

Subject: Resolution to Encourage Treatment of Victoria-area Sewage
From: "Shaun Peck" <shpeck@shaw.ca>
Date: Thu, June 25, 2009 12:11 pm
To: <Rachel.keeler@amec.com>
Cc: <LDominguez@entrix.com>

To: Rachel Keeler, Editor WA-BC American Fisheries Society Newsletter.

I am submitting the attachment for publication in the American Fisheries Society newsletter. I am also copying chapter president Larry Dominguez for his information.

Re: Resolution to Encourage Treatment of Victoria-area Sewage Discharged to the Strait of Juan de Fuca - Brought before the Membership of the Washington- British Columbia Chapter of the American Fisheries Society Annual Meeting, April 22, 2009

This recent resolution by the WA-BC chapter of the American Fisheries Society I believe demonstrates that the organization has been used in an unscientific, unprofessional and unscrupulous manner. Rather than the Society being wrong themselves, they have been bamboozled and the organization hijacked.

Did the American Fisheries Society check with the group of marine and environmental scientists at the University of Victoria who have publicly doubted whether on-land secondary treatment will provide any net benefit to the marine environment, or whether they have consulted the six former and current public health officers who have concluded that there will be increased, not decreased, risk to human health if on-land secondary treatment is instituted. Were these expert views brought to the attention of the members of the Society before the vote? The views of these two groups makes the "whereas" clauses of the resolution untenable assertions. In the attachment members of Responsible Sewage Treatment Victoria have commented on each section from their scientific perspective. I believe that members of the American Fisheries Society will appreciate the credible comments that have been made.

University of Victoria scientists and local health officers can be expected to be more familiar with local conditions off the Victoria waterfront than any other groups and to have reviewed the many studies that have been carried out over the years. However, if American Fisheries Society experts feel local University of Victoria scientists and public health physicians to be unqualified, they might be asked if they consulted the University of BC and University of Washington scientists who carried out studies some twenty years ago and reached much the same conclusions. (See 1994 Canadian Technical Report of Fisheries and Aquatic Sciences No:1948 following the joint Washington State/British Columbia Marine Science panel appointed in July 1993). I believe that the American Fisheries Society have based their April 2009 resolution on unreviewed conclusions, and that this does not fulfill the Societies mandate to carry out peer reviewed research.

Thank you,

Shaun Peck.

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The following resolution to the American Fisheries Society has been reviewed by Responsible Sewage Treatment Victoria www.rstv.ca and by nationally and internationally recognized marine scientists; combined comments are added to each component.

Resolution to Encourage Treatment of Victoria-area Sewage
Discharged to the Strait of Juan de Fuca

Brought before the Membership of the Washington- British Columbia Chapter of the American Fisheries Society Annual Meeting, April 22, 2009

WHEREAS the waters of the Strait of Juan de Fuca are vitally important rearing, migration, and spawning habitats for commercially, recreationally, and ecologically important fish, shellfish, seabirds, and marine mammals, as well as myriad other marine organisms;

Comment: This statement applies to all ocean environments and is not unique to Juan de Fuca Strait.

and WHEREAS on average over 115 million litres of raw sewage, landfill leachate, and residential and commercial wastewater per day is being discharged from Macaulay Point and Clover Point approximately 1.5 km from Victoria's shores¹;

Comment: The effluent is screened prior to discharge; thus, the term "raw" is incorrect. Both discharges are at approximately 60 m depth, which is not mentioned. Further, based on site-specific conditions, natural sewage treatment occurs with lower environmental cost or risk than human-mediated treatment: an ecosystem service that should be maintained, not unnecessarily replaced by a less effective and environmentally costly human system.

and WHEREAS twenty-eight chemicals found in Victoria's sewage have been measured at levels that exceed Canadian or provincial water quality guidelines (WQGs) for the protection of fish and aquatic life²;

Comment: Yes, prior to discharge WQGs are exceeded in the effluent. However, following discharge, exceedances of WQGs do not occur where they are intended to be applied – in the receiving environment (dilution and dispersion are rapid and complete).

and WHEREAS the effluent is lethal to all fish exposed to 100% effluent concentrations and kills 50% of fish when diluted to between 6 and 24% effluent^{3,4};

Comment: The effluent is not saline; testing is done using a freshwater rainbow trout test. It is well established that salinity (the effluent is released into and rapidly mixes with high salinity seawater) reduces the toxicity of contaminants such as metals. Further, as noted above, the effluent is rapidly dispersed such that exceedances of WQGs, intended to protect fish such as rainbow trout, cannot be detected. Finally, laboratory toxicity tests do not allow the fish to avoid noxious materials, which is not the case in the real environment. Given these facts, acute toxicity to fish in the receiving environment (which has not been assessed) is highly unlikely.

