



GALLATIN PUBLIC UTILITIES

**SANITARY SEWER OVERFLOW
EVALUATION REPORT
MAY 2012 – SEPT 2013**



Draft for Review: November 13, 2013

Prepared by: James C. Hailey & Company



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Sanitary Sewer Collection System Corrective Action Plan/ Engineering Report

Table of Contents

Report Summary.....	1
Sanitary Sewer Overflow Report.....	2
Chronic Overflow Evaluation.....	5
Woodvale Pump Station.....	5
Stephanie Street.....	5
Number 1 Pump Station	5
Bulls Creek Pump Station.....	6
Isolated Overflows.....	7
Minor Overflows.....	7
Conclusions.....	8

Report Summary

In May 2012, an Agreed Order between the Tennessee Department of Environment and Conservation and The City of Gallatin became effective. As part of the Agreed Order Gallatin Public Utilities (GPU) agreed to submit a Sanitary Sewer Overflow Evaluation Report annually. This report encompasses a summary of the documented overflows beginning at the date of the Agreed Order, May 2012, thru September 2013.

The accompanying spreadsheet documents each overflow that has been recorded over the last 16 months. The report analyzes the cause of each overflow and identifies the measures needed to identify and/or correct the overflow.

The Table Key is as follows:

Basin: The City of Gallatin is divided into three drainage basins separated by topography or system configuration.

Location: Identified as the manhole, pump station, address, etc. where the actual overflow event occurred.

Beginning Date: Identifies on what calendar day the overflow started

End Date: Identifies on what calendar day the overflow ended.

Duration: Details the total length of time that the overflow occurred.

Overflow Cause: Identifies that cause of the overflow event, i.e. rainfall, mechanical failure, etc.

Remarks: Identifies any specific notes related to the overflow event. Rainfall totals, specific system problems, actions taken, etc. specific to any given event.

Long Term Capital Plan: This section identifies each overflow location and where each stands in regards to GPU and current and/or future capital improvements.

- **N/A** – Isolated incident
- **Completed** – A current project has been completed to rectify the overflow situation
- **Under Construction** – A current construction project is underway to improve the Inflow and Infiltration
- **Current Five Year Plan** – These events have projects that are currently in the Planning and Design phase.
- **Under Review** – These events are under review to determine what if/any improvements are needed to correct the issues.

BASIN	OVERFLOW LOCATION	BEG DATE	END DATE	DURATION	OVERFLOW CAUSE	REMARKS	Long Term Capital Plan
C	Hoeganaes Lift Station	9/25/2013	9/25/2013	.50 Hours	Mechanical Failure	Float Failure	N/A
A	Across from 900 Aqua Dr	9/9/2013	9/9/2013	4 Hours	Mechanical Failure	Replace Air Release Valve	Completed - ARV was replaced
A	Across from 900 Aqua Dr	9/6/2013	9/6/2013	2.25 Hours	Mechanical Failure	Air Release Valve	N/A
A	Number One Lift Station	8/12/2013	8/12/2013	4.5 Hours	Rainfall	1.3 + Inches	Current Five Year Plan - Looking at a capital investment for system Improvements
C	Bulls Creek Lift Station	8/12/2013	8/12/2013	5 Hours	Rainfall	1.3 + Inches	Current Five Year Plan - Looking at a capital investment for upgrades
B	Lakeshore Dr Lift Station	8/8/2013	8/9/2013	17.75 Hours	Rainfall	4.5 + Inches	Under Construction - Current Rehabilitation Project to reduce Inflow
C	Bulls Creek Lift Station	8/8/2013	8/8/2013	7 Hours	Rainfall	4.5 + Inches	Current Five Year Plan - Looking at a capital investment for upgrades
A	Number 1 Lift Station	8/8/2013	8/8/2013	14 Hours	Rainfall	4.5 + Inches	Current Five Year Plan - Looking at a capital investment for system Improvements
C	Cairo Rd Lift Station	8/8/2013	8/8/2013	.5 Hours	Mechanical Failure		Under Review
A	Manhole #A17-M1	8/8/2013	8/8/2013	.5 Hours	Rainfall	4.5 + Inches	N/A - However a Current Rehabilitation Project will also reduce Inflow at this location
C	Bulls Creek Lift Station	7/30/2013	7/30/2013	.75 Hours	Mechanical Failure		Current Five Year Plan - Looking at a capital investment for upgrades
C	1830 Woods Ferry Rd	7/29/2013	7/29/2013	2.5 Hours	Damaged Force Main		N/A
C	Bulls Creek Lift Station	7/29/2013	7/29/2013	5 Hours	Damaged Force Main		N/A - Not related to flow
A	Manhole #A19-C01	7/27/2013	7/27/2013	.75 Hours	Blockage		N/A
C	Baywatch Lift Station	5/14/2013	5/14/2013	4.7 Hours	Excess Flow		N/A
C	Cairo Rd Lift Station	5/9/2013	5/9/2013	.25 Hours	Mechanical Failure		Under Review
A	Manhole #A02-A08	5/6/2013	5/6/2013	.5 Hours	Blockage		N/A
A	Number 1 Lift Station	5/5/2013	5/5/2013	16 Hours	Rainfall	3+ Inches	Current Five Year Plan - Looking at a capital investment for system Improvements
C	Bulls Creek Lift Station	5/4/2013	5/5/2013	8.5 Hours	Rainfall		Current Five Year Plan - Looking at a capital investment for upgrades
A	Manhole #A10A-A13	5/5/2013	5/5/2013	19 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
A	Number 1 Lift Station	4/27/2013	4/29/2013	39 Hours	Rainfall	5+ Inches	Current Five Year Plan - Looking at a capital investment for system Improvements
C	Bulls Creek Lift Station	4/27/2013	4/28/2013	28.5 Hours	Rainfall	5+ Inches	Current Five Year Plan - Looking at a capital investment for upgrades
B	Lakeshore Drive Lift Station	4/27/2013	4/29/2013	49.5 Hours	Rainfall	5+ Inches	Under Construction - Current Rehabilitation Project to reduce Inflow
C	Cairo Lift Station	4/27/2013	4/28/2013	2 Hours	Rainfall	5+ Inches	Under Review
A	Manhole #A10A-A13	4/27/2013	0429-13	59.25 Hours	Rainfall	5+ Inches	Under Construction - Current Rehabilitation Project to reduce Inflow

