



**BOTANY GROUNDWATER CLEANUP PROJECT
INDEPENDENT MONITORING COMMITTEE
TASK 19 FOR MEETING WITH CLC 26 OCTOBER 2007**

At the September 2007 meeting of the CLC, I was specifically requested to provide comment on the following issue:

Task 19: Provide comment on the potential health risks associated with washing fish at Penrhyn Estuary.

There are no specific data which can be applied to assessment of this issue, other than risk estimates drawn from the 2005 Human Health Risk Assessment (HHRA) prepared for Orica by URS. This HHRA addressed risks associated with eating fish caught in the Penrhyn Estuary system and also risks associated with recreational activities in this area. The 2005 report focussed on Chemicals of Potential Concern (COPC) relating to each of these areas of risk assessment, identified using conventional HHRA methodology. In the case of edible fish species, the COPC addressed were HCB, HCBD and mercury. In the case of recreational activities, the COPC included a suite of chlorinated solvents, out of which vinyl chloride monomer (VCM) was an important driver of the risk assessment outcomes because of its carcinogenic potential. The report also noted that these risk estimates tended to be inflated because the relatively high Limit of Determination (LOD) of the analytical method resulted in the assignment of relatively high concentrations of VCM to "non-detect" samples.

The report noted that exposure to COPC from eating fish made a major contribution to the overall risk estimate, and this finding was clearly instrumental in imposing a fishing ban in the estuary.

The current issue of concern to the CLC is that fish washing facilities are not available at the boat ramp, and that washing fish using water from the estuary could exacerbate any health risks.

Issues relating to eating fish washed in water from the boat ramp region

The issue is whether washing fish is likely to result in a significant incremental increase in risk as a result of transfer of COPC during the washing process and further accumulation in the flesh of the fish. My opinion is that this is unlikely, although there are no data directly supporting this inference. The characteristics of the COPC are that they would accumulate slowly in fish over time, as fish consume contaminated food sources, mainly associated with sediment deposits. The likelihood that there could be significant transfer during a brief washing process appears remote.

Issues relating to direct human exposure during the washing process

The 2005 HHRA addressed risks associated with inhalation, ingestion and exposure via the skin, of a suite of volatile chlorinated compounds. While the risks associated with chemicals designated as having a threshold for toxicity was quite low (the cumulative Hazard Index was substantially less than 1), risks associated with non-threshold chemicals (essentially the carcinogenic risks) were in some cases higher than the "target risk" level of one in a hundred thousand (1×10^{-5}). As noted in the report, much of this risk was attributable to VCM, and was possibly overestimated because of the relatively high concentrations attributed to samples where VCM was not actually detected.

It must be emphasised that these risk estimates are based on a lifetime of exposure to the COPC, although they take into consideration, estimates of the frequency and duration of specified recreational activities. These risk estimates are therefore highly conservative and, in the 2005 report, do not take into consideration any risk reductions associated with remediation activities.

My opinion is that washing of fish **could** result in exposure to volatile COPC comparable to estimates associated with wading in the estuary. In the 2005 report, risks associated with this specific source tended to be comparable to those associated with swimming, with dermal absorption accounting for much of this risk. The main mitigating factor is that activities associated with washing fish would likely be of shorter duration than the other recreational activities.



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