British Columbia's Municipal sewage regulation recognizes that the toxicity test does not apply when the discharge is to open marine waters (Section 9(2)(d)). (The referenced toxicity test is Environment Canada's 96 hour LC50 bioassay test as defined by Environment Canada's Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, Reference Method, EPS 1/RM/13).

and WHEREAS oyster and mussel larvae show abnormal development when exposed to low concentrations of effluent (1.1-3.9%)⁵;

Comment: As noted previously, exceedances of Canadian WQGs, intended to protect oyster and mussel larvae as well as fish, cannot be detected around the outfalls. The soft-bottom receiving environment around the Macaulay Point discharge is not habitat for oysters or mussels, which require hard bottom habitat. Thus this comment is not relevant to that discharge. The hard-bottom receiving environment around the Clover Point outfall supports an abundant and healthy population of mussels; scientific studies have shown that the outfall discharge does not affect reproduction or growth of these mussels other than to allow a relatively high rate of growth due to the nutrients released by the outfall. Thus, this comment misrepresents the reality at both discharges.

and WHEREAS sewage concentrations as low as 0.05% effluent in seawater caused gene expression alterations in juvenile Chinook salmon⁶;

Comment: See previous comments regarding testing effluent versus testing waters receiving the effluent. Note further that juvenile Chinook salmon are typically found in nearshore habitats where they feed and rear, not in the deep offshore waters where the discharges occur. Finally, note that gene expression alterations are a biomarker of alteration and are not necessarily a bioindicator of actual effects to individual fish or of impacts to fish populations.

and WHEREAS the area around Victoria's two outfalls has sediment quality conditions sufficient to warrant designation as a contaminated site, as defined by the BC Contaminated Sites Regulation, due to contamination by 19 different heavy metals and other chemicals⁷;

Comment: A point of clarification: the term "heavy" metals is incorrect – the terms metals or trace metals are correct. Note further that contamination simply means that a substance is present at elevated concentrations, in this case above sediment quality guidelines, and that the potential effects of these elevations need to be investigated. Chemical measurements of total metals and of other chemicals provide no information on the bioavailability let alone the toxicity of those metals and chemicals. In fact, extensive, peer-reviewed scientific studies have consistently shown that the bioavailability and toxicity of the "metals and other chemicals" originating from the outfall (there are other sources) are minimal. In summary, investigation of this contamination has not indicated any major, adverse environmental effects as confirmed by the independent, expert SETAC Panel.

and WHEREAS benthic community diversity near the diffusers is reduced and pollution tolerant invertebrates dominate the sediment-dwelling organisms⁸;

Comment: "Near the diffusers" is correct – within about 200m of the outfall, moderate nutrient enrichment effects occur. The "pollution tolerant invertebrates" referred to are capitellid polychate worms, which are tolerant of reduced oxygen conditions (they are facultative anaerobes), but not of bioavailable and toxic "metals and other chemicals".

and WHEREAS the evidence is clear that the continued dumping of raw sewage, and all the toxins it contains, is adding to the pollution of our region and harming our oceans;

Comment: This statement is incorrect and misleading for several reasons. First, as previously noted, this is not “raw sewage”. Second, it is discharged not “dumped”. Third, the term “toxin” applies to any substance including the air we breathe and the water we drink in excess (per Paracelsus, the dose makes the poison), not just to what is in the effluent. Fourth, pollution refers to contamination (as defined above) that results in adverse biological effects (all pollutants are contaminants but not all contaminants are pollutants – the dose makes the poison). Pollution due to the outfalls comprises moderate nutrient enhancement of benthic (bottom-dwelling) communities including the mussels around the Clover Point discharge, and is restricted to about 200m from the discharges. Thus, the statement regarding “harming our oceans” is at best disingenuous.

and WHEREAS in addition to the benefits that come with traditional wastewater treatment methods, new approaches and technologies for treatment can recover valuable resources from the waste that can be re-used (called Integrated Resource Management⁹). Other constituents, especially water, can be re-used for irrigation, industrial uses, or wetland recharge, thereby reducing the need for water withdrawals from fish-bearing streams;

