



THE STATE
of **ALASKA**
GOVERNOR SEAN PARNELL

**Department of Environmental
Conservation**

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November 12, 2014

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Southeast Alaska Conservation Council
244 Gold Street
Juneau, AK 99801

Bob Shavelson
Executive Director
Cook Inletkeeper
3734 Ben Walters Lane
Homer, AK 99603

Re: Request to Informally Review Decision to Reissue Large Commercial Passenger Vessel Wastewater Discharge General Permit No. 2013DB0004

Dear Ms. Marvin & Mr. Shavelson:

I have completed my review of your October 27, 2014 request for an Informal Review of the Division of Water Commercial Passenger Vessel Environmental Compliance (CPVEC) Program, or Cruise Ship Program, staff's August 29, 2014 decision to reissue the Large Commercial Passenger Vessel Wastewater Discharge General Permit (Permit Number 2013DB0004). I note that your original request for Informal Review was sent September 17, 2014; but that I have sent you two requests for additional information since September 17, 2014. Therefore, your request is timely per 18 AAC 15.185(a).

The October 27, 2014 letter requested review of the decision to:

- a) Issue a general permit for the discharge of treated sewage, treated graywater, and other treated wastewaters from large commercial passenger vessels operating within the boundaries of the State of Alaska, together with all of the Alexander Archipelago in Southeast Alaska even if outside the boundaries of the state, that authorizes mixing zones for discharges at ship speeds of under 6 knots, including when moored or docked at the Juneau Harbor or docked in Skagway at Broadway or Ore Dock inconsistent with the requirements of 18 AAC 70.240(b), (c), and (k); and
- b) Allow owners or operators of large commercial passenger vessels to obtain an authorization under the General Permit to degrade the water quality of covered Tier II waters within the boundaries of the State of Alaska, including those waters of the Alexander Archipelago in Southeast Alaska outside the boundaries of the State, without notifying the public about the nature and location of specific discharges covered by the permit.

In particular, the request contests the following: the Notice of Intent review and permit coverage determination process adopted in General Permit 2013DB0004, the reasonableness of the mixing zone analysis supporting the permit decision, and the failure to articulate a reasonable basis for the effluent limit set for ammonium¹. The October 27, 2014 request also includes a request to vacate the permit and reinstate the 2010 General Permit (Permit Number 2009DB0026) until the alleged inadequacies noted above are corrected.

The enclosed Informal Review Analysis and Decision dated November 12, 2014 includes a summary of each of the informal review points from your October 27, 2014 letter's attached Statement in Support. I deny the request to vacate the permit on the grounds that it was issued in violation of applicable law; however, I stay the effective date of the permit and remand the decision to reissue the permit to the Division of Water's Cruise Ship Program in order to address 1) the question raised by Requestors whether allowing mixing zones in Gastineau Channel will limit the existing use of the DIPAC net pens identified in Review Issue 1 and 2) the decision by the Department to use different sets of ambient copper data for the reasonable potential analysis and the CORMIX modeling, identified in Review Issue 2.

Consistent with Alaska Administrative Code (AAC) 18 AAC 15.185(c), I am advising you and all other parties of the right to seek an adjudicatory hearing under 18 AAC 15.200 or Alaska Statute 44.62.

Should you have any questions, please don't hesitate to contact me.

Sincerely,



Michelle Hale
Director

cc: Cruise Lines of Alaska
Northwest Cruise Association

¹ Elsewhere Requestors reference ammonia rather than ammonium, and the Alaska water quality standards are for ammonia (see 18 AAC 70 and the referenced *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances*).

INFORMAL REVIEW ANALYSIS AND DECISION

November 12, 2014

Request for Informal Review Decision to Vacate the Large Commercial Passenger Vessel Wastewater Discharge General Permit 2013DB0004

Review Issue 1. The Division failed to consider the effects of discharges in Juneau Harbor from vessels moored or at dock on the existing uses of the waterbody as required by 18 AAC 70.240.

Requestors (i.e., Southeast Alaska Conservation Council and Cook Inletkeeper) describe users (i.e., contact recreation users, DIPAC Hatchery and Aquarium and a nearby fish processor) of Gastineau Channel and Juneau Harbor that the Requestors allege the Department did not consider when evaluating existing uses consistent with mixing zone regulation 18 AAC 70.240(b)(3). Included within the subject section, Requestors also object to the Alaska Department of Environmental Conservation's (DEC or the Department) use of the April 2012 version of the mixing zone regulations as they state that the Environmental Protection Agency (EPA) has not approved the regulations.

Background and Analysis of Review Issue 1.

BACKGROUND

The Department's Commercial Passenger Vessel Environmental Compliance Program (CPVEC or Cruise Ship Program) issued the Marine Discharge of Treated Sewage, Treated Graywater, and Other Treated Wastewater from Large Commercial Passenger Vessels Operating in Alaska General Permit 2013DB0004 (permit or general permit) on August 29, 2014 after completing a public process that included a public notice period from April 8, 2014 to May 23, 2014. The permit was issued pursuant to Alaska Statute (AS) 46.03 and Title 18, Chapter 69 of the Alaska Administrative Code (AAC), which provides the regulatory framework for the CPVEC Program, and 18 AAC 72.600. The CPVEC Program generally regulates point source wastewater discharges and air emissions from cruise ships operating in Alaska waters including those waters specified by AS 46.03.490(18), "waters of the Alexander Archipelago." Section 1 of the permit's fact sheet further documents recent changes to AS 46.03 as a result of legislation passed in 2013 (House Bill 80), including the allowance for Department authorization of mixing zones for ships with Advanced Wastewater Treatment Systems (AWTS).

The Department's Wastewater Discharge Authorization Program (WDAP) administers the Alaska Pollutant Discharge Elimination System (APDES) Program for the State of Alaska. DEC received approval to administer the APDES Program from EPA on October 31, 2008. The APDES Program is implemented in a manner that meets the purposes of AS 46.03 and in accordance with 33 United States Codes 1342 (Clean Water Act, Section 402). Implementing regulations for the APDES Program are codified in 18 AAC 83.

