

GRAND RIVER CONSERVATION AUTHORITY

REPORT NO. CW-09-09-87

DATE: September 14, 2009

TO: Committee of the Whole (Planning and Operations)

SUBJECT: Municipal Water Managers Report: *Best Practices: Municipal Wastewater Treatment Plant Bypass and Spill Prevention and Reporting in the Grand River Watershed*

RECOMMENDATION:

WHEREAS the Water Managers Working Group completed a report “*Best Practices: Municipal Wastewater Treatment Plant Bypass and Spill Prevention and Reporting in the Grand River Watershed*” that identifies best practices for watershed Municipalities, Ministry of the Environment and the Grand River Conservation Authority; and

WHEREAS all parties have a desire to reduce the frequency and severity of spills and wastewater treatment plant bypasses in the watershed;

Be it resolved:

THAT the Grand River Conservation Authority support the recommendations made in the report: “*Best Practices: Municipal Wastewater Treatment Plant Bypass and Spill Prevention and Reporting in the Grand River Watershed*”;

AND THAT the Grand River Conservation Authority request that watershed municipalities that own or operate wastewater treatment plants or conveyance infrastructure endorse the report “*Best Practices: Municipal Wastewater Treatment Plant Bypass and Spill Prevention and Reporting in the Grand River Watershed*” and adopt an appropriate implementation schedule to implement best practices;

AND THAT the Grand River Conservation Authority forward a copy of this report and the Best Practices report and encourage the Ministry of the Environment support a pilot wastewater treatment plant performance evaluation program for the watershed to demonstrate that it is effective in reducing the frequency and severity of spills and bypasses from municipal wastewater treatment plants in the watershed;

AND THAT the Grand River Conservation Authority forward a copy of the report to the Lake Erie Region Source Protection Committee for information.

SUMMARY:

In response to a request from the Ministry of the Environment in the fall of 2007 regarding increased concern from watershed municipalities on the frequency of spills and bypasses in the

Grand River watershed, the Municipal Water Managers working group collectively prepared a report “*Best Practices: Municipal Wastewater Treatment Plant Bypass and Spill Prevention and Reporting in the Grand River Watershed.*”

The report is a collaborative effort by 12 watershed municipalities that own and operate sewage works (including wastewater treatment plants and sewage conveyance infrastructure such as pumping stations and sewers), the Technical Services Section and Guelph District Office of the Ministry of the Environment and the Grand River Conservation Authority.

By reviewing Ministry data collected between 2002 and 2006, the general causes of bypasses and spills in the watershed were identified. Constructive discussions among Water Managers throughout 2008 and into 2009 identified best practices for watershed municipalities, the Ministry of the Environment and the Grand River Conservation Authority that would assist with preventing or better responding to spills and bypasses. The report makes 13 recommendations with the intent to (1) Improve information management and communication and (2) Implement best practices to reduce the frequency and severity of spills and bypasses in the watershed.

REPORT:

Over the past few years, bypasses or spills from municipal wastewater treatment plants and collection systems have risen in the awareness of various stakeholders in the Grand River watershed. There is increased concern of the potential impacts these events may have on river water quality, especially on drinking water. This issue was presented to the Municipal Water Managers Working group in the fall of 2007 by the Ministry of the Environment (Ministry) as this group is the forum for discussing watershed issues. The working group agreed to discuss the issue and to jointly compile a list of best practices with the goal of reducing the frequency and severity of spills and bypasses in the watershed.

The working group is made up of senior managers of municipal water and wastewater services of watershed municipalities that own or operate wastewater infrastructure. The Ministry is also a member of the group, which is chaired by the Grand River Conservation Authority (GRCA). This group meets regularly to discuss watershed issues such as the assimilative capacity of the rivers to receive wastewater, nonpoint source pollution management, water supply, spill notification and wastewater bypasses in the watershed.

