

**OCEAN DISCHARGE CRITERIA EVALUATION
FOR THE ISSUANCE OF A NATIONAL POLLUTANT DISCHARGE
ELIMINATION SYSTEM PERMIT FOR THE
UNITED STATES NAVY ARCTIC ICE CAMP
IN FEDERAL WATERS OF THE BEAUFORT SEA, ALASKA**

(NPDES PERMIT NO.: AK-005378-3)



December, 2015

Prepared by:

U.S. Environmental Protection Agency
Region 10
Seattle, Washington

This page was intentionally left blank.

TABLE OF CONTENTS

1. INTRODUCTION..... 1-4

 1.1. Area of Coverage..... 1-4

 1.2. Description of Proposed Discharges..... 1-5

 1.2.1. Graywater..... 1-5

 1.2.2. Desalination/Reverse Osmosis Reject Water..... 1-6

 1.3. Estimated Discharge Volumes..... 1-6

 1.4. Proposed Permit Requirements..... 1-6

 1.4.1. Graywater (Outfall 001)..... 1-7

 1.4.2. Reverse Osmosis Reject Water (Outfall 002)..... 1-7

2. SCOPE OF ANALYSIS 2-8

3. DESCRIPTION OF THE EXISTING PHYSICAL ENVIRONMENT 3-1

 3.1. Weather..... 3-1

 3.1.1. Air Temperature..... 3-1

 3.1.2. Winds 3-1

 3.1.3. Circulation and Currents 3-1

 3.1.4. Water Temperature and Salinity 3-2

 3.2. Ice 3-2

 3.2.1. Pack Ice Zone..... 3-2

4. DETERMINATION OF UNREASONABLE DEGRADATION 4-1

 4.1. Criterion 1..... 4-1

 4.2. Criterion 2..... 4-1

 4.3. Criterion 3..... 4-2

 4.4. Criterion 4..... 4-2

 4.5. Criterion 5..... 4-3

 4.6. Criterion 6..... 4-3

 4.7. Criterion 7..... 4-3

 4.8. Criterion 8..... 4-3

 4.9. Criterion 9..... 4-3

 4.10. Criterion 10..... 4-4

5. BIBLIOGRAPHY 4-5

LIST OF FIGURES

FIGURE 1: <i>AREA OF COVERAGE FOR THE U.S. NAVY ARCTIC ICE CAMP NPDES PERMIT.</i>	1-5
FIGURE 2: <i>MAJOR WATER-MASS FLOWS IN THE CHUKCHI AND BEAUFORT SEAS (SOURCE: IMS, 2010).</i>	3-2

LIST OF TABLES

TABLE 1: <i>ESTIMATED DISCHARGE VOLUMES PROVIDED BY THE U.S. NAVY IN ITS NPDES PERMIT APPLICATION (US NAVY, 2015A AND 2015B).</i>	1-6
TABLE 2: <i>GRAYWATER EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (OUTFALL 001).</i>	1-7
TABLE 3: <i>REVERSE OSMOSIS REJECT WATER EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (OUTFALL 002).</i>	1-8

ABBREVIATIONS AND ACRONYMS

BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BE	Biological Evaluation
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
CWA	Clean Water Act
ELG	effluent limitation guidelines
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
MMS	Minerals Management Service
NAIC	Navy Arctic Ice Camp
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OCS	Outer Continental Shelf
ODCE	Ocean Discharge Criteria Evaluation
RO	Reverse Osmosis
TSS	total suspended solids
USFWS	U.S. Fish and Wildlife Service

UNITS

µg/g	micrograms per gram
µg/L	micrograms per liter
°C	degrees Celsius
°F	degrees Fahrenheit
cm	centimeters
cm/s	centimeters per second
ft	feet
ft/sec	feet per second
g	grams
gal	gallons
gal/day	gallons per day
h	hour
in	inches
km	kilometers
m	meters
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mi	miles
mm	millimeter
m/s	meters per second
nmi	nautical miles
ppm	parts per million
ppt	parts per thousand

1. INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region 10, proposes to issue a National Pollutant Discharge Elimination System (NPDES) permit for discharges of graywater and reverse osmosis (RO) reject water associated with a temporary Arctic Ice Camp (“the facility”) operated by the United States Navy (“U.S. Navy”) in federal waters of the Beaufort Sea (see Figure 1). The U.S. Navy will operate the facility approximately every other year, beginning in the winter of 2016.

The facility will be constructed on an ice floe located approximately 100-200 nautical miles (115-230 statute miles) north of Deadhorse, Alaska, and will be operated for a six-week period from late February to early April. The ice camp provides support for a variety of submarine training and testing operations, and research activities. Once constructed, the ice camp typically consists of approximately 15 to 20 buildings (housing/sleeping quarters, dining facility, a power house, command hut), a runway, and a heliport. The completed ice camp, including the runway, is approximately one mile in diameter. The estimated camp population will be an average of 48 people with a maximum population of 65 people over two separate two-day periods. During facility build-up and demobilization the population will consist of 15 people. At the end of the six-week period, the entire facility is demobilized and removed from the ice floe, including all construction materials, solid waste, hazardous waste, and sanitary waste.