States delegated the authority to administer the National Pollutant Discharge Elimination System (NPDES) Program are required to incorporate state-developed Water Quality Standards (WQS), which are composed of designated uses, numeric and/or narrative water quality criteria and an antidegradation policy, that are approved by EPA, into their state-issued NPDES permits. The CPVEC program is a state program and not a national program, and DEC is not bound to use EPA-approved WQS for state-issued wastewater permits not issued under the authority of 18 AAC 83 (i.e., the most recent state-adopted WQS regulation package is used for CPVEC permits). However, AS 46.03 does require that both CVPEC and WDAP develop wastewater discharge permits consistent with Alaska WQS, including the mixing zone regulations described therein at 18 AAC 70.240, which, in all versions, EPA approved or not, require that existing uses be maintained and protected.

As described above, while both CVPEC and WDAP regulate wastewater discharges in state waters, the two DEC programs largely do so under different legal authorities.

ANALYSIS

Consistent with 18 AAC 70.050¹, except as classified in 18 AAC 70.230(e), all marine state waters are protected for Classes (2)(A) (aquaculture, seafood processing and industrial water supply), (2)(B) (contact and secondary recreation), (2)(C) (growth and propagation of fish, shellfish, other aquatic life, and wildlife), and (2)(D) (harvesting for consumption of raw mollusks or other raw aquatic life). Neither Juneau Harbor nor Gastineau Channel have been reclassified per 18 AAC 70.230(e), so both water bodies are protected for all marine uses. Accordingly, the Cruise Ship Program completed a mixing zone analysis in Section 6.3.4 and Appendix E of the permit's fact sheet (also see Appendix G for a regulatory step through) that included evaluation of a mixing zone in the context of protecting all existing uses. The mixing zones were sized to ensure that all parameters that were screened and determined to have reasonable potential to exceed water quality criteria at the end of pipe prior to discharge will meet applicable water quality criteria in the waterbodies at the boundary of the mixing zones, thus ensuring that the waterbodies as a whole are protected for all uses (18 AAC 70.240(c)(2)) (note, water quality criteria are developed with the specific purpose of protecting waterbody uses). While it is not clear if the CVPEC Program identified those specific users identified by the Requestors, the mixing zone analysis conducted for the permit was conducted within the context of and knowledge about the vessels that would be covered under the permit. The CVPEC Program sized the mixing zones to be protective of all waterbody uses, including those mentioned by the Requestors.

First, Requestors describe primary (adolescents jumping off dock in Juneau and families playing in the surf at Sandy Beach) and secondary (windsurfers and paddle boarders in Gastineau Channel) recreation users, and state that the Department failed to consider the effects of discharges on these users. The pollutant of concern for human health protection for both primary and secondary contact is fecal coliform bacteria, and end-of-pipe water quality criteria effluent limits were set for fecal coliform bacteria for ships discharging at speeds under 6 knots thus ensuring human health protection even in the rare possibility that a human would have contact with water inside a mixing zone.

Second, Requestors describe net pens at the Douglas Island Pink and Chum (DIPAC) hatchery at Sheep Creek. Vessels traveling past the DIPAC hatchery at Sheep Creek are underway, but data is not immediately available to demonstrate the location of the net pens, the speed at which the vessels are traveling in that area, or the point at which water quality criteria would be met. Hence, I remand the specific question of whether allowing mixing zones in Gastineau Channel will limit the existing use of the DIPAC net pens to the CPVEC Program to address.

Third, Requestors describe a nearby fish processor that intakes marine waters for seafood processing near the Juneau cruise ship docks. Seafood process water regulations at 18 AAC 34.080 require that process water be disinfected; in fact, the processor in question uses City and Borough of Juneau treated drinking water for its process water and uses seawater for purposes such as deck and dock washdown – an industrial use. As with the primary and secondary contact uses, the pollutant of concern for industrial uses is fecal coliform bacteria, and the fecal coliform bacteria limits are more stringent than necessary to protect for industrial uses.

Finally, Requestors mention the touch tank at the DIPAC hatchery. Little detail is provided; however, it is important to note that the DIPAC hatchery is miles from the cruise ship dock, certainly much further than the 83-meter mixing zone that is provided for stationary vessels or vessels moving at less than six knots. Also recall that the pollutant of concern for both primary and secondary contact is fecal coliform bacteria, and end-of-pipe water quality criteria effluent limits were set for fecal coliform bacteria for ships discharging at

¹ All 18 AAC 70 citations in this document are from the WQS regulation package as amended as of April 8, 2012. As the Division describes in the Background Section of Review Issue 1, the Division uses the most recent version of the WQS when drafting CVPEC Program wastewater discharge permits as these permits are not issued under the authority of the APDES Program.

speeds under 6 knots thus ensuring human health protection even in the rare possibility that a human would have contact with water from inside a mixing zone.

With respect to 18 AAC 70.240(b)(3), which deals with the effects, if any, of cumulative effects from multiple discharges, similar to the analysis included in the paragraph above, the CVPEC Program sized the mixing zones to be protective of all existing uses and the waterbodies as a whole, including the uses that support the user activities stated by the Requestors.

CONCLUSION

The mixing zones were sized not to overlap and for water quality criteria to be met in the water bodies such that existing uses in the water bodies will be maintained and protected. Additional information is requested of CPVEC staff to demonstrate whether allowing mixing zones in Gastineau Channel will limit the existing use of the DIPAC net pens in Gastineau Channel.

Division Decision on Review Issue 1

The Director remands the decision that the Department adequately considered the effects of discharges in Gastineau Channel and Juneau Harbor and that all existing marine water body uses will be maintained and protected under the terms of the permit, including the mixing zone authorization, to address the question raised by Requestors whether allowing mixing zones in Gastineau Channel will limit the existing use of the DIPAC net pens. The Director upholds the decisions on the remainder of the issues described in Review Issue 1.

Review Issue 2. The Permit Record Does Not Reasonably Demonstrate That Allowing Mixing Zones in Gastineau Channel and Juneau Harbor Will Not Limit Existing Uses of the Waterbody for Water Supply or Contact Recreation.

