

Appendix 'E-1' – Drinking Water Issue Evaluation Protocol

The following steps were used in evaluating drinking water issues in the Cataraqui Source Protection Area.

Screening Step 1 – Benchmark Values

- Does the concentration of a parameter listed on the Ontario Drinking Water Quality Standards (ODWS) exceed the benchmark values (summarized below) in raw water?
- Where data are sparse or absent, does the parameter exceed the benchmark in treated water (Drinking Water Information System records, Adverse Water Quality Incident (AQWI) reports, inspection reports) or in data from Provincial Water Quality Monitoring Network (PWQMN) sites within the vulnerable area?

Where treated water data is used, subsequent evaluation should bear in mind that the parameter has already bypassed treatment and is being delivered to the consumer at a concentration high enough to trigger MOE investigation.

PWQMN data should be treated with discretion, as it often represents an inherently different environment than that from which raw drinking water is taken, but it may be indicative of the types of contaminants that may reach the intake.

Where raw water data are sparse or absent, a plan for investigation of the parameter in raw water will be included so that data is available for future versions of the Assessment Report.

Screening Step 2 – Reliability and Eligibility

Parameters that exceed benchmarks must meet the following conditions to be carried through to Screening Step 3:

- Is there any potential anthropogenic contribution or is the parameter from an exclusively natural source? Parameters that cannot be linked to an anthropogenic source may be listed and discussed as issues, but no issue-contributing area or issue-contributing threats will be identified.
- Is the exceedance a reliable measure? Anomalous results will be excluded.

Screening Step 3 – Trends and Treatability

Any parameter that satisfies the above criteria may be labelled an Issue, but the following should be considered:

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- Is there an increasing trend for that parameter in raw or treated water? Use simple regression and/or scatter plot where available data is not sufficient for seasonal trend analysis.
- Is the parameter currently being treated for at the intake? Is the treatment sustainable for that community? If the parameter is not currently treated directly, can it be?
- Might the parameter overwhelm the system in extreme events? (consider extreme events in raw water and increased/decreased demand from the distribution system)

Screening Step 4 – Consultation with Water Treatment Plant Staff and SP Committee

Water treatment plant operators were asked to provide comments on the list of potential drinking water issues. A final list of drinking water issues (human and natural) was endorsed by the Source Protection Committee for use in the Assessment Report. Parameters that are identified as issues with possible human sources were carried forward in the issues-based approach to drinking water threat assessment, as described in Chapter 4 of the Assessment Report.

Issue Benchmarks:

- Microbiological – 100 CFU per 100 millilitre E. coli, 1000 CFU per 100 millilitre total coliform in raw surface water; 0 CFU per 100 millilitre E. coli / total coliform in groundwater and treated surface water.
- Chemical and Radiological Parameters – Half Maximum Acceptable Concentration (MAC) /Interim MAC (IMAC) listed on the Ontario Drinking Water Quality Standards, where detection limit is greater than benchmark value.
- Provincial Water Quality Objectives for eligible parameters in surface water monitoring sites in rivers and creeks.
- Aesthetic and Operational Parameters – values as listed in **Table 4** of the Technical Support Document for Ontario Drinking Water Quality Standards, Objectives and Guidelines.
- Where more than one benchmark is given in the Ontario Drinking Water Quality Standards (organic parameters), the lowest of the given benchmarks was used. Special consideration is given to sodium, for which the O. Reg. 170/03 of the Safe Drinking Water Act identifies sodium concentrations of above 20 milligram/litre as adverse. The level at which sodium may cause an aesthetic concern is 200 milligram per litre.