UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

April 5, 2017

NOAA'S National Marine Fisheries Service
Protected Resources Division
55 Great Republic Drive
Gloucester, MA 01930

Attn: Mrs. Kimberly Damon-Randall

Re: Reissuance of National Pollutant Discharge Elimination System (NPDES) Permits for; Bayville, North Haven, Eastport Quoddy Village, Northport Village, Lubec, Stonington, Searsport, and Eastport Maine - Endangered Species Act Correspondence

Dear Mrs. Damon-Randall:

This letter is to request your concurrence that EPA's issuance of eight permits and eight waivers from secondary treatment under Section 301(h) of the Clean Water Act is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat.

**Proposed Action**

The U.S. Environmental Protection Agency, Region I, New England (EPA) is preparing to reissue the NPDES permits to eight publically owned treatment works (POTWs) in Maine. Each of these POTWs has been previously granted a waiver from secondary treatment under the provisions of Section 301(h) of the Clean Water Act. The separate NPDES Permit and Waiver from Secondary Treatment are each federal actions as defined at Section 7(a)(2) of the Endangered Species Act. Although the State of Maine received authorization from the U. S. Environmental Protection Agency (EPA) to administer the NPDES permit program on January 12, 2001, the Clean Water Act does not allow delegation of the 301(h) waiver process to States. Therefore, issuance of permits granting such a waiver may only be issued by the EPA. EPA has made the determination that the proposed action may affect, but is not likely to adversely affect, any species listed as threatened or endangered. The action is not likely to adverselyaffect designated North Atlantic right whale critical habitat, and is not located within designated Atlantic salmon critical habitat. The action is also not likely to adversely affect proposed critical habitat for Atlantic sturgeon, and no conference is needed at this time. In this letter, EPA provides its supporting analysis to NOAA's National Marine Fisheries Service Protected Resources Division (NMFS PRD) on the effects of authorizing the waivers.



Toll Free • 1-888-372-7341
Internet Address (URL) • http://www.epa.gov/region1
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical (a "critical habitat"). The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administers Section 7 consultations for freshwater species. The National Marine Fisheries Service (NMFS) administers Section 7 consultations for marine species and anadromous fish.

In 1972, Congress passed the Federal Water Pollution Control Act Amendments, which required Publicly Owned Treatment Works (POTWs) to achieve secondary treatment capability by 1977. After passage, some municipalities with POTWs that discharged into marine waters argued that this requirement might be unnecessary on the grounds that marine POTWs usually discharge into deeper waters with large tides and substantial currents, which allow for greater dilution and dispersion than their freshwater counterparts. As a result, Congress added section 301(h) to the Clean Water Act in 1977, allowing for a case-by-case review of treatment requirements for marine dischargers that applied by September 13, 1979. See 33 U.S.C. § 1311 and 40 CFR Part 125 Subpart G.

Eligible POTW applicants that met the set of environmentally stringent criteria in section 301(h) would receive a modified NPDES permit waiving the secondary treatment requirements for the conventional pollutants: biochemical oxygen demand (BOD) total suspended solids (TSS); and pH. There are 8 municipal wastewater treatment facilities (WWTF) in Maine that have waivers from secondary treatment requirements in their National Pollutant Discharge Elimination System (NPDES) permits, which are the subject of this informal consultation request.

Each of the 8 permittees has applied for reissuance of a Clean Water Act (CWA) Section 301(h) waiver. See 40 CFR Part 125, Subpart G). Reissuance of the waivers is also a federal action. EPA intends to reissue the waivers and the NPDES permits. A "Tentative 301(h) Waiver Decision" will accompany each draft permit and will discuss in more detail EPA's basis for continuation of the waiver from secondary treatment standards. Seven of the eight permits are up for reissuance. Descriptions of the facilities and discharges are described below (including discharge volume, type of treatment and location of outfalls):

Bayville Village Corporation

The Bayville Village Corporation (BVC) discharges 15 thousand gallons per day of primary treated sanitary wastewater to Linekin Bay, Class SB, in Boothbay Harbor, Maine.

The BVC sewer system serves a small seasonal residential community of 25 houses. The BVC wastewater treatment facility provides a primary level of treatment via a series of septic tanks, and disinfection via chlorination and dechlorination prior to discharge. Sanitary wastewater from twelve (12) residences flows by gravity to a 3,000-gallon septic tank which, in turn, is pumped to the first in a series of two 6,000-gallon tanks. Thirteen (13) additional residences are tied directly into the first 6,000-gallon tank and the combined waste streams are conveyed to the second 6,000-gallon tank for additional settling. The wastewater is disinfected in a chlorine contact tank using a flow-based chemical feed of sodium hypochlorite. Sodium bisulfite is currently utilized to dechlorinate the effluent prior to discharge to Linekin Bay via a polyvinylchloride (PVC) outfall pipe measuring four inches in diameter that extends out into the receiving water approximately 100 feet, as shown on Figure 1. The outfall pipe is submerged in 8-feet of water at mean low tide. The available acute dilution is 250:1.

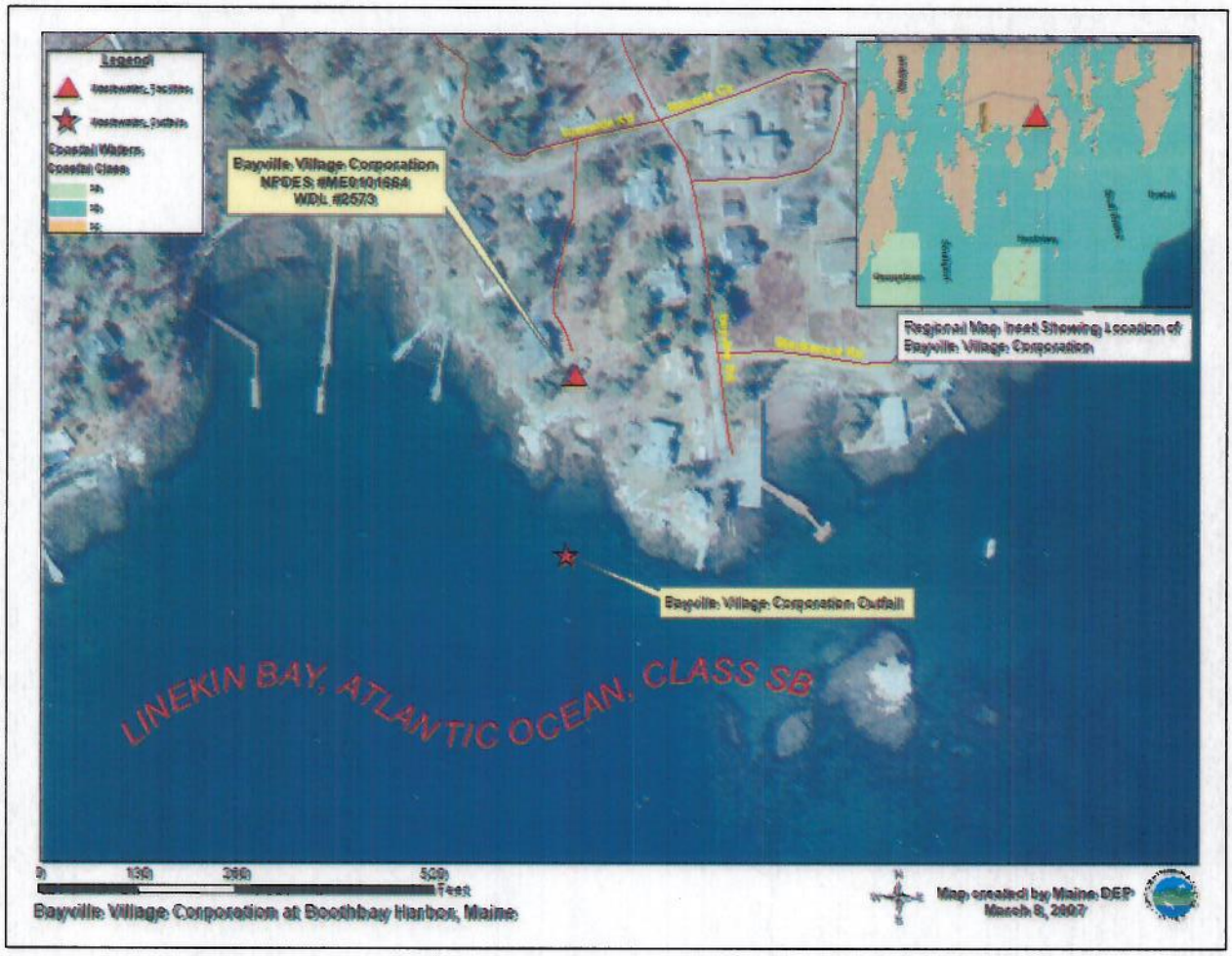


Figure 1 – Bayville Village Outfall Location Map

North Haven Wastewater Treatment Plant

The Town of North Haven discharges a monthly average flow of 40 thousand gallons per day of primary treated sanitary wastewater to the Fox Island Thorofare, a Class SB water, in North Haven, Maine.

The Town of North Haven separate sanitary wastewater collection system has 189 sewer connections. The facility does not receive any flows from industrial sources or septage from individual septic systems. Septage and primary clarifier sludge are applied to a land spreading site on the island.

The facility provides primary treatment. Flow enters the plant through a stormwater bypass structure and passes through a comminutor to a flow splitter[1]. The flow enters two separate 16,000 gallon underground settling tanks. From the settling tanks, flow enters a chlorine contact chamber for disinfection by sodium hypochlorite. At the end of the chlorine contact chamber, sodium bisulfate is added for dechlorination. The treated effluent is monitored and discharged from the chlorine contact chamber to the Fox Island Thorofare via an eight inch (8") diameter polyethylene pipe with a two port diffuser. The outfall extends into the receiving waters approximately 600 feet and is at 40 feet below mean sea level. Figure 2 shows the approximate location of the outfall. The available acute dilution is 56:1.

[1] The collection system is now separate. There is no longer a need for a stormwater bypass. The flow, however, still enters through the "stormwater bypass structure."

