

**City of Anacortes**  
**2015**  
**CSO & Wet Weather Operation**  
**Report**

**General Information**

The NPDES permit number WA-002025-7 is issued to the City of Anacortes. The permit identifies CSO by discharge number. This report will refer to the CSO as it is identified in the permit. The CSO are located as identified in the following table:

| <b>Discharge No.</b> | <b>Location</b>              |                                              | <b>Receiving Water</b> |
|----------------------|------------------------------|----------------------------------------------|------------------------|
| <b>002</b>           | Northernmost end of B Avenue | Latitude: 48 30'55"<br>Longitude: 122 38'03" | Guemes Channel         |
| <b>004</b>           | Northernmost end of Q Avenue | Latitude: 48 31'18"<br>Longitude: 122 36'34" | Guemes Channel         |

Discharge number 002 is monitored with a Marsh-McBirney Model 256A flow meter. The Model 256A flow meter measures level and velocity and reports flows to the treatment plant via a radio telemetry system. When the meter is active the plant control system is programmed to activate an alarm that indicates overflow at this CSO. The plant data acquisition system totals the flow data and includes the information on plant reports. The following information applies to the Marsh-McBirney flow meter systems at Discharge #002:

1. The flow meter level and velocity-sensing device is located directly in the outfall pipe.
2. The flow meter will detect a level in excess of 0.4 inches. Any flow that does not reach or exceed 0.4 inches will not be measured.
3. The flow meter is capable of detecting velocity only when the level in the pipe is in excess of one inch. Total flow is computed from the velocity and level measurements, therefore the flow cannot be totaled unless the level in the pipe exceeds one inch.
4. The flow meter is set to record the level and velocity for 60 seconds, once every fifteen minutes.
5. Flow information is reported from 12:00 p.m. (midnight) to 11:59:59 p.m. (midnight) on the indicated day.

Discharge number 003 – As reported in the 2010 CSO Reduction Plan Update discharge number three has been decommissioned. Improvements over the years have eliminated overflow events at this location. The outfall pipe is plugged.

Discharge number 004 is monitored with a Krohne Magmeter, type IFS-4000/PF. The flow volume measured by this meter is reported to the wastewater treatment plant via a radio telemetry system. The plant data acquisition system totals the flow data and includes the information on plant reports. A local flow totalizer was added in January 2016 as a backup to the SCADA system. A float switch also monitors this CSO. When the level in the sewer system approaches the height of the overflow weir the float is activated. This float switch activates an alarm at the wastewater treatment. Plant personnel are alerted of the impending CSO activity.

Rainfall reported is recorded at the Anacortes Wastewater Treatment Plant by a tipping bucket rain gauge. Rainfall totals are reported from 7:00 a.m. on the indicated day to 6:59:59 a.m. on the following day.

Detailed information for Discharge #002 and #004 are included in later next sections of this report with applicable flow trends included in Appendix A.

CSO #003 has been decommissioned and is no longer in service.

Rainfall data is included in Appendix B.

Public notice announcing the availability of the Annual CSO report will be advertised in the Anacortes American, the City of Anacortes official newspaper of record.

**DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE  
CONDITION, DISCHARGE NO. 002, "B" AVE. CSO**

**FREQUENCY and VOLUME**

As stated previously, discharge number 002 is monitored with a Marsh-McBirney Model 256A flow meter. Flow information from this meter is transmitted to the treatment plant via a radio telemetry system. Reports containing this flow information are generated on a daily and monthly basis.

There are no overflow events at this CSO site to report for 2015.

Total rainfall measured at the Anacortes Wastewater Treatment Plant in 2015 was 30.30".

**COMPARISON TO BASELINE**

There has not been an overflow event at this CSO since 1997. A chart comparing current data to a baseline for this site is not included in this report as there is no data to put into the chart.

## **DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE CONDITION, DISCHARGE NO. 004, "Q" AVE. CSO**

### **FREQUENCY and VOLUME**

As stated previously, discharge number 004 is monitored with a Krohne Magmeter, type IFS-4000/PF flow meter. Flow information from this meter is transmitted to the treatment plant via a radio telemetry system. The plant data acquisition system totals the flow data and includes the information on plant reports. Impending over flow events are detected via a float switch which provides an alarm at the treatment plant. Reports containing this flow information are generated on a daily and monthly basis.

There were two overflow events at this site caused by precipitation during 2015.

On January 5<sup>th</sup> 0.57" of rainfall was recorded with 1.73" on the preceding day. The total rain fall recorded during this rainfall event was 2.30" of rain. The CSO was active for 5.2 hours and discharged a total of 160,600 gallons.

On November 17<sup>th</sup> 0.99" of rainfall was recorded with 3.22" falling during the previous few days for a total of 4.21" of rain during this event. The CSO was active for 2 hours and discharged an estimated total of 46,000 gallons for the event. The radio telemetry system failed during this event. A local flow totalizer was added in January 2016 as a backup to the SCADA system. The duration and volume were estimated as explained in the following paragraph.

