FACT SHEET

PUBLIC COMMENT ISSUANCE DATE: OCTOBER 28, 2010

PUBLIC COMMENT EXPIRATION DATE: NOVEMBER 29, 2010

TECHNICAL CONTACT:

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The U.S. Environmental Protection Agency (EPA) plans to issue, a National Pollutant Discharge Elimination System (NPDES) permit to:

CONOCOPHILLIPS ALASKA, INC.
KUPARUK SEAWATER TREATMENT PLANT (AK-004335-4)

EPA PROPOSES NPDES PERMIT ISSUANCE

EPA proposes to reissue an NPDES permit to ConocoPhillips Alaska, Inc. (CPAI). The proposed permit sets conditions on the discharge of pollutants from the **Kuparuk Seawater Treatment Plant (STP)** to Simpson Lagoon of the Beaufort Sea off Alaska's North Slope. The STP is located at latitude 70°30'45" north, longitude 149°51'30" west at the tip of Oliktok Point. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged and places other conditions on the facility.

This Fact Sheet includes:

- information on public comment, public hearings and appeal procedures
- a description of the Kuparuk STP
- a description of the proposed discharges, including a map and description of the discharge locations
- a listing of proposed effluent limitations and other conditions
- technical material supporting the conditions in the draft permit

401 CERTIFICATION FOR FACILITIES THAT DISCHARGE TO STATE WATERS

EPA requested that the Alaska Department of Environmental Conservation (ADEC) certify the NPDES permit for this facility, under Clean Water Act (CWA) § 401. ADEC may, as a condition of certification, require that the permit include more stringent limitations or monitoring requirements needed to comply with the CWA or State law. EPA is required to include any such limitation or requirement in the final permit pursuant to CWA § 401(d). A draft CWA § 401

certification has been issued concurrently with this proposed permit. Comments regarding this certification should be directed to:

MR. MARC BENTLEY
Alaska Department of Environmental Conservation
Division of Water
555 Cordova Street
Anchorage, Alaska 99501-2617
Email: marc.bentley@alaska.gov

ALASKA COASTAL MANAGEMENT PROGRAM

On July 22, 2010, the Alaska Department of Natural Resources (ADNR) Division of Coastal and Ocean Management (DCOM) determined that the renewal of the NPDES permit does not require further review for consistency with the Alaska Coastal Management Program (ACMP) since the reissued permit would have no additional effect on coastal uses and resources per 11 AAC 110.820(k)(4).

PUBLIC COMMENT

EPA will consider all substantive comments on the draft NPDES permit and fact sheet before reissuing the final NPDES permit. Persons wishing to comment on, or request a public hearing for, the proposed permit action may do so in writing by the expiration date of the public notice period. A request for a public hearing must state the nature of the issues to be raised as well as the requester's name, address, and telephone number. All comments should include name, address, phone number, a concise statement of basis of comment and relevant facts upon which it is based. All written comments should be addressed to:

MS. HANH SHAW
USEPA, Region 10
1200 Sixth Avenue Suite 900, OWW-130
Seattle, WA 98101
Fax: (206) 553-0165
E-mail: shaw.hanh@epa.gov

After the Public Notice period has ended and the public comments have been considered, EPA Region 10's Director of the Office of Water and Watersheds will make a final decision regarding permit reissuance. If no substantive comments are received, the conditions in the proposed permit will become final and the permit will become effective upon issuance. If substantive comments are received, EPA will respond to the comments and the permit will become effective 30 days after its issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days.

Persons wishing to comment on the draft CWA § 401 certification should submit written comments by the public notice expiration date to the Alaska Department of Environmental Conservation (ADEC) contact listed above.

DOCUMENTS ARE AVAILABLE FOR REVIEW

The draft general NPDES permit, fact sheet and related documents can be reviewed or obtained by visiting or contacting EPA's Offices in Seattle and Anchorage between 8:30 a.m. and 4:00 p.m., Monday through Friday (see addresses below). The draft permit, fact sheet, and other information can also be found by visiting the Region 10 website at www.epa.gov/R10earth/waterpermits.htm.

U.S. EPA Region 10
1200 6th Avenue, Suite 900
Seattle, Washington 98101
(206) 553-0523

U.S. EPA Anchorage Operations Office
222 West 7th Avenue, Suite 19 (Room 537)
Anchorage, AK 99513
(907) 271 - 5083

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I. APPLICANT

This fact sheet provides information on the draft National Pollutant Discharge Elimination System (NPDES) permit reissuance for:

Mailing Address:

ConocoPhillips Alaska, Inc. (CPAI)
700 G Street
P.O. Box 100360
Anchorage, Alaska 99510-0360

Physical Location:

Kuparuk Seawater Treatment Plant (STP)
Lat = 70°30'45" north
Long = 149°51'30" west

Facility Contact:

Thomas Manson
Senior Environmental Coordinator
ConocoPhillips Alaska, Inc.
P.O. Box 100360
Anchorage, AK 99510-0360
Phone: (907) 263-4627
Fax: (907) 263-4035

II. BACKGROUND INFORMATION

A. FACILITY OVERVIEW

ConocoPhillips Alaska, Inc. (CPAI) is the operator of the Kuparuk Seawater Treatment Plant (STP) on Oliktok Point, Alaska. The STP is a self-contained process plant which treats seawater drawn from Simpson Lagoon of the Beaufort Sea for injection into the Kuparuk River Oil Field (Kuparuk). The STP is located at Latitude 70°30'45" N, Longitude 149°51'30" W, at the tip of Oliktok Point, approximately 12 miles east of the Colville River Delta (Figure A).

The primary components of the Kuparuk waterflood system consist of the STP, two clarifiers (summer time use only), a low-pressure supply pipeline, three seawater injection pumps (SIPs) located at each of the three central processing facilities, and a network of high-pressure seawater distribution pipelines with intermediate manifold facilities and injection wells.

B. PROCESS DESCRIPTION

The STP is a key component of a waterflood project designed to maintain field

pressure and enhance the recovery of hydrocarbons from the oil-bearing zone of the Kuparuk reservoir. Seawater is treated to remove debris and sediment, then injected into the oil production zone of the hydrocarbon reservoir to maintain reservoir pressure and "sweep" oil to the producing wells, thereby extending the yield and useful life of the field.