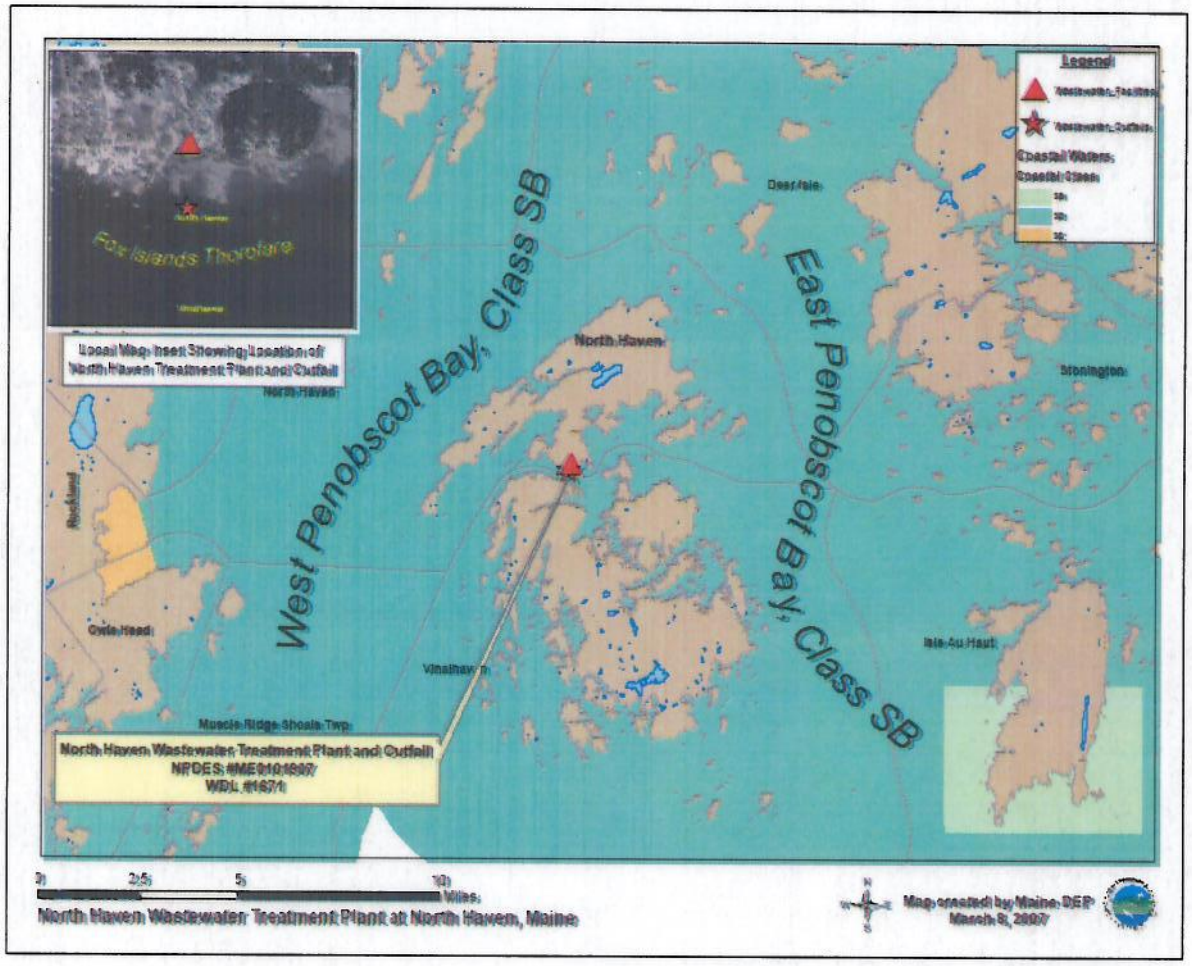


Figure 2 – North Haven Outfall Location Map

Northport Village Corporation

The village of Northport is permitted for a monthly average flow of 63,000 gallons per day (gpd) of primary treated sanitary wastewater to Belfast Bay, a Class SB water, in Northport, Maine. The highest 12 month rolling average flow since January of 2010 is 48,000 gpd. Normal flow is about 20,000 gpd.

Sanitary wastewater is generated by approximately 320 single family residences in Northport Village. The facility does not receive any flow from industrial sources. Influent enters the treatment headworks which consist of a collection manhole which intercepts flow from two (2) 10 inch PVC pipes. Flow then passes through two (2) V-notch weirs on its way to three (3) parallel trains of septic tanks. Each train consists of four (4) 8,000 gallon settling tanks in series, providing a total volume of 96,000 gallons. Sludge is removed and disposed of off-site by a contractor. Following the septic tanks, the flow recombines in a chlorination manhole that includes a 30-degree V-notch weir used for flow measurement. Sodium hypochlorite is added using a diaphragm metering pump. The pump speed is automatically adjusted to match the flow measured by the flowmeter.

The flow then enters a buried, baffled, chlorine contact tank with a capacity of about 8,000 gallons. After the chlorine contact tank, the flow enters a dechlorination (by sodium bisulfite) and sampling manhole prior to discharge to Belfast Bay via the outfall. A new 12" diameter high density polyethylene (HDPE) outfall pipe, installed during the summer of 2011, extends 760 feet from shore into 34.5 feet of water at mean low tide. Figure 3 shows the outfall location. The end of the outfall pipe is directed upward. The available acute dilution is 480:1.

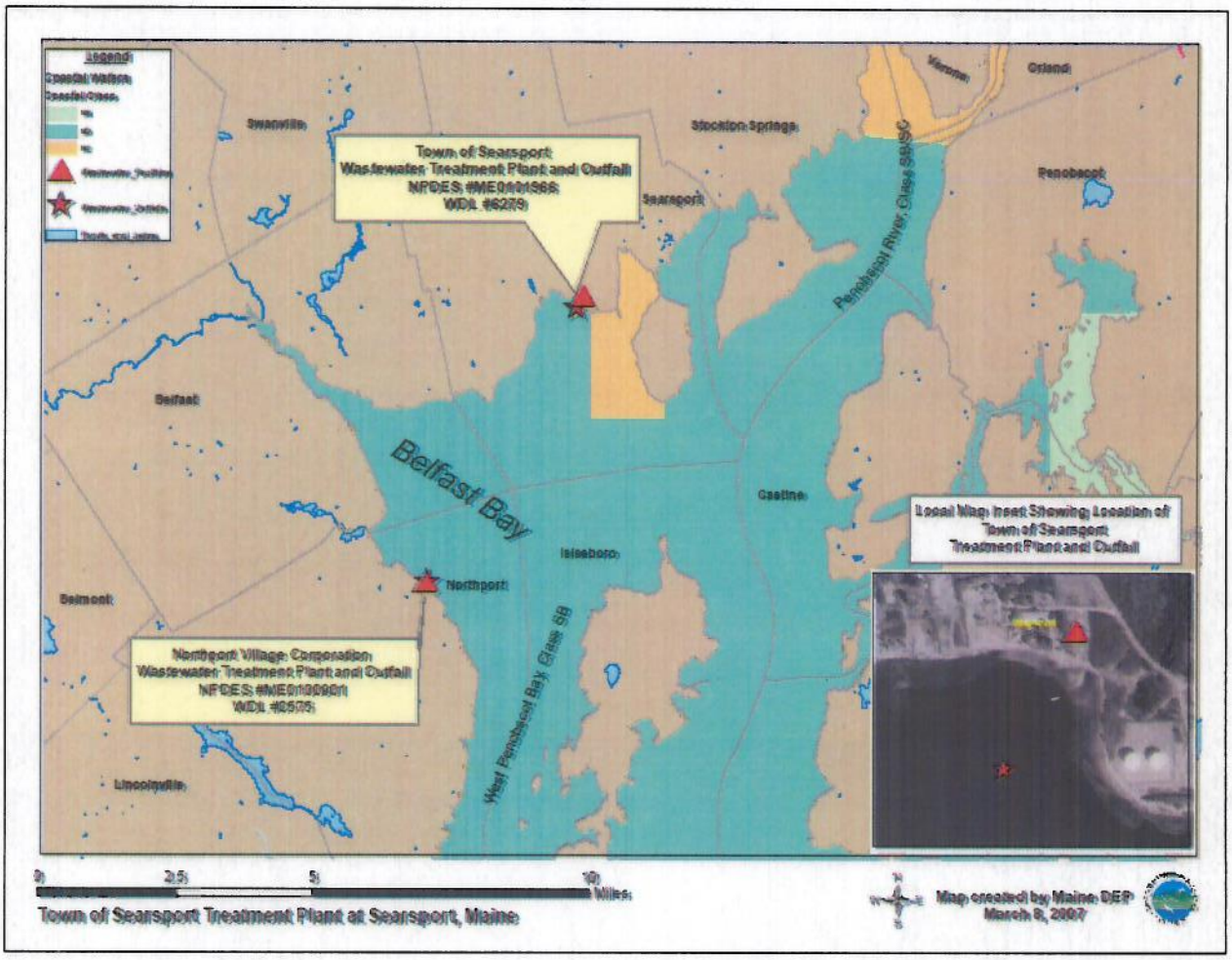


Figure 3 – Northport Village and Searsport Outfall Location Map

Searsport Wastewater Treatment Plant

The Town of Searsport discharges of up to 200, 000 gallons per day of primary treated sanitary wastewater to Penobscot Bay, Class SB, in Searsport, Maine.

Sanitary wastewater received at the treatment facility is generated by residential and commercial entities in the Town of Searsport. There are approximately 620 customers served by the treatment facility. The facility does not receive any flows from industrial sources. The sewer collection system is a separated system.

The facility provides a primary level of treatment for dry weather flows via a bar screen, a comminutor, flow measurement, primary settling via two rectangular clarifier tanks, an aerobic sludge digester for composting solids, chlorination and dechlorination. Polymer is added to the wastewater flow at the headworks to enhance flocculation and solids removal in the clarifier tanks. All wastewater treated at the facility is discharged to the Searsport Harbor by way of a ten (10) inch diameter PVC pipe. The outfall pipe extends out into the receiving waters approximately 1,200 feet from the edge of the shoreline. Figure 6 shows the outfall location. The outfall discharges at –20.0 feet mean low tide elevation. The available acute dilution is 54:1.

