducted in 1975 to provide seasonal baseline data on the ecology of benthic invertebrates and fish in the Kaktovik Lagoon.
	Gallaway and Fechhelm 2000 Fechhelm et al. 2009	Time series of summer fish monitoring studies conducted in the Prudhoe Bay/Sagavanirktok Delta region from 1981 to present. Studies were specifically designed to monitor the effects of oil development on regional fishery resources.
	Fechhelm and Griffiths 2001	Synopsis of available information describing stocks of the five Pacific salmon species known to have occurred in the Beaufort Sea – pink, chum, Chinook, sockeye, and coho.
	Nelson et al. 1987	Final report (1985) for the Endicott environmental monitoring survey initiated to evaluate regional patterns of fish distribution and movements and determine the domestic and commercial harvest and demand (or need) for fish that use the Endicott study region, primarily in the Colville River delta and at Barter Island near Kaktovik.
	Thorsteinson et al. 1991	Fish study in the nearshore waters of the Beaufort Sea, including Foggy Island Bay, Mikkelson Bay, and Brownlow Point.
	Underwood et al. 1995	Study of fish abundance, distribution, size structure, condition, and age and growth of five target species – Dolly Varden, arctic Cisco, arctic flounder, fourhorn sculpin, and Arctic cod – from 1988 to 1991 in nearshore waters of the ANWR.
General Reference — Fish and Fish Habitat	BLM 2004	Alpine Satellites EIS. Provides information on fish and fish habitat in the Prudhoe Bay area, west of the study area.
	BLM 2008	Northeast National Petroleum Reserve – Alaska Final Supplemental IAP/EIS. Provides information on fish and fish habitat in the Teshekpuk Lake region, west of the study area.
	ADNR 2009	State oil and gas lease sale final finding report for the Beaufort Sea that includes an overview of Dolly Varden and whitefish and associated fisheries.
	Barnes and Reimnitz 1974	Proceedings of a symposium on Beaufort Sea coast and shelf research including a paper titled “Sedimentary Processes of Arctic Shelves off the Northern Coast of Alaska” resulting from four years of arctic shelf studies by the USGS and published by Barnes and Reimnitz.
	Bergman et al. 1977	Results from five years of study of bird populations at Storkersen Point on the ACP, including development of a wetlands classification system to provide more detailed insight into habitat use and food webs.
	Finley and Evans 1983	Peer reviewed publication presenting results on summer diet of the bearded seal in the Canadian high arctic. It was found that arctic cod and sculpins comprised the bulk of the diet for fish species.

Table H12. Fish and Invertebrate Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
General Reference — Fish and Fish Habitat (Continued)	Bradstreet et al. 1986	Final report by LGL for the Canadian Dept. of Fisheries and Oceans on diet, age-frequency distributions of cod otoliths in predator samples, and regional growth patterns for arctic cod from six locations across northern Canada.
	Johnson 1987	Peer reviewed review of possible approaches to maximize the likelihood of successful reclamation of northern gravel sites.
	Moulton et al. 2007	Final report of surveys of fish habitats in the Teshekpuk lake region conducted in 2003-2005. Report was prepared for the North Slope Borough.
	NPFMC 2005	Final EIS for Essential Fish Habitat (EFH) identification and conservation in Alaska to address, among other topics, the level of protection needed as a response to the effects of fishing activities on sea floor habitats from bottom trawling and other fishing activities.
	Hobson and Welch 1992	Peer reviewed publication using a simple food-web model to hypothesize the existence of five trophic (relating to nutrition) levels in the Arctic marine environment. Arctic cod was found to provide an important link between primary producers and higher trophic-level vertebrates (predators) during late summer.
	Moulton and Tarbox 1987	Results of study investigating distribution and abundance of arctic cod in the nearshore region of the Beaufort Sea.
	NMFS 2005	Descriptions for federally managed species of the Alaska region.
	Morrow 1980	Field guide to the freshwater fishes of Alaska.
	Scott and Crossman 1973	Field guide to the freshwater fishes of Canada.
	Russel 2002	Species information for Pacific and arctic loons.
	Galloway and Fechhelm 2000 Moulton and George 2000	Literature review/summary analysis of stream habitat and fish presence on the north slope for fish occurring in freshwater (including the study area). Summarizes knowledge from Prudhoe Bay agency and industry-sponsored studies of key fish species presence, timing, occurrence and fish habitat. Chapters in synthesis book, <i>The Natural History of an Arctic Oil Field</i> .
	BPXA 1995	Badami Project Environmental Report. Summarizes information on fish and fish habitat, including descriptions of stream habitat in the study area.
	NRC 2003	National Academy of Sciences report on the cumulative impacts of resource development on the North Slope. Includes general descriptions of marine and nearshore fish habitat.
Climate Change	Craig 1989a	University publication describing the life history strategies of anadromous fishes in the Alaskan arctic.
	Quinn 2005	Textbook on the behavior and ecology of Pacific salmon and trout.
	ACIA 2005	Textbook providing information regarding climate change impacts on arctic and alpine areas, including discussions on carbon and nitrogen dynamics in these ecosystems, retreating glaciers, reduced sea ice coverage, permafrost thawing, and rising surface temperatures.

Table H12. Fish and Invertebrate Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Invertebrates— Marine	MMS 1987a MMS1987b MMS 1990a MMS 1996 MMS 2003	EISs incorporating studies of similar habitats (to Lion Bay) on the North Slope. Done in association with OCS lease sales 97, 109, 124, 144, 186, 195, and 202.
	MMS 2007a	EIS incorporating studies in Foggy Island Bay within study area. Done in association with BP Liberty Project.
	Carey and Ruff 1977	Peer reviewed publication of the distribution and abundance of the infauna in the western Beaufort Sea, with an emphasis on mollusks.
	Curtis 1975	Peer reviewed review of past and present studies on marine benthic organisms inhabiting the northern seas, with particular emphasis on continental shelves and directed towards knowledge of benthic macroinvertebrates.
	Schell and Horner 1981	Summary report synthesizing data on primary production, zooplankton, and trophic dynamics of Harrison Bay prepared as part of the NOAA OCSEAP program.
	LGL et al. 1998	BP Liberty Project Environmental Report. Summarizes information on invertebrates in Foggy Island Bay within the study area.
	Broad et al. 1978, 1979, 1981	Abundance and distribution data in nearshore arctic coast. Studies done as part of NOAA OCSEAP.
	Gradinger and Bluhm 2005	Study of sea ice biota, including the relationships between primary productivity, sedimentation, and invertebrate abundance.
	Pettersen 2010	Online news article regarding the discovery of invasive Chinese mitten crabs in the White Sea near Arkhangelsk, Russia.
	Smithsonian Environmental Research Center 2012	Web site presenting the biology and environmental concerns regarding the invasive Chinese mitten crab.
	Campbell 1981	Summary of invertebrate abundance and distribution study conducted in the Simpson Lagoon area of Beaufort Sea coast during the open-water seasons of 1977 and 1978 and during the winter of 1978-1979. Study done as part of NOAA OCSEAP.
Invertebrates— Freshwater	Kertell 1993	Studies of invertebrates in similar habitat in nearby Prudhoe Bay development.
	MJM 2007	Studies of invertebrates in similar habitat in the Teshekpuk Lake region.
	Rosenburg et al. 1986	Peer reviewed publication on the importance of using insects as an assessment tool in the predictive phase of an Environmental Impact Assessment.
Impact on Fish	ADF&G 2011	Information on impacts of explosives on fish populations
	ADF&G 2011b	Information on impacts of stream crossings on fish populations
	Fechhelm 1999	Study of possible correlation between installation of a 200m breach constructed near one of Prudhoe Bay's major causeways (West Dock) and population distribution of humpback whitefish in the Prudhoe Bay region.

