Friends of the San Juans

January 13, 2025

Transport Canada
Tower C, Place de Ville
330 Sparks Street
Ottawa, ON K1A 0N8

Submitted via email: MSSRegulations-ReglementsSSM@tc.gc.ca

RE: Vessels using scrubber systems in Canadian waters

To Whom It May Concern:

Thank you for your interest in the public's opinion on vessels using scrubber systems in Canadian waters.

Friends of the San Juans is an environmental nongovernmental organization with the mission to bring people and nature together to protect the San Juan Islands and the transboundary Salish Sea through education, science, policy, and law. Friends of the San Juans was a co-petitioner that led to the US federal listing of the Southern Resident killer whales as an endangered species under the Endangered Species Act. Southern Residents are also listed as endangered on Species at Risk Act Schedule 1 in Canada. The protection and recovery of the Southern Residents continues to be one of our top priorities.

Below are Friends of the San Juans' answers to your key questions.

Do you think Transport Canada should implement restrictions on scrubber system discharge from vessels in Canadian waters? Why or why not?

Yes. Transport Canada should implement restrictions on scrubber system discharge from vessels in Canadian waters. Ships that use exhaust gas cleaning systems, better known as scrubbers, instead of cleaner fuels, threaten marine economies, ecosystems, the survival of endangered species, and cause environmental and human health impacts.

To improve air quality, the North American Emission Control Area limits the sulfur content in ships' fuels to reduce their sulfur oxide emissions. Ships should be prohibited from using scrubbers to comply with air emissions requirements while continuing to use heavy fuel oil, which does not meet emission requirements.

Open-loop scrubbers continuously spray sea water into ships' exhausts to dissolve and remove the highly acidic sulfur oxides and then discharge it directly into waterways. Closed-loop systems recirculate the chemically treated scrubber wash water; however, "bleed-off" discharges still occur. There are also

hybrid systems that can toggle between the two modes. More than 80% of scrubbers are open-loop[1] and continuously discharge toxic pollutants into the ocean whenever the engines operating, including close to shorelines and in anchorages, ports, and estuaries, impacting water quality.[2]

The highly acidic scrubber discharges contribute to ocean acidification. In 2017, Washington State, which includes the transboundary Salish Sea, documented these economic impacts from ocean acidification to the state's marine economy:

> Washington is the country's leading producer of farmed bivalves, with recent annual revenue of nearly $150 million. In 2013, Pacific oysters alone contributed nearly $35 million to the state's farmed shellfish harvest production value, while geoduck and other clam sales contributed an additional $42 million. In addition to farmed bivalves, the wild Dungeness crab fishery is also a significant economic driver, providing more than $82 million in annual revenue in 2016. The shellfish and seafood industries are important employers in Washington state, especially in some rural, coastal communities. In recent years, the shellfish aquaculture industry alone employed nearly 3,000 Washingtonians in direct and indirect jobs. Washington's total seafood industry generates even more impressive employment and revenue at neighborhood seafood restaurants, distributors, processors, importers, and retailers, contributing over 50,000 jobs in Washington and over $2.5 billion to the state's economic output.
>
> Not included in these statistics are the economic and cultural value of marine resource to Washington's tribal communities. Some tribal people refer to native seafood as feeding their spirit as well as their physical needs. While we still need to learn more about how ocean acidification affects the full range of species driving our economic and cultural systems, it is clear that the effects of ocean acidification could significantly impact the state's economy and people.[3]

In addition to removing and discharging highly acidic sulfur oxides, scrubbers discharge other toxic contaminants including heavy metals, polycyclic aromatic hydrocarbons (PAHs), nitrates, nitrites, and particulate matter.[4] PAH contamination and accumulation in the critically endangered Southern Resident killer whales further threatens their survival.[5] The bioaccumulated contaminants in scrubber discharges can also be transferred up the food chain in a process referred to as biomagnification.