BASIN	OVERFLOW LOCATION	BEG DATE	END DATE	DURATION	OVERFLOW CAUSE	REMARKS	Long Term Capital Plan
A	Manhole #A10A-N1	4/27/2013	4/29/2013	42.25 Hours	Rainfall	5+ Inches	Under Construction - Current Rehabilitation Project to reduce Inflow
A	Manhole #A10A-PB1	4/27/2013	4/29/2013	42.25 Hours	Rainfall	5+ Inches	Under Construction - Current Rehabilitation Project to reduce Inflow
A	Manhole #A19-B02	4/27/2013	4/28/2013	28.5 Hours	Rainfall	5+ Inches	Under Construction - Current Rehabilitation Project to reduce Inflow
A	Manhole #A19-B03	4/27/2013	4/29/2013	42 Hours	Rainfall	5+ Inches	Under Construction - Current Rehabilitation Project to reduce Inflow
A	Manhole #TA1	4/27/2013	4/28/2013	23 Hours	Rainfall	5+ Inches	N/A - However the current Five year plan will make improvements that will affect this location
A	Number 1 Pump Station	4/11/2013	4/11/2013	4 Hours	Mechanical Failure & Rainfall		Current Five Year Plan - Looking at a capital investment for system Improvements
B	Manhole #B2-F03	3/9/2013	3/9/2013	1.75 Hours	Blockage		N/A
C	Manhole #C12-A6	2/6/2013	2/6/2013	1 Hour	Blockage		N/A
A	Number 1 Lift Station	1/30/2013	1/30/2013	4.25 Hours	Rainfall		Current Five Year Plan - Looking at a capital investment for system Improvements
A	Manhole #A10A-PB1	1/30/2013	1/30/2013	0.75 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
A	Manhole #A10A-A13	1/30/2013	1/30/2013	12 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
C	Woodvale Lift Station	1/30/2013	1/30/2013	16 Hours	Rainfall		Completed - New station placed into service March of 2013
A	Manhole #A10A-A13	1/13/2013	1/17/2013	104 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
C	Woodvale Lift Station	1/13/2013	1/17/2013	95.5 Hours	Rainfall	Replacement Under Construction	Completed - New station placed into service March of 2013
A	Number 1 Lift Station	1/13/2013	1/14/2013	30 Hours	Rainfall		Current Five Year Plan - Looking at a capital investment for system Improvements
B	Lakeshore Dr Lift Station	1/13/2013	1/14/2013	19 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
A	Manhole #TA-36	1/13/2013	1/14/2013	16 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
A	Manhole #A19-B3	1/13/2013	1/14/2013	16 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
B	Manhole #B15-A17	1/13/2013	1/14/2013	16 Hours	Rainfall		N/A
A	Manhole #A23-J3	1/13/2013	1/14/2013	12.5 Hours	Rainfall		N/A
A	Manhole #A10-A-PB1	1/13/2013	1/14/2013	22.5 Hours	Rainfall		Under Construction - Current Rehabilitation Project to reduce Inflow
B	1059 Browns Ln	1/2/2013	1/2/2013	20 Minutes	Mechanical Failure		N/A
C	Woodvale Lift Station	12/10/2012	12/10/2012	5 Hours	Rainfall		Completed - New station placed into service March of 2013
B	LH Pk @ Buckingham Blvd	9/26/2012	9/27/2012	19 Hours	Excavation Damage		N/A
C	Woodvale Lift Station	9/17/2012	9/18/2012	7.5 Hours	Rainfall		Completed - New station placed into service March of 2013

