

# **CITY OF BOWLING GREEN**

## **Comprehensive Wastewater Strategy**

**Adopted by the  
Bowling Green Board of Public Utilities  
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# CITY OF BOWLING GREEN

## Comprehensive Wastewater Strategy

### City's NPDES Requirements

The City of Bowling Green's Wastewater Treatment Plant is required by the terms of its Ohio Environmental Protection Agency (OEPA) National Pollutant Discharge Elimination System (NPDES) permit, effective June 1, 2006, to develop and submit a Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP). The permit's requirements are as follows:

#### CSO Long Term Control Plan

No later than January 5, 2007, the permittee shall develop and submit to NWDO five copies of a Long Term Control Plan. The LTCP shall include the following:

- a. A presentation of the current operating protocol for treating and/or discharge of wet weather flows at the WWTP, Wet Weather Storage Basin, Combined Sewers and Separate Sewers.
- b. A presentation of the original design basis for the wet weather storage basin, including # and volume of expected overflows and pollutant loads discharged from the WWTP, Wet Weather Storage Basin and any known overflows in the collection system. A presentation of the current # and volume of overflows and pollutant loads discharged from the WWTP, Wet Weather Storage Basin and any known overflows in the collection system. The analysis of current pollutant loads discharged shall include periodic sampling during typical storm event(s) and flow hydrographs to include flow, CBOD5, NH3, and suspended solids and E. coli.
- c. An analysis of the infrastructure and costs needed to reduce the frequency and respective volume of overflows to zero overflows per year, 2 to 4 overflows per year, 4 to 6 overflows per year, 7 to 10 overflows per year.
- d. An analysis of the infrastructure and costs to provide a) disinfection and b) advanced physical chemical treatment of discharges from the Wet Weather Storage Basin.
- e. The permittee shall identify combined sewer areas and consider ways to reduce storm water flow into combined sewers. Steps to consider include: diverting storm water away from the combined system (e.g, by constructing retention basins; removing inflow, such as roof drains); using catch basin flow restriction.

The permittee shall identify areas served by existing separate sanitary sewers and consider ways to minimize the impact of separate sanitary flows on CSO discharges and on bypasses located at the wastewater treatment plant. Steps to consider include: using express sewers to route sanitary flows around combined sewer areas; reducing infiltration and inflow into the separate sewers.

In addition to development and submittal of a LTCP, the City's NPDES permit contains the following requirements on Sanitary Sewer Overflows (SSOs):

#### Sanitary Sewer Overflow (SSO) Reporting Requirements

A sanitary sewer overflow is an overflow, spill, release, or diversion of wastewater from a sanitary sewer system. SSOs do not include wet weather discharges from combined sewer overflows specifically listed in Part II of this NPDES permit (if any). All SSOs are prohibited except under emergency conditions where the overflow occurs in full compliance with all of the provisions of 40 CFR 122.41(m) and Part III Item 11 of this NPDES permit. Sanitary sewer overflows must be reported as required below.

#### 2. Reporting for All SSOs, Including Those That Imminently and Substantially Endanger Human Health

##### b) Annual Report

You must prepare an annual report of all SSOs in your collection system, including those that do not enter waters of the state. The annual report must be in an acceptable format (see below) and must include:

- (i) A table that lists an identification number, a location description, and the receiving water (if any) for each existing SSO. If an SSO previously included in the list has been eliminated, this shall be noted. Assign each SSO location a unique identification by numbering them consecutively, beginning with 301.
- (ii) A table that lists the date that an overflow occurred, the unique ID of the overflow, the name of affected receiving waters (if any), and the estimated volume of the overflow (in millions of gallons). The annual report may summarize information regarding overflows of less than approximately 1,000 gallons.
- (iii) A table that summarizes the occurrence of water in basements (WIBs) by total number and by sewershed. The report shall include a narrative analysis of WIB patterns by location, frequency and cause.

## Comprehensive Wastewater Strategy Goals

The goals and objectives of a comprehensive long-term wastewater strategy for the City of Bowling Green include:

- Eliminate or reduce Combined Sewer Overflows into Poe Ditch
- Eliminate or reduce sewer backups into Bowling Green basements
- Meet Water Quality Standards in designated receiving waters
- Plan for possibility of future stormwater treatment

## USEPA CSO Control Policy

On April 11, 1994, the United States Environmental Protection Agency issued its CSO Control Policy. The policy established a national approach under the NPDES permit program for controlling discharges into the nation's waters from combined sewer systems.