---

[1] Lunde Hermansson, A., Hassellöv, IM., Grönholm, T. et al. Strong economic incentives of ship scrubbers promoting pollution. Nat Sustain 7, 812–822 (2024). https://doi.org/10.1038/s41893-024-01347-1.

[2] Teuchies, J., Cox, T.J.S., Van Itterbeeck, K. et al. The impact of scrubber discharge on the water quality in estuaries and ports. Environ Sci Eur 32, 103 (2020). https://doi.org/10.1186/s12302-020-00380-z.

[3] Washington Marine Resources Advisory Council (2017): 2017 Addendum to Ocean Acidification: From Knowledge to Action, Washington State's Strategic Response. EnviroIssues (eds). Seattle, Washington. Pages 7-8. https://oainwa.org/wp-content/uploads/2023/01/2017_Addendum_BRP_Report_fullreport.pdf.

[4] Pacific Environment. August 2024. Ship pollution: From air to ocean. https://www.pacificenvironment.org/wp-content/uploads/2024/08/Ship-pollution-From-air-to-ocean-Scrubbers_August-2024.pdf.

[5] Lee, K., Raverty, S., Cottrell, P. *et al.* December 2023. Polycyclic aromatic hydrocarbon (PAH) source identification and a maternal transfer case study in threatened killer whales (*Orcinus orca*) of British Columbia, Canada. *Sci Rep* **13**, 22580 (2023). https://doi.org/10.1038/s41598-023-45306-w.

According to the US Environmental Protection Agency: "Some chemical pollutants can bioaccumulate in fatty tissues or bind to muscle tissue of fish and shellfish. Even very low concentrations of these pollutants in the water or sediment can result in fish or shellfish tissue concentrations high enough to pose health risks to consumers."[6]

The Canadian Government found that on Canada's Pacific Coast, which includes the transboundary Salish Sea, scrubber discharges totaled 88.3 million tonnes (over 97.3 million US tons) in 2022, nearly double the amount that was discharged in 2019 (see Table 1 below).[7]

Table 1: Washwater and Pollutants Discharged from Scrubbers on Canada's West Coast, 2019 and 2022

Parameter	2019	2022
Unique Vessels with Scrubbers	125	466
Washwater (tonnes)	44 200 000	88 300 000
PAHphe (kg)	117	226
Nitrates (kg)	19 600	37 9100
Vanadium (kg)	9140	17 700
Nickel (kg)	2540	4910
Copper (kg)	2140	4130
Cadmium (kg)	5	9
Mercury (kg)	7	13
Lead (kg)	509	984