Table H12. Fish and Invertebrate Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Impact on Fish (Continued)	McDonald & Associates 1994	Manual developed to help North Slope operators avoid problems by providing a consistent set of design and installation standards for culverts, bridges, and pipeline crossings of fish streams.
	Nightingale and Simenstad 2001	Paper synthesizing 30 years of literature documenting the potential effects that specific overwater structures pose to important estuarine and nearshore marine habitats for juvenile salmon and other fishes in the Pacific Northwest.
	Ott 1993	Report of observations at 10 stream crossings identified as priorities in 1988 surveys, and to verify success of fish habitat remedial actions undertaken by industry at five of them. Information was submitted for use by oil and gas industry in development of design manual for fish stream crossings.
	Popper and Hastings 2009	Critical review of both peer-reviewed and 'grey' literature related to effects of anthropogenic sources of sound on fishes with the goal of determining what is known and not known to date.
	ADF&G 1991	Agency developed blasting standards for the protection of fish.
	Roach 1993	Synthesis of ADF&G reports on flooded gravel mines on the North Slope since 1986. Document is in support of ADF&G hypothesis that reclaimed deep gravel mines on the North Slope may provide useable fish and wildlife habitat.

Table H13. Land Ownership, Land Use, and Land Management Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Land Ownership	HDR 2010jwa	Personal communication with Ron Lurk the U.S. Air Force, at Joint Base Elmendorf Richardson. Provided information about Bullen Point radar installation.
	NETL 2009	A report by the National Environmental Technology Laboratory provided an analysis of current and future oil and gas resources on the North Slope.
Land Use	Agency for Toxic Substances and Disease Registry 1997	Provided information about use of airstrip at Bullen Point for recreational hunting and fishing trips.
	HDR 2010jwb	Personal communication with Gary Schultz of ADNR provided information about recreational uses primarily on state land in the project area.
	Pedersen 1990	Study for ADF&G describes land use associated with subsistence hunting and fishing practices of residents of Kaktovik, Alaska.
	NSB 1983	Highlighted subsistence hunting and fishing practices in the North Slope Borough.
Land Management	ADNR 2010	Report provides information on the state's findings on Prudhoe Bay land selections by the NSB.
	Clough et al., 1987	Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment–Report and Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement.
	HCG 2005	Feasibility study about Bullen Point restoration provided information about proposed future management of the site by the Bureau of Land Management.
	HDR 2010jwb	Personal communication with Gary Schultz of ADNR provided information about state land use plans and special use restrictions in the vicinity of the project.
	HDR 2010jwc	Personal communication with A.J. Waite of ADNR provided information about access and special use restrictions associated with Dalton Highway and recreational uses of the project area.
	HDR 2010jwd	Personal communication with Don Perrin of ADNR about the land status and management situation of the Point Thomson Unit.
	HDR 2010jwe	Personal communication with Gordon Brower of the NSB Planning Department, who provided information about current and planned borough zoning in the vicinity of Point Thompson.
	HDR 2010jwf	Personal communication with Charles Parr, consultant to NSB, provided information about borough selection of state lands.
	HDR 2010jwg	Personal communication with Bruce Phelps of ADNR provided information about borough selection of state lands.
	HDR 2010jwh	Personal communication with Sharon Seim, USFWS Arctic Refuge Planner, provided information about the Comprehensive Conservation Plan (CCP) process being conducted by the USFWS for the Arctic Refuge.
	Reed 2010	Personal communication with Jennifer Reed, visitor services coordinator for the Arctic National Wildlife Refuge, regarding refuge purposes.

Table H13. Land Ownership, Land Use, and Land Management Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Land Management (Continued)	Rosen 2009	Newspaper article provided historical information about oil and gas leases in the Point Thompson Unit.
	URS 2005	The North Slope Borough Comprehensive Plan (URS 2005) provided information about zoning and land management in the NSB.
	USFWS 2008b	Provided information about the purpose for establishing the Arctic Refuge
Cumulative Impacts	BLM 2004	Provided information on the total developed land on the North Slope.
	NRC 2003	National Research Council report on cumulative effects of oil and gas development provided analysis of land use change across the North Slope.

Table H14. Arctic National Wildlife Refuge Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Arctic Refuge Purpose and Management	ADNR 2003	Historical information about oil and gas exploration in the refuge that was proposed by the State of Alaska.
	Nash 2001	Provides information about public perception of the refuge.
	USFWS 1988	Comprehensive Conservation Plan which directs management of the refuge.
	USFWS 2008a	Provides information about USFWS jurisdiction in the refuge.
	USFWS 2008b	Provides information about purposes associated with the refuge.
	USFWS 2008c	Provides historical information about the refuge and the passage of ANILCA.
	USFWS 2008d	USFWS Wilderness Stewardship Policy.
	USFWS 2010a	Provides information about Wild and Scenic River status.
	USFWS 2010b	Announcement about pending wilderness reviews in the refuge.
Climate Change and Cumulative Impacts	Banet 1991	Study prepared for the BLM reports the dates and locations of exploratory wells drilled on the North Slope.
	Hartz et al. 2008	Study prepared for the Alaska Division of Oil and Gas provides an assessment of resources and development potential of the Thomson Sand reservoir including the dates and locations of exploratory wells drilled..
	USFWS 2009a	Provides information about potential impacts of climate change on the Arctic Refuge and its wildlife.
	USFWS 2009b	Provides history and potential impacts of oil and gas development on the Arctic Refuge.

Table H15. Socioeconomic Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Demographics	HDR 2011nsb	HDR memo summarized phone and email communication with Susana Montana of the NSB Planning and Community Services Department. Montana provided preliminary 2010 NSB Census population estimates and 2011 employment data for the NSB, NSB School District, and Nuiqsut resident employment at Alpine.
	HDR 2011hh	This HDR memo summarized phone conversation with Ingrid Zaruba with the AK DLWD statistics department. Zaruba provided information on discrepancies between available socioeconomic datasets.
	Shepro et al. 2003	The NSB 2003 Census, authored by Shepro, et al. provided detailed socioeconomic data for the NSB including demographics, employment, income, subsistence usage, and available utilities.
	U.S. Census Bureau 1990, 2000, 2010	Decennial census is a comprehensive, nationwide data collection effort for population and demographics and housing characteristics.
	Williams et.al. 2006, 2010	The ADLWD reported demographic data, including population, age, sex, birth rates, and migration by borough based on data tabulated from annual Permanent Fund Dividend returns.
Community Culture and Characteristics, Utilities, Infrastructure, and Services	AHDR 2004	Evaluated important regional considerations in analyzing human development in Arctic communities.
	ADCCED 2011	The Alaska Community Database provided a summary of history, culture, and status of utilities and infrastructure for all of communities in the NSB.
	ADEED 2011a	The Alaska Department of Education and Early Development's (ADEED) annual report card to provided educational statistics by district and school.
	AEA 2011	This Alaska Energy Authority report provided estimates of current fuel and electricity prices in Alaska. This information was used to evaluate the relative cost of living in the NSB.
	Haley et al. 2008	Haley et al. provided a case-study of the socioeconomic effects of oil and gas development on the community of Nuiqsut.
	HDR 2010dt	Meeting notes from the Alternatives Development Component Work Groups provided insight into the logistical considerations and impacts to infrastructure in the NSB.
	HDR 2011xxx	Practicability of Alternatives Meeting Notes provided information on logistics and project schedule of each of the EIS alternatives.
	Jacobson & Wentworth 1982	This report provided an in depth evaluation of history and land use values in Kaktovik.
	Libbey et al. 1979	Libbey et al. provided in depth cultural and subsistence discussion of Nuiqsut.
	MMS 1989	Minerals Management Service (now BOEMRE) study of the economic and cultural history for the communities of Kaktovik, Barrow, and Anaktuvuk Pass.
	NSB in draft	NSB in draft provided preliminary information from the Kaktovik and Nuiqsut Comprehensive Land Use Plans. Data included status of utilities and infrastructure, and a summary of community concerns.
	NSB 2011wb	The NSB website provided information on the history and culture of Native residents in the NSB.

