



THE STATE  
of **ALASKA**  
GOVERNOR SEAN PARNELL

**Department of Environmental  
Conservation**

OFFICE OF THE COMMISSIONER

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February 6, 2013

Edward K. Thomas  
President  
Central Council Tlingit and Haida Indian Tribes of Alaska  
9097 Glacier Highway  
Juneau, Alaska 99801-6922

Dear Mr. Thomas:

I am in receipt of a copy of your February 1 letter to the House Resources Committee expressing concerns about House Bill 80, a bill that would make several changes to existing state requirements relating specifically to the discharge of treated wastewater from commercial passenger vessels ("cruise ships"). I appreciate your interest in this bill and the need to protect water quality. I am providing some information that might be helpful in understanding why the Department of Environmental Conservation, which has been working diligently for a number of years on the concerns you describe in your letter, believes HB 80 would not result in the adverse effects on water quality you anticipate. In this letter, I also note several important provisions in DEC's water quality criteria and mixing zone regulations, which will continue to apply to cruise ships just as they do to other dischargers, and how these provisions protect marine and fresh waters of Alaska. We at DEC would be pleased to have the opportunity to follow up with you or your board on any other questions or concerns you might still have on this topic.

**Background**

All large cruise ships discharging in Alaska currently have Advanced Wastewater Discharge Treatment Systems onboard to treat wastewater before discharge. An earlier science panel, the current Science Advisory Panel, and the Department have all determined that, as a class, cruise ships using Advanced Wastewater Treatment systems have the best technology available for ships. Advanced Wastewater Treatment Systems generally produce higher quality effluent than shore-side treatment plants. The quality of the treated effluent of these cruise ships also exceeds that of other types of vessels operating in Alaska waters that do not employ Advanced Wastewater Treatment Systems.

In 2012 there were 28 ships that came to Alaska. Only 17 were permitted by DEC to discharge treated wastewater in Alaska waters. Eleven were permitted to discharge only while underway. Only seven cruise ships were also authorized to discharge while in port, with more stringent effluent limits.

Current state law requires large cruise ships that discharge treated wastewater into waters of the state to meet state water quality criteria "at the point of discharge." In other words, the quality of the treated effluent has to meet these high standards in the pipe within the ship before it is discharged into the receiving waters. No other dischargers, including other types of ships or shore-side treatment plants, are held to this standard, nor could most of them likely come close to meeting it. HB 80 would authorize DEC to permit

large cruise ship discharges using the same requirements that apply to all other dischargers in Alaska – those dischargers include community domestic wastewater treatment facilities and discharges from the timber, oil and gas, seafood, mining, and construction industries. Under HB 80, cruise ships operating in Alaska would be allowed to apply for a mixing zone. A mixing zone is a limited area in the receiving water where the treated effluent “mixes” with the receiving water before all water quality criteria must be met. Shore-based facilities around Alaska have been permitted to operate with such mixing zones for decades. All draft wastewater discharge permits and the proposed mixing zones, including permits for cruise ships, are publicly noticed for review and comment.

However, under HB 80, only large cruise ships with Advanced Wastewater Treatment Systems are even eligible to apply for authorization of a mixing zone. This assures that large cruise ships operating in Alaska will continue to have the best available wastewater treatment systems on-board. As you may already know, the treated effluent from these systems already largely meets state water quality criteria “at the point of discharge” and it is likely mixing zones would only be required for four parameters – ammonia and three dissolved metals (zinc, nickel and copper.)

Again, only large cruise ships with Advanced Wastewater Treatment Systems could apply for a mixing zone. Even then, no mixing zones would be allowed unless they could show to DEC’s satisfaction that the discharge would also comply with the 19-point “test” in DEC’s mixing zone regulations. These are the same regulations that apply to all other dischargers. The mixing zone regulations include requirements such as:

- no lethality to passing organisms
- overall biological integrity of the waterbody will not be impaired
- mixing zone is as small as practicable
- can’t preclude fish and shellfish harvesting
- can’t result in a reduction in fish or shellfish population levels
- can’t contain pollutants that bioaccumulate or persist above natural levels
- can’t result in undesirable or nuisance aquatic species

With these background points in mind, I will try to address some of the specific concerns raised in your letter.

