CSO PRESENTATION

VERMONT CLEAN WATER INITIATIVE
Wednesday September 21, 2016
City Council Goals 2016-2017
“C” Maintain a Safe Community & “H” Maintain a Clean & Healthy Environment

A presentation about the Montpelier waste water and storm water collection systems featuring:

- Explanation of Combined Sewer Overflows (CSO’s)
- History of Storm and Sewer Systems
- Overview of Regulatory History
- Reporting to State Regulators and Public
- The Accomplishments to Reduce Overflow Frequency
- Next Steps & Decisions to Eliminate CSO’s or Provide pre-release treatment
- The Consequences of Storm Water Separation to Manage Overflows
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Department of Public Works

Definitions

**Combined Sewer System (CSS)**
- Wastewater collection pipes which convey both sanitary waste and storm water in the same pipe. They are among the earliest sewers built in the US until the middle of the 20th century. A separated system consists of one pipe for waste water and one for storm water collection.

**Combined Sewer Overflow (CSO)**
- The discharge from a CSS at a point prior to the treatment facility. An overflow occurs at a specifically designed structure when the volume of sanitary wastewater and storm water exceeds the conveyance capacity of the pipes (aka Surcharge).

**Purpose of CSO structures**
- A safety measure so the surcharge doesn’t back-up into homes, businesses and into the streets.

**Wet Weather & Dry Weather Overflows**
- Wet weather overflows occur due to surcharging from storm water & snow melt. Dry weather overflows occur due to inadequate system capacity for normal use. Montpelier only experiences wet weather overflows.

**National Pollutant Discharge Elimination System (NPDES)**
- The national program for issuing, monitoring & imposing pretreatment requirements (permits) in accordance with the Clean Water Act.

**1272 Order**
- A legally enforceable mechanism (10 V.S.A. § 1272) which may supplement a NPDES discharge permit typically containing conditions & compliance requirements. Administered by ANR through DEC Commissioner.
A combined sewer overflow (CSO) consists of both waste water and storm water. About 10% of the CSO volume contains raw sewage. When heavy rains occur late at night or early morning, the percentage of sewage is much lower.
History:
Constructed in 1937, this was one of the city’s first waste water control system. This little dam on the North Branch is known as the “Sanitary Dam”. It’s sole purpose was to maintain the water level above the sewer outfall pipes.
In 1962 the Montpelier Water Resource Recovery Facility was completed. To bring the waste water to the new facility, the city intercepted all the outfalls to the river and built a transmission main to the new facility. This is when the original 25 CSO structures were constructed.
Between 1995 and 2009 the city separated the storm and sewer system.

Today a total of 6 overflow structures remain:
A typical surcharged CSS. If the wet weather flow doesn’t have a controlled device, the overflow can flood into streets, homes or businesses.
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**Regulatory Overview:**
CSOs are regulated by the EPA under the Federal Clean Water Act. In Vermont, this is through the ANR, Department of Environmental Conservation, Watershed Management Division. NPDES is the national program for issuing permits & enforcement. The City has a NPDES Discharge Permit with Compliance Schedules described in 1272 Orders.

**EPA National Combined Sewer Overflow Strategy 1989**

- Vermont 1272 Order No. 1207 1992
- Phasing Plan (Storm Water Separation) 1993
- Report on Roof Drain Survey 1995
- Phase II Monitoring CSO’s 2004-2006
- CSO Reporting Law (Act H.674) May 2016

**Goal: CSO Elimination**

- Vermont Combined Sewer Overflow Policy 1990
- Montpelier Combined Sewer Overflow Study 1992
- EPA’s CSO Control Policy 1994
- Design and construction of CSO Elimination Program 1994-2009
- CSO abatement progress report (1272 order required) 2013
- New CSO Rule (Former Policy) Sept 2016
Reporting of CSO events:
From 1990 through 2015, Montpelier has been in compliance with standards (1990 CSO) established in our discharge permit as recently verified by DEC. Reporting bad information has been a concern: No means to verify overflow duration or amount. The new CSO rule (in effect 9/15/2016) requires reporting to the state within 1 hour of discovery and submitting a discharge volume estimate within 12 hours.
The nine minimum controls from EPA’s CSO control Policy per the adopted 2016 CSO Rule:

- Proper operation and regular maintenance programs for the collection systems and CSO outfalls
- Maximum use of the collection system for storage without endangering public health or property, or causing solids deposition problems
- Review and modification of pretreatment requirements to assure that CSO impacts are minimized
- Maximization of flow to the treatment plant for treatment consistent with an evaluation of alternative treatment options
- Prohibition of CSOs during dry weather
- Control of solid and floatable materials in CSOs
- Establishment of pollution prevention programs to minimize contaminants in CSOs
- Public notification to ensure that the public receives adequate notification of CSOs and CSO impacts, which shall, at a minimum comply with § 34-404 of this Rule
- Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls
Current Reporting Method:
An overflow structure is controlled by a weir. Monitoring of overflows is detected by a block of wood resting on top of the weir and the block is tied off with a string. If an overflow occurs, the block of wood is displaced. Volumes are estimated by rainfall amounts, with very poor accuracy.
Reporting: On 9/5/2015 State of Vermont said:

“The Department’s nForm based system for reporting CSO events and releases of sewage is now live...
“Commencing immediately, you should report all CSO events and releases of sewage that has received less than complete treatment in your facility using this on-line system.”

Montpelier Reported CSO events on 9/30/2015 & 2/25/2016
H. 674 was signed into Law on 5/4/2016
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CSO Official State Report Procedure

During Rain Event check Rain gauge at the Water Resource Recovery Facility. If rainfall is greater than or equal to .75” in a four period or less notify Water/Sewer Division to check for CSO’s.

Sewer/Water Division will respond back to confirm if a CSO has occurred.

Staff of the Water Resource Recovery Facility will report online within ONE HOUR to submit a public alert to the State of VT for each of the confirmed CSO’s.

Check email for confirmation notice.

Staff of the Water Resource Recovery Facility will report within 12 HOURS of Discovery and enter information on: Location, Start/Stop Date and Time, Estimated Volume, Water Body Impacted, and Description of Incident.
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The Future of Reporting:

Flow Siren:
Flow Alarm
Level Sensor
Data Logging
Image Detection
Text and Email Notification

Will provide real time information including: time of event, duration, and volume. The data provided from the Flow Siren will allow City staff to analyze overflow events and help reduce future occurrences.
Accomplishments:
Since the first preliminary engineering report (PER) was submitted to the state in 1992, and as a result of a phased separation approach, we have:
✓ Catch basins connections reduced from 525 to about 40.
✓ Number of overflow structures reduced from 25 to 6
✓ Overflows occurred almost every rainfall now it typically requires an inch of rain in 4 hours or less.
✓ Reduction in Wet Weather Overflow events by raising Weir Elevations (Started in 2015)
✓ CSO separation projects completed in house in 2015-2016 & more planned
✓ Approximately $10,000,000 spent to date on CSO elimination
Next Steps:
Vermont CSO communities have two choices to achieve compliance with the VWQS from this point forward: eliminate overflows or provide pre-discharge treatment (solids removal & disinfection).

Originally, the cause of overflows was based on the following contributions to the CSS:
1) 60% combined storm sewers (storm water)
2) 30% roof tops and inflow
3) 10% infiltration (springs) and sump pumps.

The number one cause has been addressed. Roof top connections to a CSS is the next largest cause – clean water collected from over 8 acres of impervious surfaces piped to our sewers – can’t reach goal without removing it. Infiltration to be addressed with sewer reconstruction. A few of the CSS will need to be retained – Cliff St for example. Storage of peak flows or treatment may be necessary.

Implement monitoring system to collect accurate information regarding overflow durations and volumes.
Next Steps:
Develop CSO Overflow Reduction Plan
Compliance with New Rules (Effective 9/15/16)
   Phase 1 – Minimum Controls & Develop Long Term Control Plan
   Phase 2 – Implement Long Term Control Plan until VWQS achieved.
Note: The next NPDES discharge permit will include a 1272 Order which will establish 2 years to assess the system and write a control plan.

- Continue Roof Drain Separation - 21 Confirmed Connections Remain & 49 Suspected Connections Remain from 2007 CSO Monitoring Phase II Report
- Voluntary or Mandatory separation?
- Storm water Utility- tax roof drain connections? Provide incentives? Impose penalties?
- Further weir adjustments & corresponding collection pipe capacity
- Subsidize check valve installation in low elevation sewer services?
- Mandatory downtown check valve ordinance?
- East State Street Separation Project?
Consequences of a separated system; one pipe for waste water and one pipe dedicated to storm water

New storm water rules – General Permit
No longer treating storm water

The Montpelier WRRF captures and treats over 99% of the flows some of which are from the CSS systems. With a capacity of 4 MGD and average daily flows of 1.8 MGD, the WRRF is not the concern.
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