Paragraph 1 of Review Issue 2

The Requestors cite 18 AAC 70.240(c)(4)(B) and imply the regulation indicates that the discharges authorized by the permit must not preclude or limit, “established processing activities or established commercial, sport, personal-use, or subsistence fish and shellfish harvesting.” In the April 2012 version of the WQS, 18 AAC 70.240(c)(4)(B) refers to mixing zones not creating a public health hazard that would preclude or limit existing uses for water supply or contact recreation whereas 18 AAC 70.240(c)(4)(C) includes the language quoted above. Given the Requestors have quoted the above language, the Division will proceed with an analysis of 18 AAC 70.240(c)(4)(C).

Requestors indicate that given the number of cruise ship ports of call in Southeast Alaska, it is not possible to determine how many ships will discharge under the general permit, when those discharges will occur, how many discharges could be occurring in Gastineau Channel or Juneau Harbor at the same time, or the economic effects on a nearby seafood processing facility from increased oversight from the U.S. Food and Drug Administration. Requestors request a public participation process so that the Division and public can determine whether a specific discharge is “important” and “necessary” per 18 AAC 70.015(a)(2)(A).

Rephrasing for purposes of clarity, the issues raised in this paragraph can be broken down to:

- How many ships will discharge under the permit, including how many ships will discharge into Gastineau Channel or the Juneau Harbor?
- What will be the economic effect from increased United States Food and Drug Administration oversight on the seafood processor located near the cruise ship dock in Juneau?
- The public participation process provided was not meaningful and did not allow the public to determine whether specific discharges are associated with “important” economic or social development or whether, for a particular waterbody, lowering water quality is “necessary” for the development to occur.

Paragraphs 2 and 3 of Review Issue 2

Requestors also disagree with the Division's decision to use averaged ambient copper data from both Gastineau Channel (Echo Bay Alaska, Inc., 1991) and Hawk Inlet instead of the data from just Gastineau Channel. Requestors suggest that relying on the use of the averaged ambient data in Gastineau Channel will not ensure that water quality criteria will be met in the water body. Requestors also cite that the lower Hawk Inlet ambient copper data was used for the Cornell Mixing Zone Expert System (CORMIX) Model without explanation and that the use of this data cannot ensure the protection 18 AAC 70.240(c)(4)(C) provides for in the Skagway and Juneau Harbors.

Paragraph 4 of Review Issue 2

The Requestors lastly ask in this section why the year after the passage of HB 80 the Department did not undertake contemporary ambient waterbody testing. Inference is made that not collecting contemporary data is inconsistent with Department practice to give more weight to data less than five years old.

Background and Analysis of Review Issue 2.

BACKGROUND

See the Background and Analysis Section in Issue 1 for information on the Department's protection of existing uses through the mixing zone authorization process.

The Department uses general permits to cover a class of similar discharges that require the same type of effluent limits and monitoring and reporting requirements, per AS 46.03.100(b)(2) and 18 AAC 72.900. General permits are crafted when the Department determines that the effluent limits, monitoring, and reporting for the class of discharges will ensure that the water quality protection required by statute and regulation will be met. General permits and their supporting fact sheets (when applicable) are developed by the Department using the information the Department determines to be the best available information for ensuring waterbody protection for both known discharges and potential future discharges that do or may discharge into the waterbodies subject to the permit's Area of Coverage.

The State's Antidegradation Policy in 18 AAC 70.015 requires the Department to make five specific findings before authorizing degradation to waters the Department classifies as Tier II (see 18 AAC 70.015(a)(2)(A) – (E)). The CVPEC Program completed an antidegradation analysis in Appendix H of the permit's fact sheet.

ANALYSIS

Paragraph 1 of Review Issue 2

The Department crafted the general permit based on available water body and cruise ship effluent characteristics, using that information in its permitting decisions to ensure water quality protection per statutes and regulations applicable to cruise ship permits (e.g., AS 46.03, 18 AAC 69, and 18 AAC 70.204 [April 2012 version]). The Department used effluent characteristics obtained from cruise ships discharging under the previous permit as well as receiving water data to come to the conclusion, that subject to the permit's terms, all existing and future cruise ship discharges authorized by the permit will ensure the protection of existing uses.

General permits, by their nature, do not enumerate each discharging facility or vessel, nor do they specify exactly where each discharge will occur. Instead, the permits are written for a defined Area of Coverage and the conditions in the permit are developed to protect water quality and uses throughout that Area of Coverage. This general permit was developed in accordance with this principle and in adherence to AS 46.03.100(b)(2) and 18 AAC 72.900.

Appendix H of the permit's fact sheet contains the antidegradation analysis for the permit. Pages 68-69 of the fact sheet describe the reasons for conducting an antidegradation analysis, which include the likelihood that new cruise ships will discharge under the terms of the permit. Accordingly, the Department's antidegradation analysis made certain that it contemplated both existing and new discharges that may discharge to the general permit's Area of Coverage (which includes Juneau Harbor and Gastineau Channel), including that the discharges are necessary to accommodate important economic or social development in the area where the water is located (specifically see findings 18 AAC 70.015 (a)(2)(A) and (D) of the analysis included in Appendix H).

The statement that there may be economic effects on a nearby seafood processing facility from increased oversight from the U.S. Food and Drug Administration is speculative and outside the scope of this permitting activity. First, as indicated in the Response to Review Issue 1, above, the Department, in its sizing of mixing zones, has concluded that uses of the water are protected, including the use of water by the seafood processor located near the cruise ship dock in Juneau. Second, regardless of the above point, antidegradation regulations require a finding that allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located, not a finding that there are no economic effects on nearby businesses.

The Department conducted the requisite public process during the public notice of the general permit. The Area of Coverage was clearly spelled out in the permit and fact sheet during the public notice process, allowing members of the public to provide comments on the entire Area of Coverage or on specific areas.

Paragraphs 2 and 3 of Review Issue 2

In Appendix E (page 47) of the general permit's fact sheet, a narrative provided the Department's evaluation of existing ambient copper data from Area of Coverage waterbodies used for determining existing ambient copper concentrations for the purposes of completing a reasonable potential analysis. The narrative demonstrates that the Department evaluated existing ambient copper data to determine an appropriate path forward for incorporation of an ambient copper concentration average value from multiple datasets for the purposes of completing a copper reasonable potential analysis.