The overall function of the STP is to heat, strain, filter, deoxygenate, biotreat and distribute necessary volumes of waterflood source seawater from Simpson Lagoon to the SIPs. Seawater at the STP is treated: (a) to heat the seawater in order to assist with the filtration and deaeration processes and to maintain a minimum 4°C (40°F) temperature in the supply lines as a freeze-protection measure, (b) to remove suspended solids in order to prevent plugging of the porous reservoir rock, (c) to remove oxygen (to less than 30 µg/L) in order to minimize pipeline corrosion, and (d) to remove bacteria in order to minimize microbiologically induced corrosion and the bacterial production of hydrogen sulfide.

C. PERMIT APPLICATION HISTORY

EPA issued NPDES permit no. AK-004335-4 to CPAI for the Kuparuk STP in September of 1980, and reissued this permit on November 27, 1989. The permit expired on December 27, 1994, and was administratively extended until the permit was reissued on April 24, 2000. CPAI submitted timely and complete Forms 1 and 2C to EPA Region 10 on October 21, 2004, in application for renewal of the permit, and has been operating under an administrative extension. On July 21, 2008, CPAI requested a minor adjustment to the pending renewal permit application. The purpose of the amendment was to include two additional activities, the intermittent use of biocide and chlorine upstream of the filters to control biofouling and bacterial activity, and the use of sodium bisulfite and/or sodium metabisulfite as dechlorinating agents.

III. PROPOSED DISCHARGES

A. NATURE, AMOUNT, AND COMPOSITION OF DISCHARGES

The Kuparuk STP is designed to treat 440,000 barrels/day (bpd) of seawater drawn from the Beaufort Sea. Operation of the STP results in two continuous discharges into Simpson Lagoon. The continuous discharges are from the strainer/filter backwash (Outfall 001) and the marine life return system (MLRS; Outfall 002). Sanitary and domestic wastewater from the Kuparuk facility is transferred, treated, and injected downhole into the oil field at the Kuparuk Wastewater Treatment Plant.

Outfall 001 – Strainer/Filter Backwash System

A portion of the seawater that enters the facility is utilized to backwash the strainers and filters thus concentrating the detritus (tundra fiber), sediments, suspended material, and other debris, which is then discharged through Outfall

001. The system consists of two self-backwashing strainers which remove silt, sand, and detritus. Strainer backwash is then routed to the disposal tank. Under normal operations, the strainer backwash flow remains fairly constant rather than pulsing like the filter backwash.

After leaving the strainers, seawater enters the filtering system, which removes any fine materials. The system consists of seven filtering vessels, six of which are typically online at any time with the seventh in backwash or standby mode. To backwash a filter, a flow rate of approximately 2,600 gallons per minute (gpm) is maintained for six minutes. The backwash water is then also routed to the disposal tank.

The disposal system consists of a disposal tank, with a capacity of 102,500 gallons, and two disposal pumps. The disposal tank holds the seawater prior to its being pumped out to the receiving water with a portion of the seawater re-circulating back to the disposal tank. During typical operations, the amount of water in the tank is controlled by a pre-set level control valve, affecting a fairly continuous discharge with periodic spikes in the outfall flow due to the filter backwash cycles.

The discharge is through a 12-inch buried pipe that is oriented in a northwest direction that terminates approximately 870 feet (265 meters) offshore of the shoreline in a 12.5 feet (3.8 meters) deep excavated depression. The single port discharge is oriented horizontally in the same direction as the discharge line.

Outfall 002 – Marine Life Return System

Upon entering the STP, the seawater first passes through a number of intake screens, traveling screens, and diverters which collect the larger debris in the debris collector. The initial screening also acts to divert any marine life entering the facility back to the receiving water prior to encountering any pumps, clarifiers, strainers, or filters which discharge through Outfall 001.

After passing through the diverters the seawater discharges through a 14-inch line that flares to 24-inch inside diameter over the last 6.56 feet (2 meters) of the line that acts as a single-port outfall diffuser. Outfall 002 is buried approximately 4 feet in the same trench alongside of the Outfall 001 discharge line, although Outfall 002 terminates 607 feet (185 meters) closer to the shore than Outfall 001. The outfall line is oriented in a northwest direction and discharges approximately perpendicular to the prevailing currents, bathymetry, and shoreline. The discharge terminates in an excavated depression with a measured depth in the area of 12.5 feet (3.8 meters) and with the discharge terminus directed in a horizontal northwest direction. The surrounding water depths in the vicinity of both Outfalls 001 and 002 are 7-8 feet (2.2-2.5 meters) deep.

B. BIOTREATMENT OF SEAWATER

Biotreating is performed by the addition of sodium hypochlorite and/or a chemical biocide called glutaraldehyde. Biotreating is done to control biofouling and

bacterial activity within the process equipment, especially the seawater filters where the filter media will provide a large area for attachment and growth. The other major reason for performing biotreating is the neutralizing of sulfate reducing bacteria. The bacteria, if allowed to enter the oil-producing formations, will feed upon sulfur compounds and produce hydrogen sulfide (H2S).

For the most part, biotreating is only performed downstream of the discharge lines and has no possibility of entering the receiving water. However, CPAI has requested in its July 21, 2008 NPDES permit application two additional activities: (1) the intermittent use of biocide and chlorine upstream of the filters to control biofouling and bacterial activity, and (2) the use of sodium bisulfite and/or sodium metabisulfite as dechlorinating agents. The dechlorinating agents will be used to neutralize residual chlorine in the filter backwash.

Deaeration is also another important component of the seawater treatment system. Oxygen concentration can be as high as 15 parts per million (mg/L) by weight in the winter months. Deaeration will remove dissolved oxygen down to 20 parts per billion (µg/L) by weight by using fuel gas as the stripping medium. Oxygen dissolved in seawater is the most corrosive agent to carbon steel and must be removed to protect the downstream piping system.

C. COMPLIANCE HISTORY

EPA reviewed the Discharge Monitoring Reports (DMRs) from January 2000 through December 2008. During 2004, reported pH values were outside normal limits. CPAI attributed this to failure to isolate the meters during calibration resulting in the reporting of maximum and minimum values outside normal range. The company modified its automation system to calculate hourly maximum/minimum averages to avoid recording instantaneous spikes. The DMRs did not indicate any other effluent limit violations.

