

City of Anacortes
2016
CSO & Wet Weather Operation
Report

The City of Anacortes currently has two combined sewer overflow (CSO) locations as identified in the NPDES Permit issued to the City of Anacortes Wastewater Treatment Plant. Both outfalls satisfy the Washington State requirement of “greatest reasonable reduction” defined in WAC 173-245-020(22) by meeting the standard of not more than one discharge event per outfall per year on average and therefore are classified as controlled CSOs.

Background

Areas within the City of Anacortes are served by a partially combined sewer system where both the storm and sanitary sewer systems are joined. The City of Anacortes has two CSOs which have the potential to allow untreated wastewater combined with stormwater to discharge to Guemes Channel during extreme storm events. The CSOs are identified as CSO Outfall 002, the “B Avenue CSO” and CSO Outfall 004, the “Q Avenue CSO”.

Outfall 002 – B Avenue CSO

The B Avenue CSO is located one-half block north of the intersection of B Avenue and 11th Street. Discharges from the CSO occur when combined stormwater and sanitary sewer levels rise high enough in the collection system to overflow a dam in the CSO manhole separating the manhole channel from the CSO outfall pipe. Flow from the CSO is discharged into Guemes Channel through a 12-inch pipe to the outfall located at latitude: 48.515278, longitude: -122.634167 as stated in the NPDES permit.

The B Avenue CSO is monitored with a Marsh-McBirney Model 256A flow meter. The flow meter measures level and velocity and reports flows to the treatment plant via a radio telemetry system. When the meter is active a signal is transmitted to the plant which activates an alarm in the SCADA system indicating overflow at this CSO. Flow data and totalized flow are recorded by the plant data acquisition system and is available for publishing on plant reports. The following information applies to the flow meter system at the B Avenue CSO:

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.

Outfall 004 – Q Avenue CSO

The Q Avenue CSO manhole is located at the intersection of 2nd Street and Commercial Avenue on Port of Anacortes property leased to Dakota Creek Industries, Inc. (DCI) who operates a shipyard on this site.

This CSO is in a Residential/Commercial/Industrial zoned drainage basin. The outfall pipe is located at the northernmost end of Q Avenue directly underneath DCIs syncro lift facility which they use to haul large ships out of the water for maintenance. Discharges from this CSO occur when combined stormwater and sanitary sewer levels rise high enough in the collection system to overflow a concrete dam separating the manhole channel from the CSO outfall pipe in the CSO manhole at 2nd Street and Commercial Avenue. The concrete dam is equipped with a scum baffle to keep solids and floatables out of the CSO flow stream. Flow from the CSO is discharged into Guemes Channel through the outfall located at latitude: 48.521667, longitude: -122.609444 as stated in the NPDES permit.

The Q Avenue CSO 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 cellular telemetry system. Flow data and totalized flow are recorded by the plant data acquisition system and is available for publishing on plant reports. A local flow totalizer was added in January 2016 as a backup to the SCADA system. Impending overflow events are detected via a float switch which provides an alarm at the treatment plant. The float switch is activated when the level in the sewer system approaches the height of the overflow weir. The alarm alerts plant personnel of the impending CSO activity.

Rainfall Data

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.

Supporting Documents and Public Notice

Detailed information for the B Avenue and Q Avenue CSOs are included in later next sections of this report with applicable flow trends included in Appendix A.

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.

CSO Event Summary

Table 1 summarizes CSO events in the last 5 years, 2012 through 2016. There have been no CSO events at the B Avenue CSO and 3 CSO events at the Q Avenue CSO during this period of time.

Table 1. City of Anacortes Wastewater Collection System CSO History

B Avenue CSO – Discharge 002					
Date	Duration (hours)	Overflow Total (gallons)	Precipitation During Event (inches)	Storm Duration	Comments
2012 - 2016	n/a	0			
5 Year Average Number of Events: 0			No events in the past 19 years		
Q Avenue CSO – Discharge 004					
Date	Duration (hours)	Overflow Total (gallons)	Precipitation During Event (inches)	Storm Duration	Comments
2012-2014	n/a	0			
1/5/2015	5.2	160,600	2.30		
11/17/2015	2.0	46,000	4.21		Estimated Volume
2/15/2016	5.07	76,471	3.09	28.2 hrs	
5 Year Average Number of Events: 3			Past 19 years: 8 events		
2016 Annual Rainfall: 27.73 inches					

2016 Event Details – Q Avenue CSO

From 6:30 pm February 14th to 10:45 pm February 15th of rainfall was recorded with 1.27” for the preceding 3 days. Precipitation from the storm event resulting in flow from the Q Avenue CSO began on February 14th at 6:30 pm and continued until February 15th at 10:42 pm. The total precipitation recorded during this rainfall event was 3.09” of rain. The CSO was active for 5.07 hours and discharged a total of 76,471 gallons.

Flow monitoring was installed on this CSO in January of 1998. A total of eight overflow events caused by precipitation have occurred during the nineteen 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, one in 2016.

The average frequency of overflow events at this CSO since flow monitoring was installed is equivalent to one event every 2.4 years, or a 42% 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 three events at this CSO. This equates to an average of 0.6 events per year, or a 60% 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 2016 \$511,336 was expended for sanitary sewer line improvements. The improvements included replacing or repairing approximately 5900 linear feet of leaking or damaged sanitary sewer pipe. In addition, 7 manholes were replaced and 15 new manholes were installed. The vactor truck crew cleaned 244,660 linear feet of sewer line and the camera truck crew video inspected 139 linear feet of sewer lines.

In 2016, the City of Anacortes hired 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.

Planned Improvements

Rehabilitate or replace up to 4500 linear feet of sanitary sewer pipe and install 19 manholes as replacement to existing structures or as new installations. The 2017 budget includes \$618,000 allocated for this sewer line improvements.