Stonington Sanitary District (SSD)

The Stonington Sanitary District (SSD) permit authorizes the discharge of up to a 12 month rolling average flow of 175,000 gpd of primary treated sanitary wastewater to the Deer Island Thorofare, East Penobscot Bay, Class SB, in Stonington, The Draft Permit flow limit is 106,000 gpd (Tier 1) and 175,000 gpd (Tier 2). The highest 12-month rolling average flow since January 2009 is 46,858 gpd.

The facility currently provides a primary level of treatment for wastewater from 285 on-site septic tanks located on individually and publicly owned lots. Sanitary wastewater is generated by residential and commercial entities within the area served by the SSD. The facility does not receive any flows from industrial sources but does receive 1,000 gallons per year of uranium brine filter backwash waters from a local public drinking water treatment facility. The sewer collection system is a separated system and is not known to contain any combined sewer overflows. The collection system network conveys the septic tank effluent from each lot to a common disinfection tank with chlorination and dechlorination capabilities prior to discharge to Deer Island Thorofare.

The permittee is required to maintain the septic tanks according to a regular maintenance schedule where the tanks are periodically inspected to determine malfunctions, amount of accumulated solids retained in the tanks, appropriate pump-out frequency, and to facilitate accrued solids removal from the system. The permittee is required to submit a record of septic tank inspections and maintenance, documenting the amount of solids removed from each tank.

The outfall consists of a ductile iron/PVC discharge pipe measuring 8 inches in diameter that extends out into the receiving waters approximately 600 feet. Figures 3 and 4 show the location of the Stonington outfall. The outfall discharges at minus 20.0 feet mean low tide elevation. The available acute dilution is >1000:1.

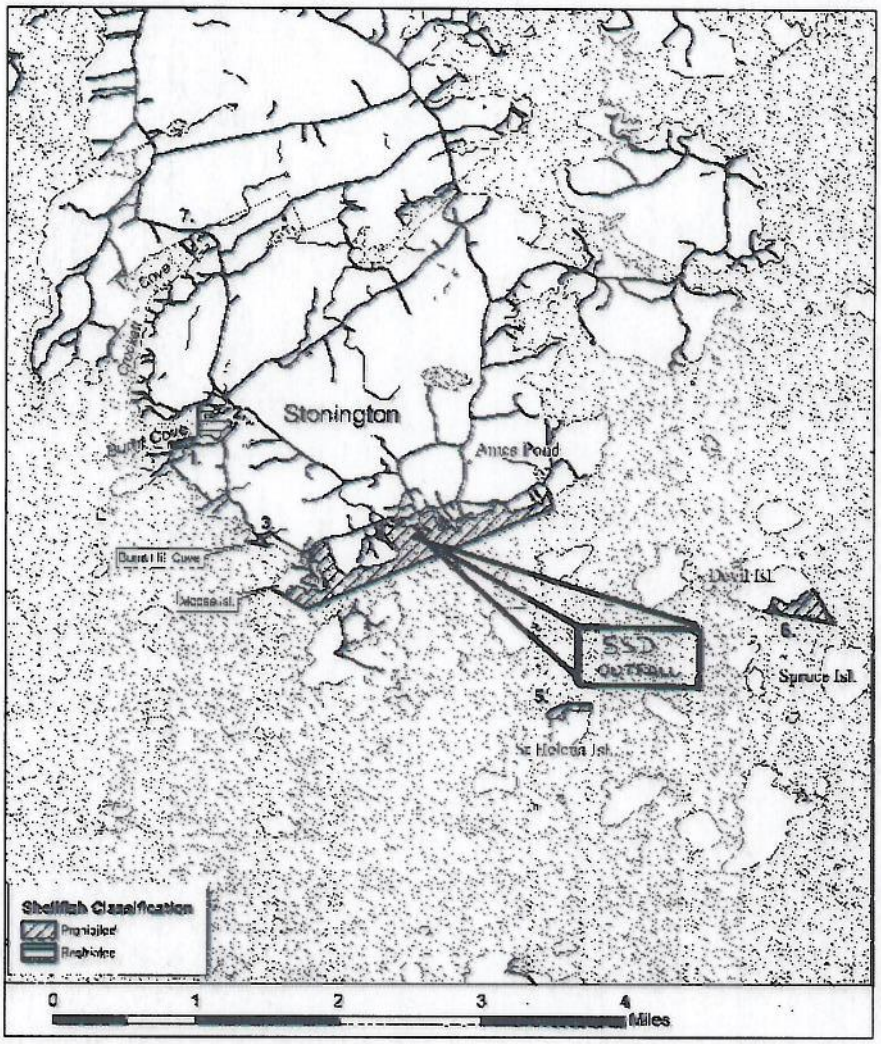


Figure 4 – Stonington Outfall Location Map

Eastport Quoddy Village Wastewater Treatment Facility

The Village of Eastport Quoddy is permitted to discharge 50,000 gpd (monthly average) of primary treated sanitary wastewater to Passamaquoddy Bay, Class SB, in Eastport, Maine. The available dilution is 202:1. The current monthly average flow is 31,000 gpd.

Sanitary wastewaters received at the treatment facility are generated by residences and commercial entities in the Quoddy Village area of the City of Eastport. The wastewater collection system in Quoddy consists of 14,400 linear feet of force main and gravity sewers with no combined sewer overflow (CSO) points in the system. Each household's wastewater flows to the sewer system via City owned and maintained septic tanks. The collection system includes only new sewers that have passed leakage tests.

There are approximately 105 residential connections to the treatment facilities. The facility does not receive any flows from industrial sources.

The facility provides a primary level of treatment by individual on-lot septic tanks. The collection system network conveys the effluent from each residence to a treatment plant which consists of an influent pump station, two chemical addition manholes, a storage tank, and effluent pump station, effluent flow metering, and a sampling manhole.

Septic tank effluent flows, by gravity to the influent pump station. The wastewater is then pumped through the first chemical addition manhole where chlorine, in the form of sodium hypochlorite, is added and is then discharged to a 38,000-gallon storage tank. The wastewater is pumped from the storage tank during high tide periods, through the access port for the second chemical addition manhole where sodium bisulfite is added to dechlorinate the wastewater, and discharged by means of a gravity sewer outfall. The effluent pumps are controlled by a float switch in the outfall manhole. Treated effluent is discharged to Passamaquoddy Bay during high tide periods through a 500-foot-long, 4-inch diameter outfall. The outfall is covered by 8 ft. of water during high tide. Figure 5 shows the outfall location. The available acute dilution is 202:1.

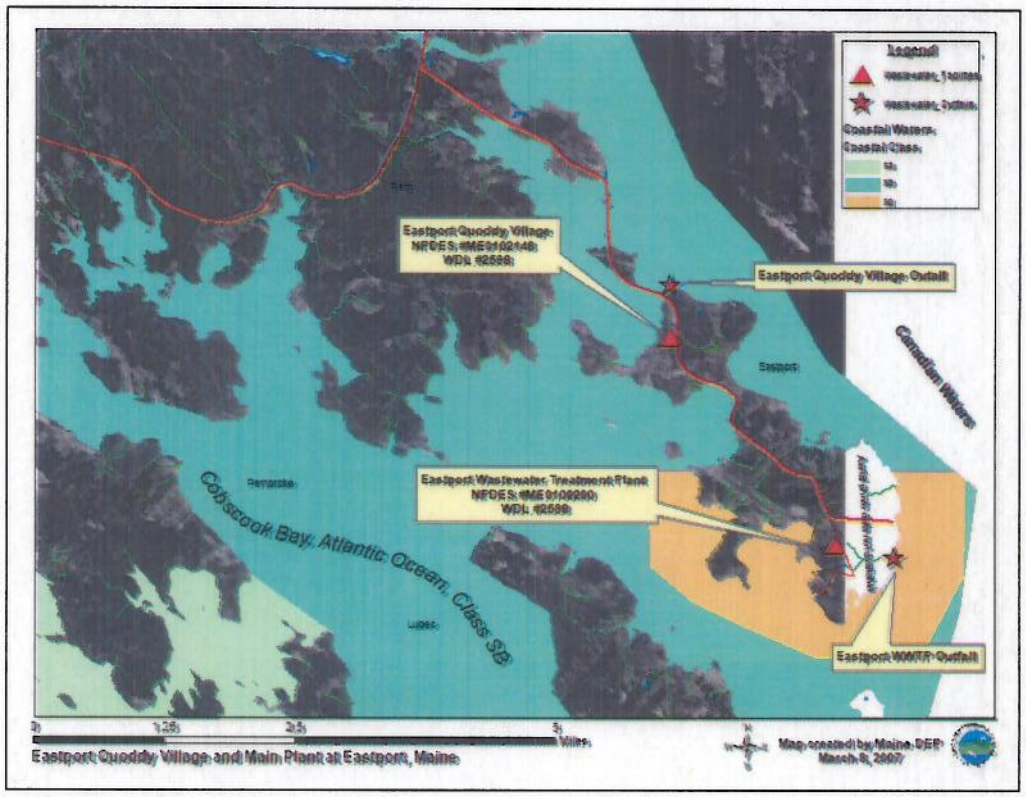


Figure 5 – Eastport and Eastport Quaddy Village Outfall Location Map

Eastport Wastewater Treatment Plant

The City is permitted to discharge 82,000 gpd of primary treated sanitary wastewater to Passamaquoddy Bay, Class SC, in Eastport, Main.

Sanitary wastewater received at the treatment facility is generated by residential and commercial entities in the City of Eastport. The facility receives no flow from industrial sources. All CSOs have been eliminated from the collection system. The wastewater collection system consists of 10 miles of interceptor and collector sewers and six (6) submersible pump stations. The collection system has been upgraded over time and the newer sewer lines have reduced the quantity of infiltration and inflow (I&I). The collection system consists of a triplex submersible pump station at Middle Street, 2,400 linear feet of 10-inch diameter force main to the treatment plant and 3,200 feet of gravity outfall sewer to Passamaquoddy Bay.