BASIN	OVERFLOW LOCATION	BEG DATE	END DATE	DURATION	OVERFLOW CAUSE	REMARKS	Long Term Capital Plan
C	Woodvale Lift Station	9/8/2012	9/8/2012	5 Hours	Rainfall		Completed - New station placed into service March of 2013
C	Woodvale Lift Station	8/17/2012	8/17/2012	9.5 Hours	Rainfall		Completed - New station placed into service March of 2013
C	Woodvale Lift Station	8/9/2012	8/9/2012	3.5 Hours	Rainfall		Completed - New station placed into service March of 2013
C	Woodvale Lift Station	7/20/2012	7/20/2012	12 Hours	Rainfall		Completed - New station placed into service March of 2013
C	Cairo Road Lift Station	7/19/2012	7/20/2012	3.5 Hours	CEMC Power Failure		Current Five Year Plan - Looking at a capital investment for a backup Generator
C	Manhole C15-A02/ Steam Plant Lift Station	7/11/2012	7/11/2012	2 Hours	Vandalization	Copper Wire stolen	N/A
C	Woodvale Lift Station	7/6/2013	7/6/2013	3 Hours	Power Outage		Completed - New station placed into service March of 2013
A	Number 1 Lift Station	5/13/2012	5/14/2012	26 Hours	Rainfall Event		Current Five Year Plan - Looking at a capital investment for system Improvements
C	Woodvale Lift Station	5/13/2012	5/15/2012	40 Hours	Rainfall Event		Completed - New station placed into service March of 2013
B	Lake Shore Lift Station	5/13/2012	5/14/2012	9 Hours	Rainfall Event		Under Construction - Current Rehabilitation Project to reduce Inflow

Chronic Overflow Evaluation

A chronic overflow for the purposes of this report are those that make up more than 10% of the total documented overflows for the review period. The 4 locations listed below represent ~52% of total documented overflows for the review period.

Woodvale Lifts Station

The most chronic and cumbersome overflow location for several years was the Woodvale Sewer Lift Station. As outlined in the Overflow report, this station made up 17% of the documented overflows from the date of the order to 9/25/13 and represented the largest single point discharge. All in past tense as a construction project completed in March of this year eliminated this overflow point from the system. The new station includes two 625 gpm pumps, variable frequency drives, a natural gas backup generator, and other amenities which have corrected the earlier problem and will now handle the capacity of the drainage in which it is located for the foreseeable future.

Stephanie Street

Manholes A10A-A13, A10A-N1 and A10A-PB1 are all three located along a short stretch of Stephanie Street and these three locations account for 13% of the current documented overflows. This area has been a chronic overflow location and has been posted for several years. The lines had been jetted and TV'd and review had revealed that there was some problems with line size vs capacity as well as one section of line that had a significant obstruction that caused surcharging and overflows above the section. The last documented overflow of these three location was May of this year, soon after a current rehabilitation project replaced the section of line that was in question and replaced it with a new HDPE line. The installation of the new HDPE line has eliminated the overflows at these locations.

