



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration

National Marine Fisheries Service

P.O. Box 21668

Juneau, Alaska 99802-1668

November 10, 2003

Michael Lidgard
Office of Water Director
U.S. Environmental Protection Agency, Region 10
1200 6th Avenue, OW-130
Seattle, WA 98101

RE: Proposed NPDES Permit Issuance,
AKG-57-1000

Dear Mr. Lidgard:

The National Marine Fisheries Service (NMFS) reviewed the proposed National Pollutant Discharge Elimination System General Permit (NPDES GP) for the direct or indirect discharge of pollutants from 22 small wastewater treatment facilities to marine waters of the Beaufort, Chukchi, and Bering Seas, and the Gulf of Alaska. The NPDES GP would authorize small publically owned treatment works and other small treatment works providing secondary treatment of domestic sewage and discharging to marine waters, and the accompanying fact sheet proposes Alaska Department of Environmental Conservation (ADEC) certification of the NPDES GP under section 401 of the Clean Water Act. The Environmental Protection Agency (EPA) has tentatively determined that issuance of this general permit is not likely to adversely affect Essential Fish Habitat (EFH) in the vicinity of the discharges. NMFS concurs with the EPA's finding of no adverse effects to EFH for 21 of the 22 proposed treatment facility discharges. The recent discovery of a Habitat Area of Particular Concern (HAPC) at the site of one of the proposed pollutant discharge sites indicates that adverse effects to EFH are likely to occur from the pollutant discharge for Lena Point Subdivision in Juneau, Alaska.

Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1855(b)) requires federal agencies to consult with NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated EFH. Because NMFS has determined that adverse effects to EFH are likely at the Lena Point Subdivision marine sewage outfall site, EPA should complete an EFH assessment and consider conservation recommendations that will avoid, reduce or minimize the adverse effects of this action. An EFH Assessment includes a description of the action, an analysis of the potential adverse effects of the action on EFH and the managed species, the agency's conclusion regarding the effects of the action on EFH, and proposed mitigation, if appropriate.

Site-specific EFH Information for Lena Point Subdivision

NMFS biologists conducted an on-site habitat survey on October 15, 2003, to evaluate the effects to EFH from the proposed marine outfall for the Lena Subdivision in Juneau, Alaska. Biologists documented the existence of a large, dense grove of soft coral colonies located immediately



downslope of the proposed pollutant outfall and within the proposed mixing zone. This survey was conducted following the recent discovery of pennatulacean soft corals commonly known as sea pens (*Ptilosarcus gurneyi*) and sea whips (*Halipteris willemoesi*) in the project area. Scuba divers surveyed a 100 m long transect from the proposed outfall site perpendicular to shore (between lat. 58°23.20'N, long. 134°46.07'W and lat. 58°23.188'N, long. 134°46.180'W). At 10 m intervals along the transect divers estimated the density of sea pens and sea whips and recorded the depth and surface sediment composition. The detailed survey report is enclosed and the findings are summarized here.

Pennatulacean corals are living marine substrates and constitute EFH for several species of federally managed fish and in addition are a Habitat Area of Particular Concern (HAPC) because of their ecological importance, sensitivity to disturbance, and rarity. This grove is the densest grove of sea pens documented in Alaskan waters, contains the largest individuals on record (65 cm), contains both adult and juvenile colonies and thus is likely to be a breeding colony. While several other sea pen groves exist in the Juneau area, they are rare and this grove is the only known breeding colony. Four federally managed species were also present within the grove during the survey: juvenile red king crab (*Paralithodes camtschaticus*), juvenile walleye pollock (*Theragra chalcogramma*) and juvenile flatfishes (probably southern rock sole, *Lepidopsetta bilineata* and yellowfin sole, *Limanda aspera*). Sea pens and sea whips provide important rearing habitat for these species.