**Concern: HB 80 will significantly reduce protection of Alaskan marine water quality from pollution, in part because DEC sets different discharge limits for different vessels and ships get to set their own limits.**

There are different types of Advanced Wastewater Treatment Systems made by different manufacturers. Some of them are configured differently and they may treat different waste streams. Even though some vessels may have the same type of system, there may be individual differences in the effluent quality due in part to these differences in configuration. These differences are accounted for by DEC when preparing its permit. Permit limits are not now, nor would they be under HB 80, determined by the cruise ship companies themselves.

**Concern: Cruise ships discharged 23-160 times over the “allowable amount under water quality standards.” This will increase algal blooms and increase paralytic shellfish poisoning.**

The chronic marine water quality criterion for ammonia (a nutrient) that is established to protect aquatic life is 1 milligram per liter (mg/l) over a four-day period. A gram is about 1/28 of an ounce. One milligram would be one one-thousandth of that amount, or one twenty-eight thousandth of an ounce. A liter is about a quart, so the standard is approximately one twenty-eight-thousandth of an ounce in a quart of water.

Effluent limits for ammonia in the current cruise ship wastewater discharge permit, for the seven vessels permitted to discharge in port, range from 12-28 milligrams per liter, which equals four ten-thousandth to ten ten-thousandth of an ounce in a quart of water. These permit limits are established to ensure that water quality standards are met in the marine water within about 15 yards of the discharge point for those seven vessels that are permitted to discharge when stationary. This is fully protective of the aquatic life in marine waters.

The effluent limits in the current permit for ammonia for the 17 vessels that were permitted to discharge underway range from 12-143 milligrams per liter. Dilution when a vessel discharges while underway is so great that the water quality standard is met nearly instantaneously after discharge to marine waters. For example, the dilution is calculated to be about 1 in 50,000 when a ship is going 6 knots. In other words, if the concentration of ammonia being discharged is 143 milligrams per liter, within seconds that 143 milligrams per liter is diluted to  $143 \div 50,000$ , or 0.00286 milligrams per liter, which is far below the 1 milligram per liter standard. Thus, there is an extremely low risk that any aquatic life in the area of the cruise ship would be exposed to any harmful concentrations of pollutants. Any exposure that could occur would be extremely short in duration because of the rapid mixing, rather than the exposure occurring over a period of days or hours as would be necessary for effects to occur.

There was no science or data provided by or to the Science Advisory Panel indicating that cruise ship discharges in Alaska cause an increase in algae growth, let alone, cause a bloom. Nor was any scientific link to paralytic shellfish poisoning in Alaska provided. The Science Advisory Panel was aware of information about nitrogen and phosphorous loading from cruise ships in the Baltic Sea, but the Panel as a whole did not extend that concern to Alaska. That is likely due to the very different nature of the Baltic Sea – it is shallow (about 30 fathoms deep) with a very low exchange of water – water remains in the Baltic for up to 30 years. Additionally, there are some 80+ million passengers in the Baltic Sea each year, whereas all of Alaska only has about one million passengers per year.

If any data or analyses come forward to show these nutrients could be concerns in Alaska, they could be addressed either in the state's water quality criteria, the state mixing zone regulations, or the terms of the permit itself. Nothing in HB 80 limits or changes DEC's authorities in these areas.

**Concern: Discharging ammonia and other waste will support the growth and propagation of invasive species. Invasive species may come from cruise ship wastewater discharges.**

Again, no data or analyses were provided to the Science Advisory Panel regarding a concern like this. DEC regulations prohibit a mixing zone if it will result in undesirable or nuisance aquatic life. Wastewater on a cruise ship - which originates as drinking water - is generated from its use in accommodations, the galley, the laundry, etc. It is highly unlikely that the original water source (drinking water) would contain invasive species and even more unlikely that such a species could survive treatment through an Advanced Wastewater Treatment System. However, if data or analyses are developed that show invasive species could be a concern, these concerns could be addressed through DEC's existing authorities and permit conditions, which again would not be diminished by HB 80.

**Concern: HB 80 is not based on the best available science and technology and limits public participation because the Science Advisory Panel has only issued a preliminary report and HB 80 repeals the Science Advisory Panel prior to its "legislatively mandated final report." This eliminates further public involvement.**

The existing law directs DEC to evaluate potential wastewater treatment methods that could result in cruise ships meeting water quality standards at the point of discharge, with advice from a Science Advisory Panel.