As part of this collaborative initiative, the Ministry drafted a report that summarized the general causes of spills and bypasses in the watershed over a five year period (2002-2006). The report was based on the information in the Ministry’s information management system. Over the five year period, a total of 136 spill or bypass events occurred in the watershed with 75% of these events having partial treatment which is the minimum requirement by the Ministry. The general causes of spills and bypasses were categorized by event:

- weather-related including events caused by high infiltration and inflow (32%);
- power failure (14%);
- equipment failure (16%);
- maintenance/repairs (10%);
- damaged/blocked sewers (10%); and

- others of unknown causes (18%).

The Ministry's report as well as additional analysis of the Ministry's data formed the basis for the many discussions at subsequent meetings by working group members.

Since many of the spills reported included events at pumping stations and sewer mains, lower tier municipalities were invited to join the Water Managers working group to solicit feedback and develop best practices for managers and operators of sewage conveyance systems.

Discussions commenced on the relative risk the various types of bypasses or spills have on the river and downstream users. In the absence of data characterizing bypass effluent quality, Water Managers agreed that effluent from a bypass of advanced wastewater treatment (e.g. tertiary wastewater treatment plant) is much higher in quality than a bypass consisting of raw sewage. Professional judgement by Water Managers, which was subsequently supported by Health Unit staff, categorized the various sewage discharges into low, moderate or high level of concern. Although spill or bypass events that discharge raw or primary-treated sewage effluent were considered to be of higher concern to downstream users, it was agreed that additional information such as volume, the environmental conditions (i.e. wet versus dry weather) and proximity to drinking water intake is necessary to completely evaluate the relative risk these events have on downstream users.

A preliminary analysis of the Ministry's data records estimated that the total volume of sewage bypassed or spilled between 2003 and 2005 was 200,448 m³. This volume represents less than 0.01% of the total river volume flowing through Brantford over the same time period. Although this analysis indicates that the total volume of sewage bypassed during this time period was extremely low, water managers agreed that bypasses and spills are still undesirable and work should continue to implement best practices.

This exercise helped to identify best practices for municipalities and the Ministry by further refining the causes of spills and bypasses that were considered to be of high concern; determine what type of facility these events were taking place at; and identify what additional information was required to be reported by operators and collected by the Ministry so that water users can make more informed decisions.

It was recognized early in the process that improved information management is critical to clearly communicate accurate and relevant information to all downstream municipal users. Many Ministry data records were incomplete and the cause of some spills or bypasses was 'unknown' (18% of the 136 events between 2002 and 2006). Operator reporting of spills and bypasses was also identified as being inconsistent across the watershed. To address this, a Sewage Discharge Notification Form was drafted for use by wastewater treatment plant and sewage conveyance operators for reporting spills and bypasses as well as for Ministry staff for collecting more complete information into their information management system. The additional information will assist Water Managers with properly evaluating the risk of a particular spill or bypass on downstream users. The new Form will be introduced to wastewater treatment plant and sewage conveyance operators at planned workshops this fall.

Although information management and communication was highlighted as a primary issue when managing spills and bypasses in the watershed, most of the bypasses were caused by large amounts of water flowing into the sewer system during wet weather (e.g. snowmelt or heavy rains) which overwhelmed the treatment plants causing bypasses. This is referred to as high inflow and infiltration into the wastewater collection system. It is important to note however, that there are no combined sewer overflows (CSO's) in the watershed. To reduce the effects of wet weather on wastewater treatment plants, aggressive inflow and infiltration abatement programs are strongly recommended. Additional best practices include backup-power at all wastewater treatment plants and pumping stations that are close to water courses. Back-up equipment should also be readily available.

This process also confirmed that improved river information would assist downstream users with making timely water management decisions. The GRCA's role in spills and bypasses is to share estimated travel times for spills and bypasses to downstream drinking water intakes. As a result, the GRCA has agreed to develop an improved travel time model for the watershed.

