CHAPTER 13.0

CONSULTATION AND COORDINATION

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13.0 CONSULTATION AND COORDINATION

13.1 DEVELOPMENT OF THE ENVIRONMENTAL IMPACT STATEMENT

During preparation of this Environmental Impact Statement (EIS), federal, state, and local agencies; industry; and the public were consulted to obtain descriptive information, to identify significant effects and issues, and to identify effective mitigation measures and reasonable alternatives to the proposed action. Information received during scoping meetings held in Barrow, Nuiqsut, Kaktovik, Anchorage, Fairbanks, and Valdez has been considered in preparing this EIS.

13.2 INCORPORATION OF TRADITIONAL KNOWLEDGE

During EIS scoping meetings for the project held in spring 1996 in the North Slope communities of Barrow, Nuiqsut, and Kaktovik several people testified that residents of the North Slope have been commenting on the same issues and concerns regarding oil and gas development over the last 20 years. The cooperating agencies and BP Exploration (Alaska) Inc. committed to reviewing and summarizing pertinent past testimony for use in this EIS. Available written and taped transcripts were collected from previous federal and state oil and gas lease sales, EISs, and applicable hearings. As a result of scoping testimony, additional meetings were scheduled in Kaktovik, Nuiqsut, and Barrow to gather Traditional Knowledge. The work plan for addressing Traditional Knowledge was reviewed by an informal peer review committee assembled by the North Slope Borough.

13.3 LIST OF CONTACTS FOR EIS

The major federal, state, and local government agencies; special interest groups; and members of the public who provided comments and information during the scoping process are listed in Table 13-1.

13.4 AGENCIES, ORGANIZATIONS, AND INDIVIDUALS WHO RECEIVED COPIES OF THE DRAFT EIS

(Refer to Mailing List in Appendix C)

GLOSSARY

GLOSSARY

active layer: The zone, near the surface of the soil in a permafrost area, that is subject to seasonal thawing.

advection: Change in property caused by motion of fluid.

Alaska Clean Seas: An oil spill response organization sponsored by oil companies and active in Alaska.

Alaskan Beaufort Sea: The southern part of the Arctic Ocean from the Alaska-Canada border west to the Chukchi Sea.

algae: Any of various chiefly aquatic, photosynthetic organisms, ranging in size from single-celled to giant kelp.

alluvial: Relating to, composed of, or found in sedimentary material which was deposited by running water.

amphipods: Small crustaceans of the order Amphipoda, having a laterally compressed body with no carapace.

anadromous: Refers to fish which spend part of their life in salt water but which spawn in freshwater steams.

anti-foaming agents: Chemicals added to filtered seawater during processing for waterflood injection. They allow more efficient processing of the water through the various treatment stages.

API: An arbitrary measure, called "API gravity," established by the American Petroleum Institute. It is the commonly used gravity scale for crude oil. API gravity is related to specific gravity as follows:

$$\text{API} = \frac{141.5}{\text{specific gravity}} - 131.5$$

aquatic: Living in or frequenting the water.

arctic: Pertaining to, located in, or relating to high latitude areas which have climates dominated by sub-freezing temperatures; characteristic of very cold, snow, windy weather. Region lying north of the Arctic Circle.

Arctic Coastal Plain: The flat stretch of land extending from the foothills of the Brooks Range to the Alaskan Beaufort Sea.

Arctic char: A type of salmonid anadromous fish (*Salvelinus malma*) found in the Beaufort Sea; a northern form of Dolly Varden.

Arctic cod: A type of marine fish (*Boreogadus saida*) found in the Beaufort Sea.

Arctic fox: A furbearing, carnivorous, dog-like mammal (*Aloplex lagopus*) found along the Beaufort Sea coastline.

arctic haze: A large-scale atmospheric pollution phenomenon occurring in the winter and spring that affects the entire Arctic area. Most of the pollution originates from Europe and the Soviet Union, thousands of miles away.

baleen: Plates found in the mouths of certain species of whales to strain plankton from the water; those species of whales which have such baleen plates.

bar: A ridge of sand or gravel along a shore or stream bed that is formed by the action of tides or currents.

barrier island: A naturally-occurring island (usually part of a chain of islands) found a few miles offshore from the mainland. In the Arctic, they protect lagoonal areas to shoreward from most of the effects of ice movement.

bathymetry: Underwater topography.

bearded seal: A large solitary seal (*Erignathus barbatus*) found in low densities (compared with the ringed seal) throughout the Arctic.