Plant staff checked the CSO several times during the event. The estimated duration of the CSO event is 2 hours based on these observations. Flow for the CSO event was estimated using the average gallon per minute flow from the preceding event on January 5, 2015 and the subsequent event on February 15, 2016. Using an average flow of 383 gallons per minute for a duration of 120 minutes, the estimated flow for the November 17<sup>th</sup> event is 46,000 gallons. This estimate is considered to be high for several reasons, first the actual duration of the event is most likely shorter than 2 hours. The CSO was checked 3 times over the course of the two hour period surrounding the event. The first time there was no flow, the next time there was flow and the final time the flow had stopped. There is no way to know if the flow started and stopped within minutes of being checked any of the three times therefore the entire period is assumed to have flow to err on the high side. Additionally the event in November was less intense and a shorter duration than the events in January 2015 and February 2016 therefore the average flow used to estimate the total volume for the event is likely much higher than the actual flow during the event.

The plant maintenance staff troubleshot the radio equipment on the 17<sup>th</sup>. The contractor on-call as the Process Instrumentation and Control System Integrator for the plant was contacted on an emergency basis and was onsite on the 18<sup>th</sup> to troubleshot and get the radio telemetry system back in service. Additionally, on January 11, 2016 a flow totalizer

was added to the CSO local radio control panel to provide redundancy for the radio telemetry system and as a backup to the SCADA system.

Total rainfall measured at the Anacortes Wastewater Treatment Plant in 2015 was 30.30”.

### **COMPARISON TO BASELINE**

Flow monitoring was installed on this CSO in January of 1998. A total of seven overflow events caused by precipitation have occurred during the eighteen year time period that flow has been monitored at this site; one in 2003, two in 2007, one in 2009, one in 2010 and two in 2015.

The average frequency of overflow events at this CSO since flow monitoring was installed is equivalent to one event every 2.6 years, or a 38.9% probability of an overflow event occurring during any given year.

The NPDES permit requires that a five year moving average value for CSO events be calculated and reported. During the last five years there have been two events at this CSO. This equates to an average of 0.4 events per year, or a 40% probability that a CSO event would occur during any given year.

A chart detailing overflow events and rainfall information for this CSO site during the most recent five year period is included in Appendix A.

## **SEWER LINE REPAIRS AND CSO REDUCTION ACCOMPLISHMENTS**

In 2015 \$471,152 was expended for sanitary sewer line improvements. Approximately 7800 linear feet of leaking or damaged sanitary sewer pipe were repaired or replaced. In addition, 9 manholes were waterproofed to eliminate stormwater inflow and 2 new manholes were installed. Around 4927 linear feet of sewer line and 36 side sewers were cleaned and video inspected.

The 9 leaking manholes were repaired and waterproofed in direct response to the CSO event in January where a significant volume of stormwater entered the sanitary sewer resulting from failure of a stormwater pump station operated by another agency.

## **PLANNED IMPROVEMENTS**

Rehabilitate or replace approximately 4800 linear feet of sanitary sewer pipe and install 21 manholes as replacement to existing structures or as new installations. The expected expenditures for this sewer line work total \$496,864. Additional work will be undertaken if resources are available.

The City is committed to reducing I&I and combined sewer overflow events. The sanitary sewer comprehensive plan currently calls for ongoing annual expenditures of \$600,000 increasing to \$1,000,000 per year by 2019. The City of Anacortes has also committed to hiring two additional employees to operate the sewer camera and vactor trucks, as well as upgrading the asset management program. These expenditures are expressly intended to assist in the execution of the I&I reduction program. Anacortes has demonstrated success in reducing I&I, and expenditures and a commitment of this magnitude are will result in reduced I&I and ultimately eliminating combined sewer overflow events.

**Wet Weather Report**  
**Summary of Secondary Bypass Events**

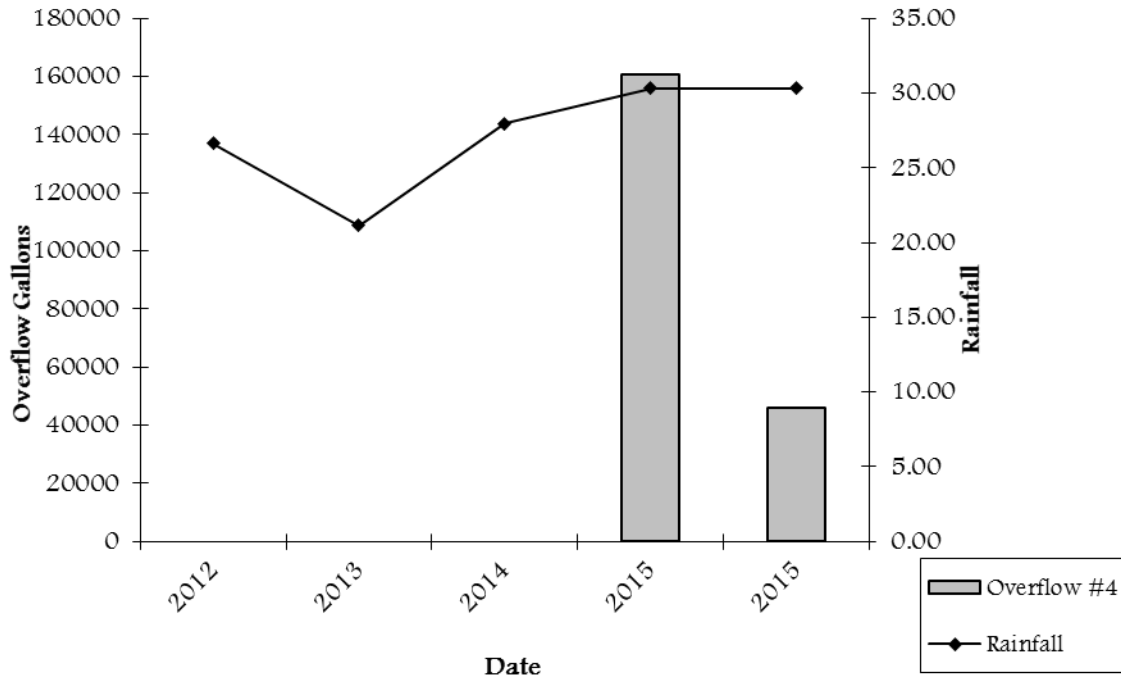
Influent flow to the Anacortes Wastewater Treatment Plant exceeded the capacity of the secondary treatment process seven times. The following information about those events is summarized in the table below:

