



2005 Annual Disinfection By-Products Summary of Greater Victoria's Drinking Water

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Executive Summary

The *2005 Annual Disinfection By-Products Summary of Greater Victoria's Drinking Water* is the third report in the Water Quality Division's 2005 annual report series. It extends the disinfectant and disinfection by-products information given in the *2005 Annual Overview of Greater Victoria's Drinking Water Quality* and details the disinfection by-products results across the Greater Victoria Drinking Water System paying particular attention to those areas where additional chlorine is added in the distribution system.

In this report, a distinction is made between sampling locations that receive water which has been disinfected at the Water Services' main treatment facility, Japan Gulch Treatment Plant, and sampling locations that receive water from chlorine booster stations located within the distribution system. The water at these latter locations is termed 'rechlorinated' because additional chlorine has been added at that booster station. This distinction is important because the regulations will be moving to location specific criteria rather than averaging the data from all locations into one number.

The primary observations and conclusions contained in this report are listed below:

1. **Trihalomethanes.** In 2005, the overall or combined average concentration of trihalomethanes (THMs) for the entire Greater Victoria Distribution System was 20.6 µg/L. This is well below the limit of 100 µg/L in the *Guidelines for Canadian Drinking Water Quality* and also below the Stage 2 USEPA maximum contaminant level (MCL) of 80 µg/L. Chloroform was the predominant type of THM detected.

The average concentration of THMs in the non-rechlorinated portion of the distribution system (all areas downstream of the main disinfection plant but upstream of any further chlorine additions) was 9.9 µg/L (**Figure 2**). This is a relatively low number and the vast majority of people in Greater Victoria receive water containing this low level of THMs. The first customer sampling location just below the Japan Gulch Treatment Plant also had relatively low THMs that ranged from 3.1 to 15.4 µg/L. As expected, the rechlorinated sampling locations within the North Saanich distribution system had higher levels of THMs than the non-rechlorinated locations but did not exceed either the Canadian or the Stage 2 USEPA regulatory limits (**Figure 3**). The average concentration of THMs for the rechlorinated samples was 42.9 µg/L. In 2005, the highest individual concentration of THMs observed in the rechlorinated portion of the distribution system was 55.7 µg/L. This level is substantively lower than in previous years.

2. **Haloacetic Acids.** Haloacetic acids (HAAs) were also found at relatively low levels (3.9-20.2 µg/L, average of 11.8) in the non-rechlorinated portion of the distribution system (**Figure 4**). As expected, in the rechlorinated portions of the distribution system, the levels of HAAs were significantly higher (36-86 µg/L, average of 57) (**Figure 6**). While some individual locations had elevated levels of HAAs, the average haloacetic acid concentration in the rechlorinated portion of the distribution system was just below the USEPA Stage 2 limit of 60 µg/L. (Canada has not established a limit for HAAs.)

RECOMMENDATION

1. Change the rechlorination process at Deep Cove Pumphouse to chloramination (chlorine and ammonia) in order to achieve the lowest possible THM and HAA concentrations without compromising the effectiveness of the water disinfection.

Figure 2. 2005 Trihalomethanes in Greater Victoria Distribution System (Non-Rechlorinated Locations)

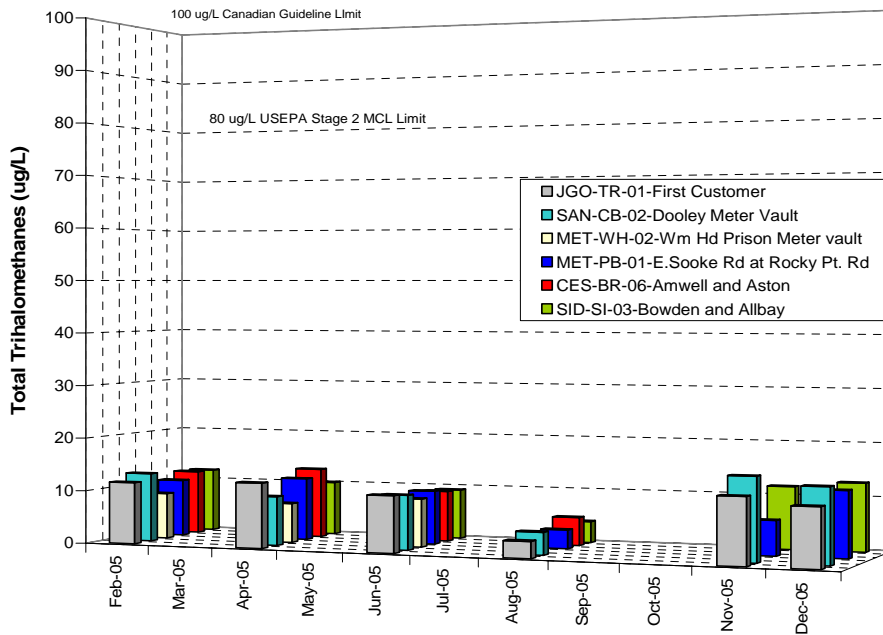


Figure 3. 2005 Trihalomethanes in Greater Victoria Distribution System (Delivery Point and Rechlorinated Locations)

