

CITY OF ANACORTES

1997 CSO REPORT

GENERAL INFORMATION

Discharge number 002 was monitored with a Marsh-McBirney Model 260 portable flow meter system from January 1st through June 1, 1997. After June 1st the discharge was monitored with 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-indicating overflow at this CSO.

Discharge number 003 was monitored with Marsh-McBirney Model 260 portable flow meter system.

The Model 260 flow meter measures level and velocity. The level and velocity measurements are stored in the meter, in the field. The meters are periodically “uploaded” to a laptop computer, level; velocity and error logs are transferred to the computer. The Marsh-McBirney T50 version 1.7 Floware Software package computes flows from this information, and generates reports.

The level and velocity-sensing device was placed directly in the outfall pipes. The flow monitored was actual flow discharged.

The flow meters detect levels in excess of 0.4 inches. In pipe flows that do not reach or exceed 0.4 inches are not measured.

The flow meters detect velocity only when the level is in excess of one inch. Therefore the flow cannot be totaled unless the level in the pipe exceeds one inch.

The flow meters were set to record the level and velocity for 60 seconds, once every fifteen minutes.

Flow information is reported from 12:00 p. m. (midnight) to 11:59:59 p. m. (midnight) on the indicated day. Rainfall totals are reported from 7:00 a. m. on the indicated day to 6:59:59 a. m. on the following day. Rainfall reported is recorded at the Anacortes Wastewater Treatment Plant by a tipping bucket rain gauge.

Daily flow totals for Discharge #002, the B Avenue CSO, are included in appendix A, daily flow totals for Discharge #003, the M Avenue CSO, are included in appendix B. Rainfall data is included in Appendix C. Appendix D includes a map of the City of Anacortes, including wastewater pump stations identified by number.

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

FREQUENCY and VOLUME

The flow meter is routinely read on a monthly basis. As stated previously, Discharge number 002 was monitored with a Marsh-McBirney Model 260 portable flow meter system from January 1st through June 1, 1997. After June 1st the discharge was monitored with Marsh-McBirney Model 256A flow meter. During the period of January 1st through June 1st the meter was active for one overflow event, continuously over a two-day period. The event was caused by a series of snowstorms that deposited more than 36 inches of snow. Each day the snow total was core sampled, and melted to determine how much rainfall the snow represented. This water was effectively stored on the surface of the ground until the temperatures increased and rain began to fall. There are many possible sources of interference with this method of determining the amount of water the snowfall represented. However it was the best and perhaps only method available to collect data for these events. The following table details the precipitation pattern.

Date	Precipitation	Snow\Rain
12/23/96	.13	Snow
12/24/96	.28	Snow
12/29/96	.35	Snow
12/30/96	.70	Snow
12/31/96	.24	Rain
1/1/97	.40	Rain
1/2/97	.01	Rain

The total precipitation quantity that fell as snow during these storm events was equivalent to 1.46 inches of rain. This was followed by .65 inches of rain. These events resulted in on overflows as follows:

Date	Overflow Volume
1/1/97	42,033 gallons
1/2/97	22,492 gallons
TOTAL	64,525 gallons

Total rainfall measured in 1997 was 26.3 inches, with the snow that was stored from the last week of December 1997; the total annual precipitation that effected CSO activity for 1997 was 27.76 inches.

Discharge from this CSO can be caused by failure of an adjacent wastewater pump station. No overflow events occurred in 1997 as a result of failure of the pump station.

COMPARISON TO BASELINE

Annual precipitation was slightly more in 1997 than in 1995 or 1996, and the total annual overflow volume was also higher in 1997 than in 1995 or 1996. There is however no comparable event in 1995 or 1996, to the combination of snow and rainstorms that caused the overflow event in 1997. Overflow events and the annual baseline are charted and included at the end of this section.

**DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE
CONDITION, DISCHARGE NO. 003, "M" AVE. CSO**

The flow meter is routinely read on a monthly basis. During the time period between October 6th to November 25th the flow meter was out of service.

Rainfall records of the time period of October 6th to November 25th indicate that one significant rainfall event occurred. However a storm event in February which resulted in more rainfall did not cause any overflow. The following tables details the two events:

Date	Rainfall	Overflow Volume
2/11/97	0.58"	0 gallons
2/12/97	0.10"	0 gallons
2/12/97	0.26"	0 gallons
2/13/97	1.06"	0 gallons
TOTAL	2.00"	0 gallons

Date	Rainfall	Overflow Volume
10/28/97	0.40"	Not recorded
10/29/97	0.85"	Not recorded
10/30/97	0.31"	Not recorded
TOTAL	1.56"	Not recorded

As the above information reveals, it is not likely that the CSO was active for the rainfall event that occurred during the period that the flow meter was out of service.

