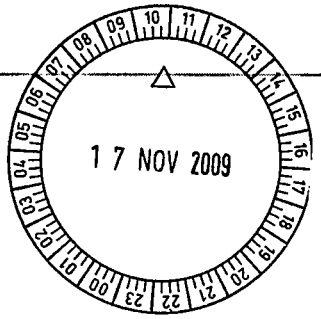
Stephenson, Cassandra



From: Bernie Masters
Sent: Friday, 13 November 2009 4:11 PM
To: Stephenson, Cassandra
Subject: Recreation Activities within Public Drinking Water Source Areas - Submission

Dear Ms Stephenson,

I wish to present the following submission to your committee on aspects of Term of Reference 1: **The social, economic and environmental values and costs of recreation access, where possible, to Perth hills and south west drinking water catchments, including the costs and benefits to public health, water quality, recreation, Indigenous culture and management options.**

I present this submission as a keen bushwalker and as president of the Busselton Naturalists Club, one of rural WA's largest and oldest conservation groups (founded in 1964, current membership 150).

As an environmental consultant with more than 30 years experience in various fields of environmental practice (including eight years as the member for Vasse and three years as the Liberal spokesperson for science and the env. ament from 2001 to 2004), the issue of allowing increased levels of human recreation in and around the catchments of water supply dams operated by the Water Corporation has been controversial for a number of reasons. However, I submit that the Corporation's opposition to increased recreational use within catchments is only partly based upon science and that it shows a lack of understanding of the history of outbreaks of disease among humans as a result of their consumption of contaminated water.

SCIENTIFIC CONSIDERATIONS

For a pathogen or other contaminant potentially able to adversely impact upon human health to enter in and remain within a water supply system, a number of factors must occur together and/or sequentially over a period of time. My understanding of these factors is that they include (but may not be limited to):

1. the introduction of a pathogen from a host (human or otherwise) or of a contaminant in sufficient quantity so as to be considered a potentially viable risk to people consuming the affected water
2. the pathogen or contaminant having the capability to impact upon human health if it persists in the water supply stream
3. a failure of the various protective measures built into the water supply system by the Water Corporation such that the pathogen or contaminant persists in spite of filtering, chlorination, storage, etc
4. drinking of the water by people susceptible to the pathogen or contaminant.

1. Pathogen or Other Contaminant Introduction

Most pathogens carried by human beings require person-to-person contact for the pathogen to persist and be transmitted successfully. Most viruses and bacteria will die in a matter of minutes or hours when introduced into a body of water as they would be in an environment unsuited to their continued existence. Only a small number of pathogens (salmonella, for example) are known to have a high persistence in water. For most people recreating in water catchments, it is highly likely that they would be fitter and healthier than the general population because of their interest and involvement in outdoor recreational activities. They are therefore less likely to carry pathogens than the population has a whole, also in part because the physical activity which they are undertaking in the catchment would normally require them to cease or not commence that activity if they were suffering from a viral or bacterial infection.

Realistically, the most likely pathway by which a pathogen could be introduced into the water of a drinking supply dam is if people undertaking recreation activity were to defaecate in or close to the water. It is not unrealistic to imagine a situation where a walker leaves home feeling less than 100% well and his or her infection strikes home with a vengeance during the walk, resulting in the person suffering diarrhea and being forced to defaecate close to (hopefully not in) the water, although a person in this situation may also wash themselves in the dam water. To mitigate against this type of situation, the Water Corporation should educate and inform walkers (and other recreational users of their catchment areas) of the need to attend to their toilet needs more than 200 metres away from the dam's water, to bury all waste at least 30 cm deep in the ground, to not wash oneself in the dam water if the person is suffering from an illness, etc. Further, appropriately designed toilets provided at appropriate intervals (several kilometres apart) and well away from public vehicular access would encourage people to attend to their toiletry needs

well away from the water's edge.

Putting aside the risk of deliberate contamination of a water supply dam, the most likely source of a non-living contaminant (petroleum products, etc) would be by a motor vehicle driven close to the dam's edge and fluids or solids escaping after an accident or other unintended event. The simple solution to mitigate this risk factor is for all public roads and tracks to be located hundreds of metres or several kilometres away from the dam edge.