Section 403(c) of the Clean Water Act (CWA) requires that NPDES permits for discharges into marine waters of the territorial seas, the contiguous zone and the oceans comply with EPA’s Ocean Discharge Criteria. The purpose of this Ocean Discharge Criteria Evaluation (ODCE) is to evaluate the discharges proposed to be authorized by EPA under the U.S. Navy Arctic Ice Camp NPDES permit (Permit No. AK-005378-3) and assess the potential for the discharges to cause unreasonable degradation of the marine environment.

1.1. AREA OF COVERAGE

The Area of Coverage for the U.S. Navy Arctic Ice Camp NPDES permit includes federal waters of the Beaufort Sea located approximately 100-200 nautical miles north of Deadhorse, Alaska. The exact location of the ice camp cannot be predicted in advance as it will depend upon ice conditions at the start of the season. The location will also change over the course of the season as the ice floe, on which the camp is built, drifts. As such, based on the quadrant data provided by the U.S. Navy, EPA calculated the extent of the Area of Coverage to be approximately 18,000 acres in size, which also accommodates for drifting of the ice camp (see Figure 1).

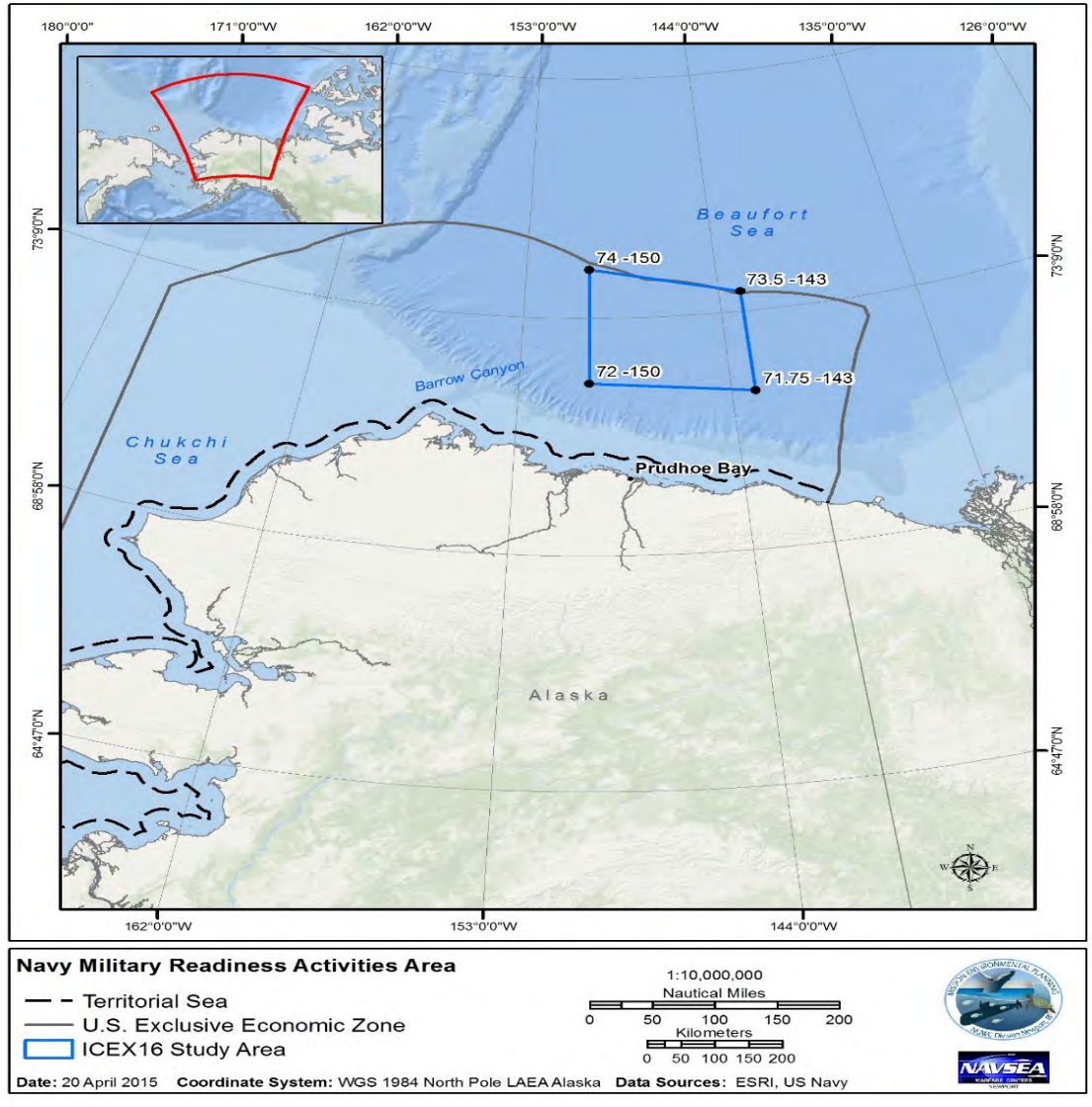


FIGURE 1: Area of Coverage for the U.S. Navy Arctic Ice Camp NPDES Permit.