IV. RECEIVING WATER

A. NATURE OF SIMPSON LAGOON AND THE BEAUFORT SEA

Within the Beaufort Sea, the nearshore relatively shallow shelf acts like a mixing zone for the turbid, sediment-bearing, fresh-water flows from the Colville, Sagavanirktok, Putuligayuk, and other rivers. The nearshore areas of the Beaufort Sea are fresher and more turbid compared to the deeper off-shore areas, which are clearer, colder and more saline.

Simpson Lagoon is similar to numerous other coastal embayment and barrier island systems in the Arctic Ocean that have at least two distinct seasonal changes each year. Consequently, for three to four months each year nearshore waters are generally ice-free, which allows the dynamic processes associate with wind and wave forces to reach their highest activity levels. Freeze-up of nearshore areas occurs between mid-September and mid-October when water temperatures drops to about 1.8ºC. By late March to April, the ice layer reaches its maximum

thickness and large areas of the water column in the bay are frozen solid and ice is about 2 meters (6.56 ft) thick (and occasionally as thick as 2.6 meters). Break-up and melting in the nearshore area usually begins in early June. On average, the nearshore waters are open and generally ice free in late July or early August. During this time, pack ice is located 10 to 20 kilometers (32.8 – 65.6 ft) offshore. The transition periods between open-water and ice-cover are characterized by broken and mobile ice flows which scour and grind the nearshore waters to depths of 12 and sometimes in excess of 20 ft mean lower low water (MLLW).

B. BENEFICIAL USES OF SIMPSON LAGOON AND THE BEAUFORT SEA

Simpson Lagoon and the Beaufort Sea are classified by the Alaska Water Quality Standards (AWQS) as Classes II A(i)(ii)(iii), B(i)(ii), C and D for use in aquaculture, seafood processing and industrial water supply, water contact and secondary recreation, growth and propagation of fish, shellfish, aquatic life and wildlife, and harvesting for consumption of raw mollusks or other raw aquatic life.

C. ISSUES OF SITE SPECIFIC INTEREST

Arctic marine waters are characterized by fewer species, with larger numbers of individuals per species than in temperate waters. Shorter food chains, or less complex food webs result in arctic marine systems being less biologically diverse, and therefore, more susceptible to environmental disruption and fluctuation. Dramatic changes in community composition are more likely related to the harsh Arctic environment than to the intrinsic lack of biodiversity.

Phytoplankton forms the base of the Arctic food web. A massive phytoplankton bloom during the short open-water season sustains the communities throughout the year, including the winter months when most invertebrates are in a "resting stage." In addition to phytoplankton, terrestrial plant material that erodes into the marine ecosystem is also a fundamental component of the Arctic food web. Beyond the shallow nearshore zone where ice scouring occurs, sessile and other long-lived organisms such as kelps, sponges, mollusks, and soft corals exist.

Distribution, abundance, and species diversity of the macroinvertebrates of the Beaufort Sea is strongly influenced by the physical-chemical environment. Carey et al. (1974) considered the following factors particularly important to the macroinvertebrate community:

- Sediment character and distribution
- Ice scouring out to the middle continental shelf
- Water and routes of organic material input to the sea floor
- Uniformly cold temperatures
- Stability of the overlying water column

Annelids, mollusks, and arthropods dominate the macroinfauna community in the western Beaufort Sea. Among that group, annelids were the most abundant, comprising between 32 to 87 percent of the community. After annelids, Mollusks and arthropods ranked equally in their abundance. The density of macroinfauna

species increases across the continental shelf and down the upper continental slope to a depth of 700 meters.

Fish in Simpson Lagoon can be classified into three general categories:

- Marine species live in the marine or brackish environment. Marine species in the Simpson Lagoon region include Arctic cod, Arctic flounder, Pacific sand lance, slender eel blenny, snailfish, capelin, and four-horn sculpin. Of these, only the Arctic cod and four-horn sculpin have been captured in large numbers.
- Freshwater species, which occasionally move into the Beaufort Sea when salinity is low, may live in the plumes of large rivers. However, such freshwater species do not occur in Simpson Lagoon in significant numbers.
- Anadromous species are freshwater forms that migrate to the sea in summer and return to freshwater to overwinter or spawn. Several species of anadromous fishes have been taken from Simpson Lagoon. Least and Arctic cisco and dolly varden char are considered to be "key" species. Both species of cisco prey on mysids and amphipods. Dolly varden char in Simpson Lagoon prey on amphipods, juvenile Arctic cod, and mysids.

Approximately 60 fish species have been reported in the Alaskan Beaufort Sea, as compared to over 300 in the Bering Sea and Gulf of Alaska. This relatively low diversity is attributed to low temperature, low productivity, and severe ice conditions in the nearshore area during the winter. Approximately 30 species occur in nearshore areas, including 16 anadromous species. During the open-water period, anadromous species become concentrated in the warmer, less saline waters around the Sagavanirktok and other major river deltas for feeding, particularly within 100 meters of the shoreline. Certain anadromous fish, such as whitefish and least cisco, spawn in the Sagavanirktok River and do not appear to disperse far from their river of origin.

Marine mammals commonly found in the Beaufort Sea include the beluga whale, ringed seal, spotted seal, bearded seal, walrus, and polar bear. Less common marine mammals include the harbor porpoise, killer whale, narwhal, and hooded seal, which occur in much greater concentrations in the western Beaufort Sea.

V. EFFLUENT LIMITATIONS

A. BASIS FOR PERMIT EFFLUENT LIMITS

In general, the CWA requires that the limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards of a waterbody are being met and they may be more stringent than technology-based effluent limits. The basis

for the proposed effluent limits in the draft permit is provided in Appendix B.

B. SUMMARY OF PROPOSED EFFLUENT LIMITATIONS

Table 1 and the discussion below summarizes the proposed effluent limits that are in the draft permit and provides a basis for the changes from the previous NPDES permit. These limits continue those from the expired permit, with some modifications to: (1) ensure consistency with current EPA permit practices and other NPDES permits for seawater treatment plants on the North Slope; (2) respond to changes in facility operations (e.g., intermittent use of biocides and chlorination agents); and (3) account for effluent and environmental monitoring data.