The Panel does not have an obligation to produce a report; however, they elected to provide information and findings to DEC through a report on their work. Although the title of their report includes the word “Preliminary,” the finding they made that Advanced Wastewater Treatment Systems, as a class, are the best currently available and are anticipated to continue to be the best available systems in the foreseeable future, are definitive. These findings support HB 80. A thorough reading of the contents of the report, and not just selected portions and the title, is important in order to understand the report’s findings. The results of two science advisory panels and two technology conferences have produced consistent results. There are no existing or emerging technologies available and engineered for installation on cruise ships that will allow the ships to meet all water quality standards at the point of discharge.

Again, it is also important to remember that DEC has many other statutory authorities (like its ability to set and amend water quality criteria and to put necessary limitations on the authorization of mixing zones) that will continue in full force if HB 80 passes. Under HB 80, DEC retains its existing authority to continue to evaluate future technological improvements and to hold cruise ships to higher standards as technology advances.

Conferences and the Panel’s meetings have been open to the public and any future workshops sponsored by DEC would also be open to the public. The public has an opportunity to review and comment on a new draft of the cruise ship wastewater discharge permit every time it is re-issued (every 5 years). Historically, when DEC has convened its own technology conferences, these have been noticed and open to the public, including the cruise ship wastewater treatment technology workshops DEC convened in Juneau in 2009 and in September of 2012.

**Concern: The panel only considered the impacts of one ship discharging in Alaskan waters and did not consider the effects of multiple ships. A newer, more sophisticated dilution model is needed.**

Among the many requirements of DEC’s mixing zone regulations, consideration must be given to the cumulative effects of multiple discharges, including discharges from sources other than cruise ships. In setting effluent limits for wastewater discharges from cruise ships or from other types of regulated ships or facilities, the Department considers other discharges in the area and other types of information such as effluent quality, quantity, and location; the characteristics of the discharge; characteristics of the receiving water such as flow, tidal influence, and stratification; and dilution studies specific to the type of discharge. The models DEC uses to predict concentrations within and at the boundaries of proposed mixing zones are in standard use around the country. If refinements to these models become available, they can be incorporated. Again, HB 80 would not put any limitations on DEC’s ability to do this.

**Concern: The Department is not considering the effects of dissolved copper in saltwater habitats.**

Water quality standards are established by each state under a process set out in the federal Clean Water Act and implementing regulations by EPA. Following the federal requirements, DEC sets water quality criteria for different pollutants (such as for copper) that are designed to protect the existing and potential uses (such as the growth and propagation of fish and shellfish) of marine and freshwater. States are required to review their water quality criteria every three years to ensure they incorporate the most current and defensible science. The criteria are established in DEC regulations which undergo public review and comment, and which must be approved by EPA. The Science Advisory Panel was not tasked with evaluating the appropriateness of any of the Department’s water quality criteria. HB 80 does not make any changes to the water quality criteria. Nor does HB 80 in any way change the rigorous scientific and public process DEC is required to follow to set and update its water quality criteria, including its statewide marine and freshwater criteria for copper.

The Department adopted copper criteria for both fresh and marine water developed by the Environmental Protection Agency to protect aquatic life. These criteria were based on many studies of both chronic and acute toxicity in marine and fresh water.

Recent studies indicating behavioral changes in salmonids at low concentrations of copper have been done in fresh water. The researchers themselves indicated that their results cannot be extrapolated to marine waters. The Department will continue to evaluate the evolving science on copper and when/if it is scientifically defensible, will change the water quality criteria for fresh and/or marine waters as appropriate.

**Concern: Marine species will be at risk if less stringent discharge standards are implemented.**

The cruise ships in Alaska have vastly improved the quality of wastewater discharge since all vessels began using Advanced Wastewater Treatment Systems by 2004. There have been no indications of harm to aquatic resources either before or since that time.

HB 80 will treat cruise ship discharge permits based on potential impact to the environment rather than based on the source of the discharge. The bill will result in them being permitted to discharge under the same rules as all other discharges and which are described above. Permits for the discharge of treated wastewater generally become more stringent over time, not less.

Thank you again for your interest in this legislation. Again, I would be happy to provide you with any additional information that may help you understand the legislation, cruise ship activities in the State, and the nature of their treated wastewater discharges.

Sincerely,

A handwritten signature in blue ink, appearing to read "Larry Hartig", with a long horizontal flourish extending to the right.

Larry Hartig  
Commissioner

cc: The Honorable Senator Giessel  
The Honorable Senator Dyson  
The Honorable Senator Kelly  
The Honorable Senator Meyer  
The Honorable Representative Feige  
The Honorable Representative Saddler