1.2. DESCRIPTION OF PROPOSED DISCHARGES

1.2.1. Graywater

Dining facility operations include food preparation and dishwashing. Prior to use, dishwashing water will be heated using an on-demand propane water heater. Water made available to camp personnel for consumption will be imbibed as is or used with powdered drink mixes, coffee, oatmeal, and other food products. Dishwashing will involve the use of a biodegradable, chlorine and phosphate-free detergents.

Wastewater generated during food preparation and dishwashing will be discharged to the Beaufort Sea via a single drain in the camp’s dining facility. The drain consists of a corrugated pipe wrapped in electric heat tape to prevent the pipe from freezing. The drain will utilize a removable metal screen to capture solid debris in the wastewater prior to discharge. The metal screen will have a mesh size of no greater than 1/16 inch. Solids captured in the screen will be disposed of via the camp’s solid waste containers

and brought back to Deadhorse for disposal. The facility’s best management policy is to reduce wastewater solids, therefore camp personnel will be directed to scrape dishes clean of any solids prior to turning them in for washing.

1.2.2. Desalination/Reverse Osmosis Reject Water

Freshwater will be generated at the facility via ice mining of multi-year sea ice that has naturally become free of salt, and through the desalination of first-year sea ice and/or of seawater using a portable reverse osmosis system. Ice mining and melting of multi-year ice will be the primary means of generating fresh water at the ice camp. Freshwater will be used for food preparation, dishwashing, and for human consumption.

The U.S. Navy intends to test the portable reverse osmosis system to determine if it can function in the Arctic environment. If the reverse osmosis system is operationally successful, the process may serve to supplement the freshwater produced from mining of multi-year sea ice. The discharge of reject water from the camp’s portable reverse osmosis system will occur during a four week period during the camp’s six weeks of operation. Treatment chemicals will not be used in the desalination process and the reject water is expected to have a salt concentration approximately three times that of the feed seawater.

1.3. ESTIMATED DISCHARGE VOLUMES

The estimated volumes of graywater and RO reject water to be discharged, including average and maximum daily volumes, maximum per season, and during the five-year permit term are developed by EPA based on information provided by the U.S. Navy in its NPDES Permit Application. The estimated volumes are summarized below in Table 1.

TABLE 1: *Estimated discharge volumes provided by the U.S. Navy in its NPDES Permit Application (US Navy, 2015a and 2015b).*

DISCHARGE	AVERAGE DAILY DISCHARGE VOLUME (gpd ¹)	MAXIMUM DAILY DISCHARGE VOLUME (gpd ¹)	TOTAL MAXIMUM DISCHARGE VOLUME ² PER SEASON (gal ¹)	TOTAL MAXIMUM DISCHARGE DURING 5 YEAR PERMIT TERM ³ (gal ¹)
GRAYWATER	100	300	6,300	18,900
RO REJECT WATER	144	288	8,064	24,192

- NOTES:**
- ¹ Units: *gpd* means gallons per day; *gal* means gallons.
 - ² Based on a six-week operating season.
 - ³ Arctic ice camp activities are anticipated to occur three times between 2016 and 2021.

The maximum RO reject water volumes shown in Table 1 reflect the system being operated 24 hours/day for four weeks. Discharge volumes are approximated due to uncertainty regarding parameters such as temperature and conductivity and how they will effect system performance. The estimated average reject water production of 144 gallons/day (50% of the maximum) is based on the RO unit not being operated continuously for 24 hours/day due to downtime associated with system maintenance and adjustments. In addition, the RO system will not be used during the camp build-up and demobilization periods.

1.4. PROPOSED PERMIT REQUIREMENTS

The proposed permit includes effluent limitations and monitoring requirements for the two proposed discharges, graywater and RO reject water, and are summarized below in Tables 2 and 3, respectively.

The permit also includes other requirements, such as reporting requirements and best management practices, to (1) prevent or minimize the generation and the potential for the release of pollutants from the facility to waters of the United States through normal operation and ancillary activities; and (2) ensure that methods of pollution prevention, control, and treatment will be applied to all wastes.

1.4.1. Graywater (Outfall 001)

The permit requires use of phosphate-free and minimally-toxic soaps and detergents for any purpose if graywater is discharged. Soaps and detergents must be free from toxic or bioaccumulative compounds. Additionally, the permit prohibits the discharging of kitchen oils through Outfall 001

TABLE 2: Graywater Effluent Limitations and Monitoring Requirements (Outfall 001).