Sea pens were found at depths between 3.1 m and 22.3 m MLLW. Juvenile sea pens were abundant between the proposed outfall site and 30 m downslope and large adult sea pens were profuse between 30 m and 70 m downslope of the proposed outfall site. Adult and juvenile sea whips were present between 60 m and 80 m downslope of the outfall site at depths of 16.8 m to 20.7 m MLLW. The proposed mixing zone would have a radius of 31.5 m. With outfall located as proposed at -14 feet MLLW, this mixing zone would result in the discharge of sewage effluent directly into the grove of sea pen colonies. The proposed mixing zone would overlap the distribution of all of the observed juvenile sea pens and the highest density of adult sea pens.

Octocorals such as sea pens and sea whips are ecologically important filter-feeding animals that are sensitive to pollution. Sewage discharge adds nutrients to the receiving waters resulting in rapid algal growth which can reduce octocoral biodiversity and abundance (Dyrynda 2003). The specific NPDES permit limits effluent volume, fecal coliform levels, dissolved oxygen (DO) levels, and pH within the mixing zone. The daily minimum allowable DO level would be 2 mg/L, which would be lethal to corals, fish and other exposed animals. Even the allowable DO level of 4 mg/L *outside* of the mixing zone is lethal to most sessile marine animal life including octocorals.

Phosphate levels would not be monitored or regulated but low levels of phosphates and other nutrients are likely to be present in the effluent that could cause algal blooms harmful or lethal to corals (Alcolado 1998). Allowable chlorine levels are not specified in the proposed permit, presumably because chlorine is not proposed for use as a disinfectant. However, the effluent is likely to contain low levels of chlorine originating from the chlorinated city water supply. Chlorine is toxic to marine life and the chlorinated sewage effluent may result in either acute or

chronic low-level exposures (Tomascik et al. 1997).

On October 29, 2003, NMFS Habitat Conservation Division and Auke Bay Laboratory staff held a meeting with staff from the City and Borough of Juneau (Lands Division and Community Development Department), U.S. Army Corps of Engineers, Alaska Department of Conservation, and Alaska Department of Natural Resources to discuss this new information and its impact on the proposed Lena Subdivision. Copies of the enclosed survey report were distributed, underwater video of the pennatulacean colony was shown, living specimens of sea pens and sea whips were examined, and the basic biology and ecology of these coral animals was explained. NMFS staff explained that the marine outfall and mixing zone as currently designed would have adverse effects on this uncommon coral habitat and that the habitat was considered both EFH and a HAPC.

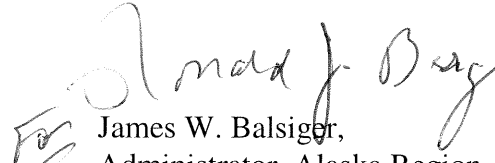
Conservation Recommendations

Per EPA's Fact Sheet for this NPDES GP, a discharge cannot be covered under the GP if the receiving water is considered to be a sensitive area by EPA or ADEC. Pollutant discharges to sensitive areas require specific permit conditions and are more appropriately regulated under individual permits. The site specific information for the Lena Point Subdivision indicates to NMFS that the area proposed for effluent discharge and mixing zone should be considered as a sensitive area. HAPCs warrant special consideration to avoid disturbance based on their ecological importance and sensitivity. The ecological importance of pennatulacean groves in Alaska waters has been investigated by Brodeur (2001) and Stone et al. (in press).

Based on the current information for the Lena Point Subdivision outfall site, NMFS recommends extending the effluent outfall pipe beyond the sea pen grove so that the pollutant outfall diffuser and mixing zone are located beyond the sea pen grove. NMFS is unable to recommend the exact location of the outfall diffuser but suggests that the outfall pipe be extended downslope of the survey transect (lat 58°23.188'N, long. 134°188'N) if ADEC effluent plume modeling demonstrates that the resulting effluent mixing zone would avoid this important habitat. If the effluent discharge location and mixing zone are relocated to avoid the sensitive area, then adverse effects to EFH are not likely to occur.