Table H15. Socioeconomic Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Community Culture and Characteristics, Utilities, Infrastructure, and Services (Continued)	NRC 2003	The National Research Council evaluated the cumulative impacts of oil and gas development on the North Slope. This report was used to identify potential effects of the proposed project on community characteristics and culture.
Income, Employment, and Tax Base	Poppel et. al. 2007	SLiCA provided several proxy measures of well-being in Native communities in the Arctic including language retention and preferences of ways of life.
	URS 2005	The NSB 2005 Comprehensive Plan (URS 2005) provided detailed community information for the NSB.
	ACS 2005-2009	The U.S. Census' American Community Survey provided economic and demographic data for the NSB averaged over five years. Data was used for borough level analysis.
	ADEED 2011b	The ADEED reported the number of students eligible for free and reduced price lunch. This data was used to provide a proxy for the number of families living at or near the federal poverty guidelines.
	ADLWD 2009	ADLWD publishes the Alaska Local and Regional Information Database that provides workforce information for communities and boroughs in the state. This database provided information on NSB residents employed in the oil and gas industry in 2009.
	ADOR 2010	The Alaska Department of Revenue 2010 Spring Forecast provided an estimate of potential state tax revenue resulting from the Point Thomson Project.
	ASRC 2011	Arctic Slope Regional Corporation website reported the number shareholder employees in 2002 and distributed dividends in 2009.
	CIA 2010	The CIA World Factbook provided values for total national oil consumption in 2010. This data was used to demonstrate the scale of potential hydrocarbon production at Point Thomson relative to daily consumption.
	ExxonMobil 2009	ExxonMobil's Environmental Report (2009) discussed potential environmental consequences of the proposed Point Thomson project including an estimate of the taxable value of the proposed project.
	ExxonMobil 2010	ExxonMobil's Economic Opportunity Plan Report detailed social, economic, and cultural programs implemented to comply with NSB municipal code. This information was used to evaluate potential socioeconomic impacts of the project.
	Fried 2008	Fried discussed the impacts of the oil and gas industry to the statewide economy.
	Hadland et al. 2011	Report published by the ADLWD on non-resident employment in Alaska. The report provided data on non-resident employment in the oil and gas industry.
	HDR 2011aa, 2011mh	"Workforce for Alternatives" memo and personal communication with Mark Harlan of Northern Solutions, provided information on workforce numbers and potential employment for each alternative.

Table H15. Socioeconomic Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Income, Employment, and Tax Base (Continued)	HDR 2011b	HDR memo summarizing personal communication with Randy Hoffbeck of the NSB Department of Administration and Finance. Hoffbeck provided information on the NSB tax structure and on potential impacts of new oil and gas developments to borough revenue.
	IRS 2003, 2006, 2010	Data allowed comparison of adjusted gross income per capita over time by zip code in the NSB.
	McDowell 2009	McDowell report quantifies differences in the cost of living in communities across Alaska.
	Northern Economics 2006	Northern Economics study of the economy of the NSB provided analysis of employment and NSB revenues and expenditures from 1965 to 2005.
	NSB 2009, 2010	NSB 2009 included financial reports from the NSB from FY 2009, including a detailed discussion of sources of revenue and borough expenditures. NSB 2010 details recent and historical revenue and expenditures for the NSB in FY2010.
	QCEW 2009	The Quarterly Census of Employment and Wages, published by the AK DLWD, provided annual employment and income for workers employed in the borough.
Climate Change and Cumulative Impacts	ACIA 2004	The Arctic Climate Impact Assessment provided a review of potential impacts to infrastructure and communities on the North Slope.
	FAA 2009a, 2009b	Environmental Assessment evaluating the relocation of the airport in Kaktovik. Provided information on impacts to the airport in the current location.

Table H16. Environmental Justice Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Methodology	Executive Order No. 12898	Executive Order 12898 provides the legal basis for the evaluation of the impacts of federal actions on low-income and minority populations.
	CEQ 1997	The Council on Environmental Quality provides guidance on identifying and addressing environmental justice concerns under NEPA.
Environmental Justice Population	ACS 2005-2009	The U.S. Census Bureau's American Community Survey provides economic and demographic data for the NSB averaged over five years. The margins of error in the NSB are high due to a small sampling size; data is only used for borough level analysis.
	Shepro et al., 2003	The NSB 2003 Census, authored by Shepro et al., provides detailed socioeconomic data for the NSB including demographics, employment, income, subsistence usage, and available utilities.
	U.S. Census Bureau 2010	The US Census Bureau's decennial census is a comprehensive, nationwide data collection effort for population and demographics.
Environmental Justice Impacts	ADCCED 2011	The Alaska Community Database provides information on the status of utilities and infrastructure for communities in the NSB.
	ExxonMobil 2010, 2011bc	ExxonMobil's Economic Opportunity Plan Report and Mitigation Report detail social, economic, and cultural programs and mitigation implemented to mitigate potential adverse impacts of the Point Thomson development.
	ExxonMobil 2011wh	ExxonMobil's 2011 Project Update includes the most recent Conflict Avoidance Agreement signed by the Applicant to mitigate impacts to subsistence harvests.
	NRC 2003	The National Research Council evaluated the cumulative impacts of oil and gas development on the North Slope. This report was used to identify potential impacts on community characteristics, culture, and cohesion.
	NSB in draft	NSB in draft provides preliminary information from the Kaktovik and Nuiqsut Comprehensive Land Use Plans. Data includes status of utilities and infrastructure, and a summary of community concerns.

Table H17. Transportation Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
NSB Transportation Infrastructure	ASCG 2005	The NSB Comprehensive Transportation Plan (ASCG 2005) provides general information on transportation infrastructure and use throughout the NSB and in Kaktovik and Nuiqsut.
	FAA 2009a	Barter Island Airport Environmental Assessment
	FAA 2009b	Barter Island Airport Finding of No Significant Impact and Record of Decision.
	FAA 2011b	Provides information on historical and project air traffic at the Prudhoe Bay/Deadhorse Airport.
Roads and Traffic	ADOT&PF 2010	ADOT&PF Northern Region's 2007, 2008, & 2009 Annual Traffic Report provides average annual daily trips for the Dalton Highway.
Off-Road Transportation	ADNR 2009	This fact sheet explains the activities that are generally allowed uses on state land, including what is allowed when travelling across state lands and guidance for off-road vehicle use in the North Slope.
	Head 2010	Photograph credit to Melissa Head, ADNR Natural Resource Specialist, from a presentation on Winter Off-Road Travel
Railroad	ARRC 2010	Alaska Railroad Corporation website provides general information about the railroad.
Construction Methods and Logistics	ExxonMobil 2009b	Applicant proposed construction methods including transport of modules, equipment, and personnel.
	ExxonMobil 2011uu	Practicability analysis that includes estimated trips needed for different modes of transportation under each alternative.
	HDR 2010	Project logistics includes transportation modes and infrastructure.
	HDR 2011uu	Practicability and logistics for all alternatives includes transportation modes and infrastructure.
Climate Change and Cumulative Impacts	ACIA 2005	Reports projected impacts of an increase in global temperature on climate in Arctic regions and the related impacts to ice roads and other transportation infrastructure.
	BLM 2004	The Alpine Satellite EIS provided general reference and background in support of transportation information.
	Frey and Smith 2003	Provides information on potential climate change impacts on arctic precipitation, winter breakup, and stream discharge.
	IPCC 2007	Reports projected increase in global temperature and its affects on sea level rise.
	NRC 2003	Provided information on "Roadless Construction" techniques used in recent North Slope oil and gas developments
	NSB in draft	Kaktovik Comprehensive Land use plan provided information on airport infrastructure and community concerns regarding erosion and flooding.