Wastewater enters the treatment plant via a 10-inch diameter force main to an influent channel to the screening and grit removal facilities. Following screening and grit removal the wastewater is conveyed by gravity to a weir controlled flow splitting structure which controls flow into two parallel Imhoff treatment tanks. The sludge and scum are stored in the mixing tank for anaerobic digestion and then seasonally disposed of by liquid sludge land application or dewatered in the on-site drying beds and either land filled or sent to another appropriate facility for further treatment and disposal. The wastewater flows from the Imhoff tanks to the chlorine contact tank for disinfection. The wastewater is disinfected by the addition of chlorine in a mixing chamber at the head end of the contact tank. The wastewater is dechlorinated at the downstream end of the chlorine contact tank in another mixing chamber. Effluent flow is monitored and sampled prior to discharge to Passamaquoddy Bay via the ocean outfall. The treated effluent is discharged to Passamaquoddy Bay by way of a twenty-four (24) inch diameter pipe that is submerged at mean low water. The available acute dilution is 14:1.

Lubec Wastewater Treatment Plant

The Town of Lubec is permitted to discharge of up to monthly average flow of 166,000 gpd of primary treated sanitary wastewater to Passamaquoddy Bay (Lubec Narrows), Class SB, in Lubec, Maine. The current average flow is approximately 39,000 gpd.

Sanitary wastewater received at the treatment facility is generated by residential and commercial entities in the Town of Lubec. The facility does not receive more than 10% of its flows from industrial sources. The wastewater collection system consists of five (5) miles of gravity collector sewers and force mains and four (4) submersible pump stations. The collection system in Lubec consists of a duplex submersible effluent pump station at the treatment plant, 2,600 linear feet of 10-inch diameter force main and 450 feet of 8-inch diameter outfall pipe which discharges treated wastewater to the tidal waters of Lubec.

The treatment facility provides a primary level of treatment and consists of (1) an influent pump station, (2) screening and grit removal, (3) two primary treatment Imhoff tanks (4) prechlorination (if needed), (4) chlorination facility, (5) effluent pump station, (6) sampling of effluent quality, (7) sludge removal, mixing, drying, stabilization, and dumping facilities

(8) lime, polymer and potassium permanganate chemical addition facilities, and (9) a Control Building. There is a dechlorination facility at the terminus of the effluent force main approximately 2,600 feet from the main treatment facility. The dechlorination facility consists of effluent flow metering, dechlorination chemical addition facilities, a effluent sampling access manhole, and the dechlorination operations building. Disinfection of the effluent is conducted during the summer season (May 15 to September 30).

Wastewater enters the influent pump station wet well through a 10-inch diameter gravity sewer. The wastewater is pumped by the influent self-priming centrifugal pumps to the headworks channel for screening and grit removal. A weir controlled splitting structure at the end of the headworks channels controls flow to the two (2) Imhoff primary treatment tanks. The sludge and scum are stored in the lower compartments of the tanks for anaerobic digestion and then seasonally disposed of by liquid sludge land application or dewatered in drying beds and either land applied, landfilled or sent to another facility for further treatment and disposal. The wastewater flows from the Imhoff tanks to the effluent pump station wet well. Sodium hypochlorite is injected into the force main in a chemical addition manhole to disinfect the wastewater.
A static mixer is provided in this manhole to thoroughly combine the wastewater with the chemical additions. A 10-inch diameter force main between the treatment plant and the dechlorination facility acts to provide the necessary detention time to provide disinfection of the wastewater flow. The 10-inch diameter force main from the effluent pump station at the treatment plant terminates at the dechlorination facility. Effluent flow monitoring and sampling are conducted at the dechlorination facility. If need be, the wastewater is dechlorinated with liquid sodium bisulfite which is injected into the force main in another chemical addition manhole. The wastewater flows from the dechlorination facility via an 8-inch diameter gravity outfall pipe and is discharged at Lubec Narrows at a depth of 18 feet below mean low tide. The available acute dilution is 1900:1. See Figure 6, Outfall Location Map.

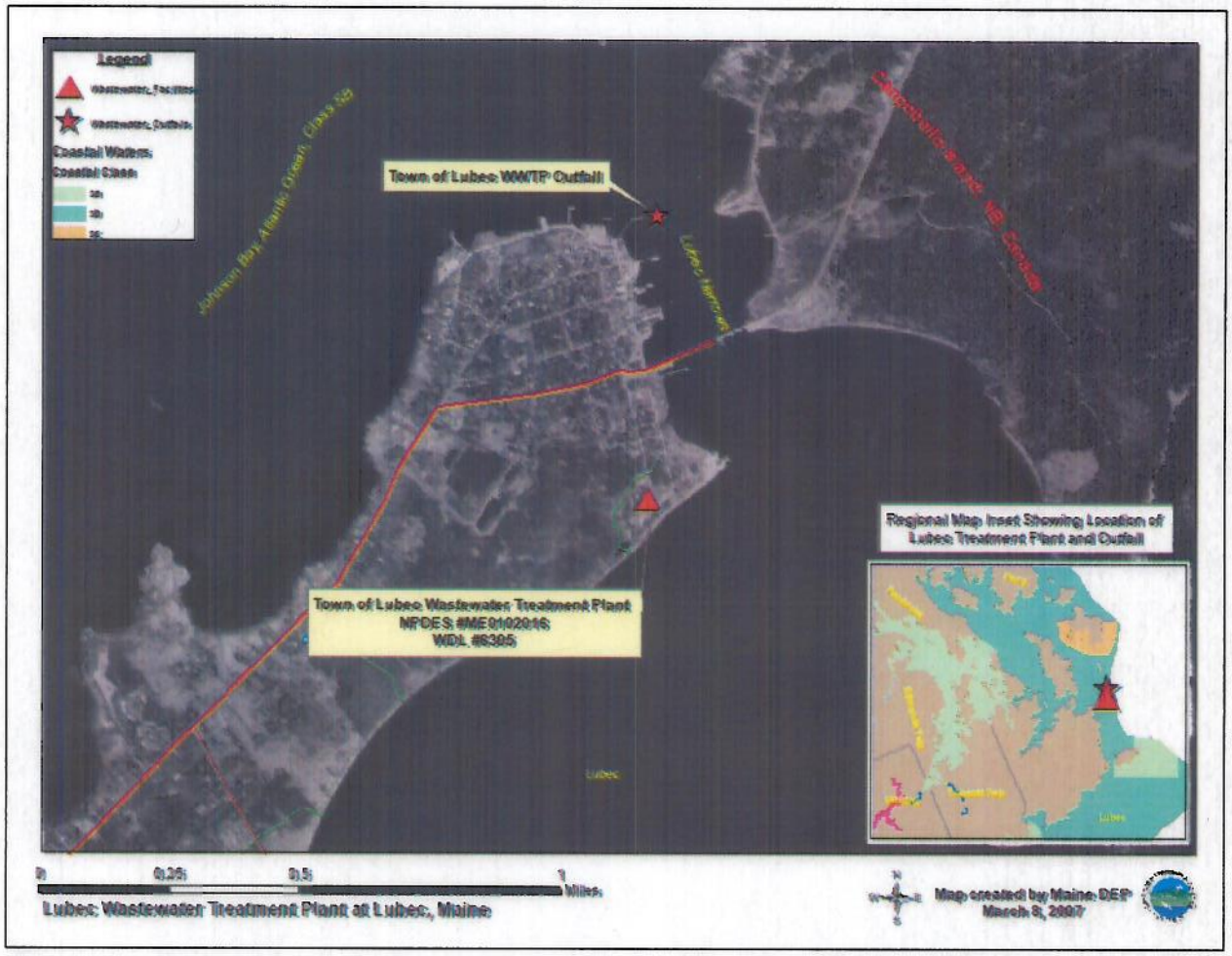


**Figure 6 – Lubec Outfall Location Map**

Description of Action Area

The 8 facilities are located on the Maine coast between Linekin Bay and Passamaquoddy Bay. See the facility locations in Figure 7 and list of discharges in Table 1. The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR § 402.02). For this action, the action area includes the 8 facilities listed below and the waters where discharges from the facilities occur until complete mixing is reached, depending on dilution ratios and water flows as tabulated below. Because dilution factors for the facilities are high and located in tidal, marine environments subject to mixing, zones of dilution are expected to be small (within a few hundred feet of the outfall).