TABLE 1: *Effluent Limits and Monitoring Requirements*

Parameter	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Sampling Method and Frequency	Reported Values
Outfall 001 – Strainer/Filter Backwash System				
Flow	--	2.2 MGD	Calculation or meter, daily	Average monthly and maximum daily, MGD
pH	--	no more than 9.0, no less than 6.0	Grab or meter, weekly	Minimum and maximum monthly values, standard units
Total Residual Chlorine (TRC)[1]	--	--	Calculation or grab, daily	Average monthly and maximum daily, µg/L
Temperature – Open Water Conditions	--	Not to exceed 16°C above ambient	Recording or meter, daily	Maximum daily, ˚C
Temperature – Under Ice Conditions		Not to exceed 12°C above ambient		
Ambient Temperature[2]	--	--	Recording or meter, daily	Maximum daily, ˚C
Whole Effluent Toxicity (WET)[3]	--	--	24-Hour composite, quarterly[4]	Report, TU_C
Outfall 002[5] – Marine Life Return System				
Flow	--	--	Calculation or meter, daily	Average monthly and maximum daily, MGD
Temperature – Open Water Conditions	--	Not to exceed 15°C above ambient	Recording or meter, daily	Maximum daily, ˚C
Temperature – Under Ice Conditions		Not to exceed 15°C above ambient		

NOTES: [1] Monitoring required only when chlorination/dechlorination chemicals are used in the seawater treatment process upstream of the filters or in the filter backwash system.

. [2] Monitor outside the edge of the mixing zone. This sample can be taken at the seawater intake bay.

[3] Applicable when biotreatment is conducted upstream of the filters or when chlorination/dechlorination agents are used upstream of the filters or in the filter backwash system.

[4] Sampling frequency will be reduced from quarterly to annually, if after the first full year of testing or after the first four WET tests indicate that no toxic effects were seen. If subsequent annual tests indicate a toxic effect, then testing would revert back to the quarterly testing requirement.

[5] Monitoring and reporting are required during periods of discharge only.

Outfall 001 – Strainer/Filter Backwash System

1. The limit on maximum flow of 2.2 MGD is retained from the previous permit.
2. Monitoring is required for TRC when chlorination/dechlorination chemicals are used in the seawater treatment process upstream of the filters or in the filter backwash system. This requirement has been revised from the previous permit.
3. The maximum daily temperature limits are not to exceed 16^{o}C above ambient for discharges in open-water conditions and not to exceed 12^{o}C above ambient for discharges in under-ice conditions are included in the proposed permit. The permit also requires monitoring of ambient temperature. These are new requirements.
4. Whole effluent toxicity (WET) monitoring is required quarterly when biotreatment activities are conducted upstream of the filters or when chlorination/dechlorination agents are used upstream of the filters or in the filter backwash system. Sampling frequency will be reduced from quarterly to annually, if after the first full year of testing or after the first four WET tests indicate that no toxic effects were seen. If subsequent annual tests indicate a toxic effect, then testing would revert back to the quarterly testing requirement. This is a new requirement.
5. The pH must be between 6.0 to 9.0 standard units. This is a new requirement.

There must be no discharge of any floating solids, visible foam in other than trace amounts, or oily wastes that produce sheen on the surface of the receiving water. This requirement is retained from the previous permit.

Outfall 002 – Marine Life Return System

1. Flow monitoring requirement is retained from the previous permit.
2. The maximum daily temperature limits are not to exceed 15^{o}C above ambient for discharges in open-water conditions and not to exceed 15^{o}C above ambient for discharges in under-ice conditions are included in the proposed permit. The temperature limits are new requirements.

C. TECHNOLOGY – BASED EVALUATION

CWA § 301 requires particular categories of industrial dischargers to meet technology-based effluent limitation guidelines. The intent of a technology-based effluent limitation is to require a minimum level of treatment for industrial and municipal *point sources* across the country based on currently available treatment technologies while allowing a discharger to choose and use any available pollution control technique to meet the limitations. Where EPA has not yet developed guidelines for a particular industry, EPA can establish permit limitations using

Best Professional Judgment (BPJ; 40 C.F.R. §§ 122.43, 122.44 and 125.3).

EPA has not established national effluent guidelines for seawater treatment facilities or marine life return systems.

D. MIXING ZONE AND OTHER VARIANCES TO STATE WATER QUALITY STANDARDS

ADEC can authorize a number of exemptions to statewide water quality standards, including a *mixing zone* wherein AWQS may be exceeded (18 AAC § 70.240-270).

In the case of this permit, CPAI submitted a mixing zone application to ADEC in June 2010 requesting a 100 meter radius around Outfalls 001 for pH, turbidity, temperature, sediment, TRC, residues, color, and WET, and a 100 meter mixing zone for Outfall 002 for temperature. The following are the dilution factors requested by CPAI in their mixing zone application:

TABLE 2: *Outfalls 001 and 002 Dilution Ratios and Dilution Factors*

	PARAMETER	DILUTION RATIO	DILUTION FACTOR
Outfall 001	Temperature – Open Water	14.9:1	15.9
	Temperature – Under Ice	11:1	12
	TRC – Chronic	12.3:1	13.3
	TRC – Acute	6.7:1	7.7
Outfall 002	Temperature – Open Water	14:1	15
	Temperature – Under Ice	14:1	15

All water quality standards must be met outside the designated mixing zone boundaries. ADEC has indicated that it will grant the mixing zone request in its draft Clean Water Act Section 401 certification of the NPDES permit.

E. WATER QUALITY – BASED EVALUATION

Water quality-based limits are derived from AWQS to protect the water quality and beneficial uses of Alaskan waters. The NPDES regulation at 40 C.F.R. § 122.44(d)(1) requires that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." The limits must be stringent enough to ensure that State water quality standards are met. Since Simpson Lagoon is protected for all uses, the most stringent State standard for each pollutant regulated under AWQS is utilized in determining water quality-based limits within an NPDES permit. Based upon CPAI's monitoring of its effluents and its receiving waters, water quality-based limits are justified for flow, temperature, and pH.

Of these potential pollutants, there is no addition of turbidity, sediment, residues,

or color in the facility's process which produces particulate-free seawater for injection and the return of "dirty" seawater to the Simpson Lagoon. AWQS state that an effluent discharge "may not, alone or in combination with other substances or wastes, make the (receiving) water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines, cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines." The permit contains a general prohibition applicable to Outfall 001 that states the discharge of floating and visible foam in other than trace amounts is prohibited.

AWQS for pH is no less than 6.5 or greater than 8.5, and may not vary more than 0.2 pH unit from natural conditions.