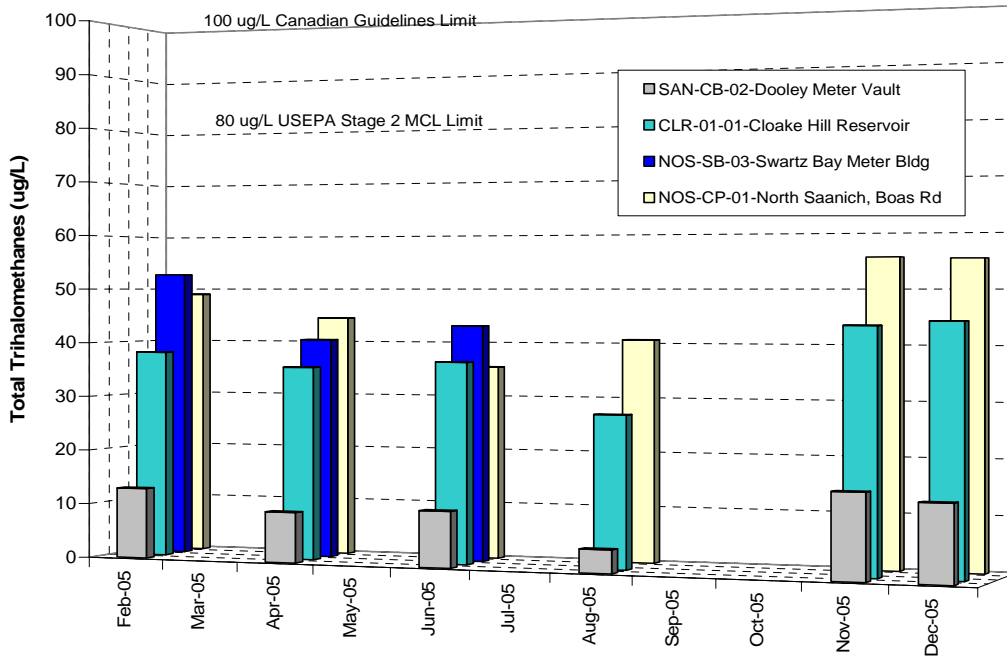


Figure 4. 2005 Haloacetic Acids in Greater Victoria Distribution System (Non-Rechlorinated Locations)

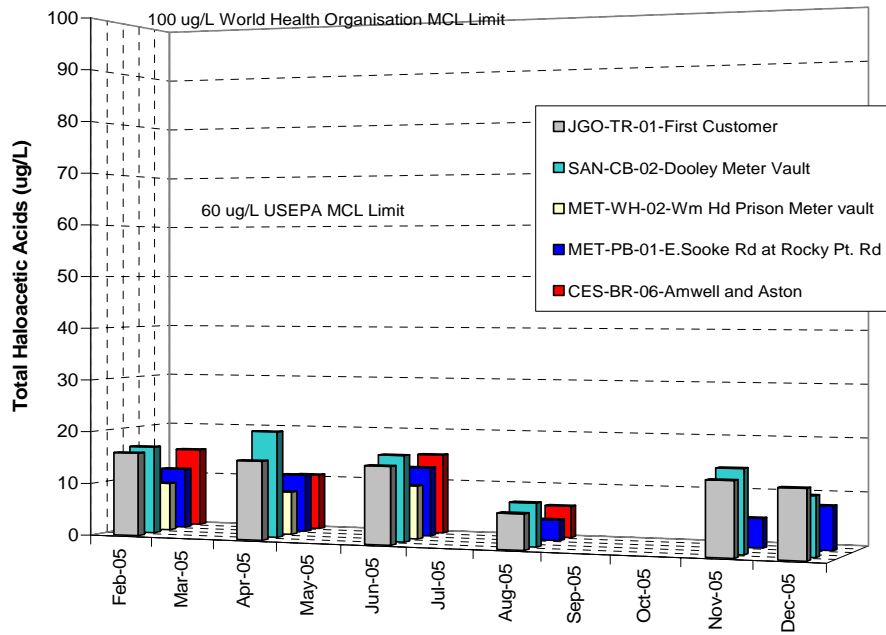


Figure 6. 2005 Haloacetic Acids in Greater Victoria Distribution System (Rechlorinated Locations)