Beaufort Gyre: The overall clockwise movement of currents in the northern hemisphere.

beluga whale: A cetacean (*Delphinaptenis leucas*) about 10 feet (ft) (3 meters [m]) long and white when an adult.

benthic: Refers to the seafloor environment.

benthos: Biota utilizing the seafloor sediments as habitat.

biocides: A chemical agent, such as a pesticide, that is capable of destroying living organisms.

bottomfast ice: Ice which is frozen to the bottom of a body of water (See FAST ICE and SHOREFAST ICE)

Boulder Patch: An anomalous cluster or field of cobbles and boulders on the seafloor. One location

found in Stefansson Sound near the mouth of the Sagavanirktok River, provides a substrate which supports biological communities not found elsewhere in the area.

bowhead whale: A species of baleen whale (*Balaena mysticetus*), ranging in size up to a maximum of about 60 ft (18.3 m); classed as an endangered species. The only significant remaining population of bowheads spends its summers in the Canadian Beaufort Sea and its winters in the Bering Sea near the southern extent of the pack ice.

braided stream: A river, such as found on the Arctic Coastal Plain, that tends to form multiple channels which separate and rejoin in a complex pattern.

breakup: Season of the year when the annual accumulation of snow and ice melts and runs off the land.

brine: Concentrated seawater.

Canadian Beaufort Sea: The southern part of the Arctic Ocean from the Alaska-Canada border east to Banks Island, Canada.

caribou: A large ungulate migratory species (*Rangifer tarandus*) found in the Arctic tundra habitat.

cetacean: Any one of a number of whale and porpoise species; referring to whales, or whale-like in character.

cofferdam: A temporary, watertight enclosure that is pumped dry to expose the bottom of a body of water so that construction may take place.

conglomerate: A rock composed of pebbles and gravel embedded in a loosely cementing material.

continental shelf: The shallow underwater extension of a continent; usually limited in depth to 656 ft (200 m).

continental slope: The steeply descending slope between the edge of the continental shelf and the abyssal plain; the ocean bottom between 656 and 13,123 ft (200 and 4,000 m).

copepods: Any of numerous small marine or freshwater crustaceans of the subclass Copepoda, having an elongated body and a forked tail.

Coriolis effect: The observed effect of moving water being deflected to the right of wind direction in the Northern Hemisphere as a result of the earth's rotation.

corrosion inhibitors: Chemicals injected into pipelines (oil or water) to reduce material loss on the interior of the pipe. They help maintain the integrity of the pipeline by slowing down the chemical deterioration of the metal.

crustacean: Any of various predominantly aquatic arthropods of the class Crustacea, having a segmented body, chitenous exoskeleton, and paired, jointed limbs (Shellfish).

dBA (A weighted sound level): A weighting system which reflects that human hearing is less sensitive at low and extremely high frequencies than at the mid-range frequencies.

DEW Line: Acronym for Distant Early Warning Line - A system of radar stations near the 70th parallel across the North American continent, maintained by the U.S. and Canada to give advance warning of approaching enemy aircraft and missiles.

diatom: Any of various microscopic one-celled or colonial algae having cell walls of silica consisting of two interlocking symmetrical valves.

dipterans: Any of the large order (Diptera) of insects that includes true flies and mosquitos characterized by a single pair of membranous wings and a pair of club-shaped balancing organs.

downwelling: Downward flowing current.

drained lake basin: A shallow depression where there was formerly a lake. (Lakes on the Arctic Coastal Plain go through a geologic cycle of formation and subsequent drainage.)

drilling mud: A slurry circulated through the wellbore while drilling an oil or gas well.

echolocation: A sensory system in certain animals in which usually high-pitched sounds are emitted and their echoes interpreted to determine the direction and distance of objects.

Ekman Transport: Water movement in an offshore direction as a result of surface currents, easterly winds, and the Coriolis effect.

emulsion breakers: Chemicals used to increase the efficiency of crude oil processing. They reduce the process time and tank size required to separate the oil/water/gas mixture produced by the wells.

epibenthos: Biota using the seafloor as habitat.

epifauna: Organisms living on top of bottom sediments.

epontic: Organisms living on the underside of sea ice.

estuarine: Pertaining to or located in an area where the sea meets a river mouth.

estuary: A partially enclosed coastal area where freshwater and seawater meet and mix.

euphausiid: Moderate-sized crustaceans which include shrimp or krill, an important food source of the bowhead and other baleen whales.

fast ice: Sea ice of any origin which remains attached with little horizontal motion along a coast or to some other fixed object.

fetch: The length of water surface across which the wind blows.

first-year ice: Sea ice of not more than one winter's growth, generally 1 to 9 ft (0.3 to 2.7 m) thick.