Table H18. Recreation Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Area Recreation (General)	Christensen and Christensen 2009	This document presents findings of a visitor use survey to provide a baseline on visitor experiences and perceptions in support of management of refuge resources. Provides extensive information on visitation in the refuge.
	Cole 2001	Wilderness recreation (compared to other recreation experiences)
	BP/ConocoPhillips 2005	The BP/Conoco Phillips Environmental Handbook summarizes procedures developed by BP Exploration and ConocoPhillips Alaska to comply with environmental regulations applicable to North Slope oil fields
	USFWS 2008	The Arctic National Wildlife Refuge management website provided general information about the management of different areas of the Arctic Refuge.
	USFWS 1988	Arctic Wildlife Refuge Comprehensive Conservation Plan. This document presents the long-term management plan for the Arctic Refuge and provides information on recreational use (and its associated management) in the Arctic Refuge.
Recreation by Local Residents	NSB 1983	Outlines land use values, including subsistence, in the Arctic Refuge.
Arctic Refuge Recreation	HDR 2010jwi	Record of personal communication with Jennifer Reed of the USFWS Arctic National Wildlife Refuge discussing visitor use of Arctic Refuge.
	HDR 2010jwj	Record of personal communication with Heather Knudson of the USFWS, Arctic National Wildlife Refuge on hunting in Arctic Refuge.
	HDR 2010jwl	Personal communication with Richard Voss, Refuge Manager of the Arctic National Wildlife Refuge provided information about recreation in the Arctic Refuge area.
	Reed 2010	Email communication with Jennifer Reed of the USFWS, Arctic National Wildlife Refuge providing visitor data for the Canning River drainage.
	USFWS 2008c	Arctic Refuge website provided comprehensive information on refuge management, recreation, and wildlife.
	USFWS 2010	Public Use Summary, Arctic National Wildlife Refuge presents a summary of historic visitor use, general recent use patterns (1998-2009) based on available data, hunting/trapping harvest data, and discusses trends in public use of the Refuge.
State Land Recreation	HDR 2010jwb	Record of personal communication with Gary Schulz of ADNR on recreational use of state lands in study area.
	HDR 2010jwc	Record of personal communication with A.J. Waite of ADNR on recreational use of state lands in study area.
	HDR 2010jwk	Record of personal communication with Jason Caikoski, ADF&G discussing hunting activity in the Point Thomson area.
	Kittick-Atos 2010	Record of personal communication with Susan Kittick-Atos of the NSB on permitted commercial recreation in the study area.

Table H19. Visual and Aesthetic Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Methodology	BLM Manual 8400	Describes the BLM methodology for visual resource inventory and visual contrast rating.
General Information on Visual Resources	Joling 2010	Fairbanks Daily New Miner article provides information on Alaska's U.S. Senators' reaction to an announced wilderness review in the Arctic Refuge.
	USFWS 1988	The Arctic National Wildlife Refuge Comprehensive Conservation Plan outlines USFWS' management goals for the Arctic Refuge
	USFWS 2008d	The USFWS nationwide Wilderness Stewardship Policy provides guidance on wilderness management.
Climate Change	ACIA 2005	Reports projected impacts of an increase in global temperature on climate in Arctic regions including a change in the frequency of storms.

Table H20. Noise Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Methodology	AEA 2008	Provided data on prevailing wind speed and direction in the project area
	ExxonMobil 2009b	The Applicant's project description provided details on equipment use, project schedule, and associated noise levels
	ExxonMobil 2011uu	The Applicant's practicability report provided details on equipment use, project schedule, and associated noise levels
	FAA 2009	Provided data on noise levels from helicopter and fixed-wing aircraft
	FHWA 2006	Published noise emissions data for mobile sources
	NPS 2005	Provides guidance on monitoring and data processing methods.
	Rau and Wooten 1980	Provides common noise sources and noise levels.
	Aerts et al. 2008	Relevant underwater ambient noise study near the project area evaluating the effects of barrier islands on sound attenuation.
Underwater Ambient Noise	Blackwell et al. 2007	Relevant underwater ambient noise study near the project area evaluating ambient noise in the vicinity of Northstar Island near Prudhoe Bay.
	Blackwell and Greene 2010	Relevant underwater noise study near the Study Area provided data on acoustic monitoring for industrial sounds.
	Bradley and Stern 2008	Reports provided background information on the characteristics of the acoustic environment experienced by marine mammals.
	Chapman and Ellis 1998	Reports provided background information on the characteristics of the acoustic environment experienced by marine mammals.
	Davis 1981	Detailed important sources of ambient underwater noise in waters off the North Slope.
	Denny 1993	Text provided physical properties of water that impact sound transmission.
	Greene 1995	Reports provided background information on the characteristics of the acoustic environment experienced by marine mammals.
	Greene and Buck 1964	Relevant underwater ambient noise study near the project area documenting the decrease in noise levels with ice cover.
	LGL and Greenridge 1996	Study measured underwater ambient noise at Prudhoe Bay during the open water season.
	Milne and Ganton 1964	Relevant underwater ambient noise study near the project area documenting the decrease in noise levels with ice cover.
	Moulton et al. 2003	Study examined baseline ambient underwater noise levels at Northstar.
	Thode 2009	Relevant underwater noise study near the Study Area provided data on acoustic monitoring for industrial sounds.
	Wille and Geyer 1983	Study quantified the importance of wind as a factor in the shallow water ambient noise level.

Table H21. Cultural Resources Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Regional Context	Ackerman 1984	Overview of Siberian Arctic prehistory illustrates cultural sequences of regional prehistory, continuity, and change originating in the Bering Straits.
	Anderson 1984	Overview of Northern Alaska prehistory illustrating cultural sequences of regional prehistory, continuity, and change growing from Bering Straits.
	Dames & Moore and Lobdell 1986	Annotated bibliography of cultural resources associated with Point Thomson.
	Dikov 1977	Archaeological site overview for several eastern Siberian archaeological sites demonstrating prehistoric connections between Siberia and Alaska.
	Dikov 1979	Describes archaeological cultures of NE Asia providing for comparison with Alaskan material and develops concept of a Beringian subcontinent.
	Dikov 1996	Discussion of one of the first sites with material culture comparable between Siberia and Alaska.
	Dikov 1997	Illustrates continuity of Alaskan archaeological cultures with those of Chukotka.
	Lobdell 1995	Discussion of pingos as important prehistoric landform, including pingos in the proposed project area recently found to have prehistoric and historic sites.
	Reanier 1996	Section of a larger book in which the early history of human occupation of Beringia is discussed. Establishes an early date for settlement of the North Slope through stylistic artifact comparisons.
Cultural Resources Reports	ADEC 2011	Contaminated Sites Program Database entries document cleanup and removal of historic DEW Line sites and components and cultural resource mitigation in their vicinity.
	Bacon 1982a	Evaluation of sites on Flaxman Island.
	Bacon 1982b	Report of survey for two drill pads on Flaxman Island.
	Bacon 1983	Report of survey for six drillsites in the Anskar area.
	Bacon 1985	Report of survey of Point Thomson drill pads.
	Campbell 1974	Early cultural resources report for the Arctic Coast and barrier islands.
	CCRS and NLUR 2010	CRM plan for project includes overview of previous research, recent field surveys and consultation with stakeholders including local government and NGOs, allotment owners and former residents of the area.
	Grover 2011	Record of personal communication with Grover regarding remaining cultural resources at Brownlow Point.
	IAI 1990a	Contains descriptions of land use locations integrated with subsistence harvest practices, historic and prehistoric sites in those landscapes and historic land tenure including the Point Thomson area for Kaktovik.
	IAI 1990b	Contains descriptions of land use locations integrated with subsistence harvest practices, historic and prehistoric sites in those landscapes and historic land tenure for Nuiqsut.
	Jacobson and Wentworth 1982	History of land use and subsistence use by then-elders of Kaktovik illustrating historic and prehistoric sites and uses in the region.
	Kunz and Reanier 1996	The Mesa site establishes a prehistoric baseline for cultural resources on the North Slope due to the inferred age and content of the deposits.