State criteria for temperature are that the temperature of a discharge may not exceed 15ºC or cause the weekly average to increase by more than 1ºC, and that normal daily temperature cycles may not be altered in amplitude or frequency. State criteria for TRC are concentrations are 13.0 µg/L acute and 7.5 µg/L chronic.

As presented in Table 1 and discussed below in section VI, the proposed permit imposes water quality-based limits on flow, temperature, and pH for Outfall 001. The proposed permit requires monitoring for TRC when chlorination/dechlorination chemicals are used upstream of the filters or in the filter backwash system. Flow monitoring and temperature is limited for Outfall 002.

Antidegradation of Water Quality: Prior to reissuing the final permit, EPA will review the State's antidegradation analysis contained in the CWA § 401 certification. The State's antidegradation policy is located at 18 AAC 70.015. ADEC determined in accordance with its interim antidegradation implementation methods that the limits in the draft permit are consistent with the State's antidegradation policy; that the draft permit is protective of State water quality standards and the water quality of the receiving water; and that the draft permit will not result in a reduction of water quality in the receiving waters.

VI. MONITORING AND REPORTING REQUIREMENTS

A. BASIS FOR EFFLUENT AND SURFACE WATER MONITORING

CWA § 308 and federal regulation 40 C.F.R. § 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results to EPA.

B. SUMMARY OF EFFLUENT MONITORING

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit (see Table 1). These samples can be used for averaging if they are conducted using EPA approved test methods (generally found in 40 C.F.R. § 136).

Table 3, below, presents the monitoring requirements for the Kuparuk STP covered under this draft permit. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

TABLE 3: *Effluent Monitoring Requirements*

PARAMETER	UNITS	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE
FLOW	MGD	Effluent	Daily (5/week)	Calculation or Meter
TOTAL RESIDUAL CHLORINE[1]	µg/L	Effluent	Daily (5/week)	Grab
pH	s.u.	Effluent	Daily (5/week)	Meter or Grab
TEMPERATURE	^{o}C	Effluent	Daily (5/week)	Meter or Grab
WHOLE EFFLUENT TOXICITY[2]	TU_c	Effluent	Quarterly (4/year)[3]	24-hour composite

NOTES:

1 Monitoring required only when chlorination/dechlorination chemicals are used upstream of the filters or in the filter backwash system.

2 Applicable when biotreatment is conducted upstream of the filters or when chlorination/dechlorination agents are used upstream of the filters or in the filter backwash system.

3 Sampling frequency will be reduced from quarterly to annually, if after the first full year of testing or after the first four WET tests indicate that no toxic effects were seen. If subsequent annual tests indicate a toxic effect, then testing would revert back to the quarterly testing requirement.

Four clarifying agents (Nalco 7607, 7768, 3332, and Chemlink 4835) are specifically approved in the previous permit for use at the Kuparuk STP at applications of no more than 1 part per million (ppm). This requirement is not retained under the reissued permit. Rather, the permittee is required to report the type of clarifying agents used and the volumes of water treated in the monthly Discharge Monitoring Reports (DMRs).

Sampling of bypass and upset. The proposed permit requires sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if such a discharge could cause a violation of an effluent limit.

C. MINIMUM DETECTION LEVELS

Water quality-based effluent limits (WQBELs) from the current permit have been incorporated into the draft permit to protect State water quality standards. The WQBEL for total residual chlorine falls below the capability of current analytical technology to detect and/or quantify the parameter. In order to determine compliance with the limit for total residual chlorine, EPA is establishing the minimum level (ML) as the quantification level for use in laboratory analysis.

EPA believes that the use of the ML as an analytical chemistry performance standard provides an unambiguous and rational means to demonstrate that the best chemistry available at the time of permit issuance is being used.

The ML is defined as the lowest concentration that gives recognizable signals and an acceptable calibration point. It is the equivalent concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes and processing steps have been followed. MLs are analyte- and method-specific and are established during the development and validation of the method.

D. SURFACE WATER MONITORING

Surface water monitoring may be required to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results to EPA.

E. WHOLE EFFLUENT TOXICITY (WET) TESTING

EPA is requiring the permittee to conduct quarterly (i.e., four times per year, every three months) short-term chronic toxicity tests on effluent samples from Outfall 001 during quarters when biocides and/or chlorination/dechlorination chemicals are used. No toxicity testing is required during quarters when no biocides or chlorination/dechorination chemicals are used. Since the use of chlorinating chemicals is the trigger for the WET testing requirements in the permit, ADEC has indicated it would authorize the same dilution mixing zone for chronic TRC and WET. Thus, the WET chronic toxicity trigger is 13.3 TU_C, resulting in a receiving water concentration (RWC) of 7.5%.

VII. OTHER PERMIT CONDITIONS

A. BEST MANAGEMENT PRACTICES PLAN (BMP)

The CWA and federal regulations authorize EPA to require *best management practices* (BMPs) in NPDES permits. See 40 C.F.R. § 122.44(k). BMPs are measures for controlling the generation of pollutants and their release to waterways. For many facilities, these measures are typically included in the facility Operation & Maintenance (O&M) plans. BMPs are important tools for waste minimization and pollution prevention. EPA encourages facilities to

incorporate BMPs into their O&M plans and to revise them as new practices are developed. The permittee has promoted their control of pollutant discharges through the use of BMP plans in the past and will continue these practices into the future. The proposed permit requires the permittee to submit to EPA and ADEC, within 90 days of the effective date of the permit, a letter certifying that a BMP plan has been developed or updated and is being implemented at the Kuparuk STP.

B. QUALITY ASSURANCE PLAN (QAP)

Federal regulations at 40 C.F.R. § 122.41(e) require permittees to properly operate and maintain their facilities, including "adequate laboratory controls and appropriate quality assurance procedures." To implement this requirement, the draft permit requires that the permittee develop or update a Quality Assurance Plan (QAP) to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The QAP must include standard operating procedures that the permittee must follow for collecting, handling, storing, and shipping samples, for laboratory analysis, and for data reporting. The proposed permit requires the permittee to submit to EPA and ADEC, within 90 days of the effective date of the permit, a letter certifying that the QAP has been developed or updated and is being implemented.