PARAMETER	EFFLUENT LIMITATIONS	SAMPLING FREQUENCY ¹	SAMPLE TYPE	REPORTED VALUES ⁶
Flow	--	Daily	Estimate ⁵ or Meter	Average Weekly and Maximum Daily; <i>gpd</i>
pH	--	Weekly	Grab	Minimum and Maximum Values; <i>s.u.</i>
Total Suspended Solids (TSS)	--	Twice per year ^{2,3}	Grab	<i>mg/L</i>
Biological Oxygen Demand (BOD ₅)	--	Twice per year ^{2,4}	Grab	<i>mg/L</i>
Oil and Grease	No Discharge	Daily	Observation	<i>Report⁷</i>
		When visual sheen observed	Grab	Average Monthly and Maximum Daily; <i>mg/L</i>
Floating Solids	No Discharge	Daily	Observation	<i>Report⁷</i>
Foam	No Discharge	Daily	Observation	<i>Report⁷</i>
Garbage	No Discharge	Daily	Observation	<i>Report⁷</i>
Oily Sheen	No Discharge	Daily	Observation	<i>Report⁷</i>

NOTES: ¹ Required during periods of discharge.

² The Permittee must monitor TSS and BOD₅ no less than twice (2) per year and may cease monitoring if a total of five (5) samples do not exceed numeric monitoring triggers for the respective parameters. The Permittee may collect and analyze all five samples during one operation season. All samples must be collected during maximum occupancy at the facility and during periods of maximum discharge. See Footnotes 3 and 4.

³ The numeric monitoring trigger for TSS is 298 mg/L. If there is no exceedance of this value for a total of five (5) samples, then the Permittee may cease TSS monitoring for the duration of the permit term.

⁴ The numeric monitoring trigger for BOD₅ is 914 mg/L. If there is no exceedance of this value for a total of five (5) samples, then the Permittee may cease BOD₅ monitoring for the duration of the permit term.

⁵ Any estimation of effluent flow must include a narrative discussion of how the estimate is derived and a description of the procedures in the QAP (Permit Part II.B.).

⁶ Refer to Permit Part I.B.2.

⁷ The daily observations must occur during periods of maximum discharge.

1.4.2. Reverse Osmosis Reject Water (Outfall 002)

The permit requires monitoring of the RO reject water discharges from Outfall 002 as specified in Table 3.

TABLE 3: Reverse Osmosis Reject Water Effluent Limitations and Monitoring Requirements (Outfall 002).			
PARAMETER	SAMPLING METHOD	FREQUENCY¹	REPORTED VALUES³
Flow	Estimate ² or Meter	Daily	Average Weekly and Maximum Daily; <i>gpd</i>
pH	Meter	Weekly	Maximum and Minimum; <i>s.u.</i>

NOTE: ¹ Required during periods of discharge.
² Any estimation of effluent flow must include a narrative discussion of how the estimate is derived and a description of the procedures in the QAP (Permit Part II.B.).
³ See Permit Part I.B.2.

2. SCOPE OF ANALYSIS

This ODCE evaluates two waste streams EPA proposes to authorize under the U.S. Navy Arctic Ice Camp NPDES permit. EPA's Ocean Discharge Criteria (Title 40 of the *Code of Federal Regulations* (CFR) Part 125, Subpart M) set forth specific determinations that must be made before permit issuance to ensure that the discharges would not cause an unreasonable degradation of the marine environment.

Unreasonable degradation of the marine environment is defined (40 CFR 125.121[e]) as follows:

- Significant adverse changes in ecosystem diversity, productivity, and stability of the biological community within the area of discharge and surrounding biological communities;
- Threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms; or
- Loss of aesthetic, recreational, scientific, or economic values, which are unreasonable in relation to the benefit derived from the discharge.

This ODCE is based on 10 criteria (40 CFR 125.122):

- Quantities, composition, and potential for bioaccumulation or persistence of the pollutants to be discharged;
- Potential transport of such pollutants by biological, physical, or chemical processes;
- Composition and vulnerability of the biological communities which may be exposed to such pollutants, including the presence of unique species or communities of species, the presence of species identified as endangered or threatened pursuant to the Endangered Species Act, or the presence of those species critical to the structure or function of the ecosystem, such as those important for the food chain;
- Importance of the receiving water area to the surrounding biological community, including the presence of spawning sites, nursery/forage areas, migratory pathways, or areas necessary for other functions or critical stages in the life cycle of an organism;

-
- Existence of special aquatic sites including, but not limited to, marine sanctuaries and refuges, parks, national and historic monuments, national seashores, wilderness areas, and coral reefs;
 - Potential impacts on human health through direct and indirect pathways;
 - Existing or potential recreational and commercial fishing, including finfishing and shellfishing;
 - Any applicable requirements of an approved Coastal Zone Management Plan;
 - Other factors relating to the effects of the discharge as may be appropriate; and
 - Marine water quality criteria developed pursuant to CWA section 304(a)(1).