Table H21. Cultural Resources Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Cultural Resources Reports (Continued)	Libbey 1981	Describes efforts to identify cultural resource sites in the various areas of the North Slope.
	Libbey 1983	A cultural resources survey inventory report for the Kaktovik area.
	Lobdell 1980	Overview of archaeological sites on coastal and barrier islands from the Colville to the Staines River.
	Lobdell 1981	Account of archaeological site demonstrating early Holocene site in project area.
	Lobdell 1988, 1992a, 1992b, 1992c, 1992d, 1997a, 1997b, 1998 Lobdell et al. 2000	Direct report on archaeology of petroleum exploration and development sites.
	Lobdell and Lobdell 2000	Overview of then-current site surveys for Point Thomson unit and overland routes to Badami.
	NLUR 2008	CR baseline for drilling program at Point Thomson with brief accounts of field surveys in study area, overview of previous research to date and condition report of known historic properties in the unit.
	Reanier 2007	Overview of road route proposals with accounts of historic properties in area between Point Thomson and Badami.
	Solecki 1950	Report of archaeological surveys conducted during geological surveys of NPRA gives overview of early hydrocarbon era archaeology on the North Slope.
	USAF 1999	Documents record the disposition of Cold War era military radar stations on DEW Line in Alaska, including sites in the proposed project area.
Ethnohistory	Binford 1978	Binford conducted ethnoarchaeology research among the Nunamiut.
	Chance 1990	Ethnographic overview of modern Iñupiat people on the North Slope of Alaska.
	Chance 2007	Historically detailed overview of Barrow reindeer herding, including efforts to prolong the practice after the herds failed.
	Cook 1977, 1971, 1970	Early cultural resource investigations on the North Slope related to the Trans Alaska Pipeline.
	Ingstad 1954	An ethnographic account of the Nunamiut of Anaktuvuk Pass in the decade following their settlement at the then-newly formed fixed community from a number of lakes and drainages to the west and from the coastal areas.
	Murdoch 1888	Ethnohistoric account of connections between Siberian and Alaskan Native peoples.
	Murdoch 1892	Ethnohistoric account of the Barrow Expedition's encounter with the Iñupiat before the turn of the 20th century including accounts of subsistence, land use, travel, material and social culture and demographics.
	Spencer 1959	Ethnographic overview of modern Iñupiat people on the North Slope of Alaska after the rush of Cold War development and oil exploration in the NPR-A.

Table H21. Cultural Resources Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
History	Beechey 1832	One of the earliest historic accounts of North Alaskan Iñupiat peoples, their way of life, places of habitation, and means of subsistence.
	BIA 1938	Reindeer program records provide the population of Brownlow Point and Flaxman Island in 1938.
	Gubser 1965	Gubser was a pioneering student of the Nunamiut people of Anaktuvuk Pass who recorded his experiences with the elders of the mid-1960s.
	Jackson 1906	Jackson's account of the introduction of reindeer to Alaska Natives on the North Slope.
	Leffingwell 1919	Geological report of the Canning River region including references to Iñupiat and Euroamerican residents of the North Slope and Interior in their daily lives.
	Mikkelson 1909	Mikkelson's account includes references to cultural resources on Flaxman Island.
	Nielson 1977	History of land use and subsistence use of the Beaufort Sea, coastal areas and shorelines by Inupiat people.
	NSB 1977	The NSB Commission on History and Culture's Traditional Land Use Inventory documenting the historic uses of lands along the Beaufort Sea lease sale area by Inupiat people of the North Slope.
	NSB 1980	The NSB Commission on History and Culture's Inventory of historic and subsistence sites on the Mid-Beaufort Sea.
	NSB 1979	Inupiat land use of the North Slope Borough from a diachronic perspective, documenting long term history of Iñupiat on the landscape.
	Nygren 2001	Account of postwar era activity and Inupiat recent history on the North Slope during the transition from centralization in Barrow to rebirth of Nuiqsut and Kaktovik east of Barrow.
	Oldham n.d	Literature review describing the known traditional subsistence harvest resource locations for Nuiqsut and Kaktovik.
	Orth 1971	Dictionary of known, official place names for Alaska including a number of locations on the North Slope of Alaska and in the Point Thomson area.
	Pedersen et al. 1985	Document recording place names and subsistence harvest and use areas for the community of Kaktovik demonstrating the historic time depth of subsistence activities in the eastern North Slope region.
	Porter 1991	Listing of historic Inupiat place names on the Mid-Beaufort Sea coast.
	Rausch 1951	Account of the settlement of the Nunamiut in Anaktuvuk Pass and their environment and resources from a biologist's perspective.
	Stefansson 1921	Account of Stefansson's encounters with Iñupiat people during his five year exploratory mission across the Arctic.
	Stockton 1890	Account of Captain Stockton's visit to the North Slope in 1889.
	Stuck 1920	Stuck, a traveling priest, documented his travels among the Iñupiat and the few Euroamericans in Alaska's Arctic regions.
Cultural Resource Site Data	ADNR OHA 2010a	ADNR Office of History and Archaeology database of known and documented historic properties in the proposed project area of potential effect.

Table H21. Cultural Resources Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Cultural Resource Site Data (Continued)	ADNR OHA 2010b	ADNR Office of History and Archaeology database of references to reports for archaeological and historical surveys conducted in the proposed project area of potential effects.
	NSB IHLC 2010	NSB Iñupiat History, Language and Culture Division database file including an inventory of TLUI sites in the Point Thomson project area.
	MMS 2000	Minerals Management Service database of shipwrecks with approximate locations, time periods and some historic context for each shipwreck.
Project Data	ExxonMobil 2009a	Point Thomson project environmental report illustrating the proposed project.
Regulatory	NPI 2010	Regulatory information regarding cultural resource laws and NEPA.
Subsistence Uses	SRB&A 2010	Provides subsistence use areas for key species for the communities of Nuiqsut and Kaktovik for the 1996-2006 (Kaktovik) and 1995-2006 (Nuiqsut) time periods; key indicators (e.g., months, travel method) associated with use areas; and traditional knowledge from active harvesters regarding subsistence hunting and harvesting activities.
	Pedersen and Linn 2005	Provides contemporary Kaktovik fish use areas and descriptions of contemporary fishing patterns.
Cumulative Impacts	BLM 2004	Final EIS for the Alpine Satellite Development Plan provides information on cumulative impacts to cultural resources across the North Slope.