Requestors indicate that the Department's use of the selected data does not ensure water quality criteria will be met under the described mixing zone boundaries. I believe that the assessment is sufficient for ensuring waterbody protection based on existing information. Ambient receiving water concentrations are not uniformly distributed in a complex media like marine surface water. As such, it is appropriate for the Department to evaluate existing ambient copper data from waterbodies included in the Area of Coverage and average that data to ensure all relevant existing data was taken into account. However, the use of different ambient copper data values as described in the fact sheet for the purposes of completing the reasonable potential and mixing zone analyses is unclear and potentially conflicting. Accordingly, I remand this issue back to CVPEC Program staff to address.

Paragraph 4 of Review Issue 2

As described in the analysis above, the Department completed its analysis based on existing data (collected in 2006-2010 and the early 1990s). The Department found there to be adequate data to draft and issue general permit 2013DB0004 without collecting additional ambient data. Receiving water sampling required in the permit will provide additional data on ambient conditions: The permit requires one of the receiving water monitoring samples to be opposite the prevailing tidal current and uninfluenced by the discharge (See Section 6.9.3) which will provide additional ambient data to be collected throughout the permit cycle. The Department may collect additional ambient data during permit cycle 2103DB0004 for the purposes of reissuing the permit in the future. Additionally, use of data older than five years is not inconsistent with the Department's practices. The Department does not just incorporate one set of data instead of another because

it is more recent. Such an approach would be without regard for defining the use of the data, data quality, and other relevant factors.

CONCLUSION

The CVPEC Program adequately considered the potential number of discharging vessels and adequately considered the necessity and importance of the proposed discharges via the antidegradation analysis included in Appendix H of the fact sheet, which was public noticed with the general permit. The CVPEC Program did not clearly explain the use of different sets of ambient copper data for the reasonable potential analysis and the CORMIX mixing zone modeling. Finally, sufficient ambient data existed for the CVPEC Program to draft and issue 2013DB0004.

Division Decision on Review Issue 2

The Director remands the decision by the Department to use different sets of ambient copper data for the reasonable potential analysis and the CORMIX modeling. The Director upholds the decisions on the remainder of the issues described in Review Issue 2.

Review Issue 3. The Permit Record Does Not Reasonably Demonstrate That Allowing Mixing Zones Will Not Preclude or Limit Established Uses.

Division Decision on Review Issue 3

No new content was brought forth in the Requestors' Review Issue 3. See Director's Decisions on Review Issues 1 and 2.

Review Issue 4. The Division Can Not Reasonably Demonstrate That Approved Mixing Zones At Speeds Under 6 Knots, Or When The Permittee Is Moored Or Docked, Are As Small As Practicable.

Paragraph 1 of Review Issue 4, page 3 of Requestors' letter

The Requestors cite 18 AAC 70.240(k)(1), which is generally referred to as the "small as practicable" mixing zone regulation. Requestors state that, "efforts to delineate the three-dimensional mixing zone geographic extent and volume are insufficient considering the high volume of effluent and small volume of some receiving waters in the cruise ship transit corridor."

Paragraphs 2-7 of Review Issue 4, page 4; and paragraphs 11-12, page 5 of Requestors' letter

Requestors suggest that the Department failed to incorporate the fact that mixing zones fluctuate over tidal cycles (i.e., the effect tidal reversals have on mixing zones and the potential re-entrainment of the mixing zone plume) when evaluating discharges occurring under 6 knots or when the permittee is moored or docked. Requestors point out that CORMIX version 8.0 has the capability to model tidal fluctuations using the dynamic ambient feature in CORMIX 8.0. The October 27, 2014 letter goes on to state that the Department did not use "available data" and therefore ignored evidence of a complex mixing pattern including tidal action when conducting the modeling.

Paragraphs 8-10 of Review Issue 4, pages 4-6 of Requestors' letter

The Requestors also cite 18 AAC 70.240(d)(8), which discusses consideration of exceeding acute aquatic life criteria at and beyond the boundaries of a smaller initial mixing zone, the size of which shall be determined using methods approved by the Department. Requestors discussed a drifting organism being in contact with a chronic mixing zone for more than 15 minutes.

Requestors indicate the Department should have used slack tide when evaluating acute toxicity to a drifting organism. Narrative included in this section also discusses scenarios proposed by the Requestors that might occur for a drifting organism in docking scenarios in Juneau and Skagway and cite EPA 910/B-94-007,

Technical Assistance Report for the Alaska Juneau Gold Mine Project, Appendix D2 (Dec. 1994) to provide additional information.

Paragraphs 13-16 of Review Issue 4, page 6 or Requestors' letter

Lastly, in this section of the October 27, 2014 letter, the Requestors indicate that the mixing zone modeling failed to account for constrained (bounded) channel conditions when ships discharge toward shore while stationary, and that the Department failed to input any data into the mixing zone models that describe the "bounded" effects of either the ship or shore.

BACKGROUND

Appendix F of the general permit's fact sheet, specifically Fact Sheet Section F.4, discusses ambient conditions considered for mixing zone authorizations while cruise ships are moving under 6 knots or docked/moored. Appendix F and Section 6.3.3 of the general permit's Fact Sheet discusses effluent characteristics, ambient conditions considered, and the Department's mixing zone modeling approach (e.g., the use of CORMIX version 8.0).

In order to satisfy applicable mixing zone regulations, the Department generally follows the approach described in EPA's Technical Support Document for Water Quality-based Toxic Controls (TSD) (March, 1991). Chapter 4 of the TSD includes relevant technical guidance for modeling mixing zones, including modeling mixing zones in the marine environment. Chapter 4 of the TSD includes recommendations for modeling tidal ambient velocities at certain percentiles (e.g., 10th percentile for determining minimum dilution in a marine setting; not slack tides). The CVPEC Program also used the Department's Implementation Guidance: 2006 Mixing Zone Regulation Revisions February 3, 2009 document for determinations of lethality in mixing zones based on acute effects.