Comment: Traditional and new waste water treatment methods have advantages, but they also all have environmental disadvantages, which are curiously not mentioned in the above overly general statements. As previously noted, natural sewage treatment is an environmental service that has lower environmental costs or risks than traditional wastewater treatment methods, including environmental re-use of nutrients and reduced bioavailability and toxicity of metals and other chemicals (compared to concentrating these in sludge). There is no evidence that the current discharges are adversely impacting fish-bearing streams due to water withdrawals. Further, monies not spent on unnecessary human sewage treatment can be used to improve the situation where there truly are significant adverse human impacts on the environment and/or to save human lives (e.g., improved medical/hospital services as advocated instead of sewage treatment by the Region’s Medical Health Officers).

and WHEREAS the Washington - British Columbia Chapter of the American Fisheries Society is an organization of nearly 800 fisheries science and management professionals and therefore particularly qualified to render an opinion on this issue;

Comment: They and other scientists are only qualified to render an opinion if they have fully examined the available evidence, not if they are simply reacting to incorrect and misleading statements such as those above. The scientific method should apply before scientific opinion is rendered.

THEREFORE BE IT RESOLVED, that it is our scientific professional opinion that ending the ongoing sewage discharge from the McCauley and Clover outfalls in the Juan de Fuca Strait is scientifically justified; and

Comment: See previous comment.

THEREFORE BE IT FURTHER RESOLVED that we believe that it is in the best

interest of Victoria-area residents, the citizens of British Columbia and Washington, and the marine environment to move toward Integrated Resource Management to optimize the benefits of sewage treatment;

Comment: See previous two comments. Further, it would be presumptuous at best for this group of scientists to speak for “the best interest of Victoria-area residents, the citizens of British Columbia and Washington”, particularly given that those best interests are not only based on scientific considerations. As regards the interests of the marine environment, see previous comments regarding the moderate nutrient-enrichment effects of the discharges on a very small portion of the sea bottom. As regards optimizing the benefits of sewage treatment, see previous comments regarding environmental services.

and THEREFORE BE IT FINALLY RESOLVED, the Washington - British Columbia Chapter of the American Fisheries Society encourages and supports the efforts of B.C. provincial and regional leaders, and the public, to bring secondary or better sewage treatment to the Capital Regional District of Victoria as quickly as possible.

Comment: See previous comments – in brief: (1) scientists evaluate the facts before rendering an opinion; (2) that opinion, if based on scientific facts, is worthy of consideration along with non-scientific considerations (e.g., social and economic); (3) scientists advise on science not on policy; (4) the weight of peer-reviewed scientific evidence clearly indicates that the two discharges are not having environmental effects commensurate with the above proposed remedy.

¹ CRD Summary of Annual Report for 2006, www.crd.bc.ca/wastewater/marine/reports.htm

² Golder. 2005. *Potential environmental effects of the Macaulay and Clover Point outfalls and review of the wastewater and marine environmental program.*

³ EVS Environment Consultants. 1998. *Toxicity Testing on Samples Identified as Project X2 MC and Project X2 CL (Both Collected March 23, 1998),*

⁴ Environment Canada (DOE) Toxicity Testing Lab, unpublished data

⁵ Golder. 2005. *Potential environmental effects of the Macaulay and Clover Point outfalls and review of the wastewater and marine environmental program*

⁶ Osachoff, H.L. 2008. Toxicogenomics effects of sewage on juvenile Chinook salmon (*Oncorhynchus tshawytscha*). Thesis (M.Sc.) - Dept. of Biological Sciences - Simon Fraser University.

⁷ MacDonald DD, Smorong, DE. 2006. MacDonald Environmental Sciences Ltd. *An Evaluation of Sediment Quality Conditions in the Vicinity of the Macaulay Point and Clover Point Outfalls*, pg. 39 & tables 17-20

⁸ Stubblefield, W.A., et al. 2006. SETAC. *Scientific and Technical Review, Capital Regional District Core Area Liquid Waste Management Plan*, pg.13.

⁹ Integrated Resource Management Study Team. 2008. Resources from Waste, Integrated Resource Management Phase I Study, c/o Aqua-Tex Scientific Consulting Ltd., Suite 205, 2187 Oak Bay Avenue, Victoria BC V8R 1G1.