

season. Most ships have multiple MSDs and multiple gray water tanks. Ships have between 5 and 24 overboard discharges.

Each of the overboard discharges will be sampled twice for biochemical oxygen demand, chemical oxygen demand, total suspended solids, ammonia, chlorine residual, pH, and fecal coliform. Each ship will also be sampled once for a list of 126 toxic compounds known as the priority pollutants. The results of these samples will show if any hazardous materials are being mixed with gray water.

As of September 5, 12 ships have been boarded. From those ships, 36 treated blackwater samples and 23 gray water samples were analyzed. 9 other ships will be sampled this season.

WHAT ARE THE STANDARDS?

The only cruise ship wastewater currently regulated under federal law is treated black water or toilet waste discharged from the Marine Sanitation Devices (MSDs). Gray water (from sinks, showers, etc.) is not treated or regulated.

The fecal coliform standard set by EPA is 200 fecal coliform per 100 milliliters. Fecal coliform indicates the possible presence of human or warm-blooded animal waste. It is not itself a pathogen. The total suspended solids allowable under EPA (Clean Water Act) regulations is 150 mg/l.

The state standard for fecal coliform is 14 per 100 milliliters for both treated black and gray water. Alaska communities' sewage facilities discharging wastewater must meet this 14 standard at the edge of a small mixing zone that allows for dilution. This means that the end of pipe discharge levels can be higher. Alaska facilities with secondary treatment or disinfection have end of pipe discharge levels for fecals ranging from 200 to 850. If a facility has the secondary treatment waiver, it can discharge at levels up to 1.5 million. However, there is active testing of these effluents to assure that state standards are met at the edge of mixing zone.

WHAT HAVE WE FOUND?

Of 36 overboard discharges of treated black water from 12 ships:

- Only 25% (9) were in compliance for fecal coliform.
- Only 14% (5) were in compliance for total suspended solids.
- None of the 36 met both limits.

Fecal coliform levels in the gray water discharges were very high in many cases. 17 out of the 23 (over 70%) gray water samples tested so far have over five times the regulatory limit of fecal coliform for treated black water (200 per 100 ml). Three of those samples show over 50,000 times that limit.

We do not yet have results for the priority pollutant testing.

AIR AND OIL SPILL READINESS

- There is improvement in oil spill response capability.

- There have been 29 violations of opacity air standards out of 202 readings conducted so far. The rate of violations is decreasing now that we are so carefully tracking the industry's performance.
- The ambient air quality monitoring got started several months late, but the earliest indications are that no standards are being exceeded. We will continue this effort next summer.

CONCLUSION

These results came as a major shock to us and, I believe, to the federal agencies and industry. It very likely means that the cruise ship industry Marine Sanitation Devices are inadequate. Even more important is the fact that it does not appear that anyone is checking the effluent quality. It is my understanding that there are logbooks on operations that the captain or the chief engineer reviews. It is hard to believe that there were no indications that there were problems with the MSDs.

Second, we must deal with the fact that high levels of fecal coliform are present in the unregulated gray water. On average, these vessels discharge 200,000 gallons a day. A very large cruise ship may discharge as much as 350,000 gallons of gray water and treated black water per day. That is a considerable amount of waste. These vessels are essentially floating cities. When several are traveling at once in the Inside Passage, their combined populations make them larger than most of our SE communities which do have to meet strict standards for both black and gray waters.

Enclosure.



WASTEWATER MONITORING

Alaska Cruise Ship Initiative

Alaska Department of Environmental Conservation

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<http://www.state.ak.us/dec/press/cruise/cruise.htm>

WHAT IS WASTEWATER MONITORING?

- Prior to this season's sampling program, there was little information on the quality of cruise ship wastewater.
- A work group of the Cruise Ship Initiative developed a wastewater sampling protocol. 21 large cruise ships visiting Alaska's waters will each be boarded twice during the 2000 season, and each of their overboard discharges will be sampled for biochemical oxygen demand, chemical oxygen demand, total suspended solids, ammonia, chlorine residual, pH, and fecal coliform.
- Each ship will also be sampled once for a list of 126 toxic compounds known as the priority pollutants. This list was adopted by Congress in 1977.
- Stakeholders agreed that ship names would not appear on analytical results and would be known only to the Coast Guard. A ship's name would only be released if the results showed it was illegally discharging.

WHAT HAVE WE TESTED? WHAT ARE THE STANDARDS?