C. BASIS FOR ANNUAL REPORT

The proposed permit requires the permittee to submit an annual report summarizing the monthly use of biocides and/or chlorination/dechlorination chemicals that are being used upstream of the filters or in the filter backwash system. The annual report must contain the type and quantity of chemicals used. The annual report must also include effluent monitoring data and report any and each permit violation, upset condition, by-pass condition, plant or process change, and corrective action(s) undertaken to improve wastewater treatment and pollution prevention at the facility. The annual report must provide a comprehensive record of wastewater discharge at the facility and must include an electronic spreadsheet containing all historical data beginning with the effective date of this permit, as well as a comparison of monitoring results over time (to show any trends). The annual report must cover the entire calendar year that precedes the March DMR to EPA. The annual report must be submitted to EPA with the March DMR.r. See 40 C.F.R. §§ 122.41 ("Conditions applicable to all permits"), 122.44(i) ("Monitoring requirements"), and 122.48 ("Requirements for recording and reporting of monitoring results").

D. ADDITIONAL PERMIT PROVISIONS

In addition to facility-specific requirements, most of sections II, III, IV, and V of the draft permit contain standard regulatory language. Standard regulatory language applies to all permittees and must be included in NPDES permits. Because they are regulations, standard regulatory language cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers

requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. OTHER LEGAL REQUIREMENTS

A. STATE WATER QUALITY STANDARDS AND CERTIFICATION

Section 401 of the CWA requires EPA to seek State certification before issuing a final permit. As a result of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with State water quality standards or other applicable State law requirements. EPA obtained ADEC's draft certification on October 22, 2010. The draft certification contained authorization for a 100-meter mixing zone, which EPA has included in the proposed permit.

In accordance with 40 CFR §124.10(c)(1), public notice of the draft permit has been provided to the State agencies having jurisdiction over fish, shellfish and wildlife resources, and over coastal zone management plans.

B. ENDANGERED SPECIES ACT

Pursuant to 40 C.F.R. § 122.49(c), the following effect determinations are made based on the Biological Evaluation (BE) EPA developed to assist with consultations with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) for the proposed permit action in accordance with the Endangered Species Act (ESA) Section 7.

Species	ESA Status	Jurisdictional Agency	Critical Habitat	Effect Determinations
Bowhead Whale *(Balaena mysticetus)*	Threatened	NMFS	No	***MA/ NLAA***[1]
Polar Bear *(Ursus maritimus*)	Threatened	USFWS	Proposed	***MA/ NLAA***[1]
Spectacled eider (*Somateria fischeri*)	Threatened	USFWS	Designated	***MA/ NLAA***[1]
Steller's eider (*Polysticta stelleri*)	Threatened	USFWS	Designated	***MA/ NLAA***[1]
Yellow-billed Loon *(Gavia adamsii)*	Candidate	USFWS	No	***MA/ NLAA***[1]
Kittlitz's murrelet *(Brachyramphus brevirostris)*	Candidate	USFWS	No	***No Effect***

[1] May affect, but are not likely to adversely affect

EPA is requesting concurrence from USFWS and NMFS on the determinations and will consider their comments in the final permit decisions.

C. ESSENTIAL FISH HABITAT

Under the Magnuson-Stevens Fishery Conservation and Management Act, NMFS and various fisheries management councils must identify and protect "essential fish habitat" for species managed under the Act. EPA tentatively has determined that reissuance of this NPDES permit will **not adversely affect** on essential fish habitat. Any comments received from the NMFS regarding EPA's finding will be considered prior to reissuance of the final permit.

D. COASTAL ZONE MANAGEMENT ACT

The permittee has certified that the activities authorized by the draft permit are consistent with the Alaska Coastal Management Plan (ACMP). Pursuant to 40 C.F.R. § 122.49(d), requirements for State coastal zone management review and approval must be satisfied before the permit may be issued. On July 22, 2010, the Alaska Department of Natural Resources (ADNR) Division of Coastal and Ocean Management (DCOM) determined that the reissuance of the NPDES permit does not require further review for consistency with the Alaska Coastal Management Program (ACMP) since the reissued permit would have no additional effect on coastal uses and resources per 11 AAC 110.820(k)(4).

E. POLLUTION PREVENTION ACT

It is national policy that, whenever feasible, pollution should be prevented or reduced at the source, that pollution which cannot be prevented should be recycled in an environmentally safe manner, and that disposal or release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner. The permittee will discharge at the facility in accordance with best management practices that will address the provisions of the Pollution Prevention Act.

F. OIL SPILL REQUIREMENTS

Section 311 of the Clean Water Act prohibits the discharge of oil and hazardous materials in harmful quantities. Discharges specifically controlled by the draft permit are excluded from the provisions of Section 311 because these discharges are limited to amounts and concentrations which are deemed to be protective of State water quality standards. However, the permit does not preclude federal enforcement of or relieve the permittee from any responsibilities, liabilities, or penalties for other unauthorized discharges of toxic pollutants under Section 311 of the Act.

IX. MODIFICATION OF PERMIT LIMITS OR OTHER CONDITIONS

When EPA receives information that demonstrates the existence of reasonable cause to modify a permit in accordance with 40 C.F.R. § 122.62(a), EPA may modify the permit. "Reasonable cause" includes alterations or additions to the facility or activity, new

federal regulations or standards, new state water quality standards, the completion or modification of total maximum daily loads or wasteload allocations for the receiving water of the facility (see 40 C.F.R. § 122.44(d)(1)(vii)(B)), failure of the permit to protect state water quality standards, a change in a permittee's qualification for net limits, any relevant compliance schedule, the need to incorporate or revise a pretreatment or land application plan, when pollutants which are not limited in the permit exceed the level which can be achieved by technology-based treatment, the correction of technical mistakes and legal misinterpretations of law made in determining permit conditions, and the receipt of new information relevant to the determination of permit conditions. Minor modifications to a permit may be made by EPA with the consent of a permittee in order to correct typographical errors, change an interim compliance schedule, allow for a change in ownership, change a construction schedule, or delete an outfall. Pursuant to 40 C.F.R. § 122.63, minor modifications may be made without public notice and review.

X. PERMIT EXPIRATION

The permit will expire five years from its effective date. In accordance with 40 C.F.R. § 122.6(a), the conditions of an expired permit continue in force under 5 U.S.C. § 558(c) until the effective date of a new permit, when a permittee submits an application for permit reissuance 180 days before the expiration of the permit. Permits that are continued remain fully effective and enforceable.

XI. LIST OF ACRONYMS AND DEFINITIONS

§ means section or subsection.

AAC means Alaska Administrative Code.