The following nine minimum controls are identified in the CSO Control Policy as minimum technology-based controls that can be used to address CSO problems without extensive engineering studies or significant construction costs, prior to the implementation of long-term control measures:

1. Proper operation and regular maintenance programs for the sewer system and CSO outfalls
2. Maximum use of the collection system for storage
3. Review and modification of pretreatment requirements to ensure that CSO impacts are minimized
4. Maximization of flow to the Publicly-Owned Treatment Works (POTW) for treatment
5. Elimination of CSOs during dry weather
6. Control of solid and floatable materials in CSOs
7. Pollution prevention programs to reduce containments in CSOs
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

## Action Items

Development and implementation of a comprehensive long-term wastewater strategy that complies with the City's NPDES permit requirements include:

### Assess Current Situation

- Investigate combined sewer system flow monitoring to better understand how the system operates under typical and peak stormwater flow events, establish hydraulic gradients/profiles, and identify areas where sewer backups occur. This will help the City determine whether local sewer line replacements or other improvements can eliminate specific backup conditions. A hydraulic model, calibrated with sewer flow and rainfall data, will provide a more intimate understanding of how the sewer system operates under varying conditions and assist the City in determining system improvements.
- Encourage customers to contact the City if they experience wet or damp basements so that such reports can be investigated to determine possible causes and corrective measures.
- Send a wastewater utility representative to investigate the possible cause(s) of all wet/damp basement calls. Develop a survey form to collect all useful information, including suspected cause(s) of wet basements, maximum depth of water and damage assessment. Take photographs to document conditions.
- Note all customer reports of wet/damp basements on a map by date to help provide visual determination of problem areas and to tie reports to specific rainfall events.
- Detect and eliminate sources of infiltration/inflow (I/I) and clean water from the sanitary and combined sewer systems. Implement Maple Street Wetland Project to remove clean water from the combined sewer system. Other storm detention projects in the separated sewer areas should also be investigated, such as expanding Bowling Green State University's retention ponds on Poe Ditch, constructing a pond on the Toussaint Ditch, Belleville Ditch and South Main Street areas.

## Establish Preventive Measures

- Develop written operating protocol for treating and/or discharge of wet weather flows at the Wastewater Treatment Plant, Wet Weather Storage Basin, Combined Sewers and Separate Sewers
- Develop, implement and periodically test emergency contingency plans for loss of power at lift stations and Wastewater Treatment Plant.
- Continue programs of televising and cleaning sewers, sewer relining/replacements, sealing manholes and removing sump pumps from sanitary sewers.
- Remove sump pumps and downspouts from combined and sanitary sewers
  - Consider providing financial incentives to customers
  - Consider adopting legislation requiring disconnection with allowance for an appeal process
  - Apply for stormwater credits for removal of downspouts and sump pumps from combined sewers
  - Promote installation of rain gardens, grass strips, landscaping beds and other means of detaining/retaining rainfall and snowmelt.
- Discourage or prohibit installation of gravity toilets, showers, sinks and floor drains in basements unless a check valve is also installed on the facility's sewer lateral. This will eliminate one of the means by which basement flooding occurs. Alternatively, the City may investigate adopting requirements that sewer laterals be installed at higher elevations that prevent installation of gravity toilets, showers, sinks and floor drains.
- Require installation of clay/Bentonite dams on all new or upgraded sewer laterals
- Consider requiring installation of check valves on all new or upgraded sewer laterals in combined sewer areas
- Consider installing catch basin grates with less open area in combined sewer areas and using curbed streets to detain stormwater. Alternatives include vortex regulators or catch basin orifice caps with smaller diameter openings to retard flow
- Consider legislation or policy changes that require increases in permeable area or addition of stormwater detention for facilities constructed or remodeled in the combined sewer area

- Investigate addition of distributed combined wastewater storage such as underground tanks in downtown parking areas to detain peak storm flows and release slowly to system.
- Consider requiring increases in storage capacity of retention/detention ponds above current standards
- Continue infiltration and inflow preventive measures such as televising sewers, repairing/replacing sewers, sealing manholes, and removing sump pumps.