flaw: A narrow separation zone between pack ice and fast ice, where the pieces of ice are in a chaotic state, that forms when pack ice shears under the effect of a strong wind or current along the fast ice boundary.

flaw lead: A lead (fracture or passage) between pack ice and fast ice.

floe: A segment of ice that has broken away from either first year or multi-year ice sheets.

flooded ice: Sea ice which has been flooded by melt water or river water and is heavily loaded with water and wet snow.

floodplain: The relatively flat area near a watercourse which is subject to periodic flooding.

flow station: A petroleum processing facility where crude oil from the ground is depressurized and where water and gas produced with the oil are separated (See GATHERING CENTER).

fluvial: Caused by the action of flowing water (rivers and streams).

food web: The food dependency relationship network among animal species in an ecological unit.

fourhorn sculpin: A type of marine fish (*Myoxocephalus quadricornis*) found in the Beaufort Sea.

fracture: Any break or rupture through very close, compact, or consolidated pack ice, fast ice, or a single floe resulting from deformation processes (lead). Fractures may contain pieces of ice and be covered with a thin layer of ice; length may be a few feet or many miles.

frazil ice: Fine spicules or plates of ice, suspended in water.

freezeup: Period in the fall when water freezes in rivers and nearshore areas.

frost heave: The expansion of soil due to freezing, usually accompanied by the growth within it of an ice lense, which causes displacement of the soil surface.

frost jacking: Soil, bonded to an object moves upward through frost heaving and carries the object with it; upon thawing, the object does not return to its original elevation.

gathering center: A petroleum processing facility where well fluids (gas and water) produced are separated from crude oil (See FLOW STATION).

genera: Plural of genus - A taxonomic category ranking below family and above species, generally consisting of a group of species exhibiting similar characteristics.

General Fund: That portion of state revenue over which the legislature and governor have complete discretion and upon which no restrictions on spending have been placed. For fiscal year 1997, 78% of the money in the General Fund came from oil revenues.

geomorphic: Surface configurations of the earth.

gray whale: A medium-sized (up to 46 feet) baleen whale (*Eschrichtius robustus*) which primarily utilizes summer feeding grounds in the Bering and southern Chukchi Seas.

greenhouse gas emissions: Greenhouse gases are assumed to contribute to a "global warming" scenario or global increase in temperature and include such gases as methane, carbon dioxide, and water vapor.

grizzly bear: A large omnivorous mammal (*Ursus arctos*) found in northern regions. The arctic coast of Alaska is the northern extent of the grizzly bear range.

haulout: An area where marine mammals (generally pinnipeds) come onto land to rest and socialize.

high-centered polygon: High-centered polygons are produced when soil at the perimeter of a polygon subsides into the surrounding ice wedge trough leaving the center higher than the edges (See ICE WEDGE).

hummocky terrain: A landform characterized by a lumpy, irregular surface. Hummocky terrain is found on slopes in permafrost areas.

hydrography: Salinity and temperature of water.

iceberg: A massive piece of ice of greatly varying shape with a freeboard of more than 16 ft (5 m), which has broken away from a glacier and may be afloat or aground.

ice breaker: A ship built for breaking a passage through icebound waters.

ice gouge: Grooves cut in the seafloor by the keels of floating ice.

ice floe: Fragmented pieces of either first or second year ice sheets.

ice island: Large piece of ice broken off of an ice shelf.

ice pile-up: The vertical buildup of ice at the shore which occurs when moving ice sheets contact steep slopes or bluffs, resulting in buckling and pile-up of the ice.

ice ride-up: A process wherein large sheets of wind-driven sea ice become pushed up onto the land, sometimes for a considerable distance past the shoreline.

ice road: A temporary road constructed in winter by spraying water on the intended roadway. The resulting ice buildup improves the load-bearing capacity. The technique can be used for road construction on tundra or sea ice surfaces.

ice sheet: Laterally continuous, relatively undeformed piece of sea ice with lateral dimensions of 33 ft (10 m) or larger.

ice shelf: Floating ice sheet of considerable thickness, showing 6 to 164 ft (2 to 50 m) or more above sea level and attached to a coast.

ice wedge: An underground, wedge-shaped prism of ice such as commonly found in permafrost areas.

infauna: Organisms living within bottom sediments.

invertebrate: Refers to animals without back bones, e.g. insects, shellfish, etc.

isobath: A line on a map or chart that connects points of equal water depth.

insolation: Exposure to sunlight causing a change in water temperature; the amount of solar radiation per surface area.

isopods: Any of numerous crustaceans of the order Isopoda, characterized by a flattened body bearing seven pairs of legs.