In order to make mixing zone decisions, the Department has elected to use the CORMIX modeling software as its primary mixing zone modeling software, which incorporates many of the recommendations in the TSD to robustly model mixing environments. Further, CORMIX is capable of modeling beyond just the physical mixing process and has been specifically designed to assist in regulatory mixing zone decision making (e.g., a user can input a state water quality criteria into the model's interface to simulate where a projected discharge of a certain concentration will meet that criteria within a specified surface water environment). As the general permit's fact sheet indicates in Section 6.3.4.1, CORMIX is widely used by EPA and state water quality regulators in the mixing zone decision making process.

ANALYSIS

General Discussion of Review Issue 4

Through extensive modeling of ships that discharge under 6 knots, including while docked and moored, the Department arrived at a regulatory mixing zone scheme for discharges both away from shore and towards shore. Section 6.3.3 and Appendix F of the general permit's fact sheet discuss the items brought up in the informal review request, including: consideration of tidal reversals and incorporation in mixing zone authorizations (see fact sheet sections 6.3.4.4, F.4.5, F.8.2, and F.8.1), acute toxicity to drifting organisms evaluation (see fact sheet sections 6.3.4.2, 6.3.5, and F.6), and "bounded" conditions consideration (see fact sheet sections F.4.1 and F.9).

The main objective behind the Department's mixing zone analysis is to document whether water quality criteria will be met in the waterbody and therefore existing uses maintained and protected. In addition, an acute toxicity evaluation (as required by 18 AAC 70.240(d)(8)), which is conducted by methods approved by the Department (e.g., drifting organism analysis), is conducted to specifically provide protection of acute aquatic life criteria. Acute aquatic life criteria are derived from toxicological studies that determine at which concentration acute toxicity is observed for a one hour exposure. The requirement that a drifting organism

not be exposed to the initial mixing zone for more than 15 minutes *only* applies to the smaller, initial mixing zone, not the larger authorized chronic mixing zone, which is sized based on chronic water quality criteria.

The Department's Reasonable Potential Analysis (see Appendix E of the Fact Sheet) as well as the mixing zone evaluation (see Appendix F and G as well as Section 6.3.3 of the Fact Sheet) demonstrate that the Department evaluated existing data it found to be available and incorporated that data into the decision-making process. The Department was able to determine after it synthesized the data that authorizing mixing zones of 83 meters (with the exception of multiple ships while a ship is at the Broadway dock in Skagway) according to the 10th and 90th ambient tidal velocities for cruise ships discharging under 6 knots will ensure that mixing zones will not overlap and water quality criteria will be met at the boundary of the authorized mixing zone within a tidal cycle; thus ensuring that water quality in the waterbodies as a whole will be maintained and protected without the need for modeling for plume re-entrainment as the Requestors suggest in the October 27, 2014 letter.

Paragraph 1 of Review Issue 4, page 3 of Requestors' letter

It is not clear where the cases of "high volume of effluent and small volume of some receiving waters in the cruise ship transit corridor" are located, so this statement will not be addressed. The Department has generally found the opposite to be true. Cruise ship discharge volumes are small relative to the volume of receiving waters and the amount of tidal mixing that occurs within the receiving waters.

Paragraphs 2-7 of Review Issue 4, page 4; and paragraphs 11-12, page 5 of Requestors' letter

Tidal fluctuations were considered in that the mixing zone size determination was made by doubling the size of the mixing zone output derived via the CORMIX simulations to ensure water quality criteria will be met at the boundary of the mixing zone regardless of the direction of tidal ebb or flow. The Department states in the last two sentences of the first paragraph in Section F.8.2 of the Fact Sheet that, "The tidal current will change direction as it moves from a flood to an ebb tide and vice versa. The mixing zone size needs to be a radius of 83 meters to accommodate the shift in discharge plume to either side of the discharge port fore, aft, or any angle in between."

As mentioned in the Background Section for Review Issue 4, the Department uses the widely accepted CORMIX modeling software for the regulatory mixing zone decision making process. CORMIX is a steady-state model, which is why the Department relies on the fixed values of the 10th and 90th percent ambient tidal velocities to simulate worst case scenarios. There are other unsteady-state hydrodynamic models available that are capable of modeling estuarine and other larger scale waterbody processes; however, it is generally unnecessary and impracticable to use such a complicated, data-intensive far-field model to model mixing in the near field. The Department recognized this limitation in Fact Sheet Section F.9.1. However, the Department also concluded in Fact Sheet Section F.9.1 that the results of the Department's conservative steady-state model (i.e., CORMIX), demonstrated that the mixing zones were sized to ensure that water quality criteria will be met at the boundaries of the mixing zones. Note, as reference has been made several times in this analysis, the Department generally uses the 10th percentile ambient tidal velocity for completing worst-case mixing zone assessments in the marine environment, not slack tide, as mixing zones are tidally driven and slack tide generally occurs for a very short period in the marine environment in Alaska.

Paragraphs 8-10 of Review Issue 4, pages 4-6 of Requestors' letter

With respect to the drifting organism analysis, and as mentioned above, the Department uses the DEC Implementation Guidance: 2006 Mixing Zone Regulation Revisions February 3, 2009 document to evaluate acute toxicity to a drifting organism consistent with 18 AAC 70.240(d)(8). Of the four options to evaluate drifting organism acute toxicity, the Department selected the third method (i.e., a drifting organism reaches the acute mixing zone boundary in 15 minutes or less). Sections 6.3.4.2 and F.6 of the Fact Sheet include the Department's drifting organism analysis. These sections indicate that all 18 scenarios for all 16 ships modeled

were evaluated consistent with the third method, and that specifically CORMIX was used to determine which ships would require longer than 15 minutes to reach the acute aquatic life water quality criteria. Most ships, considering the 10th percentile of ambient tidal velocity which is the Department's standard practice for marine mixing zone modeling, meet the acute aquatic life water quality criteria within 15 minutes. The Department clearly states that mixing zones will not be authorized for those ships that cannot meet the acute water quality criteria in 15 minutes.

The standard for determining lethality in this case is based on a drifting organism traversing a smaller initial mixing zone sized to prevent lethality and to ensure acute aquatic life water quality criteria are met at its boundaries. The Department has clearly stated that it has evaluated each ship modeled for lethality based on multiple modeling simulations and that it will only authorize mixing zones that are consistent with 18 AAC 70.240(d)(8).