| Date     | Duration (hours) | Bypass Volume in gallons | Flow at the time bypass started | Precipitation (inches) |
|----------|------------------|--------------------------|---------------------------------|------------------------|
| 1/4/15   | 4.73             | 320,360                  | 9.77                            | 1.72                   |
| 1/5/15   | 15.12            | 1,149,751                | Continued from 1/4/15           | 0.57                   |
| 11/12/15 | 1.67             | 104,799                  | 9.4                             | 1.34                   |
| 11/13/15 | 12.87            | 410,032                  | Continued from 11/12/15         | 1.04                   |
| 11/17/15 | 9.47             | 688,411                  | 9.3                             | 0.99                   |
| 12/18/15 | 2.03             | 41,168                   | 8.3                             | 0.29                   |
| 12/24/15 | 2.3              | 19,525                   | 7.8                             | 0.30                   |

## Appendix A



Discharge 004, Q Ave, CSO Annual Baseline



## Appendix B

Anacortes Wastewater Plant  
Annual Rainfall Report  
2015

| Day             | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec   |
|-----------------|------|------|------|------|------|------|------|------|------|------|------|-------|
| 1               | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.26 | 0.00 | 0.09 | 0.19  |
| 2               | 0.18 | 0.17 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.03 | 0.00 | 0.04 | 0.02  |
| 3               | 0.04 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.35  |
| 4               | 1.72 | 0.31 | 0.00 | 0.00 | 0.72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.01  |
| 5               | 0.57 | 0.03 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 0.03 | 0.07  |
| 6               | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.26 | 0.18 | 0.11  |
| 7               | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 | 0.23 | 0.18  |
| 8               | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 1.08  |
| 9               | 0.04 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45  |
| 10              | 0.03 | 0.01 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.11 | 0.03  |
| 11              | 0.14 | 0.00 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| 12              | 0.00 | 0.02 | 0.00 | 0.06 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.05 | 1.34 | 0.36  |
| 13              | 0.00 | 0.04 | 0.16 | 0.13 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.04 | 0.30  |
| 14              | 0.00 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.64 | 0.02  |
| 15              | 0.03 | 0.00 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29  |
| 16              | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.20 | 0.00  |
| 17              | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.99 | 0.99  |
| 18              | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.29  |
| 19              | 0.00 | 0.07 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.09  |
| 20              | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 | 0.00 | 0.00 | 0.04  |
| 21              | 0.10 | 0.00 | 0.22 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.41  |
| 22              | 0.04 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24  |
| 23              | 0.38 | 0.00 | 0.05 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 | 0.45  |
| 24              | 0.13 | 0.00 | 0.17 | 0.08 | 0.00 | 0.00 | 0.18 | 0.00 | 0.06 | 0.01 | 0.00 | 0.30  |
| 25              | 0.00 | 0.11 | 0.05 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.51 | 0.00 | 0.00  |
| 26              | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  |
| 27              | 0.00 | 0.12 | 0.37 | 0.04 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.01 | 0.00 | 0.28  |
| 28              | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.29 | 0.00 | 0.59 | 0.00 | 0.01  |
| 29              | 0.00 |      | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.41 | 0.00 | 0.15 | 0.00 | 0.00  |
| 30              | 0.00 |      | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00  |
| 31              | 0.03 |      | 0.00 |      | 0.00 |      | 0.00 | 0.35 |      | 0.78 |      | 0.00  |
| Monthly Total   | 4.38 | 2.00 | 2.41 | 0.91 | 0.84 | 0.37 | 0.26 | 1.38 | 1.79 | 3.81 | 5.59 | 6.56  |
| Annual Rainfall |      |      |      |      |      |      |      |      |      |      |      | 30.30 |

Rainfall data represents inches of precipitation in a 24-hour period from 7 am to 7 am.