Table H22. Subsistence and Traditional Land Use Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Subsistence and Ethnographic Studies	ADF&G 2011b	ADF&G Division of Wildlife provides household harvest and use data for the study communities of Kaktovik (all resources study years 1985, 1986, and 1992; caribou study years 1987, 1990, and 1991) and Nuiqsut (all resources study years 1985 and 1993; caribou study years 2002-2003, 2003-2004, 2004-2005, and 2005-2006). Data were extrapolated to provide estimates for the community as a whole.
	ADF&G 2003a	Unpublished Division of Wildlife Kaktovik caribou subsistence harvest data by location. Provides number of caribou harvested by placename harvest location for various study years in the 1980s and 1990s.
	Bacon et al. 2009	Provides all resources household harvest data for the study communities of Kaktovik (study year 2002-03) and Nuiqsut (study years 1995-96 and 2000-01). Harvest numbers were extrapolated to provide estimates for the community as a whole.
	Brower and Hepa1998	Provides all resources household harvest data for Nuiqsut for the study year 1994-1995. Harvest numbers were extrapolated to provide estimates for the community as a whole.
	Brown 1978	Provides extended historic and current (circa 1978) intensive subsistence use areas for all resources; resource specific use areas were provided by three Nuiqsut hunters. Defines the cultural landscape for Nuiqsut
	Coffing and Pedersen 1985	Provides Kaktovik caribou harvest data (also provided in ADF&G 2010), harvest location data (also provided in ADF&G Division of Subsistence 2003), and a description of caribou hunting patterns for the 1983-84 study year.
	Fuller and George 1999	Provides 1992 all resources harvest data for eight North Slope communities including the study communities of Kaktovik and Nuiqsut; due to a low response rate in Kaktovik, harvest data should be viewed with caution.
	Galginaitis2006, 2008a, 2008b, 2009a, 2009b, 2009c, 2010, 2011; Galginaitis and Funk 2004a, 2004b, 2004c, 2005	Provides GPS tracks of Nuiqsut bowhead whale hunting activities at Cross Island for 2001-2010 and description of yearly bowhead whale hunting activities, harvests, hunting conditions, and hunter observations.
	Hall et al. 1985	Utilizes data from 30 Anaktuvuk Pass interviews to characterize changes in subsistence use and subsistence use areas and reports lifetime subsistence use areas. Also uses existing ethnohistoric information to recreate land use patterns from the 1860s through the 1890s.
	Hoffman et al. 1988	Provides data on historical settlement patterns, a discussion of Nuiqsut land use patterns over time, a description of the Nuiqsut seasonal round, and an ethno history of the Nuiqsut area based on archaeological investigations of selected TLUs.
	HRAF 1992	Provides data on regional North Slope settlement patterns and history.
	IAI 1990a	Study of contemporary and historic subsistence use patterns in Nuiqsut and effects of oil development on subsistence; provides maps and place names based on verbal descriptions of hunting, fishing, and gathering areas.

Table H22. Subsistence and Traditional Land Use Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Subsistence and Ethnographic Studies (Continued)	IAI 1990b	Study of contemporary and historic subsistence use patterns in Kaktovik and effects of oil development on subsistence; provides maps and place names based on verbal descriptions of hunting, fishing, and gathering areas.
	Jacobson and Wentworth 1982	Provides data on the history of Kaktovik, a description of TLUIs in the Kaktovik area, a discussion of Kaktovik land use patterns over time including historic and contemporary (1970s and 1980s) subsistence use patterns, an analysis of the economic importance of Kaktovik, and a description of the seasonal cycle of Kaktovik subsistence activities.
	Libbey et al. 1979	Provides data on historical settlement patterns, a discussion of Nuiqsut land use patterns over time, a description of the Nuiqsut seasonal round, and a description of key TLUI sites relevant to Nuiqsut.
	NSB 2003, 2006, and 2010b	NSB Division of Wildlife unpublished Kaktovik subsistence harvest data by location. Provides number of caribou harvested by placename harvest location 1995, 1998, 1999, 2005, 2006, and 2007. Also provides bowhead whale harvest location data for Kaktovik and Nuiqsut.
	Pedersen 2008	Provides data on annual caribou harvests for Nuiqsut in the NPR-A
	Pedersen 1990	Provides Kaktovik caribou harvest data (also provided in ADF&G 2010), harvest location data (also provided in ADF&G Division of Subsistence 2003), and a description of caribou hunting patterns for the 1987-88 study year.
	Pedersen 1986	1986 Nuiqsut subsistence use area mapping updated from 1979 lifetime use areas.
	Pedersen 1979	Lifetime to 1979 use area mapping for Nuiqsut and Kaktovik.
	Pedersen and Coffing 1984	Provides Kaktovik caribou harvest data (also provided in ADF&G 2010), harvest location data (also provided in ADF&G Division of Subsistence 2003), and a description of caribou hunting patterns for the 1981-82, 1982-83, and 1983-84 study years.
	Pedersen and Linn 2005	Provides contemporary Kaktovik fish use areas and descriptions of contemporary fishing patterns.
	Rausch 1988	Overview of historic and contemporary Anaktuvuk Pass subsistence uses and settlement patterns.
	Spearman et al. 1979	Provides data on historical settlement patterns, a discussion of Anaktuvuk Pass land use patterns over time, a description of the Anaktuvuk Pass seasonal round, and a description of key TLUI sites relevant to Anaktuvuk Pass.
	SRB&A 2010a	Provides subsistence use areas for key species for the communities of Nuiqsut and Kaktovik for the 1996-2006 (Kaktovik) and 1995-2006 (Nuiqsut) time periods; key indicators (e.g., months, travel method) associated with use areas; and traditional knowledge from active harvesters regarding subsistence hunting and harvesting activities. SRB&A collected data from 38 active harvesters in Kaktovik and 33 active harvesters in Nuiqsut; active and knowledgeable harvesters were selected using social networking techniques.

Table H22. Subsistence and Traditional Land Use Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Subsistence and Ethnographic Studies (Continued)	SRB&A 2003a	Field interviews conducted by SRB&A in association with the Alpine Satellite Development Plan Final Environmental Impact Statement. Provides partial subsistence use areas for Nuiqsut for the 1994-2003 time period.
	SRB&A 2003b	Field interviews conducted by SRB&A in preparation for the 2003 Point Thomson Environmental Impact Statement. Interviews focused on subsistence use area mapping, traditional knowledge, and issues and concerns relevant to the proposed Point Thomson Project.
	SRB&A and ISER 1993b	Subsistence mapping and harvest study conducted in 1988 and 1989 in Wainwright. Provided methods of converting bowhead whale lengths to pounds of edible weight.
	Suydam and George n.d.	Summary of bowhead whale harvests, including numbers and lengths, by Alaska Eskimos from 1994-2003.
	Suydam et al. n.d.a	Summary of bowhead whale harvests, including numbers and lengths, by Alaska Eskimos in 2004.
	Suydam et al. n.d.b	Summary of bowhead whale harvests, including numbers and lengths, by Alaska Eskimos for 2009.
	Suydam et al. n.d.c	Summary of bowhead whale harvests, including numbers and lengths, by Alaska Eskimos for 2010.
	Wentworth 1979	Provides data on historical settlement patterns, a discussion of Kaktovik land use patterns over time, a description of the Kaktovik seasonal round, and a description of key TLUI sites relevant to Kaktovik.
	Wolfe et al.2000	Discusses the annual variability of subsistence harvests in Kaktovik and Nuiqsut.
Subsistence Regulations/ Definitions	State and Federal Statutes	Alaska statutes, Alaska Administrative Code, Code of Federal Regulations (CFR), and the Alaska National Interest Lands Conservation Act (ANILCA); used to establish and describe state and federal regulations affecting subsistence in the study communities.
	AFN 2005	Provides the Alaska Federation of Natives definition of subsistence.
Subsistence and Cultural Impacts	ACIA 2004	Discussion of impacts of climate change on the Arctic, including impacts on subsistence activities in Arctic communities.
	BLM 2004	EIS for the Alpine Satellite Development Plan. Includes a discussion of impacts on Nuiqsut subsistence uses related to oil and gas development.
	Brubaker et al. 2010	Study of the impacts of climate change on traditional food cellars in Alaska.
	Callaway 1998	Discussion of impacts of climate change on subsistence in Alaskan communities.
	EPA 2009a	EIS for the Red Dog Mine Extension Aqqaluk Project. Includes a discussion of impacts on subsistence uses since development of the Red Dog mine, including impacts on beluga and caribou harvests.
	ExxonMobil 2009	Provides information on the Point Thomson project design features that may mitigate impacts on subsistence and traditional land use.