If the Regional Administrator determines that the discharge will not cause unreasonable degradation of the marine environment, a NPDES permit may be issued. If the Regional Administrator determines that the discharge will cause unreasonable degradation of the marine environment, a NPDES permit may not be issued.

If the Regional Administrator has insufficient information to determine, prior to permit issuance, that there will be no unreasonable degradation of the marine environment, an NPDES permit may not be issued unless the Regional Administrator, on the basis of best available information, determines that: (1) such discharge will not cause irreparable harm to the marine environment during the period in which monitoring will take place; (2) there are no reasonable alternatives to the on-site disposal of these materials; and (3) the discharge will be in compliance with certain specified permit conditions (40 CFR 125.122). “Irreparable harm” is defined as “significant undesirable effects occurring after the date of permit issuance which will not be reversed after cessation or modification of the discharge” (40 CFR 125.122[a]).

EPA’s evaluation of each of the 10 criteria is presented in Section 4.

3. DESCRIPTION OF THE EXISTING PHYSICAL ENVIRONMENT

3.1. WEATHER

The Area of Coverage is in the Arctic climate zone. The Arctic climate is characterized by high spatial variability and affected by the extreme solar radiation conditions of high latitudes. Important weather conditions that could affect the discharges proposed to be authorized by the permit include air temperature as well as wind speed and direction. Wind speed and direction in turn can affect ice floe drift rate and direction. The following sections describe the physical setting within the Area of Coverage.

3.1.1. Air Temperature

In the Beaufort Sea, the air temperatures are below freezing the majority of the year. Average minimum temperatures are lowest in February at -25 °F (NMFS 2011). Temperature data collected by the Applied Physics Laboratory (APL) during its operations of the winter ice camps in 1988 and 1990 indicated ranges from – 36 °F to 32 °F (APL 1989a and 1990b).

3.1.2. Winds

Observed wind directions over the area are seasonally variable and range from an average summer flow of 8.0 to 11.4 miles per hour (mph) from the south and southwest to a winter flow, which averages 8.0 to 17.3 mph from the east and southeast (Weingartner et al. 2009).

Wind speed and direction data from APL ice camps during the 1986, 1988, and 1990 seasons indicate they are highly correlated, suggesting that floe drift is mainly wind driven (APL 1987, 1989a, 1990b).

3.1.3. Circulation and Currents

Circulation in the Beaufort Sea offshore waters are primarily influenced by the large-scale Arctic circulation known as the Beaufort Gyre, which is driven by large atmospheric pressure fields. In the Beaufort Gyre, water moves to the west in a clockwise motion at a mean rate of 5–10 cm per second. The Beaufort Gyre expands and contracts, depending on the state of the Arctic Oscillation (Steele et al. 2004 as cited in MMS 2008). Below the surface flow of the Beaufort Gyre, the mean flow of the Atlantic layer (centered at 500 m) is counterclockwise in the Canada Basin. Below the polar mixed layer, currents appear to be driven primarily by ocean circulation rather than the winds (Aagaard, Pease, and Salo 1988 as cited in MMS 2008).

Pickart (2004) documents the presence of the Beaufort shelfbreak, a narrow eastward current that carries much of the outflowing water from the Chukchi Sea toward the eastern Canada Basin. Depending on the season, the Beaufort shelfbreak is associated with advection of summer-time Bering water, winter-transformed Bering water or upwelled Atlantic water. Figure 2, below, illustrates the major watermass flows in the Chukchi and Beaufort Seas.