NMFS is available to assist the EPA and ADEC with any further information needs regarding this interesting site, and in developing an acceptable solution for the Lena Point Subdivision project. We can provide a copy of the video footage of the coral grove upon request and are available for further scuba assessments of the area if more information is needed. Please contact Susan Walker (907-586-7646 or susan.walker@noaa.gov) with any project related questions or concerns.

Sincerely,


James W. Balsiger,
Administrator, Alaska Region

Enclosure

cc:

ADEC, Juneau, Shawn Stokes
ADNR, Juneau, Sandy Harbanuk
CBJ, Lands Department, Cynthia Johnson, Steve Gilbertson
CBJ, Community Development, Teri Camry
ACOE, Juneau, Susan Hitchcock
ADFG, Juneau, Janet Schempf
NMFS, ABL, Robert Stone

Literature Cited:

Alcolado, P.M., R. Claro, G. Menendez, P. Garcia-Parrado, and B. Martinez-Daranas. 1998. Status of Cuban coral reefs. Atlantic and Gulf Reef Assessment Workshop. June 2-6, 1998. Available at Institute of Oceanography, Ministry of Science, Havana, Cuba.

Broder, R.D. 2001. Habitat-specific distribution of Pacific ocean perch (*Sebastes alutus*) in the Pribilof Canyon, Bering Sea. *Continental Shelf Research* 21: 207- 224.

Dyrynda, P.E.J. 2003. Octocorallia. In: *Marine Biodiversity - An Introduction*. Available at University of Wales Swansea, Wales, UK or <http://www.solaster-mb.org>.

Tomascik, T.A., J. Mah, A. Nontji, and M.K. Moosa. 1997. *The Ecology of the Indonesian Seas. Part Two*. Periplus Editions, Singapore. 745 p.

Stone, R.P., M.M. Masuda, and P.W. Malecha. In Press. Effects of bottom trawling on soft-sediment communities in the Gulf of Alaska. *Proceedings of the Symposium on Benthic Habitats and the Effects of Fishing*. American Fisheries Society, Bethesda, Maryland.



UNITED STATES DEPARTMENT OF COMMERCE
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October 22, 2003

MEMORANDUM FOR: Record

FROM: Robert Stone *RRS*

SUBJECT: Habitat Survey at CBJ Proposed Outfall Site

Research biologists' Robert Stone and Patrick Malecha of the National Marine Fisheries Service (NMFS) Auke Bay Laboratory, conducted a habitat survey on 15 October 2003 in the immediate area of a proposed domestic wastewater outfall site near Point Lena in Juneau, Alaska. Susan Walker, habitat biologist for the Habitat Conservation Division of the NMFS, also participated in the survey. The outfall proposed by the City and Borough of Juneau (CBJ) would service the South Lena Subdivision. Approximately 114,000 to 303,000 liters of treated domestic wastewater would be discharged daily at the site, which is located at a depth of 4.3 m and approximately 55 m seaward from the adjacent shoreline or mean lower low water (MLLW) line.

In an earlier study, a current meter was deployed at the proposed outfall location between 28 June and 30 July 2002 to determine the fate of discharged sewage and to examine the possibility that this outfall would contaminate the seawater source at the proposed NOAA Fisheries research facility to be located 930 m to the north (Malecha and Stone, 2003). The study indicated that currents at the site were generally weak with a mean current velocity of 2.52 cm/s. Current headings were mostly bidirectional and approximately parallel to the shoreline. Based on those findings, Malecha and Stone (2003) concluded that there was little likelihood of contamination at the NOAA seawater intake site. They did, however, caution that the sluggish nature of the currents at the proposed site were probably insufficient to disperse wastewater far from the source, and that there was the potential for contamination of the shoreline if one or more of the treatment systems failed and raw sewage entered Favorite Channel from the marine outfall.