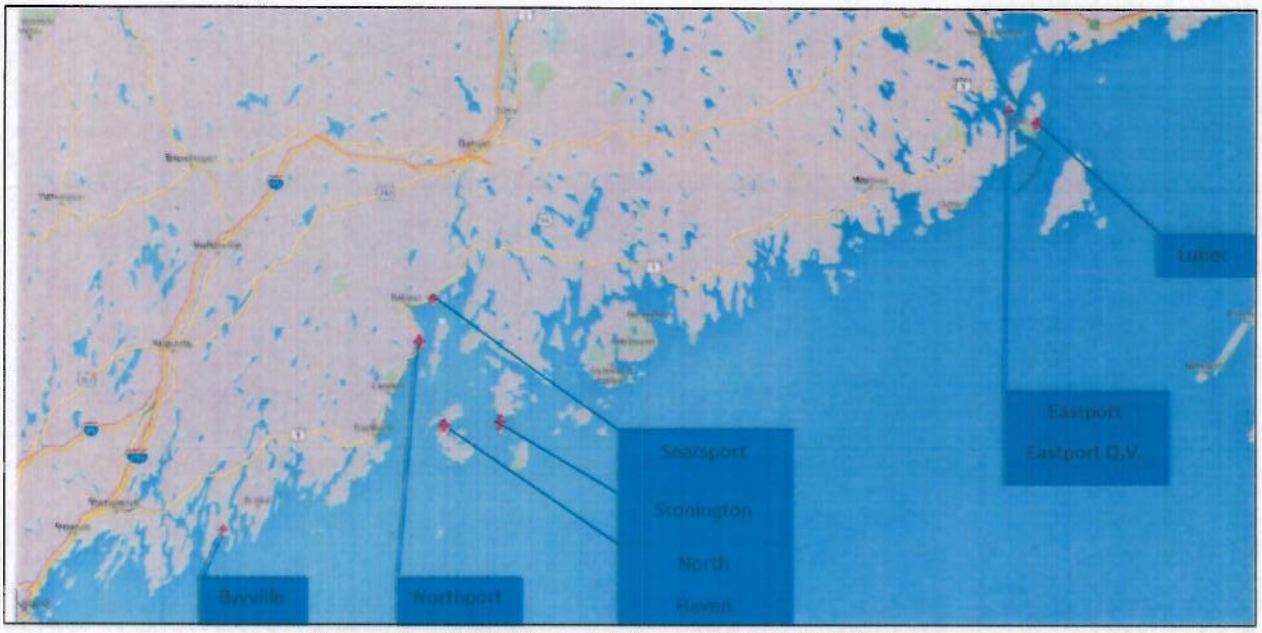


Figure 7 – POTWs in Maine with 301(h) Waivers

**Table 1 - 8 NPDES Permit for Reissuance**

| Permittee | Permit Number | Permitted Flow GPD | Current Ave Flow GPD** | Max Flow GPD** | Dilution Acute | Dilution Chronic |
|---|---|---|---|---|---|---|
| **Bayville** | ME0101664 | 15,000 | 2,535 | 6,267 | 250:1 | 730:1 |
| **North Haven WWTP*** | ME0101907 | 40,000 | 3,200 | 55,627*** | 56:1 | 340:1 |
| **Eastport Quoddy Village** | ME0102148 | 50,000 | 30,894 | 72,400 | 202:1 | 202:1 |
| **Northport Village** | ME0100901 | 63,000 | 14,065 | 420,000*** | 480:1 | 871:1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Lubec** | ME0102016 | 166,000 | 38,581 | 68,229 | 1,900:1 | 4,700:1 |
| **Stonington** | ME0101851 | 175.000 | 29,874 | 46,858**** | >1,000:1 | 4,700:1 |
| **Searsport** | ME0101966 | 200,000 | 78,597 | 129,000 | 54:1 | 188:1 |
| **Eastport** | ME0100200 | 820,000 | 124,041 | 333,700 | 14:1 | 341:1 |

* Permit reissued June 5, 2014 and will expire June 5, 2019.
** Calendar years 2010-2015
*** High flow reported before large amount of I/I removed from system
**** Twelve month rolling average flow

Listed Species and Critical Habitat in the Action Area

As the federal agency charged with authorizing the discharges from these facilities, EPA has reviewed available habitat information developed by the Services to see if one or more of the federal endangered or threatened species of fish, wildlife, or plants may be present within the influence of the discharge. Federally listed species which may potentially inhabit (seasonally) the Gulf of Maine in the area of one or more of the POTWs are listed in Table 2.

**Table 2 - Federally Listed Endangered and Threatened Species in Maine Marine Waters[2]**

| NAME | SPECIES | STATUS |
|---|---|---|
| North Atlantic Right Whale | *Eubalaena glacialis* | Federally Endangered |
| Fin Whale | *Balaenoptera physalus* | Federally Endangered |
| Atlantic Salmon | *Salmo salar* | Federally Endangered |
| Shortnose Sturgeon | *Acipenser brevirostrum* | Federally Endangered |
| 5 DPS (Distinct Population Segments) Atlantic sturgeon | *Acipenser oxyrinchus oxyrinchus* | 1 Federally Threatened, 4 Federally Endangered |
| Loggerhead Turtle (Northwest Atlantic DPS) | *Caretta caretta* | Federally Threatened |
| Leatherback Turtle | *Dermochelys coriacea* | Federally Endangered |
| Green Sea Turtle | *Chelonia mydas* | Threatened* |
| Kemp's Ridley Turtle | *Lepidochelys kempii* | Federally Endangered |

[2] Federally Endangered Species in Marine Waters (and Minke Whale), Maine Department of Marine Resources Section 6 Application Appendix 10-B https://www1.maine.gov/ifw/pdfs/reports_appendix10.pdf

*Population of Green Sea Turtle present in action area listed as threatened. Breeding populations in Florida and Mexico's Pacific Coast listed as Endangered.

In addition, the proposed actions may affect designated critical habitat for North Atlantic right whale and proposed critical habitat Atlantic salmon. Proposed critical habitat for Atlantic sturgeon is also located near the action area.

Whales

North Atlantic right whales (*Eubalaena glacialis)* are the world's rarest cetacean, with estimates of between 300 and 325 individuals in existence today. Right whales are large, rotund, slow-swimming whales that inhabit shallow, coastal waters along the East Coast of the United States and Canada. The right whale (*Eubalaena glacialis*) has been listed as endangered under the ESA since 1973. The North Atlantic right whale primarily occurs in coastal or shelf waters with calving and nursery areas off the Southeastern U.S. and summer feeding grounds extending from New England waters north to the Bay of Fundy and Scotian Shelf (NMFS 2005). The distribution of right whales seems linked to the distribution of their principal zooplankton prey, calanoid copepods (Baumgartner and Mate 2005; Waring et al. 2012). The largest threat to recovery of the population is ship collisions and entanglements. Other threats include habitat degradation, noise, contaminants, and climate and ecosystem change (NMFS 2005).

Congregations of copepods, especially *Calanus finmarchicus*, attract North Atlantic right whales to the plankton-rich waters off the coast of New England. Right whales likely feed off the coast of New England year-round with peak occurrence in winter/spring, while the Bay of Fundy is a major summer nursery ground (NOAA 2005). According to NOAA, right whales have been sighted offshore along the Maine Coast in the past 5 years during all months. Right whales were most commonly spotted nearshore in the Bay of Fundy in the vicinity of the Eastport and Lubec facilities.[3]

The fin whale (*Balaenoptera physalus*) has been listed as endangered under the ESA since its passage in 1973. The fin whale is widely distributed in the North Atlantic and occurs from the Gulf of Mexico and Mediterranean Sea northward to the edges of the Arctic ice pack (NMFS 2010). Off the eastern U.S., fin whales are centered along the 100 m isobaths but with sightings well spread out over shallower and deeper water, including submarine canyons along the shelf break (Kenney and Winn 1987; Hain et al. 1992). Hain et al. (1992) identified Jeffrey's Ledge as a primary feeding area. Fin whales prey on both pelagic crustaceans and schooling fish (NMFS 2010). The overall distribution may be based on prey availability, as this species preys opportunistically on both invertebrates and fish (Watkins et al. 1984).

Like right and humpback whales, fin whales are believed to use North Atlantic waters primarily for feeding, and more southern waters for calving.

---

[3] NOAA Northeast Fisheries Science Center Interactive North Atlantic Right Whale Sightings Map. Accessed on April 12, 2016. http://www.nefsc.noaa.gov/psb/surveys/

This species is commonly found from Cape Hatteras northward. During the 1978-1982 aerial surveys, fin whales accounted for 24% of all cetaceans and 46% of all large cetaceans sighted over the continental shelf between Cape Hatteras and Nova Scotia (Waring et al. 2014). Underwater listening systems have also demonstrated that the fin whale is the most acoustically common whale species heard in the North Atlantic (Clark 1995).

The single most important area for this species appeared to be from the Great South Channel, along the 50 meter isobath past Cape Cod, over Stellwagen Bank, and past Cape Ann to Jeffreys Ledge (Hain et al. 1992).

Although fin and right whales may occur offshore of coastal Maine, we do not expect them to be in the action area as mixing zones for the facilities occur nearshore and both species of whales are expected to utilize deeper, offshore waters based on their depth and foraging preferences. As such they will not be considered further in this analysis.

Sea Turtles

The Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) has been listed as endangered throughout its range since the passage of the ESA in 1973. The species has a relatively limited distribution with nesting beaches primarily located in the western Gulf of Mexico; eggs and hatchlings are not likely to occur in the action area. Juveniles in the Northwest Atlantic transition into shallow coastal habitats (including bays and sounds) extending from Florida to New England (Morreale et al. 2007). Both adult and juvenile Kemp's Ridley turtle may use New England waters from June through October as seasonal feeding grounds with crabs as its primary prey (NFMS et al. 2011). Migration from coastal foraging areas to overwintering sites is likely triggered by temperature declines. By late fall, most are found south of Chesapeake Bay towards North Carolina (NMFS et al. 2011).

The loggerhead turtle (*Caretta caretta*) is widely distributed throughout most of the world's warm oceans. In the western Atlantic they range as far north as Newfoundland in the summer, although sightings along the Maine coast and in the Gulf of Maine are rare. Loggerhead distribution varies widely according to life stage. Nesting occurs from Texas to Virginia; eggs and hatchlings are not likely to occur in the action area (NMFS and USFWS 2008). Following the oceanic stage, juvenile loggerheads transition to the neritic zone where they are common along the eastern U.S. seaboard in continental shelf waters from Cape Cod Bay, MA to the Gulf of Mexico feeding primarily on benthic invertebrates. Along the northern limits of their range, loggerheads may become cold-stunned and die from hypothermia.

In the Atlantic, the leatherback turtle (*Dermochelys coriacea*) ranges from the Gulf of Mexico and the Caribbean Sea to Newfoundland and Labrador and across to Norway and the British Isles. Nesting beaches occurs in the Gulf of Mexico and U.S. Caribbean islands (e.g., the U.S. Virgin Islands and Puerto Rico) (NMFS and USFWS 1992), therefore, eggs and hatchlings are not likely to occur in the action area. Periodic sightings of leatherbacks have occurred in New England waters, particularly around Cape Cod during summer months (NMFS and USFWS 1992).

