

Medical Officer of Health Environmental Health ADVICE

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Introduction

This issue focuses on water supplies. The Medical Officers of Health in the Environmental Health Team have reviewed the treatment process and the water quality for the Waikato Water Treatment Plant at Tuakau. In this edition of EH Advice, we discuss the health risks associated with roof-water supplies and provide sources of information on maintenance and treatment options for communities relying on roof water.

Waikato Water Treatment Plant



The Waikato Water Treatment Plant, near Tuakau, has been completed, eight years after the water crisis of 1994. The plant has a capacity of 40 million litres of water per day. This is equivalent to about 10% of Auckland's total daily usage. Water treatment plants need approval from the Medical Officer of Health. This involves assessing the treatment technology being used, the quality of the source water and testing the treated water to see if it meets the New Zealand Drinking Water Standards (2000).

The water treatment process at the Tuakau plant includes standard clarification and filtration as used in most large treatment plants in the country, followed by membrane micro-filtration and carbon filtration. The water is chlorinated to kill any viruses or bacteria that remain or may get into the pipes through leaks. Membranes and carbon filters are additional to the technologies used in most treatment plants in New Zealand. Membrane filters are increasingly being used for drinking water treatment as they produce high quality water. They have microscopic pores, which are smaller than bacteria, protozoan cysts and spores. Membrane filters are also very effective at removing organic matter and along with many chemical contaminants.

The Waikato River is used as a drinking water source by over 20 communities. Hamilton City is the largest and it has an "A" grading for its treatment plant and meets the NZ Drinking Water Standards (2000). Like many other rivers used for drinking water, the Waikato is affected by bacteria and waste from farming, industry, storm water and treated effluent from sewage treatment plants. The river also contains geothermal chemicals, including low levels of arsenic. Arsenic

is effectively removed by standard water treatment processes, such as occurs at Hamilton and the new plant at Tuakau. By international comparison the Waikato River is of reasonable quality. It has a small population and water use, and in proportion to the river's flow, there is comparatively little chemical contamination from industry. Water quality has improved substantially in the last 20 years through controls on various discharges. The bacterial counts in the river water at the inlet to the Tuakau Treatment Plant are comparable to those in some protected catchments currently used for drinking water supplies in Auckland.

Staff members from Auckland Regional Public Health have been collecting samples of both treated and untreated water from the plant. These samples were analysed for a range of bacteria, viruses and chemicals as specified in the New Zealand Drinking Water Standards (2000). Tests undertaken by Environment Waikato and Watercare have also been reviewed. Test results indicate that the plant meets the Standards, and will provide high quality water for the Auckland region. Approval was only given following review of the testing results and of the documents on the plant and its operations, monitoring and planning.

Further information:

Waikato River Quality: www.ew.govt.nz.

Drinking Water Standards: www.moh.govt.nz/publications.

Membrane Filters:

<http://www.epa.gov/safewater/mdbp/mfreport.pdf>

Rural Drinking Water Supplies

ties rely on untreated roof water and bores for potable water. Roof water is commonly contaminated by bird, possum and cat faeces. Shallow bores can be contaminated by livestock, septic tank effluent and agricultural activities (either on-site or from neighbouring properties). Poorly constructed and maintained systems can be contaminated by lead or chemicals from treated timber. Some hazards from these water supplies are summarised in Table 1.

Microbiological

- ▶ Giardia
- ▶ Cryptosporidium
- ▶ Salmonella
- ▶ Campylobacter
- ▶ *E. coli* 0157

Chemical

- ▶ Lead
- ▶ Arsenic
- ▶ Copper
- ▶ Nitrates
- ▶ Pesticides (spray drift)

Research conducted by Public Health, Auckland District Health Board and the University of Auckland confirms that using roof water poses a greater risk of water borne disease than using reticulated town supplies¹. *Salmonella* and *campylobacter* bacteria are often detected in roof water supplies. Over the 6 month period July 2001 to January 2002, 7 cases of salmonellosis alone in the Auckland region were linked to private drinking water supplies. This is an underestimate as less than a quarter of the cases of gastroenteritis is notified to public health services who can then investigate. Current local research indicates a link between rural water supplies and *Giardia*.

People may also be exposed to chemical hazards. A Health Research Council funded survey of roof water supply quality in the Auckland region found copper and lead levels commonly exceeding the maximum acceptable values of the New Zealand Drinking water standards. Lead flashings and lead-based paint are the most common sources of elevated lead in these water supplies. Treated timber coming into contact

with water can cause arsenic and copper contamination. Agricultural spray drift can also contaminate roof water supplies.

The health risks from using roof water can be reduced by the installation of first flush diverters, regular maintenance and water treatment. Where the use of roof water as a source of drinking water is unavoidable, water treatment options include water filters, chlorination and ultraviolet dis-infection. Further details on water treatment options and maintenance are detailed in the Ministry of Health's *Public Health Risk Management Plan Guide: Roof Water Sources*. This document is available from the Ministry of Health's website www.moh.govt.nz. Copies of the Ministry of Health's publication *Household Water Supplies* are available free of charge from the Duty Environmental Health Protection Officer, phone (09) 262 1855.