- The first five ships were sampled in late July and early August. As of September 5, 36 samples have been analyzed from 12 ships. 9 other ships will be sampled this season.
- The only cruise ship wastewater currently regulated is treated black water or toilet waste discharged from the Marine Sanitation Devices (MSDs). Gray water (from sinks, showers, etc.) is not treated or regulated. Most ships have multiple MSDs and multiple gray water tanks. Some ships have as many as 24 overboard discharges.
- The fecal coliform standard under EPA (Clean Water Act) regulations is 200 fecal coliform per 100 milliliters. Fecal coliform indicates the possible presence of human or warm-blooded animal waste. It is not itself a pathogen.
- The total suspended solids allowable under EPA (Clean Water Act) regulations is 150 mg/l.

WHAT HAVE WE FOUND?

- Of 36 overboard discharges of treated black water from 12 ships:
 - Only 25% (9) were in compliance for fecal coliform.
 - Only 14% (5) were in compliance for total suspended solids.
 - None of the 36 met both limits.
- Fecal coliform levels in the gray water discharges were very high in many cases. DEC's regulations treat gray water as sewage and require the same degree of treatment for black water, gray water, and sewage (combined gray and black water).
- 17 out of the 23 (over 70%) gray water samples tested so far have over five times the regulatory limit of fecal coliform (200 per 100 ml). Three of those samples show over 50,000 times that limit.

WHAT HAVE WE FOUND? (CONT.)

- Alaska's water quality standard for fecal coliform is stricter (14 FC/100 ml) in marine waters to protect people eating raw shellfish. It is unlikely, however, that high levels of fecal coliform are reaching shores where local residents collect shellfish.
- The churning caused by the ship's movement dilutes the discharge so that within about 35 meters, the concentration is diluted approximately 200 times.

WHY DO WE CARE?

- These results may mean that the cruise ship industry Marine Sanitation Devices are inadequate. This may be a result of poor operation and maintenance, or the device specifications may need to be redesigned.
- We may be underestimating the amount of fecal coliform found in gray water.
- One of the larger cruise ships visiting Alaska may discharge as much as 350,000 gallons of gray water and treated black water per day.
- This season's sampling is not yet complete and no attempt has been made to assess the probable impact on water quality. Preliminary results, particularly high fecal coliform in gray water, indicate the need to accelerate improved design and installation of gray water treatment devices aboard the ships. Research with Alaska communities about the potential of upgrading existing shoreside sewage treatment plants to accept cruise ship waste may also be in order.
- Alaskans rely on their marine environment for subsistence, employment, and recreation. Monitoring of sensitive marine and coastal areas such as subsistence harvest areas and sensitive wildlife habitat should be considered.
- **We do not know if these discharges present a long-term environmental or public health risk.**



AMBIENT AIR MONITORING

Alaska Cruise Ship Initiative

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<http://www.state.ak.us/dec/press/cruise/cruise.htm>

WHAT IS AMBIENT AIR MONITORING?