The Green Sea Turtle (*Chelonia mydas*) was listed as endangered for coastal breeding colonies in Florida and Mexico's Pacific coast and threatened throughout the rest of its range in 1978. The green turtle occurs in tropical and sub-tropical waters worldwide; in Atlantic waters green turtles are found around the U.S. Virgin Islands, Puerto Rico, and the continental U.S. from Texas to Massachusetts. Primary nesting beaches occur in east central and southeast Florida, and in smaller numbers is Puerto Rico and the U.S. Virgin Islands. Eggs and hatchlings are not likely to occur in the action area. After transitioning from pelagic habitat to shallow, benthic feeding grounds, herbivorous juvenile and adult green turtles forage in pastures of seagrasses and/or algae but can also be found over coral reefs, warm reefs, and rocky bottoms (NMFS and USFWS 1991).

Although sea turtles may be transient along coastal Maine during the summer months, we do not expect them to be present in the nearshore action area where discharges will occur because of their habitat preference for offshore deeper waters. Therefore, they will not be considered further in this analysis.

Atlantic Sturgeon (*Acipenser oxyrinchus oxyrichus*)

The Atlantic sturgeon is a species of sturgeon distributed along the eastern coast of North America from Hamilton Inlet, Labrador, Canada to Cape Canaveral, Florida, USA. NMFS has delineated U.S. populations of Atlantic sturgeon into five distinct population segments (DPSs): the Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs. *See* 77 Fed. Reg. 5880 and 5914 (February 6, 2012). NMFS has listed the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs as endangered species. See 77 Fed. Reg. 5912 and 5981-82. NMFS has listed the Gulf of Maine DPS of Atlantic sturgeon as a threatened species and extended the prohibitions under section 9(a)(1) of the ESA to this DPS. *See* 77 Fed. Reg. 5911 and 78 Fed. Reg. 69,310 (November 19, 2013).

The primary factors responsible for the decline of the Atlantic sturgeon DPSs include the destruction, modification, or curtailment of habitat due to poor water quality, dredging and the presence of dams; overutilization due to unintended catch of Atlantic sturgeon in fisheries; lack of regulatory mechanisms for protecting the fish; and other natural or manmade factors including loss of fish through vessel strikes. *See* 77 Fed. Reg. 5905, 5967.

The general distribution of Atlantic sturgeon includes the Atlantic Ocean waters and associated bays, estuaries, and coastal river systems from Hamilton Inlet, Labrador, Canada to Cape Canaveral, Florida. After emigration from the natal estuary, subadults and adults travel within the marine environment, typically in nearshore waters less than 50 meters in depth characterized by gravel and sand substrate, including the Gulf of Maine. Adult and subadult Atlantic sturgeon originating in different rivers mix in the marine environment (Stein et al. 2004). As a result, individuals from any of the five DPSs may be present along the Maine coast in the vicinity of the permitted facilities.

Two extant subpopulations of Atlantic sturgeon exist in the Penobscot and Kennebec rivers. Four of the permitted facilities are located at the mouth of the Penobscot River. One permitted facility is located in the vicinity of the Kennebec River system (NOAA 2007). In bottom trawl surveys of the New Hampshire and Maine coast from 2001 to 2006, 36 of the 38 captured Atlantic sturgeon were caught near the Kennebec estuarine complex while the other two were captured south of the Kennebec near the Saco River (Dunton et al. 2010). Because the action area is limited to the marine environment, EPA expects that only adult and subadult Atlantic sturgeon may be present in the action area. As spawning activity is generally limited to freshwater and estuarine environments and does not take place in marine, near-coastal habitat, EPA does not expect any other life stages of Atlantic sturgeon to be present in the action area.

Shortnose sturgeon *(Acipenser brevirostrum)*

Shortnose sturgeon (*Acipenser brevirostrum*) are currently listed as endangered throughout their range along the east coast of the United States. Shortnose sturgeon generally prefer the estuarine, and riverine habitat of large river systems and most shortnose sturgeon adults remain in their natal river or estuary (Kynard 1997). This species, unlike other anadromous species in the region such as shad or salmon, do not appear to make long distance offshore migrations. Rare individuals have been occasionally captured in nearshore marine waters (reviewed by Dadswell et al. 1984).

Shortnose sturgeon are present in the Piscataqua River, Kennebec River (which includes the Androscoggin and Sheepscot Rivers), Penobscot River, and St. John River in New Brunswick, Canada. Tagged sturgeon have been observed moving between the Penobscot and Kennebec Rivers (NOAA 2013). Removal of the Great Works and Veazie Dams in 2012 and 2013 by the Penobscot River Restoration Trust has made historical habitat on the Penobscot River accessible to shortnose sturgeon for the first time in more than 100 years.[4] Four of the facilities are located at the mouth of the Penobscot River. One facility is located in the vicinity of the Kennebec River system. Adult and subadult shortnose sturgeon may be present in the action area. As spawning activity does not take place in marine, near coastal habitat, EPA does not expect any other life stages of shortnose sturgeon to be present in the action area.

Atlantic Salmon *(Salmo salar)*

The Gulf of Maine DPS, which included all naturally reproducing remnant populations of Atlantic salmon from the Kennebec River (downstream of the former Edwards dam site) north to the mouth of the St. Croix River, was initially listed as endangered in 2000. See 65 Fed. Reg. 69,459 (November 17, 2000). In 2009, the listed GOM DPS was expanded to include all naturally reproducing anadromous Atlantic salmon having a freshwater range in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, including associated conservation hatchery populations, and wherever these fish occur in the estuarine and marine environment. *See* 74 Fed. Reg. 29,344 (June 19, 2009).

[4] Penobscot River Restoration Trust. http://www.penobscotriver.org/

At the time of the 2009 listing, NOAA identified three Salmon Habitat Recovery Units (SHRUs) within the DPS: Merrymeeting Bay (including Androscoggin and Kennebec river basins), Penobscot Bay, and Downeast Coastal, as shown on Figure 2. *See* 74 Fed. Reg. 29,300 (June 19, 2009). The three SHRUs encompass the action area for the eight 301(h) waiver facilities.

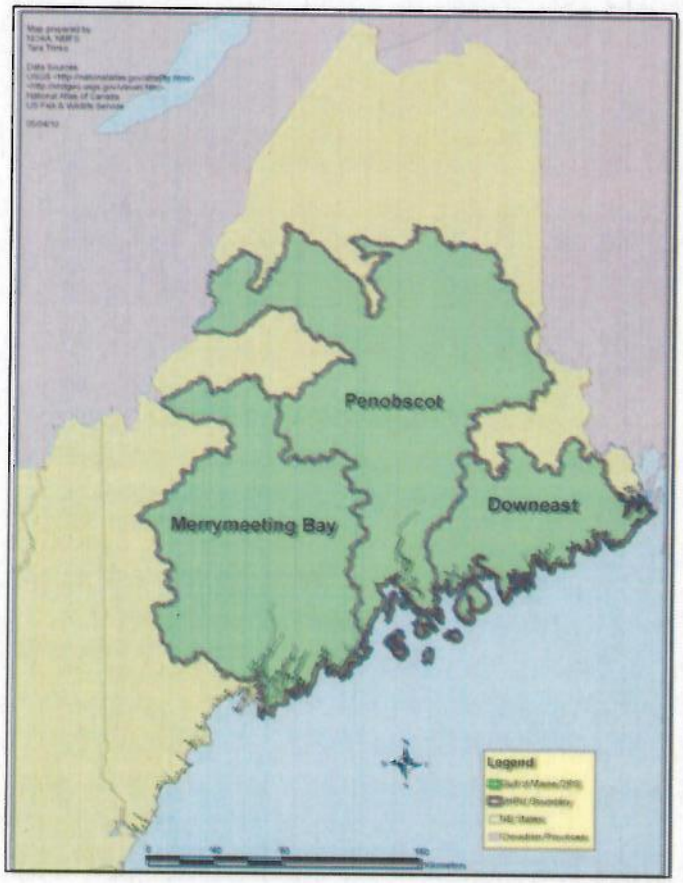


Figure 8 - Salmon Habitat Recovery Units within the GOM DPS. From Public Review Draft Recovery Plan for the Gulf of Maine DPS of Atlantic Salmon. (NMFS and USFWS 2016).

Adult Atlantic salmon in Maine enter freshwater between May and Mid-July (Baum 1997) and spawning occurs in late fall. After spawning, salmon may return to sea or remain in freshwater until the following spring (Fay et al. 2006).

Atlantic salmon remain in freshwater through the egg and larval fry stages. Paar (juvenile) stages generally also remain in freshwater, although some have been documented using estuarine habitats. After two or three years, paar undergo smoltification as they transition for life in marine water. Post-smolts travel out of coastal systems during spring migrations. *See* 74 Fed. Reg. 29, 316.

Because the action area is limited to the marine environment, EPA expects that only post-smolt and adult life stages would be present. Other life stages are generally limited to freshwater and estuarine environments and would not be expected to be present in the action area. All 8 discharges are to marine waters. No marine habitat was designated by NMFS as critical habitat for the salmon.[5] The closest discharger to any of the DPS Rivers is Northport Village. The discharge is approximately one mile from the outlet of the Ducktrap River. Dilution modeling for the 63 thousand gallon per day facility indicates that the dilution factor is approximately 480:1 at the point where the effluent reaches the ocean surface. The high rate of effluent dispersion from this facility and each of treatment plants leaves no opportunity for salmon to be exposed to concentrated effluent outside of a small zone of initial dilution in the DPS river. Therefore, only post-smolts and adult life stages may be exposed to any effects of the action in the marine environment.

Designated Critical Habitat for North Atlantic Right Whale

Critical habitat for right whales was initially designated for most of Cape Cod Bay (CCB), Great South Channel (GSC), and coastal Florida and Georgia (outside of the action area). The habitat features identified in this designation include copepods (prey), and oceanographic conditions created by a combination of temperature and depth that are conducive for foraging, calving and nursing. See 59 Fed. Reg. 28,805 (June 3, 1994). On January 27, 2016, NMFS published a final rule (81 Fed. Reg. 4,838) to replace the critical habitat for right whales in the North Atlantic with two new areas. The effective date for this final rule is February 26, 2016. The areas being designated as critical habitat contain approximately 29,763 square nautical miles of marine habitat in the Gulf of Maine and Georges Bank region (Unit 1, Northeastern U.S. Foraging Area), shown in Figure 3, and off the Southeast U.S. coast (Unit 2, Southeastern U.S. Calving Area).