keel: The underside of an ice ridge that projects downward below the lower surface of the surrounding sea ice.

kelp: Any of various brown, often very large algae of the order Laminariales.

krill: Small marine crustaceans of the order Euphausiacea that are the principal food of baleen whales.

lacustrine: Relating to lakes.

lagoon: A shallow body of water separated from the sea by sand bars, barrier islands, or coral reefs.

landfast: Ice which is attached to a shoreline, generally consisting of grounded and floating ice zones.

lead: Any fracture or passage through sea ice that is generally too wide to jump across. A lead may contain open water (open lead) or be ice covered (frozen lead).

least cisco: A type of anadromous fish (*Coregonus sardinella*) found in rivers and lakes of Northern Alaska and the Beaufort Sea.

lemming: A small, burrowing rodent which lives in the arctic tundra.

lithology: The physical character of a rock or rock formation.

low-centered polygon: A polygonal landform found in permafrost areas, consisting of a low center with raised rims. Low-centered polygons are formed when expanding ice wedges cause upward displacement of adjacent soils (See ICE WEDGE).

marine: Of the sea or ocean.

meteorology: The study of weather.

midges: Any of various small flies of the families Chironomidae and Ceratopogonidae, frequently occurring in swarms near ponds and lakes.

muskox: A large woolly species of wild ox (*Ovibos moschatus*) found in arctic tundra areas of Greenland and North America.

multi-year ice: Ice which has survived more than two summers made up of multiple layers of annual ice formed during successive winters.

mysids: Any of various small, shrimplike, chiefly marine crustaceans of the order Mysidacea, the females of which carry their eggs in a pouch beneath the thorax.

National Petroleum Reserve, Alaska (NPRA): Formerly the Naval Petroleum Reserve - Alaska.

nautical mile: A unit of length used in sea and air navigation, based on the length of one minute of arc of a great circle; equal to about 1.15 miles (1.8 km).

nearshore: Located in water adjacent to the shoreline.

offshore: Located at a distance from shoreline.

oligochaetes: Any of various annelid worms of the class Oligochaeta, including earthworms and a few small freshwater forms.

onshore: Located on the land.

open water: A large area of freely navigable water in which sea ice is present in less than 1/10 concentration.

oriented lake: A lake with its long axis oriented at right angles to the prevailing wind. This phenomenon is commonly observed on the Arctic Coastal Plain where lakes are relatively shallow and certain wind directions are strongly predominant.

overwinter: To spend the winter.

pack ice: Area beyond the continental shelf consisting of multi-year ice with first-year ice forming in open leads during the winter.

passerine: Of or relating to birds of the order Passeriformes, which is largely comprised of song birds.

peat: Partially decomposed vegetative matter. Tundra soils commonly contain large amounts of peat.

pelage: The coat of a mammal, consisting of hair, fur, wool, or other soft covering, as distinct from bare skin.

pelagic: Of, relating to, or living in open oceans or seas rather than waters adjacent to land or inland waters.

permafrost: Soil which remains continuously frozen for more than one year.

pH: A measure of the hydrogen ion concentration and an indicator of relative acidity or aklalinity.

phytoplankton: Small plants (millimeter size range and smaller) suspended in the sea (See ZOOPLANKTON).

Pig (Pigging): A mechanical device designed to travel within and monitor or clean a pipeline.

pingo: A small, conical mound or hill which has been pushed up by the action of freezing soil moisture which was confined in the bed of a former lake.

pinniped: Of or belonging to the Pinnipedig, a suborder of carnivorous aquatic mammals that inlcudes seals and walruses.

polar bear: A large creamy-white bear (*Ursus maritimus*) which spends most of its life on the pack ice.

polar ice pack: The dense accumulation of sea ice found in arctic marine areas.

polygon: Ground which is segmented into polygonal shapes by ice wedges at the polygon boundaries (See ICE WEDGES).

polynya: Any nonlinearly shaped opening surrounded by ice.

porosity: A property which indicates the ratio of the volume of voids to the total volume of a solid mass.

pressure ridge: Ice ridges formed at the contact area between two ice fields or along cracks or leads in an ice sheet when they close under pressure.