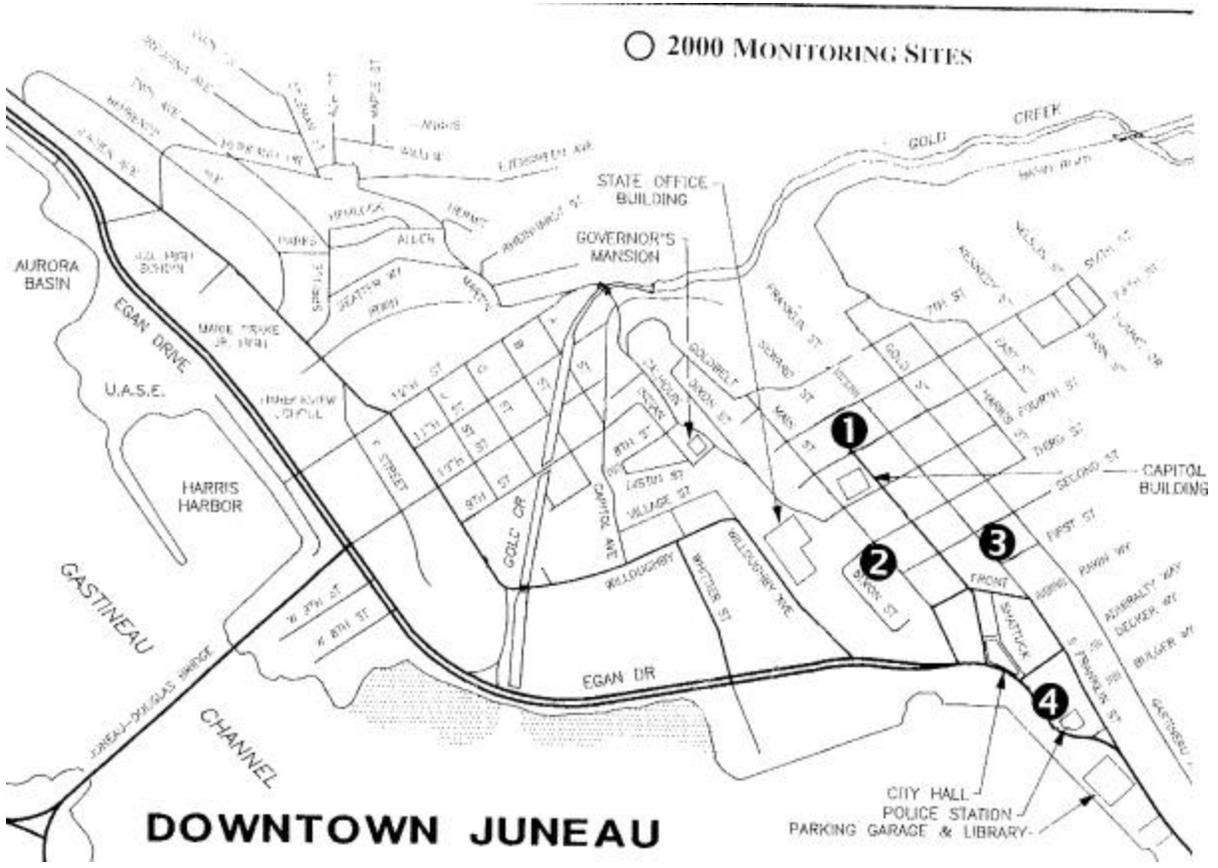
- Ambient air monitoring evaluates the quality of the outdoor air we breathe. It does not monitor air within the fence of an industrial facility or business, or air inside homes and buildings.
- Monitoring instruments are placed in specific locations to measure the level of harmful pollutants in the air and their potential impact on public health.

What are the Ambient Standards? Why do we care?

- The federal government has established air quality standards for the protection of public health.
- When these standards are exceeded, the risk of respiratory ailments goes up. Extreme levels of exposure (many times the standard) can be fatal. While each person's exposure threshold varies, the standards were established to protect the sensitive segments of the population – children, the elderly, and those with respiratory diseases.
- There are no federal standards to assess haze or visibility. Visibility is not an element of this study.

Juneau Cruise Ship Monitoring – 2000

- DEC designed a monitoring program with the cruise ship industry and concerned citizens to measure the concentrations of sulfur dioxide, nitrogen dioxide, and fine particulates in downtown Juneau.
- DEC is managing three monitoring sites through a third party contractor. DEC is operating a fourth site, on top of the Court Plaza building.
 - Capitol School park (site 1 on map) – sulfur dioxide and fine particulates.
 - Court Plaza building roof (site 2) – sulfur dioxide.
 - Baranof Hotel roof (site 3) – sulfur dioxide, fine particulates, and nitrogen oxides.
 - Paradise Lunch and Bakery roof (across from Marine Park) (site 4) – fine particulates.
- Monitoring was to begin in late May or early July, but was delayed until early August.
- The limited results gathered so far suggest that the ambient pollution levels have been low (one-tenth of the standard or less), but it is too early to draw any firm conclusions.
- DEC intends to monitor again next season. The results of both this year's monitoring efforts will determine if monitoring is required beyond next season.
- If the ambient standards are being approached or if public health has been threatened, DEC will work to continue this monitoring program. The limited sampling to date indicates that public health is not at risk, but additional sampling may be necessary to confirm this.



2000 AMBIENT AIR MONITORING SITES



OPACITY MONITORING

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<http://www.state.ak.us/dec/press/cruise/cruise.htm>

WHAT IS OPACITY?

- Opacity is visible emissions emitted from a smoke stack – in these cases, from a cruise ship.
- Opacity cannot be used to measure impacts on public health.
- Opacity is an aesthetic or quality of life issue.

WHY IS IT IMPORTANT?

- Alaskans are concerned about the amount of smoke coming from cruise ship smoke stacks and high opacity levels that reduce visibility and obscure views. Tourism also depends on presenting Alaska as a pristine environment.
- Although opacity cannot be measured for public health impacts, the more material that comes out of cruise ship smoke stacks, the higher the risk of adverse impacts on public health and the environment.
- People report fallout from cruise ship emissions – particles landing on houses, autos, and outdoor decks and furniture.