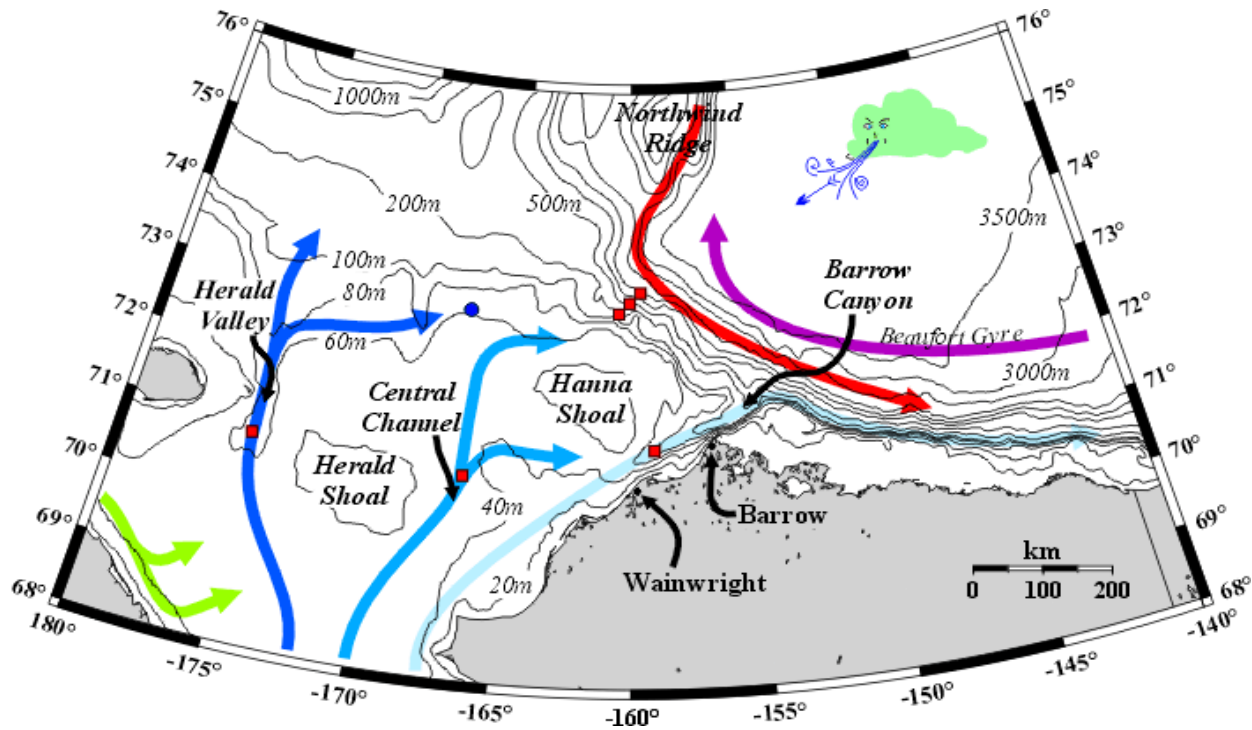


FIGURE 2: Major water-mass flows in the Chukchi and Beaufort Seas (Source: IMS, 2010).

3.1.4. Water Temperature and Salinity

Offshore waters are colder and more saline than the coastal waters. Water temperatures are near 32 °F and have salinities of 32.2 to 33 parts per thousand (ppt) (Lewbel and Gallaway 1984). Similar water temperatures and salinity ranges were also observed during APL field measurements conducted during the ice camps activities in 1986, 1988, and 1990. During the 1986 and 1988 ice camps, salinity measurements ranged from 29.069 ppt to 34.727 ppt, collected at depths ranging from 16 m to 243 m (APL 1987, 1989a). Salinity measurements from the 1990 ice camp ranged from 29.00 ppt near the surface to 34.00 at 700 m (1990b).

3.2. ICE

Sea ice is frozen seawater with most of the salt extruded out that floats on the ocean surface; it forms and melts with the polar seasons. In the Arctic, some sea ice persists year after year. Sea ice in the Arctic appears to play a crucial role in regulating climate because it regulates heat, moisture, and salinity in the polar oceans. Sea ice insulates the relatively warm ocean water from the cold polar atmosphere, except where cracks or leads (areas of open water between large pieces of ice) in the ice allow exchange of heat and water vapor from ocean to atmosphere in winter.

3.2.1. Pack Ice Zone

Pack ice is seaward of the stamukhi ice zone and includes first-year ice, multiyear ice, and ice islands. First-year ice that forms in fractures, leads, and polynyas (large areas of open water) varies in thickness from a few centimeters to more than a meter. Multiyear ice is ice that has lasted one or more melt seasons.

Movement in the pack ice zone in the Area of Coverage is generally small during the winter, moving from east to west in response to the Beaufort Gyre (MMS 2008). Ridges indicate deformed pack ice. In 1986, the APL ice camp was established on 4.3 meters (14 ft) of ice. Ice camps in 1988 and 1990 were established on ice ranging from 1.5 meters (4.9 ft) to 2.4 meters (7.8 ft) (APL 1987, 1989a, 1990b).

4. DETERMINATION OF UNREASONABLE DEGRADATION

The EPA has determined that due to the limited discharge quantities, the remote offshore location and short duration of the ice camp activities, the issuance of the NPDES permit for the U.S. Navy Arctic Ice Camp will not cause an unreasonable degradation to the marine environment. EPA's ocean discharge criteria evaluation, related findings and determinations are discussed in this section.

4.1. CRITERION 1

The quantities, composition, and potential for bioaccumulation or persistence of the pollutants to be discharged.

The proposed permit authorizes two discharges during a six-week period while the U.S. Navy conducts training and testing operations, and research activities at the temporary ice camp. It is estimated that graywater will be discharged at a rate of 100 gallons/day, with an estimated maximum daily flow of 300 gallons/day during periods of food preparation and dishwashing. The estimated total discharge volume per season from the ice camp's dining facility is 6,300 gallons. A 1/16-inch mesh screen will be used to strain solids from the wastewater prior to discharge. As a best management practice, camp personnel will be directed to scrape dishes clean of any solids prior to turning them in for washing. Dishwashing will involve the use of a biodegradable, chlorine and phosphate-free detergent.