Table H22. Subsistence and Traditional Land Use Information Sources and Adequacy

Topic	Reference	Relevance and Adequacy
Subsistence and Cultural Impacts (Continued)	Haynes and Pedersen 1989	Article describing the effects of oil development on subsistence in North Slope villages. Includes descriptions of impacts on user access to subsistence harvest areas, resource availability, and competition for subsistence resources.
	Kaleak 1996	A history of whaling by Kaktovik presented by Joseph Kaleak during the 1995 Arctic Synthesis Meeting. Includes a discussion of the impacts of industrial activity on bowhead whaling success.
	Long 1996	A history of whaling by Nuiqsut presented by Frank Long, Jr. during the 1995 Arctic Synthesis Meeting. Includes a discussion of the impacts of industrial activity on bowhead whaling success.
	MBC 1997	Proceedings of the MMS-Sponsored Arctic Synthesis Meeting in 1995, including discussions of biological studies on bowhead whale migrations and effects of industrial activities on bowhead whales, and observations of the effects of industrial activities on bowhead whales by local residents and North Slope organizations.
	MMS 2007a	EIS for the Chukchi Sea Planning Area – Oil and Gas Lease Sale 193 and Seismic Surveying activities in the Chukchi sea. Discusses potential impacts of offshore oil development on hunting by North Slope Iñupiat.
	MMS 2003	EIS for the Beaufort Sea Planning Area Oil and Gas – Lease Sales 186, 195, and 202. Discusses potential impacts of offshore oil development on the Beaufort Sea communities of Nuiqsut and Kaktovik .
	Moulton et al.2003	Provides data on bowhead whale avoidance responses to industrial noise, including vessel traffic.
	NRC 2003a	A description of known and probable cumulative effects of oil and gas development on Alaska's North Slope. Includes discussions of impacts on subsistence resources and subsistence activities.
	Pedersen et al. 2000	Provides an analysis of the relationship between subsistence economies in Nuiqsut and Kaktovik and oil development activities. Includes an overview of development near Kaktovik and Nuiqsut; a description of impacts on Nuiqsut and Kaktovik subsistence users, including the failed 1985 bowhead whale hunt in the two communities, and displacement of subsistence users from traditional subsistence hunting areas; and recommendations for lessening future impacts on subsistence users.
	RFSUNY 1984	Study documents the movement of subsistence use areas for the community of Nuiqsut away from development and beyond the development footprint.
	Richardson and Malme 1993	Provides data on bowhead whale avoidance responses to industrial noise, including barge traffic.
	SRB&A 2011	Caribou subsistence monitoring study for the community of Nuiqsut for the 2010 study year; monitors impacts on caribou hunting and harvests related to CD4 and other Alpine Satellite Developments.
	SRB&A 2010b	Caribou subsistence monitoring study for the community of Nuiqsut for the 2009 study year; monitors impacts on caribou hunting and harvests related to CD4 and other Alpine Satellite Developments.

Table H22. Subsistence and Traditional Land Use Information Sources and Adequacy		
Topic	Reference	Relevance and Adequacy
Subsistence and Cultural Impacts (Continued)	SRB&A 2009	Study of the impacts and benefits of oil and gas development based on interviews with active harvesters in four North Slope communities, including Nuiqsut, and on public testimony from all North Slope communities. Documents both concerns and personal experiences with impacts and benefits.
	Yost and Wright 2001	Study examining wildlife distribution in relation to road traffic in Denali National Park.
General Reference	Craig 1989	Information about anadromous fish in Arctic Alaska.
	Johnson 1990	Reference for methods related to informant selection for SRB&A (2010a) mapping interviews.

Table H23. Health Information Sources and Adequacy

Topic	References	Relevance to Proposed Project
Potentially Affected Communities	ACS 2005-2009	The U.S. Census Bureau's American Community Survey provides 5-year averages on the educational attainment rates and poverty levels for the NSB region, among other economic and demographic data. The margins of error in the NSB are high due to a small sampling size.
	ADCCED 2010	Community profiles and detailed information on the NSB villages provided by the Alaska Community Online Database of the Alaska Department of Commerce, Community, and Economic Development (ADCCED).
	ExxonMobil 2009a	Provides project information on anticipated local hiring opportunities and limitations. The report also discussed the relationship between increased income and improved community health.
	U.S. Census Bureau 2000, 2010	Decennial census is a comprehensive, nationwide data collection effort for population and demographics.
HIA Guidance & Methodology	ADHSS 2011	Draft guidance for HIA practitioners on the approach for developing HIAs in Alaska; served as the framework for the Point Thomson HIA.
	IFC 2007	An international standard for managing community health and safety as part of private sector projects that seek and receive IFC financial lending.
	Rowe and Wright 1999	The rating of impacts for the Point Thomson HIA followed a modified Delphi approach by Rowe and Wright (1999), a technique used in judgment and forecasting situations where pure model-based statistical methods are not practicable.
	Winkler et al. 2010	The Point Thompson HIA followed the risk assessment technique described by Winkler et al (2010) that ranks the significance of identified health impacts allowing health planners prioritize management actions.
Health Outcome Indicators	ADHSS 2001	A state report that sets public health targets for 2010 to track changes in health status of Alaskans. The Healthy Alaskan 2010 goals served as a point of reference for certain health outcome indicators discussed in the Point Thomson HIA technical report.
	AN EpiCenter 2009a	Summarizes the health status of Alaska Native population on mortality, morbidity, lifestyle risk factors, maternal and child health, cancer and cancer screening, immunizations, diabetes, infectious disease, environmental health and dental health. The report focuses on the health of Alaskan Natives who account for the majority of the Arctic Slope's population. The report also provides sufficient mortality and morbidity data for Non-native Alaskans.
	AN EpiCenter 2009b	Summarizes the health status of the Alaska Native population living in the Arctic Slope Region. The report accessed regional level data from a variety of key sources made available by multiple state and tribal entities. Health information provided includes: mortality and morbidity; health promotion and protection; preventative services; and access to health care. Much of the information presented in this document was previously analyzed and has been re-produced for this report.
	HDR 2011aa	"Workforce for Alternatives" memo provided information on workforce numbers and potential employment for each alternative.
Climate Change	Brubaker et al. 2010	Study evaluates the impacts of climate change on food storage on the North Slope.