¹ Simmons G, Hope V, Lewis G, Whitmore J and Gao W. (2001) Contamination of potable roof collected rainwater in Auckland, New Zealand. *Water Research*; 35 (6):1518-24.

Childhood Poisonings

Twenty six cases of poisonings in children under 7 were reported to Public Health Protection over the time period January 2001 to February 2002. Twenty four of these children were 4 years old or younger. Poisonings at home are often caused by young children playing with:

- ▶ medicines including both prescription and over the counter
- ▶ household cleaners e.g. disinfectants, bleach, dishwasher detergents
- ▶ garden chemicals e.g. pesticides and baits
- ▶ home improvement products e.g. paint, polish
- ▶ cosmetics, hair colouring agents, essential oils

Ways to reduce the risk of young children being poisoned:

- ▶ Limit the quantities of poisons in and around your home and garden shed.
- ▶ Ask for child safety caps on your medicines and use all child-resistant packaging as instructed.
- ▶ Check that you can open **and** close child safety caps before you leave the pharmacy.
- ▶ Always read the labels of medicines and poisons, so that you know how to use and store them safely.
- ▶ Lock away all medicines and poisons in high cupboards with safety catches.
- ▶ Keep an eye on what young children are doing.
- ▶ Throw out old and out of date medicines.

If a child swallows a poison

Do NOT make the child vomit or force them to drink lots of fluids.

Call the National Poisons Centre 0800 POISON (0800 764 766) or a doctor immediately for advice.

Short Notes

▶ Southern Salt Marsh Mosquito found at Whitford

In March 2002 Southern Salt Marsh Mosquito (*O camptorynchus*) larvae were found at Whitford during routine mosquito surveillance. A delimiting survey to define the extent of its spread was undertaken by both helicopter and ground teams. The delimiting survey took place in the area between Miranda and Howick (on the mainland) and across to nearby Hauraki Gulf islands. Only two additional, positive locations were found- both close to the index site.

The Associate Minister for Biosecurity authorised immediate treatment of the infested areas. This was undertaken to prevent the larvae from hatching into adults. Subsequent light trapping in the area has not detected any SSM adults. Routine surveillance of potential habitat for the Southern Salt Marsh Mosquito in the Auckland region will continue.

Short Notes

contd.

▶ **New Public Health Resource Te Pai Me te Oranga O Nga Iwi: Health for All People**

The Public Health Directorate of the Ministry of Health has produced a publication *Te Pai Me te Oranga O Nga Iwi: Health for All People* which describes the concept of public health and the types of services and activities that come under the public health umbrella in New Zealand. The publication also explains the interface between public health and other parts of the health system. It is available from the Ministry of Health website www.moh.govt.nz.

▶ **Hand Foot and Mouth Disease in Early Childhood Centres**

Hand Foot and Mouth Disease is an acute viral disease that occurs in children. Symptoms include sudden onset of fever, sore throat and small blisters. These blisters occur in the mouth including the edge of the tongue. A rash including small blisters also occurs on the hands, feet and sometimes the buttocks. The disease spreads readily in early childhood environments, and can be harmful to foetuses and newborn babies. Hand, foot and mouth disease in children is not related to foot and mouth disease in livestock. Our communicable disease team has recently updated its information sheet and recommendations for controlling this infectious disease. For a copy of the updated information sheet and recommendations, please contact the duty Medical Officer of Health (Communicable Disease), phone (09)262 1855.

▶ **Your Emergency Survival Kit**

Each household should have the following items handy in case of an emergency.

Health and safety

- ▶ First aid kit
- ▶ Essential medicines
- ▶ Insect repellent
- ▶ Fire extinguisher

Food and water

- ▶ Food-canned and dried
- ▶ Food that requires no cooking e.g. dried fruit, nuts, cereals
- ▶ Means of cooking, e.g. primus, barbecue
- ▶ Water- bottled and/or frozen
- ▶ Can opener and knife
- ▶ Household bleach and disinfectant
- ▶ Pet food supplies

Clothes, bedding and hygiene

- ▶ Clothing-warm, windproof and rainproof
- ▶ Strong shoes, rubber gloves
- ▶ Blankets or sleeping bags
- ▶ Plastic bags, garden lime, toilet paper, soap

Means of communication

- ▶ Waterproof torches and spare batteries
- ▶ Radio and spare batteries
- ▶ Pencil and paper

Further information is available in a booklet *Protecting your health in an emergency*. This booklet is available free of charge from Public Health Promotion phone 09 815 6204.



Snezana Nikolic

Snezana has recently joined the environmental health team as a health protection officer. Snezana trained as a doctor in Yugoslavia where she worked as a blood transfusion specialist. She moved to New Zealand with her family in 1996 and retrained in Environmental Health Science through Massey University in Wellington. Before joining Public Health Protection, Snezana worked as a health protection officer for 18 months in Lower Hutt. Snezana is currently involved in disease outbreak investigations and is studying towards the National Diploma in Drinking Water Assessment.