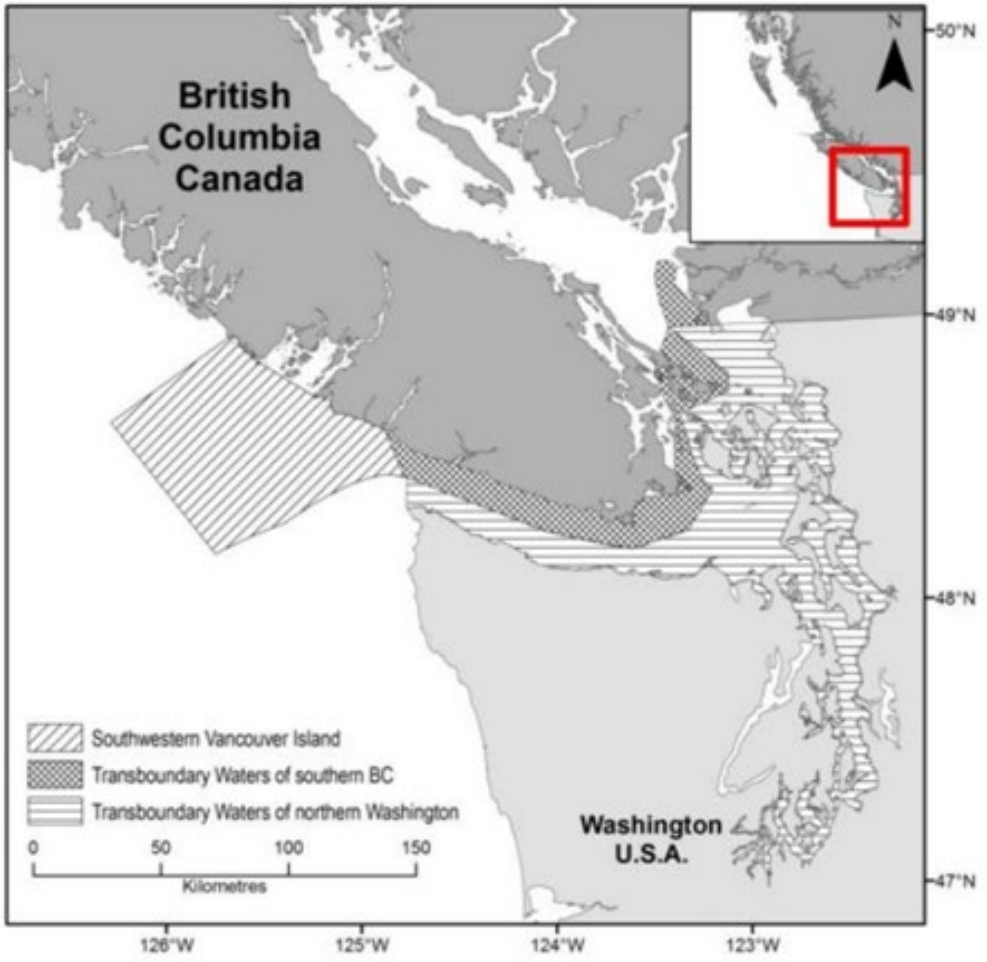
Honda M, Suzuki N. Toxicities of Polycyclic Aromatic Hydrocarbons for Aquatic Animals. Int J Environ Res Public Health. 2020;17(4):1363. doi:10.3390/ijerph17041363. https://pmc.ncbi.nlm.nih.gov/articles/PMC7068426/.

[6] United States Environmental Protection Agency webpage. Exposure Assessment Tools by Media - Aquatic Biota. https://www.epa.gov/expobox/exposure-assessment-tools-media-aquatic-biota.

[7] Commission for Environmental Cooperation. April 12, 2024. VESSEL POLLUTION IN PACIFIC CANADA Government of Canada Response to Submission SEM 23-007. Prepared by: Environment and Climate Change Canada for the Government of Canada. Page 28. http://www.cec.org/wp-content/uploads/wpallimport/files/23-7-rsp_en.pdf.

A study that analyzed sediment collected from 98 sites along the British Columbia coast between 2018 and 2020 found that the levels of the heavy metals mercury, cadmium, arsenic, nickel, copper, and lead may pose a threat to Chinook salmon and Southern Resident killer whales both directly and indirectly.[8] In 2022, the Canadian Government found that there were over 26 million tonnes (28.66 million US tons) of scrubber discharges in the Southern Resident killer whales' critical habitat in the transboundary Salish Sea which includes the US State of Washington (see Figure 3 below).[9]

Figure 3. Critical habitat areas identified for Southern Resident Killer Whale in the 2018 Recovery Strategy for the Northern and Southern Resident Killer Whales (Orcinus orca) in Canada. The hatched areas represent critical habitat. The hatched area in US waters is designated as Southern Resident Killer Whale critical habitat under the US Endangered Species Act.



[8] Kim, J.J., Delisle, K., Brown, T.M. *et al.* Sediment Spatial Distribution and Quality Assessment of Metals in Chinook Salmon and Resident Killer Whale Marine Habitat in British Columbia, Canada. *Arch Environ Contam Toxicol* **85**, 73–91 (2023). https://doi.org/10.1007/s00244-023-01013-1.

[9] Commission for Environmental Cooperation. April 12, 2024. VESSEL POLLUTION IN PACIFIC CANADA Government of Canada Response to Submission SEM 23-007. Prepared by: Environment and Climate Change Canada for the Government of Canada. Pages 28-31. http://www.cec.org/wp-content/uploads/wpallimport/files/23-7-rsp_en.pdf.