Table H24. Contaminated Sites and Spill History Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
General References	ARCO and BPXA 2000	Alaska Waste Disposal and Reuse Guide, Revision 5 (Red Book)
	BPXA and ConocoPhillips 2005	North Slope Environmental Field Handbook
	ExxonMobil 2009a	This report is the Point Thomson project description and describes reservoir pressures.
	ADCCED 2011	Alaska Community Database website provides information on the Oxbow landfill located near Deadhorse.
	NRC 2003a	Assessment of cumulative impacts for North Slope activities including oil spills
Spill History	ADEC 2010c	This is the ADEC spills database for the State of Alaska, and was used for the background and history of North Slope spills.
	ADEC 2008b	The final situation report on spill BP GC-02 which occurred at Prudhoe Bay, located west of the study area.
	AOGCC 2008	This 50 th Anniversary report of the Alaska Oil and Gas Commission contains information on well blowouts on the North Slope between 1949 and 2008.
	NRC 2003b	An appendix to this report contains information on spill history on the North Slope. This book examines oil spills worldwide.
	Mach et al. 2000	This report provides one of the earlier assessments of oil spill likelihood and causes on the North Slope, and a basis for a longer term assessment of changes over time when compared to recent analyses.
	BLM 2004	Final EIS for Alpine Satellite Development Plan documents correspondence regarding the Alaska Oil Spill Database as it existed in 2003 and describes the structure, inputs, outputs, and limitations.
Spill Assessment	MMS 2007a	The Liberty Development and Production Plan Environmental Assessment provides one of the more recent and complete statistical analyses of the probability of oil spills on the North Slope.
	BLM 1998	One of several EISs and environmental assessments reviewed and cited because they provide a description of the likelihood, fate, and effects of spilled oil in the Arctic with emphasis on the North Slope of Alaska. This EIS is the Northeast National Petroleum Reserve-Alaska Final Integrated Activity Plan/Environmental Impact Statement.
	MMS 2002	This EIS written for the Liberty Project contains oil spill analysis for the North Slope.
	Maxim and Niebo 2001a,b,c	General background (reference material) information referenced in this EIS because they did the comprehensive statistical analyses for the industry and set the stage for the likelihood analyses described in this EIS.
	Jorgenson and Martin 1997	Provides a summary of the impacts that may result from vehicle traffic and potential oil spills in winter operations for the pipeline and roads.
	USACE 1999a	One of several EISs and environmental assessments reviewed and cited because they provide a description of the likelihood, fate, and effects of spilled oil in the Arctic with emphasis on the North Slope of Alaska

Table H24. Contaminated Sites and Spill History Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Spill Assessment (Continued)	Everest Consulting Services 2007	This is a detailed statistical analysis of spills on the North Slope based on a thoroughly vetted ADEC database with additional data and information from other sources for the North Slope of Alaska. Appendix A of Liberty Development Plan Environmental Assessment.
	Malins 1977	Comprehensive and early description of impacts of oil on arctic ecological systems and resources.
Mitigation	Starr et al. 1981	Recommendations for Minimizing the Impacts of Hydrocarbon Development on the Fish, Wildlife, and Aquatic Plant Resources of the Northern Bering Sea and Norton Sound.
	Hamilton et al. 1979	Recommendations for Minimizing the Impacts of Hydrocarbon Development on the Fish, Wildlife, and Aquatic Plant Resources of Lower Cook Inlet. Vols. I and II
Weathering Processes and Toxicity	Boehm 1987	Thorough summary of the weathering processes of crude and refined oil in the marine environment. Numerous subsequent publications provide details and updates but do not substantially change the general descriptions.
	Boehm et al. 1987	Thorough summary of the weathering processes of crude and refined oil in the marine environment, with an emphasis on Arctic environments. Numerous subsequent publications provide details and updates but do not substantially change the general descriptions.
	Lehr 2001	Provides some background on models for the rates and mechanisms of oil weathering in support of the change in toxic and physical impacts to resources over time
	Leirvik et al. 2002	This document written for BOEMRE (formerly MMS) examines the weathering process on oil spills in the Arctic.
	BLM and MMS 2003a, b, 2004	This Integrated Activity Plan and Environmental Impact Statement for the Northwest NPR-A contains analyses on the behavior and fate of spilled materials.
	BLM 2004	The Alpine Satellite Development Plan FEIS contains analyses on the fate and behavior of spilled materials.
	BLM and MMS 2002	One of several EISs and environmental assessments reviewed and cited for providing a description of the likelihood, fate, and effects of spilled oil in the Arctic with emphasis on the North Slope of Alaska
	BLM 2007	One of several EISs and environmental assessments reviewed and cited for its description of the likelihood, fate, and effects of spilled oil in the Arctic with emphasis on the North Slope of Alaska
	Polyscience 2010	The MSDS for ethylene glycol.
	Staples et al. 2001	General discussion and summary of impacts of antifreeze on various species
	Pillard 1995	Example of antifreeze toxicity to aquatic organisms
	Hanna and Drivas 1993	Provides a general description of potential air quality impacts from volatile petroleum hydrocarbons
	TAPS Owners 2001	This EIS written to renew the Trans Alaska Pipeline System Right of Way contains information on source, cause and probability of pipeline oil spills and spill history in the North Slope as well as the tundra/taiga of Alaska.

Table H24. Contaminated Sites and Spill History Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Tundra Impacts	McKendrick 1996, 1999, 2000a, 2000c, 2001, 2003a	Describe the effects of and recovery from saltwater spills on tundra communities in Arctic Alaska
	McKendrick 1997, 2000b, 2003a, 2003b	Describe the recovery of tundra impacted by oil field construction and are relevant to recovery from oil/saltwater spills
	McKendrick and Mitchell 1978	Describes the effects of and recovery from oil spills on tundra communities in Arctic Alaska
Aquatic Impacts	Miller et al. 1978	Summarizes the early studies of effects of oil on tundra pond phytoplankton biology and ecology
	Barsdate et al. 1980 Hobbie 1982, 1984	Summarize the early studies of effects of oil in tundra pond biology and ecology
	Prentki et al. 1980	Summarizes the physical and biochemistry of tundra ponds as a basis for evaluation of oil spill impacts as oil weathers
	O'Brien et al. 1995	A summary of a long term study in the ecology of a North Slope Lake and provides a basis for oil spill effects
	Miller et al. 1980	Comprehensive description of the physical and biological functions of tundra ponds on North Slope and a basis for evaluating oil spill impacts
	Taylor and Stubblefield 1997	Summary of oil spill effects in a wide range of freshwater environments
	Vandermulen et al. 1992	Summary of oil spill effects in freshwater environments including northern climes
	API 1992a API 1992b API 1997	These documents compile and summarize the literature to date (1991-1992) of the fate and effects of oil spills into a wide range of freshwater environments. They provide additional references for an interested reader.
Bird Impacts	Holmes 1985	Summarizes effects of oil on sea bird reproduction
	Larned 2009	Multi-year summaries of annual aerial population surveys for nesting eiders and other waterfowl on the ACP conducted by USFWS.
Aquatic Impacts	Hose et al. 1996 Heintz et al. 1999	Example of effects of oil on early life history stages of fish in cold water environments
Socioeconomic Impacts	Fall and Utermohle 1999	Background for assessment of impacts from oil on socio-economic conditions
	Fall et al. 2001	Background for assessment of impacts from oil on socio-economic conditions
Cultural Resource Impacts	Bittner 1996	Overview of observed adverse effects to cultural resources as a result of the Exxon Valdez Oil Spill.
	Mobley et al. 1990	Overview of observed adverse effects to cultural resources as a result of the Exxon Valdez Oil Spill.
Mammal Impacts	Geraci 1990	Review of oil spill impacts on cetacean physiology and behavior.
	St. Aubin 1990a	Review of oil spill impacts on polar bear physiology and behavior.
	St. Aubin 1990b	Review of oil spill impacts on pinniped physiology and behavior.

Table H24. Contaminated Sites and Spill History Information Sources and Adequacy		
Topic	References	Relevance to Proposed Project
Mammal Impacts (Continued)	Bratton et al. 1993	Review of oil spill impacts on cetacean physiology and behavior.
	Lowry et al. 1994	Review of oil spill impacts on pinniped physiology and behavior.
	Amstrup et al 2006	Summarizes potential impacts to polar bears
	Amstrup et al. 1989	Provides an example of polar bears being affected by normal operations.
	Derocher and Stirling 1991	Example of the potential effects of oil on polar bears
	Rowe et al. 1973	An example of oil toxicity to large mammalian herbivores as there is limited experimental work on North Slope ungulates.
	Kuopat and Bryant 1980	Provides a background for assessing potential effects of oil on caribou forage.
	Lewis and Sellers 1991	An example of the potential effects of oil on large carnivores on the North Slope where there are few direct studies on them.
	Schliebe et al. 2006	This USFWS polar bear status review provides information on spills effects relative to polar bears.