They recommended that the outfall be moved 100 m further offshore into deeper water to mitigate potential contamination of the shoreline. This recommendation was based on observations of the bathymetry and water currents at this site and did not consider potential adverse effects that the discharge might have on fish habitat in the area.

During the June and July 2002 current meter deployments, scuba divers noted the presence of large numbers of juvenile sea pens, *Ptilosarcus gurneyi*, in the immediate vicinity of the proposed outfall. The purpose of the 15 October 2003 survey was to determine the depth distribution of sea pens at the site and identify potential habitat concerns at the outfall location recommended by Malecha and Stone (2003) 100 m seaward and downslope of the CBJ proposed outfall site.

Scuba divers established a survey transect between the CBJ proposed outfall site (lat. 58°23.20'N, long. 134°46.07'W) and a location 100 m seaward and perpendicular to the shoreline (lat. 58°23.188'N, long. 134°46.180'W). At 10-m intervals, divers documented the depth and surficial sediment composition, and estimated the density of pennatulaceans (sea pens and sea whips) in the immediate area of the transect. The seafloor along the transect was also documented by video recording.

Results from the survey are presented in Table 1. Sea pens were widely distributed on the survey transect from the proposed outfall site (0 m) to approximately 90 m downslope and at depths between 3.1 and 22.3 m MLLW. A dense grove of adult sea pens was present between 30 and 70 m downslope of the proposed outfall site. Juvenile sea pens were present between the outfall site and 30 m downslope. Some adult and juvenile sea whips (*Halipteris willemoesi*) were present between 60 and 80 m downslope on the transect at depths between 16.8 and 20.7 m MLLW. Pennatulaceans were not observed downslope from the end of the survey transect at a depth of 23.5 m MLLW. The surficial substrate along the transect was predominantly medium sand to a depth of 16.8 m MLLW and fine sand below that depth. Pebbles and shell hash were observed in some areas. The seafloor downslope of the proposed outfall is of low to moderate gradient (6.8 to 18.8°). Divers noted the presence of juvenile red king crabs (*Paralithodes camtschaticus*), juvenile walleye pollock (*Theragra chalcogramma*), and juvenile pleuronectids (probably *Lepidopsetta bilineata* and *Limanda aspera*) within the sea pen grove. All four species are managed in Alaska under Fishery Management Plans.

Pennatulaceans, along with other octocorals, are considered "living substrates" and pennatulaceans are listed as "habitat area of particular concern" (HAPC) biota (NMFS, 2002). These

HAPCs are given special consideration from disturbance by fishing and non-fishing activities based on their ecological importance, sensitivity to disturbance, and rarity. The ecological importance of pennatulacean groves has been noted in Alaska waters (Brodeur, 2001; Stone et al., In press). Pennatulacean groves are a rare habitat type in the Juneau area and the grove at the proposed outfall site is unique given the presence of large numbers of juveniles. This is the densest grove of adult, and presumably breeding, sea pens observed by Auke Bay Laboratory research scientists in Alaskan waters and the grove contains the largest individuals (65 cm tall) on record (Barr and Barr, 1983; Gotshall and Laurent, 1979). We made no attempt to delineate the boundaries of the grove along the slope (e.g., northwest to southeast), so we can say little about the overall dimensions of the grove, other than it was at least 20 m wide.

Sewage and other forms of pollution can adversely affect nearshore octocoral biodiversity and abundance by favoring algal growth (Dyrynda, 2003). Sewage discharge causes organic nutrient enrichment of receiving waters, rapid increases in biological production, and eutrophication through depletion of dissolved oxygen (Tomascik et al., 1997). High concentrations of phosphates in effluent may also cause algal blooms lethal to corals (Alcolado, 1998). Chlorine is toxic to marine life, and chlorinated sewage effluent (note that the CBJ water supply is chlorinated) may subject marine biota, including octocorals, to either single-event acute exposures or to chronic exposures (Tomascik et al., 1997).