2. Pathogen Persistence

The persistence of most bacterial and viral pathogens in water is low; they quickly die if exposed to sunlight, lower temperatures, are removed from their sources of sustenance (i.e., human or other cells to infect and to reproduce within), etc. My understanding is that the times when these factors are overcome such that there is a longer term survival of pathogens is when the water is turbid as a result of it carrying a high level of suspended solids such as clay, in which case sunlight is not able to penetrate far into the water column and the water temperature may be higher as a result of the suspended material being dark in colour and absorbing heat from the sun rather than having it reflected back into the atmosphere from the surface of the water. As well, pathogens can attach themselves to the outside of these suspended particles and, if the suspended load is sufficiently high for the Water Corporation's filtration stage to be ineffective, then some sediment plus pathogens can persist in the water supply to the point where the polluted water is consumed by humans.

The Water Corporation has used the argument in that past that walkers will potentially disturb the soil upon which they walk, with subsequent rain washing soil into the dam in amounts sufficiently large to take a slug of suspended solids through to the dam's outlet and then through the water supply system to the consumer. However, conservation agencies around the world have studied this problem for many years (and not just close to water supply dams) as the cost of track maintenance increases if erosion occurs and the aesthetics of the tracks to users are diminished. Agencies such as the Department of Environment and Conservation now have a good understanding of the solutions to this problem and their expertise should be employed when walking tracks are sited and constructed in catchments. In addition, the Water Corporation can locate recreational walking tracks such that they are appropriate distances away from the water's edge or the Corporation could apply a crushed limestone surface to susceptible sections of track or they could revegetate susceptible sections of tracks and allow walkers to ramble through the bush, i.e., walk without a defined track being provided in such areas.

Clearly, the major potential source of suspended solids being washed into a water supply dam is from the actions of machinery, including motor vehicles. It is therefore considered reasonable, as a general principle, to maintain a vehicle access separation distance of several hundred metres between the nearest road or carpark and the water's edge.

UNDERSTANDING HISTORY

I urge the committee to fully consider the lessons of history as contained within the most authoritative book on water supply contamination problems: **Safe Drinking Water: Lessons from Recent Outbreaks in Affluent Nations.** Authors Steve E Hrudey and Elizabeth J. Hrudey, Department of Public Health Sciences, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Alberta, Canada. Published in 2004 by IWA Publishing , Alliance House, 12 Caxton Street, London, UK. This book is recognised by most water safety authorities as the definitive summary of the types of incidents which have occurred over recent decades and which the Water Corporation is understandably trying to avoid.

The main lesson to be learned from the history of the 65 or 66 incidents written up in the book is that the type of low key recreation which the public of WA have been calling for in the south west's water supply catchments have not been caused by such low-key recreation elsewhere in the world. The book tells almost unbelievable stories of major equipment failure followed by a lack of obvious action by water supply authorities, human error repeated several times before the multiple checks and balances within a water supply system were overwhelmed, stupidity bordering on the incomprehensible, etc. Incidents included:

* sewage discharge pipes being located above and close to a water supply intake pipe
* the spreading of animal manure on private farmland close to a water supply bore after which heavy rain washed the manure into the bore
* dead animals such as bears decomposing just metres away from the intake pipe of a small community's water supply stream
* deliberately ignoring low chlorine readings (or not taking such readings) taken from a water supply facility
* contamination by industrial discharge water due to equipment inadequacies

In no cases did low key recreation such as back-pack hiking and camping, bushwalking, rogaining or orienteering result in adverse water quality such that human health was affected. History therefore shows that the Water Corporation's continuing opposition to such recreational activities in water supply catchments is unsupportable.

Having had several dealings with the Water Corporation and the WA Health Department (which provides health-related advice to the Corporation) over my 8 years as a state MP, it is clear that they have erred on the side of caution when restricting human recreational activities within water supply catchments. The time has now arrived, however, when the increasing size of Perth's population, combined with several decades of investigation and understanding of incidents in many developed countries requires that the standards which currently apply have to be relaxed to a level consistent with public demands while still maintaining more than adequate human health water supply standards.

I conclude by submitting that most forms of passive and non-vehicular human recreation can and should be allowed to occur within the water supply catchments of Perth and south west dams.

If requested, I would be pleased to appear before your committee and provide further commentary of relevance to your inquiry. In particular, I would seek the protection of parliamentary privileged to pass on a story of deliberate mis-application of science to prevent a scheme to re-use treated wastewater on the Busselton golf course from proceeding.

Bernie Masters