Primary mixing of cruise ship wastewater is not a result of the ambient flow. As described in Section 6.3.4.1 of the Fact Sheet, "Figure 2 shows how available dilution changes from being determined by the discharge characteristics to being determined by waterbody mixing... This shows the decreasing speed of the discharge and the greater influence of the ambient environment once outside of the smaller initial mixing zone ["within the first ten meters or within the smaller initial mixing zone"]." Figure 2 shows that 62% to 75% of the available dilution occurs within the first ten meters, under the direct influence of the discharge, as compared to the dilution achieved at 100 meters under ambient flow. Under docked scenarios a drifting organism moves through the acute or initial mixing zone, rather than the acute mixing zone moving at the speed of the organism.

As described in Section 6.3.4.2, compliance with acute water quality criteria is evaluated in the initial mixing zone and must be achieved within 15 minutes in order to assume compliance with acute aquatic life criteria. For discharge while at speeds under 6 knots, tidal flows near slack tide would result in the least dilution and longest exposure for a drifting organism. Under these conditions, the drifting organism is traveling at approximately 0.06 m/s (10th percentile tidal velocity for Juneau; see Fact Sheet Appendix F, Section F.4.5) and would need to travel tens of meters to reach the boundaries of the chronic mixing zone – and the organism is not being exposed at the acute criteria level during this travel time to the boundaries of the chronic mixing zone. The organism would then need to travel at least an additional 83 meters or a minimum of 23 minutes total before it reached the vicinity of the nearest possible ship's discharge port where concentrations could again exceed acute criteria. Even this scenario is highly unlikely as ships do not typically travel in such close proximity for safety reasons. Individual, docked ships show compliance with the acute aquatic life criteria in seconds up to 12 minutes; for a ship traveling at speeds of less than six knots this compliance will occur in less time due to the additional mixing that occurs due to the ship's travel. In practice, the tidal current is unlikely to be perfectly parallel to the ship and two ships are unlikely to be discharging simultaneously from no more than 166 meters (twice 83 meters) apart, each exposing a drifting organism to 15 minutes of concentrations exceeding acute aquatic life criteria. If they were, the *maximum* possible exposure would be 30 minutes over the course of an hour, and the acute aquatic life criteria are based on a one-hour *average* exposure. In no case would a drifting organism be exposed to concentrations exceeding the acute aquatic life criteria for 15 minutes only to be exposed again a few seconds later as asserted by the Requestors. In other words, while a drifting organism might possibly be exposed for more than 15 minutes in one hour to more than one acute mixing zones, it would only do so after drifting through the chronic mixing zone and outside the mixing zone before drifting back into another acute mixing zone – and this is allowable per the acute aquatic life criteria.

Finally, this scenario being described is at the low tidal velocity of 0.06 m/s, and as tidal velocities increase the exposure to the acute/initial mixing zone decreases.

Paragraphs 13-16 of Review Issue 4, page 6 or Requestors' letter

With respect to modeling “bounded” discharges while moored or docked and discharging towards shore, the Department in Fact Sheet Section F.9 describes its decision-making process for authorizing mixing zones for discharges towards shore. CORMIX can simulate bounded conditions, but it is limited in that it is unable to consider additional down-current dilution once a “shoreline” boundary is encountered such as is the case for the permit for discharges towards shore (see the second paragraph of Fact Sheet Section F.9); however, in actual practice additional dilution will be available and mixing will continue to occur between the ship and shore down-current from where the discharge plume first encounters the shoreline boundary (i.e., at the port or stern of the ship). Accordingly, the Department made a decision based on the available information, including the results of the CORMIX modeling effort along with the objective of preventing overlapping mixing zones to ensure protection of existing uses, to size the mixing zones towards shore consistent with the mixing zones sized for the seaward discharges from cruise ships moving less than 6 knots or moored or docked. The Department will use this permit cycle to closely evaluate additional modeling and monitoring that can be completed to enhance the Department’s understanding of the discharges towards shore.

CONCLUSION

The mixing zones were specifically sized not to overlap and for water quality criteria to be met in the water bodies at the boundaries of the mixing zones (i.e., based on the class of ships’ effluent data, the ships were only authorized sufficient dilution to meet water quality criteria at the boundary of where the mixing zone was sized; no additional dilution allowance has been authorized).

Division Decision on Review Issue 4

The Director upholds the decision that the Department adequately demonstrated that authorized mixing zones at speeds under six knots, or when the permittee is moored or docked, are as small as practicable.

Review Issue 5. Allowing Large Cruise Ships to Degrade Tier II Waters without Notifying the Public about the Nature and Location of the Specific Discharges Violates Alaska’s Antidegradation Policy.

Requestors main point with respect to this issue is that allegedly under both Alaska’s antidegradation policy and federal regulations, the Division may only lower water quality in Tier II waters after following a process of public participation and making certain location-specific determinations, including that allowing lower water quality is necessary for important economic or social development (18 AAC 70.015(a)(2)(A)-(E); Code of Federal Regulations [CFR] 40 CFR 131.12(a)(2)). The October 27, 2014 letter asserts that only after a Notice of Intent, or NOI, is submitted can the Department know the specific locations a cruise ship expects to discharge.

Requestors’ cite the Hearing Officer’s Final Decision in Adjudication of EPA General Permits AKG701000 and AKG700000, pages 38-43 (May 10, 2002) (LTF Adjudication) and also *Ohio Valley Environmental Coalition, et al., v. Horinko*, 279 F.Supp.2d 732, 761-62 (S.D.W.VA. 2003) (*Horinko*). Mention of EPA’s approval of the State of Washington’s antidegradation regulations is also provided.

With respect to the LTF adjudication, Requestors request that DEC review the decision, and Requestors cite an opening remark in the Final Decision authored by the Hearing Officer that indicates the final decision will have the effect of closing litigation on the subject matter for the parties involved. Requestors’ October 27, 2014 letter also includes several clipped citations from the Hearing Officer’s Final Decision regarding the Department’s responsibility to make site-specific findings for Zones of Deposits (ZOD) to ensure water quality protection. This discussion is used by the Requestors to conclude that DEC precedent requires that it provide for public notice, an opportunity to comment, as well as the opportunity to go to court and appeal an unfavorable decision on an authorization under the permit. Requestors also cite AS 46.03.462 as encompassing DEC’s responsibilities under Alaska’s Antidegradation Policy. Finally, mention of an agency’s ability to change course is provided, but that it should be done using rulemaking or formal adjudication.