The location proposed by the City and Borough of Juneau for a treated sewage outfall is heavily colonized by a large breeding population of sea pens and is a rare nursery habitat for these octocorals. Octocorals are ecologically important species and are sensitive to sewage pollution. The proposed outfall should be moved downslope of our survey transect (lat. 58°23.188'N, long. 134°46.180'W) to where effluent, given a much larger mixing zone in deeper water, will be flushed away from the octocoral habitat. The potential for shoreline contamination due to treatment system failure would also be reduced if the outfall was moved further offshore.

Citations:

Alcolado, P. M., R. Claro, G. Menendez, P. Garcia-Parrado, and B. Martínez-Daranas. 1998. Status of Cuban coral reefs. Atlantic and Gulf Reef Assessment Workshop. June 2-6, 1998. Available at Institute of Oceanography, Ministry of Science, Havana, Cuba.

- Barr, L., and N. Barr. 1983. Under Alaskan Seas--The Shallow Water Marine Invertebrates. Alaska Northwest Publishing Company, Anchorage, Alaska. 208 p.
- Dyrynda, P. E. J. 2003. Octocorallia. In: Marine Biodiversity-- An Introduction. Available at University of Wales Swansea, Wales, UK or <http://www.solaster-mb.org>.
- Brodeur, R. D. 2001. Habitat-specific distribution of Pacific ocean perch (*Sebastes alutus*) in the Pribilof Canyon, Bering Sea. Continental Shelf Research 21:207-224.
- Gotshall, D. W., and L. L. Laurent. 1979. Pacific Coast Subtidal Marine Invertebrates. Sea Challengers, Los Osos, California. 107 p.
- Malecha, P. W., and R. P. Stone. 2003. Benthic currents at three nearshore sites near Point Lena and Auke Bay, Alaska. AFSC Processed Report 2003-06. 39 p. Auke Bay Laboratory, 11305 Glacier Highway, Juneau, Alaska, 99801.
- National Marine Fisheries Service (NMFS). 2002. Magnuson-Stevens Act Provisions; Essential Fish Habitat (EFH). Final Rule. Federal register 67(12): 2343-2383.
- Stone, R. P., M. M. Masuda, and P. W. Malecha. In press. Effects of bottom trawling on soft-sediment communities in the Gulf of Alaska. Proceedings of the Symposium on Benthic Habitats and the Effects of Fishing. American Fisheries Society, Bethesda, Maryland.
- Tomascik, T. A. J. Mah, A. Nontji, and M. K. Moosa. 1997. The Ecology of the Indonesian Seas. Part Two. Periplus Editions, Singapore. 745 p.

Table 1. Depth (relative to mean lower low water), surficial substrate composition, seafloor slope, and estimated density of pennatulaceans on a survey transect between the CBJ proposed domestic wastewater outfall site near Point Lena and a location 100 m seaward of that site. MS = medium sand, P = pebble, SH = shell, FS = fine sand, SL = silt. PG = *Ptilosarcus gurneyi*, HW = *Halopteris willemoesi*.

Distance (m)	Depth (m)	Slope (°)	Substrate	Density of Pennatulaceans (no. per m ²)			
				Adult PG	Juvenile PG	Adult HW	Juvenile HW
0	3.1		MS	0	>1	0	0
10	4.6	8.5	MS	0	>1	0	0
20	6.1	8.5	MS/P/SH	0	>2	0	0
30	9.5	18.8	MS	10	<1	0	0
40	12.2	15.1	MS	7	0	0	0
50	14.3	11.9	MS	5	0	0	0
60	16.8	13.5	MS	4	0	<1	0
70	18.9	11.9	FS/SH	1	0	<1	<1
80	20.7	10.2	FS/SH	<1	0	<1	<1
90	22.3	8.5	FS/SH	<1	0	0	0
100	23.5	6.8	FS/SL/SH	0	0	0	0

cc: M. Dahlberg
P. Rigby
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S. Walker

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SW 11-10-03