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Editorial

Sewage treatment wasted – The Victoria (BC, Canada) example

A previous Editorial (Chapman, 2006) provided the background for issues regarding sewage discharged by the City of Victoria (British Columbia, Canada) and environs (the Capital Regional District, CRD). In brief, the sewage receives preliminary screening to remove solids larger than 6 mm prior to discharge more than 1 km offshore in roughly 60 m deep, well-mixed marine waters with strong tidal currents. Despite scientific evidence that there are no major environmental or human health impacts, this discharge of 'untreated' sewage has been a constant irritation to the city's US neighbours and to environmental groups, has resulted in a large number of lay opinions in the popular media (radio, television, newspapers, magazines), and finally resulted (July 2006) in the British Columbia Minister of the Environment directing the CRD to move to secondary sewage treatment.

Prior to this direction, an independent expert scientific review had been completed under the auspices of the Society of Environmental Toxicology and Chemistry (SETAC; Stubblefield et al., 2006). This independent review made an important point that appears to have been overlooked by the Minister and others in favour of secondary treatment. Specifically, stormwater, sanitary and combined overflows, and other discharges, particularly into the surface waters in Victoria's harbours, present more pressing environmental issues than the current offshore submarine sewage discharges. But there was no opportunity to properly discuss and evaluate the SETAC review; the CRD's plan to review the SETAC report over a 5-month period, with public input, prior to deciding how to proceed was obviated by the Minister's direction, which was handed down just two days after the release of the SETAC report.

The SETAC review, previous assessments, and subsequent expert opinion by local medical health officers have all confirmed that there are no major human health concerns associated with the sewage discharge. Granted, gastrointestinal illness and/or ear infections could conceivably occur if individuals were in offshore waters when, during certain periods in the fall and winter, excessive rainfall entering the drainage system can cause the sewage plume to surface. But this would not be a common occurrence to say the least, and the risks would be far smaller than those posed by the combined-overflows problem specified above.

The SETAC review also confirmed that the outfalls were not causing major adverse environmental effects. The review specifically stated "There is no reason to believe that serious human health effects or severe ecological consequences not yet in evidence will arise in future" but, not unreasonably, the reviewers admitted that they could not predict future risks due to emerging contaminants of concern ("the larger problem is with estimating the likelihood of events that have not yet, and might never, occur").

The Minister's direction to proceed to sewage treatment was neither based on the evidence of present environmental or human health impacts, nor on the evidence for future environmental or human health impacts. Moreover, it was not based on any recommendation from the SETAC review. Rather, it was based on the possibility of future risks (on hazard, not actual risk); undue reliance was placed on a report that only assessed total concentrations of chemicals in the environment, not their bioavailability or their environmental effects (MacDonald and Smorong, 2006). The Minister's direction was also, presumably, based on 'doing the right thing'.

The Victoria sewage situation is not unique. For instance, over a decade ago, the City of San Diego was similarly ordered (by the USEPA) to upgrade from primary to secondary treatment. Again the scientific evidence did not support the need for this higher level of treatment at that location. But environmental groups and numerous individuals and politicians agreed it was the appropriate thing to do. Then a group of marine scientists, mostly from the Scripps Institute of Oceanography, began to take an active public role and "the public gradually learned that they were going to be spending billions for little or no benefit, to comply with a federal mandate that was imposed with no consideration for local conditions" (Loehr and Brooks, 1995). Further, secondary treatment entails environmental negatives including substantial additional energy requirements and CO_2 emissions, sludge production, and land use associated with treatment plants. San Diego's sewage treatment upgrade would also have resulted in a loss of reclaimed water. After duly considering all of the evidence, a federal judge eventually struck down the USEPA order.

The parallels between San Diego and Victoria in terms of political rather than science-based requirements are obvious. Costs for secondary treatment for Victoria are predicted to be less than for San Diego but could still well be in the billion-dollar range. There will be minimal, if any, marine environmental benefits, and those benefits have yet to be specifically identified. Environmental negatives will include increased energy usage and the need for sludge disposal, and almost certainly a subsequent deficit in both money and political will to address the more pressing environmental issues identified by the SETAC review and by others.

The scientific evidence of lack of harm is clear, as is the evidence that secondary sewage treatment will not remove all uncertainties related to emerging contaminants. Some contaminants will not be removed from the effluent, while others will be removed to and concentrated in the sludge that will then require safe disposal. A focused, objective evaluation of different sewage effluent components (e.g., nutrients, metals, emerging

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contaminants, etc.) is needed that will address questions such as: (1) Is the component producing, or likely to produce, anything more than minor local effects?; (2) If so, does it come mainly from the effluent, or from more widely-distributed sources?; (3) If from the effluent, what kind of treatment would take care of it (e.g., source control, primary treatment, secondary, more advanced, other types, etcetera) and what would be the monetary and other environmental costs?; (4) If the problem is serious and comes from wider sources, what can be done about it? The value of such an evaluation to stake-holders and decision-makers, particularly if it were conducted as a part of the CRD's originally planned public review of the SETAC report, is obvious. An urgent parallel requirement for this evaluation is news media reporting that correctly weighs the scientific evidence for both sides – benefits versus costs – such that 'the right thing to do' truly does emerge from this process (e.g., see Boykoff, 2008) rather than from Ministerial direction, based on public opinion, that overrides any useful evaluation.

The concept of natural sewage treatment has been criticized in the media, but in fact waste treatment is well recognized as a useful ecosystem service contributing to human well-being (Costanza et al., 1997; Boyd and Banzhaf, 2007). The focus of environmental protection is changing to preserving such ecosystem services to the benefit of both human beings and the natural environment (e.g., USEPA, 2008). It makes no sense to replace a natural ecosystem service with a human creation that is energy inefficient and has other harmful environmental consequences.

As noted above, recommendations to examine environmental priorities holistically before taking action have been ignored. A great deal of money has now been committed to resolving an arguably relatively minor environmental issue. Will monies also be available for dealing with more pressing issues including those identified by the SETAC review? Will the CRD's new directed focus on relatively expensive sewage treatment reduce or even eliminate their present, very useful programs to address stormwater and other overflows, watersheds and landfills? Unfortunately, we all know the likely answer to these questions. As the cartoon character Pogo said so long ago in a sentence that applies too well to the Victoria sewage issue and to other environmental issues, "We have met the enemy, and they is us".

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