[5] "We are not able at this time to identify the specific features characteristic of marine migration and feeding habitat within U.S. jurisdictional waters essential to the conservation of Atlantic salmon and are, therefore, unable to identify the specific areas where such features exist. Therefore, specific areas of marine habitat are not designated as critical habitat." See Page 6, Designation of Critical Habitat for Atlantic Salmon (Salmo salar) in the Gulf of Maine Distinct Population Segment Final ESA Section 4(b)(2) Report, 2009 National Marine Fisheries Service Northeast Region

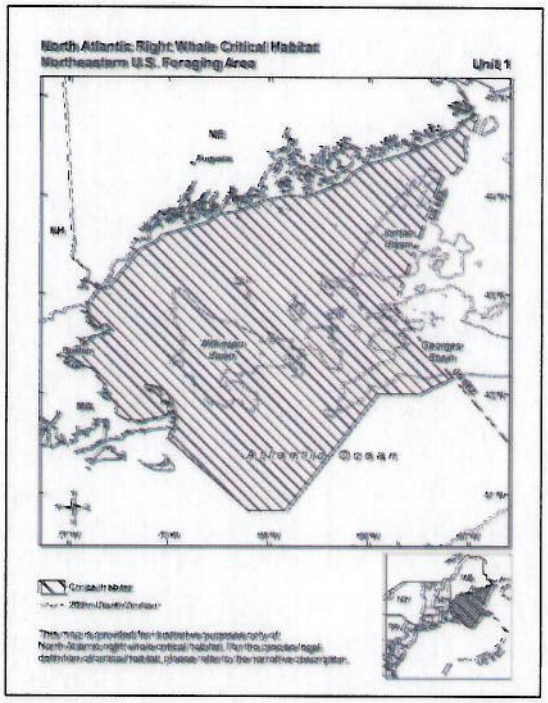


Figure 9 – North Atlantic Right Whale Critical Habitat

The final rule identifies the following four physical and biological features of the Northeastern U.S. foraging habitat that are essential to the conservation of the species: (1) the physical oceanographic conditions and structures of the Gulf of Maine and Georges Bank region that combine to distribute and aggregate *Calanus finmarchicus* for right whale foraging, namely prevailing currents and circulation patterns, bathymetric features (basins, banks, and channels), oceanic fronts, density gradients, and temperature regimes; (2) low flow velocities in Jordan, Wilkinson, and Georges Basins that allow diapausing *C. finmarchicus* to aggregate passively below the convective layer so that the copepods are retained in the basins; (3) late stage *C. finmarchicus* in dense aggregations in the Gulf of Maine and Georges Bank region; and (4) diapausing *C. finmarchicus* in aggregations in the Gulf of Maine and Georges Bank region. Re-issuance of the 301(h) waivers for the facilities above and described in the following section would continue to authorize discharge of effluent to the Gulf of Maine; however, because of rapid dilution and tidal mixing, the continued discharges from the facilities will not adversely affect any of the four physical or biological features. As such, designated critical habitat for right whales will not be considered further in this analysis.

Proposed Critical Habitat for Atlantic Sturgeon

On June 3, 2016, NMFS proposed to designate critical habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments (DPSs) of Atlantic sturgeon. *See* 81 Fed Reg. 35717, (June 3, 2016). The specific areas of Maine proposed for designation include: (1) Penobscot River main stem from the Milford Dam downstream to where the main stem river drainage discharges at its mouth into Penobscot Bay;

(2) Kennebec River main stem from the Ticonic Falls/Lockwood Dam downstream to where the main stem river discharges at its mouth into the Atlantic Ocean; and (3) Androscoggin River main stem from the Brunswick Dam downstream to where the main stem river drainage discharges into Merrymeeting Bay.

NMFS did not propose to designate marine waters beyond the mouth of each estuary as critical habitat. All 8 discharges from the permitted facilities at issue are restricted to marine waters downstream of the proposed designated critical habitat for Atlantic sturgeon and do not overlap with nearby critical habitat. Because the action area is limited to the marine environment, EPA expects that proposed critical habitat for Atlantic sturgeon will not be impacted by the discharges from the permitted facilities, thus conference is not required at this time.

## Effects Determination

EPA is proposing to approve each of the requests for renewal of the eight §301(h) waivers since the discharges will not adversely affect endangered species or critical habitat.

Since all eight of the POTWs outfalls are located relatively nearshore and whales and turtles are typically found farther offshore in deeper waters such as near Jeffreys Ledge, we do not expect any effects to sea turtles or whales from the action. Nor will the discharges affect proposed or designated critical habitat.

While adult and sub-adult Atlantic sturgeon, shortnose sturgeon, and Atlantic salmon may be present in the action area permit conditions will ensure protection of aquatic life in the vicinity of the discharge, including from the cumulative effects of any constituents in the effluent.

The Draft Permits limit discharge flow and impose limits on total residual chlorine, pH, fecal coliform bacteria, and enterococci bacteria which will ensure that the discharges do not adversely affect Atlantic sturgeon, shortnose sturgeon, or Atlantic salmon as explained in the following paragraphs.

<u>Biochemical Oxygen Demand ($BOD_5$) and Total Suspended Solids (TSS)</u>

Federal regulations state that primary or equivalent treatment means treatment by screening, sedimentation, and skimming adequate to remove at least thirty percent (30%) of the BOD5 and 30% of the TSS material in the treatment works influent (40 CFR §125.58(r)). The Department considers a thirty percent (30%) removal of BOD5 and a fifty percent (50%) removal of TSS from the influent loading as a best professional judgment (BPJ) determination of best practicable treatment (BPT) for primary facilities. EPA will require 50% removal of TSS consistent with Maine requirements.

EPA has determined that these effluent limits are sufficient to ensure that discharges from this facility do not cause an excursion below the Maine Water Quality Standard, which requires that Class SB waters must be not less than 85% of saturation, between May 15th and September 30th. The ability of treated effluent to depress ambient DO levels is not immediate. H. W. Streeter and Earle B. Phelps developed the DO sag equation, which demonstrates that the effects of effluent biochemical oxygen demand occur over time[6]. Dilution insures that oxygen demanding effluent is thoroughly dispersed well before it has time to depress ambient DO (See Table 1-8 – Dilution Factors).

Generally, sturgeon may be more sensitive to hypoxia than other fishes although scarce literature has estimated lethal DO levels on sturgeon species (Secor and Niklitschek 2002). Jenkins et al. (1993) demonstrated that shortnose sturgeon are adversely affected by DO levels below 5.0 mg/l while, Secor and Niklitschek (1998) observed mortality of juvenile Atlantic sturgeon at a DO level of 3.0 mg/L and temperatures of 26°C. Migrating salmon require a minimum of 5 mg/l dissolved oxygen for exposure less than 6 hours (Fish and Wildlife Service). Salmon avoid areas where dissolved oxygen is below 7 mg/l (Canadian Council of Ministers of the Environment). The $BOD_5$ criteria, which are established to ensure that the DO level will not be less than 85% of saturation, will provide conditions adequate for Atlantic sturgeon, shortnose sturgeon, and Atlantic salmon in the action area. Any effects of effluent caused DO fluctuations on salmon, Atlantic, and shortnose sturgeon will be so small they cannot be detected, and therefore insignificant.

TSS can affect aquatic life directly by killing them or reducing growth rate or resistance to disease, by preventing the successful development of fish eggs and larvae, by modifying natural movements and migration, and by reducing the abundance of available food (EPA 1986). These effects are caused by TSS decreasing light penetration and by burial of the benthos. The previously mentioned SCUBA surveys in proximity to the outfalls, show no signs of solids deposition. Eggs and larvae are most vulnerable to increases in solids, but this area is not considered spawning habitat for sturgeon or salmon.

Studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations greater than 580 mg/L to 700,000 mg/L, depending on species. The concentrations of suspended solids from each of the facilities will be less than 580 mg/L at the end of the outfall or before rapid mixing (see individual permit limits). For all 8 facilities, as permitted, TSS will be below 40 mg/L at the edge of the zone of initial dilution. The buoyant effluent is greatly disbursed by tidal action before any settling occurs.

---

[6] https://en.wikipedia.org/wiki/Streeter%E2%80%93Phelps_equation

Studies with striped bass adults showed that pre-spawners did not avoid concentrations of 954 to 1,920 mg/L to reach spawning sites (Summerfelt and Moiser 1976 and Combs 1979 in Burton 1993).

While there have been no directed studies on the effects of TSS on Atlantic sturgeon or Atlantic salmon, shortnose sturgeon have been documented in turbid water in the juvenile and adult stage, Dadswell et al. (1984) reports that shortnose sturgeon are more active under lowered light conditions, such as those in turbid waters. As such, anadromous species are assumed to be at least as tolerant as other estuarine fish such as striped bass. EPA concludes that any effects of TSS will be so small they will not be able to be measured and therefore any effects to Atlantic sturgeon, shortnose sturgeon, and Atlantic salmon are insignificant.

pH

The Draft Permit includes pH limitations which are required by state water quality standards, and are at least as stringent as pH limitations set forth at 40 C.F.R. § 133.102(c). The pH of the effluent shall not be less than 6.0 or greater than 9.0 standard units at any time.

The water quality-based numeric effluent limitations for pH in the Draft Permit are to protect water quality. Negative effects from effluent pH are extremely unlikely to occur for Atlantic sturgeon, shortnose sturgeon, and Atlantic Salmon, and therefore all effects are discountable.

Toxic Pollutants

Total Residual Chlorine

Chlorine can be toxic to aquatic life. The acute and chronic water quality criteria for chlorine defined in the 2002 EPA National Recommended Water Quality Criteria for saltwater are 13 µg/l and 7.5 µg/l, respectively. Given the dilution factors of 14 and above and the high rate of chlorine dissipation in salt water, EPA expects that the water quality-based numeric limits are protective of aquatic life and chlorine in the effluent and any effects will be small they cannot be detected or measured and are therefore insignificant.