During 1997, the meter was active for one overflow event, continuously over a two-day period. The event was caused by a series of snowstorms that deposited more than 36 inches of snow. Each days snow total was core sampled, and melted to determine how much rainfall the snow represented. This water was effectively stored on the surface of the ground until the temperatures increased and rain began to fall. There are many possible sources of interference with this method of determining the amount of water the snowfall represented. However it was the best and perhaps only method available to collect data for these events. The following table details the precipitation pattern.

Date	Precipitation	Snow\Rain
12/23/96	.13	Snow
12/24/96	.28	Snow
12/29/96	.35	Snow
12/30/96	.70	Snow
12/31/96	.24	Rain
1/1/97	.40	Rain
1/2/97	.01	Rain

The total precipitation quantity that fell as snow during these storm events was equivalent to 1.46 inches of rain. This was followed by .65 inches of rain. These events resulted in overflows as follows:

Date	Overflow Volume
1/1/97	366,667 gallons
1/2/97	179,440 gallons
TOTAL	546,107 gallons

Total rainfall measured in 1997 was 26.3 inches, with the snow that was stored from the last week of December 1997; the total annual precipitation that effected CSO activity for 1997 was 27.76 inches.

COMPARISON TO BASELINE

The 1995 CSO report detailed three overflow events that were from unknown causes. It was stated in that report that the City would aggressively pursue any events of unknown cause in the future. No events of unknown cause were recorded in 1996 or in 1997.

Annual rainfall was slightly less in 1996 than in 1995, and the total annual overflow volume was also slightly less in 1996 than in 1995. Overflow events and the annual baseline are charted and included at the end of this section.

1997
**DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE
CONDITION, DISCHARGE NO. 004, "Q" AVE. CSO**

NPDES permit number WA-002025-7, condition S-12 required the City of Anacortes to commence monitoring of CSO outfall #004 (#004) no later than October 1, 1996. The City has not met this requirement.

CSO #004 is located on Port of Anacortes property leased to Dakota Creek Industries, Inc. (DCI). DCI is operating a shipyard on this site. The outfall pipe for #004 is located directly underneath the facility referred to as the syncro lift. The syncro lift facility is used to haul ships up to 275 feet long and 75 feet wide, weighing up to 5000 tons out of the water for maintenance. The ships are lifted out of the water on a platform. The ships then can be rolled off of the platform across a set of heavy rails. The CSO manhole containing the overflow weir is beneath the rails that carry the ships off of the syncro lift platform.

The method of flow measurement used in the past at this CSO was to measure the elevation of water above the overflow weir. When the syncro lift was installed the outfall pipe was damaged. Due to the damage to the pipe, there is not a free fall of water on the downstream side of the weir. Weir overflow rates cannot be accurately determined unless the water is allowed to fall freely downstream of the weir. Therefore, in the current configuration accurate flow measurement is not possible. Repairs will need to be made to the outfall pipe.

Repairing the outfall pipe requires that the syncro lift be taken out of operation, the heavy rail system must be removed to provide access to the pipe and overflow structure. This obviously will have significant impact on DCI. The syncro lift provides a large portion of DCI's business. To force the shut down of the syncro lift would cause unacceptable economic hardship on DCI. And as a major employer, the negative impact on DCI would have far reaching effects on the local economy.

DCI plans to (and is required to) take the syncro lift out of service in the near future, within the next two or three years, to make improvements that allow ship bottom wash water to be captured and treated. While the syncro lift is out of service, making repairs and improvements to the CSO could be accomplished without economic hardship to DCI and the local economy.

The City reported in the 1996 CSO report that discharge #004 would be monitored for frequency and duration (but not volume) during 1997. Due to difficulty coordinating this work with DCI, the equipment to perform this was not installed until January of 1998. As of the writing of this report the CSO is being monitored for frequency and duration.

CSO REDUCTION ACCOMPLISHMENTS

A storm water catch basin that was tied into the sanitary sewer has been identified in the drainage basin served by discharge #002. This connection was eliminated by the construction of a storm sewer to serve this catch basin. The new storm sewer reduced flows to CSO discharge #002. Since the drainage basin served by discharge #002 flows to a pump station that pumps into the drainage basin served by CSO discharge #003, this storm flow reduction will also reduce storm flows to CSO discharge #003.

An AC powered flow meter was installed on discharge #002 in 1997. The new meter has provided improved reliability, immediate real time reporting and alarm capability of CSO overflow events, as well as immediate reporting of meter malfunctions. This should minimize the possibility of unmeasured CSO overflow events.

PLANNED IMPROVEMENTS

The improvements planned for 1998 are as follows:

1. Install frequency of discharge monitoring on discharge #004.
2. Study the collection system to determine the appropriate location of future repairs to reduce inflow and infiltration.