HOW IS IT READ?

- Opacity is measured by looking through smoke and determining how much of the background is obscured because of the smoke.
- Certified smoke readers attend a class, pass a written classroom test, and pass a semi-annual visible emission observation test.

WHAT IS DEC'S CRUISE SHIP OPACITY MONITORING PROGRAM?

- This program is a component of Royal Caribbean Cruises Limited's (Royal Caribbean) January, 2000 civil settlement agreement for past violations.
- Under the settlement agreement, Royal Caribbean is required to provide funding for a five-year \$250,000 cruise ship opacity monitoring program in several Southeast communities.
- The program's purpose is to help the cruise ship industry learn more about their ships' operations and to ensure in that process that Alaskans' public health and welfare is protected.
- DEC reviews the readings and immediately notifies cruise ship companies when readings show a ship is exceeding the state's opacity standard. DEC then sends a Notice of Violation to the ship owner that breaking the standard.
- DEC, at the end of the season, turns the violations over to Department of Law for enforcement action.

WHY DOES DEC HAVE THIS PROGRAM?

- DEC is not able to perform cruise ship opacity oversight because of funding constraints.
- DEC stopped performing this monitoring in 1996.
- DEC has received calls from concerned members of the public stating the emissions are impacting their quality of life ever since the program was suspended, but had no ability until now to respond.
- This is the most extensive opacity testing ever undertaken by DEC. The Environmental Protection Agency is also conducting spot readings.

MONITORING RESULTS SUMMARY

- The contractor started monitoring cruise ships' opacity on July 11, 2000, while the ships are at dock in Juneau, Ketchikan, Sitka, and Skagway.
- By September 10, 202 readings have been completed, showing 30 violations. The rate of violations has been decreasing. The monitoring season ends September 30, 2000.



OIL SPILL RESPONSE

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WHY ARE WE CONCERNED ABOUT CRUISE SHIPS AND OIL SPILLS?

- A large cruise ship visiting Alaska may be carrying over half a million gallons of fuel.
- Cruise ships are not required to have a contingency plan for oil spill prevention and response preparedness or to have an in-region response capability for a spill.
- Existing response equipment in Southeast Alaska is primarily designed for highly refined products such as diesel fuel. Cruise ships use more persistent oil, which is more like crude oil, that cannot be effectively recovered with the existing spill response inventory in Southeast Alaska.
- Even diluted concentrations of hydrocarbons from discharged oil can put wildlife, sea life, and tourism at risk as well as pose health risks and risks to subsistence harvests.

IMPROVEMENTS IN OIL SPILL PREVENTION AND RESPONSE CAPABILITY

- DEC and the Coast Guard joined with the Southeast Subarea Plan Committee – the multi-agency planning group that developed the existing Southeast Alaska area oil spill response plan – to specify regional response needs for large cruise ships carrying persistent oil.
- The North West Cruise Ship Association provided the Southeast Alaska Petroleum Resource Organization (SEAPRO) with 8 spill response barges containing open water recovery systems (skimming, boom, temporary storage, and work boat) which are pre-staged at 4 locations.
- Royal Caribbean, under the settlement agreement, is providing \$2,100,000 for additional oil spill response equipment to be positioned over the next year, including fast response vessels, boom, skimmers and storage devices. These will be integrated into the existing response capability in Southeast Alaska, resulting in a greatly improved response system.
- DEC has placed a nearshore response equipment package in Northern Lynn Canal and signed an agreement with the Haines Borough and the cities of Haines and Skagway governing the use of the equipment.
- The member cruise lines of the North West Cruise Line Association have signed 15 year contracts with SEAPRO for immediate oil spill response action.
- Royal Caribbean's settlement requires up to \$250,000 for the development of geographic response strategies for Southeast Alaska.

WHAT IS BILGE WATER? HOW IS IT REGULATED?

- Bilge water is water that collects and stagnates in the bilge or bottom-most areas of a ship. It is often contaminated with oil and other substances from the ship's machinery spaces. The amount that accumulates depends on many factors including the size of the ship, hull design, prevailing weather conditions and seastates.
- Federal standards mandate that bilge water must have an oil content of less than 15 parts per million (ppm) if discharged within 12 nautical miles of the nearest land, and less than 100 ppm if discharged more than 12 nautical miles from land.