Uranium

EPA evaluated the backwash brine from the Stoning Water Company and found no constituents in concentrations sufficient to have a reasonable potential to cause or contribute to a violation of surface water quality standards. The SSD discharge contains trace concentrations of uranium below that found in seawater. Since these levels are so small and will not violate water quality standards, any effects of exposure to the backwash water introduced into the SSD treatment system will be too small to be measured and are insignificant.

Filter backwash discharged through the Stonington treatments system does not contain pollutants in concentrations that pose a reasonable potential to cause or contribute to an exceedance of any state water quality criteria. Any effects of exposure to filter backwash will be so small they cannot be detected and therefore insignificant.

## Conclusion

It is EPA's determination that the operation of these facilities, as governed by these permit actions and the related approvals of the CWA Section 301(h) waiver requests, are not likely to adversely affect the listed species occurring in the vicinity of the receiving waters for the following reasons:

- The POTWs withdraw no water from ocean and therefore have no water intake structures in operation. No impingement or entrainment impacts to ESA species are associated with this proposed permit actions.
- The discharges are all to areas with strong currents which provide rapid dilution. Biochemical oxygen demanding effluent will be rapidly dispersed, having insignificant effect on dissolved oxygen in the areas of discharge.
- The discharge pipes are not associated with any potential obstructions or entanglements that may adversely affect listed species in the area of the outfalls.
- Total suspended solids (TSS) shall be in sufficiently low concentrations as to be unlikely to concentrate or settle in the swift moving water; thus any effects will not be meaningfully detected and are insignificant.
- The Draft Permits shall include pH limitations of 6.0-9.0 standard units which are protective state water quality standards found at MEDEP Effluent Guidelines and Standards, Chapter 525(3)(III)(c). The effects of any pH variations in the vicinity of the outfalls are discountable.
- The Draft Permits contain requirements to comply with all state water quality standards for the protection of fish and excellent habitat, therefore effects are extremely unlikely and discountable.
- The buoyant effluent moves upward for wide dispersion. Benthic SCUBA surveys show no discernable differences between nearfield benthic locations and control sites, therefore any effects to benthic habitats are extremely unlikely and discountable.

Based on the analysis of potential impacts presented here, impacts to Atlantic sturgeon, shortnose sturgeon, and Atlantic salmon from the Maine POTWs discharges, if any, will be discountable and/or insignificant.

EPA has made the determination that the renewal of these 8 permits and the approval of the CWA Section 301(h) waiver requests may affect, but are not likely to adversely affect, any listed species or critical habitat under NMFS' jurisdiction. Therefore, EPA has judged that a formal consultation pursuant to Section 7 of the ESA is not required. EPA is seeking concurrence from NMFS regarding this determination through the information presented in this letter. And we certify that we have used the best available scientific information.

Re-initiation of consultation will take place: (a) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (c) if a new species is listed or critical habitat is designated that may be affected by the identified action.

EPA shall submit each Draft Permit, Fact Sheet, and Draft 301(h) Waiver Decision Document to NOAA Fisheries Protected Resources when they are prepared for public review. Please contact Doug Corb, Permit Writer, at (617) 918-1565 with any questions related to this letter.

Sincerely,

Ellen B Weitzler

Ellen Weitzler, P.E., Chief
Municipal Permits Section

CC: Gregg Wood, Maine Department of Environmental Protection, Augusta

## Literature Cited


Atlantic Sturgeon Status Review Team. 2007. Biological Assessment of Atlantic Sturgeon *Acipenser oxyrinchus oxyrinchus*. Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007 (updated July 27, 2007). 174 pp.

Baum, E.T. 1997. Maine Atlantic Salmon: A National Treasure. Atlantic Salmon Unlimited. 224 pp.

Baumgartner, M.F. and B.R. Mate. 2005. Summer and fall habitat of North Atlantic right whales inferred from satellite telemetry. Canadian Journal of Fisheries and Aquatic Science 62:527-543.

Burton, W.H. 1993. Effects of bucket dredging on water quality in the Delaware River and the potential for effects on fisheries resources. Versar, Inc., 9200 Rumsey Road, Columbia, Maryland.

Canadian Council of Ministers of the Environment. 1999. Canadian water quality guidelines for the protection of aquatic life: Dissolved oxygen (freshwater). In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

Clark, C.W. 1995. Application of US Navy underwater hydrophone arrays for scientific research on whales. Rep. Int. Whal. Commn. 45:210–212.

Dadswell, M.J., B.D. Taubert, T.S. Squiers, D. Marchette and J. Buckley. 1984. Synopsis of biological data on shortnose sturgeon (*Acipenser brevirostrum*, LeSueur 1818). NOAA Tech. Rept. NMFS 14. 45 p.

Danie, D. 8., J. G. Trial, and J. G. Stanley. 1984. Species profiles: life histories and environmental requirements of coastal fish and invertebrates (North Atlantic) — Atlantic salmon. U.S. Fish Wildl. Serv. FWS/OBS-82/11.22. U.S. Army Corps of Engineers, TR EL-82-4. 19 pp.

Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.J. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. Fishery Bulletin 108:450-465. Available at http://greateratlantic.fisheries.noaa.gov/protected/atlsturgeon/references/dunton_et_al_2010.pdf

Environmental Protection Agency. 1986. Quality Criteria for Water 1886. EPA Office of Water 440/5-86-001.

Fay, C., M. Bartron, S. Craig, A. Hecht, J. Pruden, R. Saunders, T. Sheehan, J. Trial. 2006. Status review for anadromous Atlantic salmon (*Salmo salar*) in the United States. Report to the National Marine Fisheries Service and U.S. Fish and Wildlife Service. 294 pp.

Hain, J.H.W., M.J. Ratnaswamy, R.D. Kenney, and H.E. Winn. 1992. The fin whale, *Balaenoptera physalus*, in waters of the northeastern United States continental shelf. Rep. Int. Whal. Commn. 42:653–669.

Jenkins, W.E., T.I.J. Smith, L.D. Heyward, and D.M. Knott. 1993. Tolerance of shortnose sturgeon, *Acipenser brevirostrum*, juveniles to different salinity and dissolved oxygen concentrations. Proceedings of the annual Conference Southeastern Association of Fish and Wildlife Agencies 47: 476-484.

Kenney, R.D. and H.E. Winn. 1987. Cetacean biomass densities near submarine canyons compared to adjacent shelf/slope areas. Continental Shelf Research 7:107–114.

Kynard, B. 1997. Life history, latitudinal patterns, and status of shortnose sturgeon. Environmental Biology of Fishes 48:319-334.

Kynard, B., M. Horgan, M. Kieffer, and D. Seibel. 2000. Habitats used by shortnose sturgeon in two Massachusetts rivers, with notes on estuarine Atlantic sturgeon: a hierarchical approach. Transactions of the American Fisheries Society 129: 487-503.

Morreale, S.J., P.P. Plotkin, D.J. Shaver, and H.J. Kalb. 2007. Adult migration and habitat utilization: ridley turtles in their element. In: Plotkin, P.T. (editor), Biology and Conservation of Ridley Sea Turtles. Johns Hopkins University Press, Baltimore. p. 213-229.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991. Recovery Plan for U.S. Population of Atlantic Green Turtle (*Chelonia mydas*). National Marine Fisheries Service, Washington, D.C.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery Plan for Leatherback Turtles (*Dermochelys coriacea*) in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C.

National Marine Fisheries Service. 2005. Final Recovery Plan for the North Atlantic Right Whale (*Eubalaena glacialis*) Revision. National Marine Fisheries Service, Silver Spring, MD. 137 pp.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2008. Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*) Second Revision. National Marine Fisheries Service, Silver Spring, MD.

National Marine Fisheries Service. 2010b. Final Recovery Plan for the Fin Whale (*Balaenoptera physalus*). National Marine Fisheries Service, Silver Spring, MD. 121 pp.

National Marine Fisheries Service, U.S. Fish and Wildlife Service, and SEMARNAT. 2011. Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) Second Revision. National Marine Fisheries Service, Silver Spring, MD. 156 pp.

National Oceanic & Atmospheric Administration. 2008. News from NOAA: High numbers of right whales seen in Gulf of Maine. December 21, 2008. Available on-line at http://www.nefsc.noaa.gov/press_release/2008/SciSpot/SS0818/RW%20sightings%20release.pdf.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2016. DRAFT Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon (*Salmo salar*). 61 pp.

Secor, D.H. and T.E. Gunderson. 1998. Effects of hypoxia and temperature on survival, growth, and respiration of juvenile Atlantic sturgeon, *Acipenser oxyrinchus*. Fishery Bulletin 96: 603-613.

Secor, D.H. and J.E. Niklitschek. 2002. Sensitivity of sturgeons to environmental hypoxia: physiological and ecological evidence. In: Thurston, R.V. (Ed.), Fish Physiology, Toxicology, and Water Quality. Proceedings of the Sixth International Symposium, La Paz, Mexico. p. 61-78.

Shortnose Sturgeon Status Review Team. 2010. Biological Assessment of Shortnose Sturgeon *Acipenser brevirostrum*. Report to National Marine Fisheries Service, Northeast Regional Office. November 1. 2010. 417 pp.

Stitut De Radioprotection Et De Sûreté Nucléaire. August 9, 2012. Natural Uranium and the Environment

Stein, A.B., K.D. Friedland, and M. Sutherland. 2004. Atlantic sturgeon marine distribution and habitat use along the Northeastern coast of the United States. Transactions of the American Fisheries Society 133:527–537.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel (eds.). 2012. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments—2011. NOAA Technical Memorandum NMFSNE- 221:1-319.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel (eds.). 2014. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments - 2013. NOAA Technical Memorandum.

Watkins, W.A., and W.E. Schevill. 1982. Observations of right whales (*Eubalaena glacialis*) in Cape Cod waters. Fish. Bull. 80(4): 875-880.