With respect to the *Horinko* decision and EPA's approval of the State of Washington's antidegradation regulations, Requestors indicate that the matters are distinguishable from DEC's 20013DB0004 permit in that the public processes were different and that DEC's September 19, 2014 Response to Comments were the first indication of a supposed change in agency precedent. The October 27, 2014 letter states that EPA's approval of the State of Washington's antidegradation regulations was more intricate than provided by DEC in the September 19, 2014 Response to Comments at 88 in that the State of Washington provides for public involvement throughout the permitting process, including listing all existing facilities and the water bodies they discharge to and posting NOIs when they are received.

BACKGROUND

The Department issued the final general permit on August 29, 2014 with a supporting fact sheet that included an antidegradation analysis in Appendix H. On September 19, 2014 the Department issued a final response to comments for the subject permitting action, which at 88 pages 38-39 discusses much of the Department's position on the matters described immediately above.

On May 10, 2002, Hearing Officer Andrew Hemenway issued the Final Decision in the matter of the Adjudication of EPA General Permits AKG701000 and AKG700000, also known as the Log Transfer Facility (LTF) Adjudication. Several findings were made in the LTF Adjudication, but the pertinent findings with respect to this review are a determination on the binding nature of the LTF Adjudication to other permits, and the timing of when an antidegradation analysis must be completed and what factors must be considered.

On August 23, 2003, the U.S. District Court for the Southern District of West Virginia issued a decision regarding EPA's approval of West Virginia's methods for implementing its antidegradation policy, also known as the *Horinko* case. As mentioned in the Response to Comments, the judge specifically found that EPA acted inconsistent in its position on what was required for a Tier II analysis for a general permit and consequently acted arbitrarily and capriciously in approving West Virginia's regulations.

On May 2, 2007, in a letter from EPA to the State of Washington, EPA approved Washington's 2003 Water Quality Standards Regulations for Antidegradation. Pages 11 – 16 of EPA's approval letter include a detailed analysis of EPA's perspective of Tier II antidegradation analyses in general permits.

On July 14, 2010, DEC implemented its Policy and Procedure for Interim Antidegradation Implementation Methods (Interim Methods), which were subsequently sent to EPA and were reviewed and determined on July 15, 2010 to be "consistent with EPA's antidegradation regulation at 40 CFR 131.12, as well as Alaska's Antidegradation Policy at 18 AAC 70.015." Additionally, the Interim Methods were later challenged in court, and on September 4, 2012, Superior Court Judge Eric Aarseth found that the Department's use of the Interim Methods was lawful. Note, pages 10-11 of the Interim Methods discuss completing an antidegradation analysis for a general permit.

ANALYSIS

As discussed in DEC's September 19, 2014 Response to Comment document, the Department maintains that an antidegradation analysis can adequately be completed during general permit issuance. The Department maintains it satisfied the Antidegradation Policy found in 18 AAC 70.015 (A)-(E) for Tier II waters through its analysis, including the public noticing of its analysis, in Appendix H of the fact sheet. The general permit included a prescribed Area of Coverage for which all waters were Tier II waters. As discussed in the September 19, 2014 Response to Comment document, the antidegradation analysis was crafted to protect Tier II waters for all existing and future authorized cruise ship discharges in the Area of Coverage subject to compliance with the terms of the general permit.

With respect to the precedent and/or binding nature of the LTF Adjudication, the Department finds that the adjudication was specific to the ruling on that particular permitting action(s). DEC interprets the Requestors'

referenced Hearing Officer's remarks in (b), Page 1 of the Final Order to infer the finality on the subject adjudication, not as a means to set agency precedent.

Page 42 of the LTF Final Decision states that "Public notice is not required by law after receipt of a Notice of Intent (NOI), but additional public notice may be necessary in order to ensure that DEC provides a reasonable opportunity for public comment in satisfying its obligation to take a "hard look" at the issues relevant to issuance of approval of operations at any particular site, or as a matter of administrative discretion." Later on page 42, the hearing officer states, "To incorporate any specific DEC practice regarding public notice as conditions of the permit would unduly restrict DEC's ability to make appropriate administrative adjustments as dictated by changing funding levels, agency policy, and applicable law." The Division maintains the hearing officer's decision is in reference to the specifics of the LTF General Permits' adjudication; nevertheless, explicitly stated in the preceding quoted sentences and as discussed in the September 19, 2014 Response to Comments at 88, DEC, in its discretion, will evaluate the need to complete additional analysis and complete public notice for unique, individual authorizations on a case-by-case basis, but DEC is not required to public notice each authorization, Notice of Intent or mixing zone as the general permit provides the requisite analysis and public notice opportunity.

The detailed analysis provided in the hearing officer's Final Decision illustrates that the analysis was unique to the regulatory Project Area ZODs (not mixing zones as per the Cruise Ship Permit) authorized by the LTF General Permits subject to the adjudication. Project Area ZODs in the LTF general permits are sized according to unique siting guidelines and each one is a different size and configuration whereas the cruise ship general permit authorizes standard mixing zone sizes for discharges at different speed classifications; the cruise ship general permit does not authorize water quality variances (i.e., mixing zones) that differ from what was already public noticed with the general permit (i.e., standard size of 63 meters while underway at speeds greater than 6 knots and 83 meters while docked or at speeds less than 6 knots, except in Skagway while multiple vessels are docked). As such, since individual authorizations will not differ from the terms, including mixing zone authorization, of the public noticed general permit, there is not a need for the Department to provide a second public notice during the authorization process as public participation in both the mixing zone and antidegradation process have already occurred.

It is unclear what connection the Requestors are trying to make by referencing AS 46.03.462 and the State's Antidegradation Policy in 18 AAC 70.015. AS 46.03.462 discusses restricting discharge areas and setting permit terms in a specific area, which the Department has done through the general permit process (e.g., setting different mixing zone sizes for discharges and setting mixing zone limits in Skagway Harbor).