Number 1 Lift Station

Number 1 Lift station is the primary pump station that transports the collected sewer of "A" Basin, in its entirety to the Wastewater Treatment Plant which accounts for approximately 85% of the total flow on the system. Number 1, as it is referred to, currently has two 8,500 GPM pumps which are connected to a pair of force mains. Currently Number 1 and its overflow problem are under review. The construction of the Woodvale lift station and new force main, removed a sizable load from the "A" basin and Number 1, and the current rehabilitation project is making significant strides in targeted Inflow reduction. Upon completion of the current project we intend to monitor Number 1 for overflows. As rehabilitation projects continues to chip away at the I-N-I problems, there are preliminary discussions of construction of some equalization tankage or other peak storage measures that would be used to clip the peaks and

allow for better control of the overflows at Number 1. There have not been any final decisions made as to how best control these peaks, but as outlined in the Collection system CAP-ER, the city is committed to reducing the running average of the peak flows below 10,000 gpm within the next 5 years.

Bulls Creek

Bulls Creek is the last of the “chronic” overflow locations for the review period, making up 10% of the current documented overflows. Bulls Creek was on the radar, but did not become a “chronich” offender until earlier this year. As the primary pump station for “C” Basin, the overflows started soon after the New Woodvale station went on-line. The new Woodvale station took its capacity off of “A” basin and Number 1 and shifted that flow to “C” basin and Bulls Creek. It should be noted that a couple of the overflows were the result of mechanical failures, however, that coupled with the additional flows it is currently seeing have move it up on the “To-Do” list. The collection system CAP-ER indicated that a thorough evaluation of the Bulls Creek options would be performed within 3 years of the completion of the Woodvale lift station, however, given that the number of Overflows has increased, the City has moved this up and Bulls Creek is currently under review for needed improvements to control the number of annual overflows.

Isolated Overflows

Isolated incidents, denoted with an N/A on the Report, make up right at 25% of the total documented overflows. These incidents are generally the result of a mechanical failure, damaged infrastructure, or other freak incidents resulting in a reported overflow. Over the 16 months outlined in the report, the events labeled as isolated were just that, Isolated, occurring only once over during the review period. These isolated incidents were corrected by a mechanical repair, line cleaning or other readily achievable measure which resulted in the overflow not repeating.

Minor Overflows

The remaining 20% of overflows have been categorized as minor, in that they do not make up more than 10% of the overflows.

The Cairo Rd Pump Station has 4 of the reported overflows and the reasoning varies from 1 Power failure, 2 mechanical failures and 1 rainfall event. The Cairo Road Lift station was identified within the CAP-ER as a location that would be monitored. As outlined in the CAPER, the Cairo Road Sub-Basin is under review for I & I problems and GPU has plans to purchase and install a back-up Generator for this location to help with the inconsistent power feed issues.

The Lakeshore Drive Pump Station has 4 reported overflows during the review period, all of which are the direct result of a rainfall event. This was recognized prior to the bidding of the current rehabilitation project and a number of pipe was added within the Lakeshore Lift Station sub-basin in order to better control the I & I coming to this location. Upon completion of the rehab, we will continue to monitor this location and will take further action as needed. This station also has some age and is slated for replacement in the coming years as well.

The overflows at TA-36 and A19-B2 and A19-B3 are all part along a section of the Main trunk line that is to be replaced as part of the current rehabilitation project. These 3 sites make up 4 of the reported overflows during the current period of review, and all were the result of rainfall events. There are 4 section of Trunk Line that will be replaced, including one section that will be up-sized to match the upstream and downstream piping. Upon completion of the current project, this area will continue to be monitored and additional action taken as needed.

Conclusions

As per to the Agreed Order, Gallatin Public Utilities (GPU) has monitored for and maintained all sanitary sewer overflows (SSO) within the system. This report has taken each overflow, reviewed them, and identified the appropriate action that should be taken to correct. As this report has demonstrated, GPU is very active and aggressive in the combating of SSO's and many of the documented overflows over the 16 month review period have already been corrected by a construction project, or will be improved and likely corrected by a current construction project. As with any system there are always going to be unusual circumstances that can contribute to an overflow, and mechanical failures and system damage can occur at any time and are hard to prepare for. However, as this report demonstrates, GPU has identified those and appropriate actions taken. GPU has also identified the know and recurring problems, many of which are already being addressed and those that are not being directly addressed currently have projects in planning and design to correct them in the near future. GPU will continue to aggressively attack the problems of I & I and will continue to be vigilant and proactive, that is not always a match for the Wrath of Mother Nature.