The discharge of reject water from the camp's portable reverse osmosis system will occur for a four-week period during the camp's six weeks of operation. Treatment chemicals will not be used in the desalination process and the reject water is expected to have a salt concentration approximately three times that of the feed seawater. The average flow is expected to be 144 gallons/day with a maximum daily flow of 288 gallons/day. The maximum total discharge volume of reject water from the ice camp is 8,064 gallons.

Both discharges do not include pollutants that will bioaccumulate or persist in the environment. The potential pollutants of concern in the graywater include pH, total suspended solids (TSS), biological oxygen demand (BOD₅), and oil and grease. These are considered conventional pollutants and are non-toxic. The permit includes monitoring provisions to ensure they do not cause an unreasonable degradation of the marine environment.

4.2. CRITERION 2

The potential transport of such pollutants by biological, physical, or chemical processes.

Pollutant transfer can occur through biological, physical, or chemical processes. Due to the limited volume of graywater and RO reject water to be discharged, the short-term nature of the activities, and the requirements established by the permit, the transfer of pollutants are not expected to cause an unreasonable degradation of the marine environment.

4.3. CRITERION 3

The composition and vulnerability of the biological communities which may be exposed to such pollutants, including the presence of unique species or communities of species, the presence of species identified as endangered or threatened pursuant to the Endangered Species Act (ESA), or the presence of those species critical to the structure or function of the ecosystem, such as those important for the food chain.

The Endangered Species Act (ESA) requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) if the federal agency's actions could beneficially or adversely affect any threatened or endangered species or their critical habitat. Two threatened and endangered species are expected to occur within the Area of Coverage during the winter months: ringed seals and polar bears. These species live or spend a portion of their lives in the Area of Coverage, and currently, there are no designations of critical habitat areas for these species. While unlikely, the potential exists for the species to interact with the graywater and RO reject water discharges.

Pursuant to 40 C.F.R. § 122.49(c), EPA has made the determination that the proposed permit action is Not Likely to Adversely Affect the ringed seal (Arctic species, *Phoca hispida hispida*). EPA's effect determination is made based on the Informal Consultation Document developed by the Navy in close coordination with EPA. The Informal Consultation Document evaluates the proposed ice camp activities, including the potential effects from the wastewater discharges proposed to be authorized by EPA. The Informal Consultation Document serves as the consultation document with the National Marine Fisheries Service (NMFS) for both agencies under the Endangered Species Act (ESA) Section 7. EPA is requesting concurrence from NMFS on our effect determination.

EPA has made the determination that the proposed discharges will have No Effect on the polar bear (*Ursus naritimus*). EPA's analysis supporting this conclusion is included in the Administrative Record. Polar bear dens are found near shorefast ice and pack ice. Ringed seals are polar bear's primary food source, and areas near ice edges, leads, or polynyas where ocean depth is minimal are the most productive hunting grounds (USFWS 2009). Polar bears are more likely to be encountered if activities were conducted in shallow, nearshore locations in the Beaufort Sea; however, the U.S. Navy has developed a polar bear interaction plan to ensure deterrence measures are in place in the event of an encounter with a polar bear.

4.4. CRITERION 4

The importance of the receiving water area to the surrounding biological community, including the presence of spawning sites, nursery/forage areas, migratory pathways, or areas necessary for other functions or critical stages in the life cycle of an organism.

Since the proposed discharges from the U.S. Navy Arctic Ice Camp occur on a temporary basis to the Beaufort Sea, 100-200 nautical miles (115-230 statute miles) from shore, the presence of spawning sites, nursery/forage areas, migratory pathways, or areas necessary for other functions or critical stages in the life cycle of an organism are not expected to be a concern.

4.5. CRITERION 5

The existence of special aquatic sites including, but not limited to, marine sanctuaries and refuges, parks, national and historic monuments, national seashores, wilderness areas, and coral reefs.

No marine sanctuaries or other special aquatic sites, as defined by 40 CFR 125.122, are in or adjacent to the Area of Coverage.

4.6. CRITERION 6

The potential impacts on human health through direct and indirect pathways.

Human health within the communities on the North Slope communities is directly related to the subsistence activities in the Beaufort Sea. In addition to providing a food source, subsistence activities serve important cultural and social functions for Alaska Natives. Individuals in the communities have expressed concerns related to contaminant exposure through consumption of subsistence foods and other environmental pathways. Concerns have also been expressed over animals swimming through discharge plumes that may contain chemicals.