Pump Station No. 1: The first pump station of the Trans-Alaska Pipeline System, located at the Prudhoe Bay oil field, which collects the oil from the North Slope oil fields and starts pumping it down the pipeline.

pycnocline: An area where an abrupt change in density occurs between two layers of water.

raptor: A bird of prey.

relict: Something that has survived from an earlier time in an environment that has changed considerably.

ridge: Linear accumulations of ice rubble caused by interaction of ice floes and sheets.

ridging: The process whereby ice is deformed into ridges.

ringed seal: A pinniped (*Phoca hispida*) found widely in the Arctic. Ringed seals are the major prey of polar bears.

riverine: Of or with reference to rivers.

rookery: The onshore breeding areas of birds or animals; where they birth and raise their young.

saline advection: Movement, or transport, of salt water through sediment.

salinity: The salt content of a material.

sand dune: A wind-formed mound of sand.

seal: Carnivorous sea mammal.

sealift: Annual transport of equipment and supplies to the North Slope by barge; generally used to transport large items which cannot be trucked or flown in.

seasonal pack ice: Floating sea ice which accumulates in winter but melts and dissipates in summer.

sedimentation: The accumulation of particulate material which has been relocated through the action of wind or water.

setdown: Fall in water level.

setup: Rise in water level.

shear ridge: Long, straight ice ridges produced by lateral movement between fixed landfast and seasonal pack ice.

shear zone: The boundary between the moving pack ice and the fixed "fast ice" which is attached to the shore. An area in which a large amount of shearing deformation has been concentrated. (See STAMUKHI)

shoal: A shallow area in a body of water, often constituting a hazard to navigation; a sandbank or sandbar.

shorefast ice: Floating ice which is held in place by being frozen to a shoreline or locked in place by the shape of the shoreline. (See FAST ICE, BOTTOMFAST ICE).

spit: A narrow point of land extending into a body of water.

stamukhi zone: The boundary zone between the moving pack ice and the essentially stationary fast ice near shore characterized by large accumulations of ice rubble. (See SHEAR ZONE)

storm surge: Variation in the sea surface elevation caused by wind, large ice movements, and/or atmospheric pressure changes.

strangmoor: Refers to tundra areas characterized by irregular linear markings.

stratigraphy: The study of rock layers, especially their distribution, deposition, and age.

strudel scour: Depressions in the seabed created by the scouring effect of the downward flow of overflood water through cracks or holes in overlying ice. Typically occurs within a 10-mile (16-km) radius of river mouths along the Alaskan Beaufort Sea.

subsistence: Refers to the source of the essential resources for life, i.e. food, clothing, and shelter. Subsistence hunting and fishing provide a substantial share of food needs for people living in remote arctic areas.

suprapermafrost: Layer of soil above the permafrost.

TAPS: Acronym for Trans-Alaska Pipeline System - An 800-mile (1,288 km) pipeline which transports North Slope crude oil from Pump Station No. 1 at Prudhoe Bay to a marine terminal at Valdez, Alaska.

terrace: A flat, narrow stretch of ground, often having a steep slope, facing a river, lake, or ocean.

terrestrial: Of or referring to the land or users of land habitat.

terrigenous: Sediments derived from the terrestrial environment.

thaw bulb: Permanently unfrozen soil found beneath the beds of lakes in permafrost areas.

thaw lake: A lake produced by thawing and subsidence of ice-rich permafrost.

Thaw-Lake Plains: Thaw-lake plains are areas characterized by the presence of numerous permafrost-related lakes and ponds.

throughput: Volume or flowrate of fluids flowing through a pipeline or processing facility.

tundra: An arctic, subarctic, or alpine area characterized by low-growing vegetation and virtual absence of trees.

upwelling: A process in which cold, often nutrient-rich waters from the ocean depths rise to the surface.

VSM: Acronym for Vertical Support Member - Consists of a vertical pole driven into the ground with a cross-piece welded to the top upon which pipelines lay.

walrus: A large, bottom-feeding pinniped (*Odobenus rosmarus*) with a discontinuous circumpolar range.

waterfowl: A bird (ducks, geese, and swans), especially a swimming bird, that uses the water as an important part of its habitat.

well pad: Earth- or gravel-filled embankments placed at an oil well location to support drilling and maintenance operations.

whale: Large sea mammal (order Cetacea) which spends all its life in the ocean.

wind chill factor: A measure of the cooling effect which takes wind velocity as well as air temperature into account.

wind stress: Force applied to water or ice which can result in horizontal movement or currents.

wolverine: A carnivorous mammal (*Gulo gulo*) of the weasel family.

zooplankton: Small animals (millimeter range and smaller) found in the sea (See PHYTOPLANKTON).

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TRADITIONAL KNOWLEDGE INDEX

Provides an index to the Traditional Knowledge used in this EIS by the topics listed below. Each section where a comment/statement utilizing Traditional Knowledge on a particular topic appears is listed in order to facilitate finding Traditional Knowledge information and seeing how it was used in relation to western science. Full quotes and citations are presented in the X.2 section of each chapter.

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