Numerous Water Managers working group meetings throughout 2008 and 2009 yielded constructive discussions and information sharing among working group members. The City of Guelph shared their experience in optimizing their wastewater treatment plant to produce higher quality effluent, reduce the frequency of bypasses; and reduce the total volume of sewage bypassed since the implementation of their optimization program in 2006. Haldimand County has also initiated a wastewater treatment plant performance evaluation on the Dunnville and Caledonia wastewater treatment plants with the aim to improve effluent quality and reduce the frequency of spills and bypasses. A wastewater treatment plant performance evaluation pilot for the watershed is a key recommendation by Water Managers which would address the goal to reduce the frequency and severity of bypasses in the watershed.

Collective effort from members of the Water Managers working group has resulted in the report: *Best Practices: Municipal Wastewater Treatment Plant Bypass and Spill Prevention & Reporting in the Grand River Watershed*. The following lists the recommendations that have been made under two key objectives that were defined through this process:

Objective 1: Improve information management and communication

Recommendation 1. All wastewater treatment plant and wastewater collection system operators should start to use the draft *Sewage Discharge Notification Form* following its introduction at an operator training workshop in the fall of 2009.

Recommendation 2. The Ministry of the Environment should make provisions in their procedures and their Integrated Divisional System (IDS) for accommodating the additional information collected and reported by wastewater treatment plant operators using the new Sewage Discharge Notification Form.

Recommendation 3. A workshop should be held for wastewater treatment plant and wastewater collection system operators, municipal staff and interested Health Unit staff to review spills and bypass reporting procedures for the Grand River Watershed including the draft

Sewage Discharge Notification Form. An annual workshop for wastewater plant and collection operators should be considered to promote training and best practices.

Recommendation 4. The new reporting procedures, including the updated *Non-Standard Procedure for Reporting Spills and Bypasses in the Grand River watershed* and the *Sewage Discharge Notification Form* should be reviewed annually to evaluate its effectiveness with all watershed municipalities and agencies. The annual review can be facilitated by the Water Managers working group.

Recommendation 5. The current closure notification procedures for municipalities and wastewater treatment plant operators should be reviewed with the Ministry and if determined feasible, a new closure notification procedure be developed as part of the *Non-Standard Procedure for Reporting Spills and Bypasses in the Grand River watershed*.

Recommendation 6. Municipalities that operate wastewater treatment plants, drinking water treatment plants and wastewater collection systems should review internal communication procedures to ensure that there is a consistent approach for documenting and communicating relevant information on spills and bypasses.

Recommendation 7. Progress made in implementing the best practices outlined in this report should be reported annually. The Water Managers Working Group for the Grand River Watershed can be the forum for reporting progress and sharing information on Best Practices.

Objective 2: Implement Best Practices

Recommendation 8. Watershed municipalities should implement aggressive programs to reduce inflow and infiltration to lower the number of weather-related wastewater treatment plant bypasses.

Recommendation 9. Back-up power and equipment or appropriate procedures should be available at all pump stations and wastewater treatment plants.

Recommendation 10. Watershed municipalities should give appropriate consideration to prioritizing capital infrastructure renewal projects that would benefit the Grand River and its tributaries.

Recommendation 11. The Grand River Conservation Authority develop a time-of-travel model to improve the estimated travel times under steady-state conditions for watershed municipalities to help them better plan to deal with spills and bypasses.

Recommendation 12. Watershed municipalities should conduct regular wastewater treatment plant infrastructure and performance reviews with the end goal of achieving good, economical effluent and a reduction in the frequency and severity of bypasses.

Recommendation 13. The Ministry of the Environment should encourage and support a wastewater treatment plant performance evaluation pilot for the Grand River watershed.

FINANCIAL IMPLICATIONS:

The development of the time of travel model is incorporated into GRCA staff workplans in 2009/2010

OTHER DEPARTMENT CONSIDERATIONS:

n/a

Prepared by:

Sandra Cooke,
Senior Water Quality Supervisor

Approved by:

George Sousa,
Manager, Resource Science,
Information and Policy