ACMP means Alaska Coastal Management Program.

ADEC means Alaska Department of Environmental Conservation.

ADNR means Alaska Department of Natural Resources.

Average monthly discharge means the average of "daily discharges" over a monitoring month, calculated as the sum of all daily discharges measured during a monitoring month divided by the number of daily discharges measured during that month. It may also be referred to as the "monthly average discharge."

AWQS means Alaska Water Quality Standards.

BE means Biological Evaluation.

Best management practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

ºC means degrees Celsius.

CPAI means ConocoPhillips Alaska, Inc.

C.F.R. means Code of Federal Regulations.

CV means coefficient of variation.

CWA means the Clean Water Act, (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92-500, as amended by Public Law 95-217, Public Law 95-576, Public Law 96-483 and Public Law 97-117, 33 U.S.C. 1251 et seq.

Daily discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Daily maximum discharge means the highest allowable "daily discharge" and is also referred to as the "maximum daily discharge."

DCOM means the Alaska Department of Natural Resources Division of Coastal and Ocean Management.

Discharge of a pollutant means any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source" or any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation.

Discharge Monitoring Report (DMR) means the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by "approved States" as well as by EPA.

Effluent limitation means any restriction imposed by the Director on quantities, discharge rates, and concentrations of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.

EPA means U.S. Environmental Protection Agency.

ESA means the Endangered Species Act.

EFH means Essential Fish Habitat.

^{o}F means degrees Fahrenheit.

Facility or activity means any NPDES "point source" or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under the NPDES program.

gpd means gallons per day.

gpm means gallons per minute.

LTA means longterm average.

Maximum means the highest measured discharge or pollutant in a waste stream during the time period of interest.

Maximum daily discharge limitation means the highest allowable "daily discharge."

MDL means Method Detection Limit.

MGD means million gallons per day.

mg/L means milligrams per liter.

MLRS means marine life return system.

Mixing zone means the zone of dilution authorized by the Alaska Department of Environmental Conservation under 18 AAC 70.240 wherein pollutant concentrations may exceed the criteria of the AWQSs for the proscribed pollutants.

ML means minimum level.

MLLW means mean lower low water.

NMFS means National Marine Fisheries Service.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA.

O&M means Operation and Maintenance.

OWW means EPA Region 10's Office of Water and Watersheds.

Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

QAP means Quality Assurance Plan.

RWC means receiving water concentration, which is the inverse of the dilution factor.

SIP means seawater injection pumps.

STP means seawater treatment plant.

Technology-based limit means a permit limit or condition based upon EPA's technology-based effluent limitation guidelines or EPA's best professional judgment.

TRC means Total Residual Chlorine.

TSD means Technical Support Document.

USFWS means U.S. Fish and Wildlife Service.

µg/L means micrograms per liter.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Waterflood means the process designed to maintain field pressure and enhance recovery of hydrocarbons from the oil-bearing zone of a reservoir, thereby extending the yield and

useful life of the field. Waterflooding discharges typically include strainer and filter backwash water.

Water quality-based effluent limit (WQBEL) means a permit limit derived from a state water quality standard or an appropriate national water quality criteria.

WET means Whole Effluent Toxicity.

WLA means wasteload allocation.

WQBEL means water-quality-based effluent limitation.

XII. REFERENCES

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USEPA, 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water, Washington, D.C. EPA/505/2-90-001, 1991.