These discharges included 69 kg of PAHphe (PAHs as phenanthrene equivalents) and over 8,000 kg of metals.[10] PAH contamination and accumulation in the critically endangered Southern Resident killer whales further threatens their survival.[11] PAHs accumulate in sediments and bioaccumulate through the food chain, affecting fish and shellfish, which pose a risk to humans who consume them.[12]

To comply with the Species at Risk Act, Transport Canada needs to prohibit scrubber discharge from vessels in the Southern Resident killer whales' critical habitat.

The pollution impacts from scrubber discharges are an urgent and growing issue. Pollution prevention is paramount. The transfer of pollution from air to water is not a pollution solution.

What factors should be considered when exploring a timeline for the introduction of potential restrictions on scrubber discharge from vessels and why?

The implementation of restrictions on scrubber system discharge from vessels in Canadian waters should occur as quickly as possible.

Scrubbers are optional for ships to use. The majority of ships use emission-compliant cleaner fuels to comply with the North American Emission Control Area requirements. Vessels that use scrubbers in Canadian waters can switch to cleaner fuels without installing new or retrofitting existing equipment. There are no barriers that would keep vessel owners from adopting a requirement to use cleaner fuels.

The only advantage to using scrubber systems is the lower cost of the heavy fuel oil that is not compliant with the North American Emission Control Area requirements, as compared with emission-compliant cleaner fuels. Any cost savings for vessel owners and operators are far outweighed by the costs associated with scrubber discharge impacts to human health; aquaculture; commercial, recreational, and cultural harvests of wild shellfish and fish; eco-tourism; and other marine economies.

There is some kind of restriction or ban on scrubbers in seventeen European Union countries and the United Kingdom.[13] Scrubber discharges are banned in the US State of Connecticut[14] and cleaner fuels are required in California.[15]

---

[10] *Ibid*.
[11] Lee, K., Raverty, S., Cottrell, P. *et al*. Polycyclic aromatic hydrocarbon (PAH) source identification and a maternal transfer case study in threatened killer whales (*Orcinus orca*) of British Columbia, Canada. *Sci Rep* **13**, 22580 (2023). https://doi.org/10.1038/s41598-023-45306-w.
[12] Madhumitha Vijayanand et al. Polyaromatic hydrocarbons (PAHs) in the water environment: A review on toxicity, microbial biodegradation, systematic biological advancements, and environmental fate, Environmental Research, Volume 227, 2023, 115716, ISSN 0013-9351, https://doi.org/10.1016/j.envres.2023.115716.
[13] International Council on Clean Transportation (ICCT). June 2023. Global update on scrubber bans and restrictions. https://theicct.org/wp-content/uploads/2023/06/Scrubbers_policy_update_final.pdf.
[14] Final 2013 Vessel General Permit. See Section 6.5 Connecticut. https://www3.epa.gov/npdes/pubs/vgp_permit2013.pdf.
[15] California Air Resources Board webpage. Ocean-Going Vessel Fuel Regulation. https://ww2.arb.ca.gov/our-work/programs/ocean-going-vessel-fuel-regulation.

An immediate stop to this preventable pollution is needed to protect water quality, public health, endangered species including Southern Resident killer whales, marine economies, the environment, and the shared waters of the Salish Sea.

Restrictions on scrubber system discharges from vessels in Canadian waters should be implemented as soon as possible.

Is there anything else that Transport Canada should consider about vessels using scrubber systems, including when exploring potential restrictions?

Friends of the San Juans is advocating for Washington State to adopt cleaner fuel requirements. This would eliminate the toxic pollution from scrubber discharges in Washington State's jurisdiction, which includes the transboundary Salish Sea.

Thank you for considering these comments.

Sincerely,

Lovel Pratt

Lovel Pratt
Marine Protection and Policy Director