Relevant to the inferences the Requestors made to the *Horinko* case and EPA's approval of the State of Washington's 2003 antidegradation regulations, the Department disagrees there has been a change in agency precedent in terms of not publicly noticing individual NOIs or authorizations that are consistent with the terms of the general permit. The Department has included prospective antidegradation analyses in its APDES general permits. In fact, the LTF General Permits are the only permits that include the requirement to public notice new (but not existing) authorizations during the permit cycle including an updated antidegradation analysis for new Project Area ZODs. In addition, as discussed in the background section for this review issue, the Department's July 14, 2010 Interim Methods, which have undergone EPA review and successful litigation, discuss the Department's ability to complete an antidegradation analysis during the general permit process. As the Requestors' are aware as well, the Department has also public noticed draft antidegradation implementation regulations that include completing the antidegradation analysis as part of the general permit process.

DEC's decision to complete an antidegradation analysis for the general permit is not a new agency precedent introduced during the tail end of the cruise ship permitting action, but the result of current Department practice documented in existing policy and procedures, found consistent with federal regulations and the

State's Antidegradation Policy found at 18 AAC 70.015 by EPA, and that has withstood litigation. The example of EPA's approval of the State of Washington's 2003 antidegradation regulations serves only to reaffirm that the process of completing an antidegradation analysis for general permits is indeed legal.

CONCLUSION

The permit's fact sheet, specifically Appendix H, included the requisite Tier II antidegradation analysis consistent with applicable regulations including the state's Antidegradation Policy. The antidegradation analysis along with the permit's Area of Coverage and authorized discharges were public noticed with the draft permit, which is consistent with the Department's Interim Guidance Policy and other Departmental wastewater discharge permitting precedent.

Division Decision on Review Issue 5

The Director upholds the decision that the Department adequately notified the public about the nature and location of the specific discharges consistent with Alaska's Antidegradation Policy during the general permit process.

Review Issue 6. The Division Lacks a Reasonable Basis for Concluding that all Ships Lumped into the AWTS Class have Achieved the Most Effective and Reasonable Methods of Pollution Prevention, Control, and Treatment for Discharge of Treated Sewage, Treated Graywater, and other Treated Wastewater.

The Requestors state the proper operation of AWTS has been demonstrated to significantly improve effluent quality. They assert that the permit lacks a basis to show that the most effective and reasonable methods of pollution prevention, control, and treatment have been achieved. The Requestors also take issue with consideration of AWTS as a class when making such findings. In addition, the Requestors question the basis for ammonium [ammonia] effluent limitations for vessels moving at speeds of less than 6 knots when individual ships or cruise lines show median or average concentrations consistently below the ammonia effluent limitations.

BACKGROUND

All AWTS are designed to treat conventional pollutants (biochemical oxygen demand, fecal coliform bacteria, oil and grease, pH, and total suspended solids) and are classified as a group based on that performance. Their performance with regard to ammonia and dissolved metals varies with the mix of blackwater and graywater treated and the type of AWTS used (Cruise Ship Wastewater Science Advisory Panel Preliminary Report to Alaska Department of Environmental Conservation Commissioner, November 1, 2012, Section 4.1). The Science Advisory Panel and the Department evaluated additional pollution prevention, control, and treatment technologies that could be used to meet water quality criteria at the end of pipe or that could consistently improve a vessel's effluent quality over methods that a vessel currently uses (See Section 3 of DEC's Preliminary Report on Cruise Ship Wastewater, January 1, 2013). No additional feasible methods were identified. Specifically with respect to treatment, the Panel

“was unable to identify technologically effective and economically feasible treatment methods, expected to consistently meet the numeric water quality criteria at the point of discharge that have been proven on cruise ships. Application of existing technologies in addition to AWTS, such as nitrification, ion exchange (IX) and reverse osmosis (RO), is expected to further reduce ammonia and dissolved metal concentrations; however, there is no evidence to prove adding additional technology will be technologically effective at meeting WQC, be economically feasible, or provide much environmental benefit. Modifying operational procedures and additional staff training may help improve treatment performance. This panel recommends continued sampling and monitoring of cruise ship effluent. Adaptation of emerging technologies from other industries to cruise ships presents significant feasibility challenges.” (See Section 9 of the Panel's November 1, 2012 Preliminary Report).

ANALYSIS

The permit requires that the “permittee shall at all times properly operate and maintain all facilities and systems of treatment and control and related accessories” (See Section 8.1). If effluent quality can be improved via proper operation and maintenance that would be demonstrated through on-going effluent monitoring and then reflected in the next permit issuance.

It is appropriate to treat AWTS systems as a class because they are all designed to address conventional parameters as initially required by the 2001 “Murkowski Law.”² Neither the Department nor the Science Advisory Panel found a basis for requiring additional pollution prevention, control, or treatment methods.

As identified in Table 5 of the Fact Sheet, the most restrictive chronic marine water quality criteria for ammonia is 1.0 mg/L and is based on the protection of aquatic life. As described in Section 6.3 of the Fact Sheet, the ammonia water quality-based effluent limit was based on historical effluent monitoring data (2008–2012) and the available dilution in the mixing zone authorized for discharge while moving at speeds under 6 knots. The 95th percentile of the historical ammonia dataset that could meet the applicable 1.0 mg/L chronic ammonia water quality criteria at the boundaries of the authorized 83 meter mixing zone is 78 mg/L.

Consistent with the guidance of EPA’s TSD in Chapter 3, effluent limitations for aquatic life criteria are not derived based on median or average values but rather are based upon a 95th or 99th percentile of the effluent distribution.

CONCLUSION

The permit record includes a reasoned and adequate basis and analysis, including incorporation of the Science Advisory Panels findings, to conclude that the AWTS class of discharges authorized have achieved the most effective and reasonable methods of pollution prevention, control and treatment.

Division Decision on Review Issue 6

The Director upholds the decision that the Department has a reasonable basis for concluding that the AWTS class of ships identified in the permit achieved the most effective and reasonable methods of pollution prevention, control, and treatment for discharge of treated sewage, treated graywater, and other treated wastewater.

² United States Code Title XIV – Certain Alaskan Cruise Ship Operations codified in Public Law 106-554, 33 U.S.C. 1901.