

## PROBLEM

A municipal landfill in Niagara recently completed a constructed wetland in order to provide enhanced treatment of landfill surface water runoff prior to discharge to a local watercourse. Several parameters were routinely monitored in the discharged run-off and within the watercourse as general indicators of water quality. Municipal operations staff were still unsure of the impact of the landfill discharge on watercourse aquatic organisms and the ecological integrity of the stream system, and were looking for methods to monitor the health of the water system.



## APPROACH

Benthic organisms are valuable indicators of water quality, as diverse populations present within the sediments of watercourses may be composed of either pollution-tolerant or pollution-intolerant organisms. Monitoring of benthic organisms both upstream and downstream of the landfill surface water discharge was initiated and data were collected over a four-year period. The presence of pollution-intolerant benthic organisms is a strong indicator of good water quality; and inversely, pollution-tolerant benthic macro-invertebrate presence is associated with poor water quality. Jagger Hims Limited provided statistical analysis of the data, interpreted the monitoring data, and provided a comprehensive report detailing the results.

## RESULTS

Analysis and interpretation of the data showed no significant difference between upstream and downstream reaches of the watercourse. Macro-invertebrate groups in both upstream and downstream samples were dominated by “chironomids” or pollution-tolerant organisms. The absence at both locations of Ephemeroptera, Plecoptera, or Trichoptera groups, which are intolerant to organic pollutants, indicated that the watercourse quality was degraded, and was not capable of supporting these organisms.

## SOLUTION

The program was continued to assess longer-term impacts, and demonstrated that the landfill surface water discharge was not adversely impacting watercourse quality downstream, relative to the quality upstream.