APPENDIX A. MAP

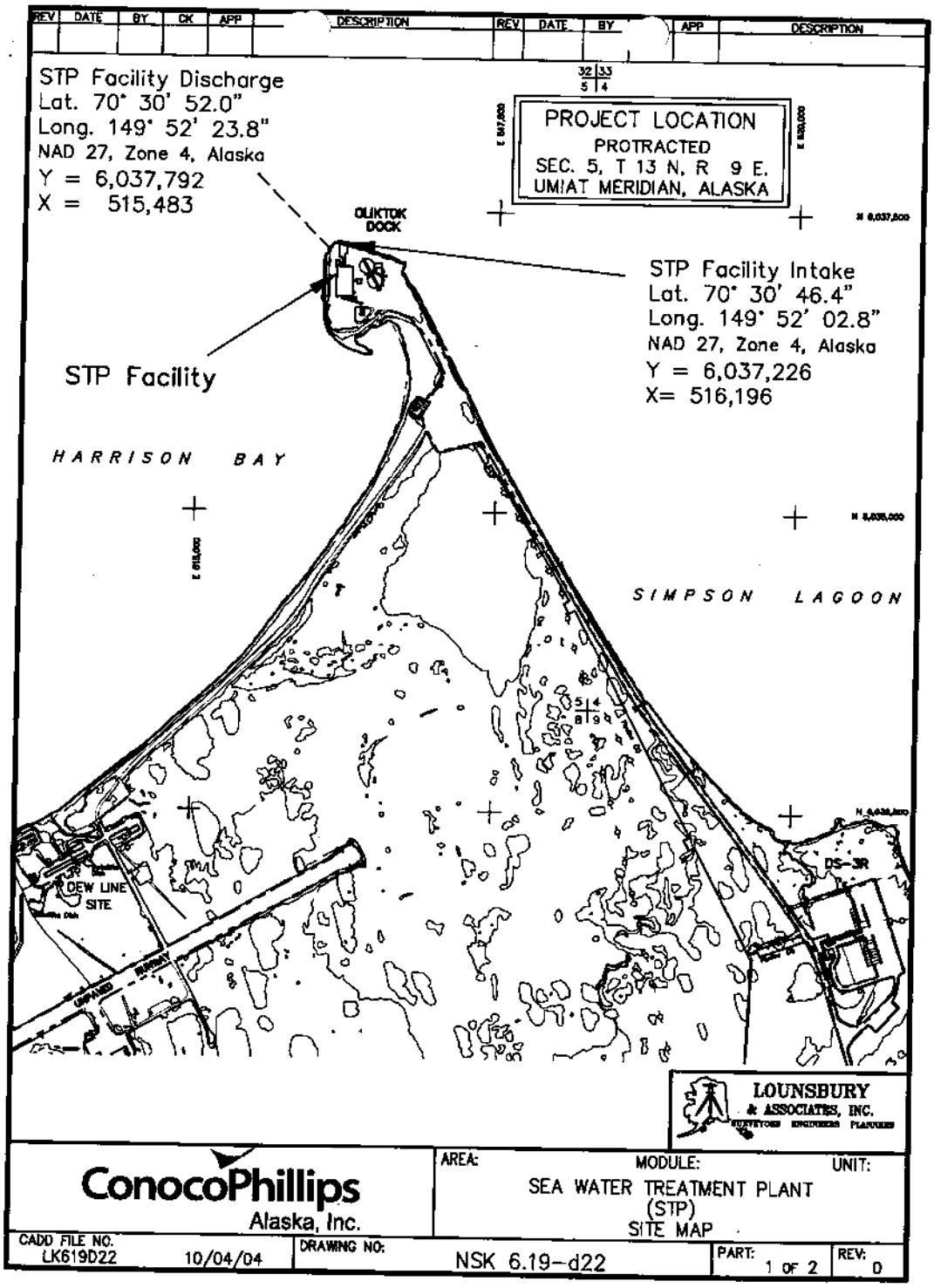

FIGURE A-1: ***Location of the CPAI Kuparuk Seawater Treatment Facility.***

APPENDIX B. BASIS FOR WATER QUALITY BASED EFFLUENT LIMITATIONS

TABLE B-1: *Applicable Alaska Water Quality Standards*			
DISCHARGE	**POLLUTANT PARAMETER**	**CRITERIA**	
		Aquatic Acute	**Aquatic Chronic**
001	Total Residual Chlorine	13.0 µg/L	7.5 µg/L
001, 002	pH	6.5 - 8.5[1]	
001	Temperature	not to exceed 15ºC or cause the weekly average to increase by more than 1ºC	
Footnotes: [1] May not vary more than 0.1 pH unit from natural conditions.			

In addition to the numeric criteria, above, the most stringent narrative criteria based on the beneficial uses for the Beaufort Sea and Simpson Lagoon are summarized in the following paragraphs:

1. Residues. Floating solids, debris, sludge, deposits, foam, scum, or other residues may not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause acute or chronic problem levels as determined by bioassay or other appropriate methods; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.
2. Odor or Taste to Fish or Aquatic Organisms. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms based on bioassay or organoleptic tests.

A. REASONABLE POTENTIAL EVALUATION

1. Determination of Reasonable Potential

To determine if there is "reasonable potential" to cause or contribute to an exceedance of water quality criteria for a given pollutant (and therefore whether a water quality-based effluent limit is needed), for each pollutant present in a discharge, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is "reasonable potential," and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the TSD (EPA, 1991) to conduct this "reasonable potential" analysis.

2. Reasonable Potential Evaluation Procedure with Numeric Criteria

a. Because the effluent discharges are to a marine environment, the appropriate steady-state mixing model to calculate the minimum dilution at critical conditions is:

$$C_d \times V_d = (C_e \times V_e) + (C_u \times V_d),$$

where, C_d is the projected receiving water concentration, V_d is the volume of the receiving water used for mixing (i.e., the mixing zone dilution), C_e is the maximum effluent concentration, V_e is the estimated volume of effluent discharged, and C_u is the existing receiving water concentration prior to effluent discharge.

For a 1:1 dilution, C_d should be 50% of C_e or $C_d = C_e/2$, resulting in a mass balance equation of:

$$C_d \text{ x } (V_d + V_e) = (C_e \text{ x } V_e) + (C_u \text{ x } V_d), \text{ or}$$

$$C_d = \frac{(C_e \times V_e) + (C_u \times V_d)}{V_d + V_e}$$

where the ratio of the effluent volume to the receiving water volume ($V_e \div V_d$) is the dilution ratio. The dilution ratio is determined from computer modeling performed by the applicant and confirmed by ADEC.

If C_u is equal to 0, the equation becomes:

$$C_d = \frac{C_e \times V_e}{V_d + V_e}$$

b. The criterion is then compared to the maximum projected receiving water concentration to determine the need for a water-quality-based effluent limitation (WQBEL). If the projected receiving water concentration is equal to or greater than the criterion, then a WQBEL for that pollutant must be incorporated into the permit.

3. Reasonable Potential Evaluation Procedure with Narrative Criteria.

EPA must establish levels that are protective of the narrative criteria (40 CFR 122.44(d)(1)(vi)) in the absence of State numeric criteria and when there is reasonable potential for the discharge to cause or contribute to an excursion that results in the violation of the narrative water quality standard. In order to determine this, EPA must use the best information available to characterize the conditions of the receiving water body and the point source discharge (effluent).

4. Reasonable Potential Analysis for Total Residual Chlorine.

When determining the projected receiving water concentration, the TSD recommends using the maximum projected effluent concentration. To

determine the maximum projected effluent concentration (C_e), EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) (standard deviation/mean) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for a parameter has been calculated, the reasonable potential multiplier used to derive the maximum projected effluent concentration (C_e) can be calculated using the method provided in Section 3.3.2 of EPA's TSD. The maximum projected concentration (C_e) for the effluent is equal to the highest observed value of the data set multiplied by the reasonable potential multiplier.

B. WATER QUALITY-BASED PERMIT LIMIT DERIVATION

In the event that EPA determines a water quality-based limit is required for a pollutant, the first step in developing the permit limit is development of a wasteload allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that may be discharged without causing or contributing to an exceedence of water quality standards in the receiving water. The WLAs and permit limits are derived based on guidance in the TSD (EPA, 1991). The WLAs are then converted to long-term average concentrations (LTAs) and compared. The most stringent LTA concentration for each parameter is converted to effluent limits.

1. Total Residual Chlorine

The Alaska water quality standard for chlorine for protection of aquatic life in marine water is 7.5 µg/L as a four-day average and 13 µg/L as a one-hour average.

Reasonable potential calculations were not performed for the Kuparuk STP. The monitoring data received from Kuparuk STP indicated that no chlorine was detected in their discharge and, consequently, there is no reason to perform a reasonable potential calculation as the maximum effluent concentration (Ce), and the resulting projected receiving water concentration (Cd), would both be zero. Therefore, the Kuparuk STP is considered to not have a reasonable potential to exceed the water quality criterion for chlorine.

2. pH

The draft permit incorporates the pH range of 6.0 to 9.0 standard units.

3. Residues

The draft permit prohibits any discharge of floating solids, debris, sludge, deposits, foam, scum, or other residues of any kind in concentrations causing nuisance, objectionable, or detrimental conditions or that make the water unfit or unsafe for the use.