### Increase System Capacity

- Clean Poe Road and other trunk sewers if inspection project shows sediment buildup to increase their storage and transfer capabilities
- Clean the Mercer Road stormwater overflow holding basin to increase its effective storage capacity
- Investigate options for utilizing the full 6.0 million gallons (MG) of the Mercer Road stormwater overflow holding basin's storage capacity (as opposed to current 4.0 MG storage capacity)
- Investigate options for increasing stormwater overflow holding basin pumping capacity to the wastewater treatment plant.
- Investigate cleaning and enlarging the City's drainage outlets
- Investigate enlarging Poe Ditch on City-owned property to provide additional temporary storage.
- Investigate ways to maximize wet weather flow rate through the wastewater treatment plant while meeting all NPDES permit requirements
  - Get more flow to the plant
    - Investigate running all four (4) pumps at the Poe-Mercer pumping station.
    - Investigate changing elevation settings to so all (4) pumps run before the holding basin begins to fill.
    - Evaluate force main capacity
    - Increase pumping capacity of Poe-Mercer and Dunbridge Road pump stations
  - Maximize flow rate through plant for sustained periods
    - Continue investigation of different modes of plant operation such as contact stabilization and step-feed
    - Evaluate final clarifier performance in different modes of operation.
    - Evaluate maximum effective filtration rates

- Develop a master plan for the WPC facility
- Increase tertiary filtration and ultraviolet disinfection capacity to 30 MGD.

### Public Input and Education

- Public participation in the development of Long Term Control Plans is required for cities with populations of less than 75,000 people. Although the Board of Public Utilities approval process may meet the letter of such requirements, the City may wish to consider soliciting citizen input at meetings designed to discuss pertinent issues and recommended courses of action, or to formalize this input by creation of customer focus/ advisory groups to help guide the development process and establish priorities.
- Develop and distribute information on the installation of clay/Bentonite dams on sewer laterals to prevent stormwater backups entering basements through footer tiles
- Meet with local plumbers and contractors to solicit input on possible alternatives

### Remaining Questions

- If the City separates all combined sewers, what is the likelihood of future stormwater treatment requirements/regulations?
- If the City separates all combined sewers, what is the likelihood of continued sewer backups due to localized flow restrictions (i.e., sewer too small to meet peak flows, sewer blockages, drainage ditches at capacity, backup of stormwater along sewer laterals, excessive inflow/infiltration from sewer laterals, etc.)?

In response to the City's January 24, 2008 meeting, the Ohio Environmental Protection Agency proposed the following NPDES permit modifications, which became effective March 1, 2008:

#### 4. Wastewater Plant Upgrades/CSO Elimination Plan

The permittee has proposed improvements to the wastewater treatment plant (WWTP) that will allow the WWTP to treat and discharge maximum flows of at least 30 MGD.

1. No later than March 31, 2009, the permittee shall complete construction on upgrades to the wastewater treatment plant that include the secondary clarifiers and the tertiary sand filters. These upgrades are to be designed to increase peak flow at the WWTP to at least 30 MGD.
2. Notify Ohio EPA Northwest District Office within seven days of completing item 1.
3. No later than December 31, 2009, the permittee shall complete construction on upgrades to the ultraviolet disinfection system. These upgrades are to be designed to increase peak flow at the WWTP to at least 30 MGD.
4. Notify Ohio EPA Northwest District Office within seven days of completing item 3.
5. No later than July 1, 2009, the permittee shall submit a report to the Ohio EPA Northwest District Office which includes the following:
  - a. A characterization of the increased capacity of the WWTP,
  - b. A characterization of the capacity of the Storm Water Overflow Holding Basin,
  - c. An evaluation of combined sewer overflow characteristics including overflow occurrence and volume, and
  - d. An evaluation of the need for additional storage at the WWTP to reduce overflows to four, two, and zero occurrences per year. This evaluation should include an implementation schedule and cost data for any proposed projects.

Including this implementation schedule in this NPDES permit shall in no way be construed as acceptance or approval of detail plans.