EPA has determined the proposed discharges will not impact subsistence harvest activities or human health through direct and indirect pathways for the following reasons: (1) The location of the U.S. Navy Arctic Ice Camp activities will be located 100-200 nautical miles (115-230 statute miles) offshore during the winter months on pack ice; (2) The small volumes of graywater and RO reject water discharges will occur on a temporary basis for a short duration; and (3) the monitoring requirements established by the permit are protective of the marine environment.

4.7. CRITERION 7

Existing or potential recreational and commercial fishing, including finfishing and shellfishing.

There are no recreational, commercial or subsistence fishing, finfishing or shellfishing activities within the Area of Coverage.

4.8. CRITERION 8

Any applicable requirements of an approved Coastal Zone Management Plan.

Not applicable.

4.9. CRITERION 9

Such other factors relating to the effects of the discharge as may be appropriate.

EPA has determined that the proposed discharges of graywater and RO reject water will not have disproportionately high and adverse human health or environmental effects with respect to minority or low-income populations living on the North Slope. In making this determination, EPA considered the potential effects of the discharges on the communities, including subsistence areas, the distance from shore, and the receiving marine environment.

4.10. CRITERION 10

Marine water quality criteria developed pursuant to CWA section 304(a)(1).

The U.S. Navy Arctic Ice Camp NPDES permit includes monitoring of graywater for the following parameters: pH, TSS, and BOD₅, and oil and grease if a sheen is observed. Additionally, the permit prohibits the discharge of floating solids, garbage, debris, sludge, deposits, foam, scum or other residues (excluding residual salt from desalination/RO reject water) of any kind. Federal criteria applicable to these parameters include oil and grease. The criterion establishes levels of oils or petrochemicals in the sediment which cause deleterious effects to the biota should not be allowed. In addition, surface waters shall be virtually free from floating nonpetroleum oils of vegetable or animal origin, as well as petroleum-derived oils.

5. BIBLIOGRAPHY

- Aagaard, K., C.H. Pease, and S.A. Salo. 1988. *Beaufort Sea Mesoscale Circulation Study-Preliminary Results*. NOAA Technical Memorandum ERL PMEL 82. Seattle, WA:USDOC, NOAA, PMEL, 171 pp. plus appendices.
- APL. Applied Physics Laboratory. 1987. *Environmental Measurements in the Beaufort Sea, Spring 1986*. Technical Report APL-UW-4-86. University of Washington, Seattle, WA.
- _____. 1989a. *Environmental Measurements in the Beaufort Sea, Spring 1988*. Technical Report APL-UW-TR 8822. University of Washington, Seattle, WA.
- _____. 1990b. *Environmental Measurements in the Beaufort Sea, Spring 1990*. Technical Report APL-UW-TR 9105. University of Washington, Seattle, WA.
- Lewbel, G.S., and Gallaway, B.J. 1984. Transport and fate of spilled oil. In: Proceedings of a Synthesis Meeting: The Barrow Arch Environment and Possible Consequences of Planned Offshore Oil and Gas Development. Girdwood, AK Oct 30-Nov 1 1983. Anchorage, AK. USDOC, NOAA OCSEAP and USDOI, MMS. p. 7-29.
- MMS (Minerals Management Service). 2008. *Beaufort Sea and Chukchi Sea Planning Areas Oil and Gas Lease Sales 209, 212, 217, and 221 Draft Environmental Impact Statement (OCS Report MMS 2008-0055)*. November 2008.
- NMFS (National Marine Fisheries Service). December 2011. *Effects of Oil and Gas Activities in the Arctic Ocean Draft Environmental Impact Statement*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources. December 2011.
- Pickart, R.S. 2004. Shelfbreak Circulation in the Alaskan Beaufort Sea: Mean Structure and Variability. *Journal of Geophysical Research* 109:C04024.
- Steele, M., J. Morrison, W. Ermold, I. Rigor, M. Ortmeier, and K. Shimada. 2004. Circulation of Summer Pacific Halocline Water in the Arctic Ocean. *Journal of Geophysical Research* 109(C02027):DOI 10.1029/2003JC002009.
- USFWS (U.S. Fish and Wildlife Service). 2009. Polar Bear (*Ursus maritimus*) Fact Sheet. USFWS Endangered Species Program. Arlington, VA. October 2009.
- US Navy. 2015a. U.S. Navy Arctic Submarine Laboratory NPDES Permit Application, Form 1 and 2E. Submitted April 21, 2015.
- US Navy. 2015b. U.S. Navy Arctic Submarine Laboratory Revised NPDES Permit Application, Form 2E. Submitted May 19, 2015.
- Weingartner, T.J., S.L. Danielson, J.L. Kasper, and S.R. Okkonen. 2009. *Circulation and water property variations in the nearshore Alaskan Beaufort Sea (1999 – 2007)*. Prepared by the Institute of Marine Science for the U.S. Department of the Interior Minerals Management Service, Alaska OCS Region, Anchorage, AK.