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. Anacortes has demonstrated success in reducing I&I; expenditures and a commitment of this magnitude will result in reduced I&I and ultimately eliminating combined sewer overflow events.

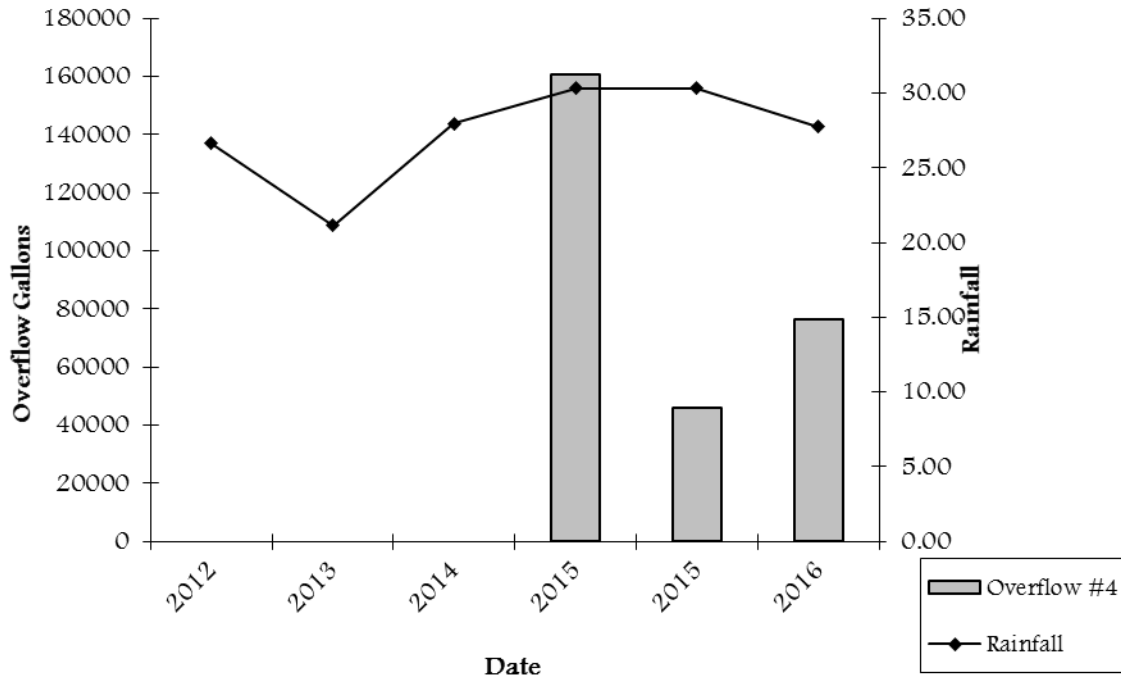
Wet Weather Report
Summary of Secondary Bypass Events

Influent flow to the Anacortes Wastewater Treatment Plant exceeded the capacity of the secondary treatment process two 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)
2/15/16	20.7	1,509,032	9.61 MGD	0.90
2/17/16	3.18	107,460	9.27 MGD	0.61

Appendix A

Discharge 004, Q Ave CSO Annual Baseline



Appendix B

Anacortes Wastewater Plant Annual Rainfall Report 2016

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.00	0.05	0.18	0.00	0.00	0.10	0.00	0.00	0.02	0.00	0.19	0.10
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.26	0.09
3	0.00	0.05	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.44
4	0.07	0.01	0.03	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.28	0.03
5	0.04	0.06	0.26	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.98	0.08
6	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.01	0.00
7	0.00	0.01	0.35	0.00	0.00	0.00	0.03	0.00	0.04	0.09	0.01	0.00
8	0.00	0.00	0.01	0.00	0.00	0.00	0.11	0.00	0.00	0.62	0.02	0.01
9	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.11
10	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
11	0.07	0.40	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.12
12	0.04	0.76	0.05	0.31	0.00	0.06	0.00	0.00	0.00	0.25	0.02	0.05
13	0.00	0.09	0.04	0.00	0.00	0.08	0.00	0.00	0.00	0.64	0.20	0.00
14	0.00	0.95	0.29	0.04	0.00	0.01	0.00	0.00	0.00	0.50	0.22	0.00
15	0.26	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.02	0.00
16	0.04	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.06	0.29	0.00	0.00
17	0.05	0.61	0.00	0.00	0.00	0.23	0.00	0.00	0.37	0.08	0.00	0.00
18	0.00	0.02	0.00	0.00	0.18	0.18	0.00	0.00	0.01	0.13	0.00	0.35
19	0.51	0.16	0.00	0.00	0.05	0.00	0.00	0.00	0.02	1.02	0.00	0.25
20	0.17	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
21	0.05	0.00	0.07	0.00	0.06	0.00	0.00	0.00	0.00	0.13	0.00	0.00
22	0.06	0.00	0.01	0.01	0.00	0.19	0.00	0.00	0.00	0.00	0.69	0.55
23	0.27	0.00	0.26	0.21	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.37
24	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.32	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00
26	0.05	0.03	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.81	0.17
27	0.16	0.01	0.10	0.00	0.15	0.05	0.00	0.00	0.00	0.02	0.15	0.16
28	0.09	0.00	0.00	0.00	0.04	0.00	0.00	0.05	0.00	0.00	0.00	0.00
29	0.34	0.21	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.13	0.16	0.14
30	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.26	0.00
31	0.07		0.00		0.00		0.00	0.19		0.21		0.28
Monthly Total	2.34	4.56	2.55	1.28	0.56	1.21	0.14	0.24	0.64	5.99	4.86	3.36
Annual Rainfall												27.73

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