



City of Spokane

Wastewater Management



Combined Sewer Overflow Annual Report – FY 2003

July 1, 2004

City of Spokane
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 Wastewater Management Department

1) **Introduction:** There are 24 permitted outfalls associated with the City of Spokane’s combined sewer collection system. These are identified in the City’s NPDES Permit No. WA-002447-3 and are listed as follows:

OUTFALL NUMBER	OVERFLOW STRUCTURE DESCRIPTION	OUTFALL DESCRIPTION
Discharges to Spokane River (North Bank)		
002	Hartley @ NW Blvd.	0.5 miles downstream of WWTP
003	Assembly @ NW Blvd Albi Assembly @ NW Blvd - Royal Ct	0.2 miles downstream of WWTP
006	Kiernan @ NW Blvd	0.25 miles upstream of WWTP
007	Columbia Circle @ NW Blvd	0.4 miles upstream of WWTP
010	Cochran @ Buckeye	At Downriver Bridge
012	Nora @ Pettet Dr	0.55 miles upstream of Bridge
014	Sherwood @ Summit	2.0 miles upstream of Bridge
015	Ohio @ Nettleton	2.5 miles upstream of Bridge
Discharges to Spokane River (South Bank)		
016	'A' @ Linton - Westgrove 'A' @ Linton - Geiger	1.45 miles downstream of Monroe St Dam
018	'A' @ Linton - Federal	1.45 miles downstream of Dam
Discharges to Latah Creek		
019	Seventh @ Cannon	At High Bridge (East Side)
020	S.Manito Relief Sewer	2.65 miles upstream of High Bridge
Discharges to Spokane River (South Bank)		
022	Main @ Oak	0.7 miles downstream at Monroe St Dam
Discharges to Spokane River (North Bank)		
023	Cedar @ Ide	0.3 miles downstream at Monroe St Dam
Discharges to Spokane River (South Bank)		
024	Cedar @ Riverside Cedar @ Riverside	0.3 miles downstream at Monroe St Dam
025	Cedar @ Main	0.3 miles downstream at Monroe St Dam
026	Lincoln @ Spokane Falls Blvd	At Monroe St Dam
033	Fifth @ Arthur Third @ Perry Third @ Arthur First @ Arthur	0.15 miles upstream of J. Keefe Bridge
034	Crestline @ Riverside	At Trent Bridge
038	Magnolia @ S. Riverton	0.15 miles upstream of Mission
039	Altamont @ S. Riverton	0.5 miles downstream of Greene
040	Regal @ S. Riverton	0.25 miles downstream of Greene
Discharges to Spokane River (North Bank)		
041	Rebecca @ Upriver Dr	0.5 miles upstream of Greene
Discharges to Spokane River (South Bank)		
042	Surro Dr	0.5 miles downstream of Upriver Dam

Outfall Number 003 was functionally eliminated as a CSO overflow point upon completion of the CSO 2&3c Control Facility, which discharges only to Outfall Number 002. Corresponding separation in CSO Basin 3B made that Regulator inactive. Upon physical elimination of Regulator 3B in 2004, the City will formally request Outfall Number 003 and Regulator 3B be removed from the NPDES Permit. CSO Outfall 003 and CSO Regulator 3B are treated as permitted facilities in this 2003 Report and their elimination will be reflected in the 2004 Report.

The combined sewer system is comprised of approximately 400 miles of sewers. The system includes 30 combined sewer overflow regulating structures which periodically overflow via the 24 outfalls listed in the table above. Regulators that overflow to a common outfall are 2 and 3c; 16a and 16b; 24a and 24b; and 33a, 33b, 33c, and 33d. Flow from basin 18 is diverted into a line upstream of 16b and is thus regulated at 16b.

The interceptor system has two (2) in-line pump stations located downstream of CSO regulators. Regulators 16a, 16b, 18, and 19 are all located upstream from the Clarke Avenue Pump Station. Similarly, Regulators 22b and 25 are located upstream of the Elm Street Pump Station.

The NPDES Permit requires the City to submit a Combined Sewer Overflow Report annually. This report is to detail the past year's frequency and volume of combined sewage discharged from each CSO outfall. Field monitoring is required to determine these parameters. The monitors will also determine the duration of the overflows. The City has developed a report format to summarize this information.

In addition to flow monitoring, the City collects rainfall data from nine (9) gauges distributed throughout the City and also utilizes records from the Spokane International Airport, National Weather Service, and Airway Heights' weather stations. Overflow and rainfall data are collected, analyzed, and archived for future use. Some rain gauges are heated, which helps differentiate snow or snowmelt from rain.

2) Baseline Conditions: The 1979 CSO Abatement Plan, the 1994 CSO Reduction Plan, or subsequent analyses, did not establish a combined sewer overflow baseline for frequency of occurrence or volume of discharge from each CSO regulator. Consequently, a baseline condition is not available to assess the status of system performance in comparison with the past. The methodology for identifying the base line conditions for each CSO outfall will be developed as part of the CSO program efforts currently underway.

The 1994 CSO Reduction Plan provides an average annual volume and frequency, which can be used as a benchmark to compare or evaluate the current outfall performance. These values are presented on the following table:

Average Annual CSO Volumes and Frequencies¹

CSO No.	CSO Location	Annual Overflow Volume (MG) ²	Annual Frequency of Overflows ²
2	NW Blvd. @ Hartley	1.72	40
3b	NW Blvd. @ Assembly	0.00	1
3c	NW Blvd. @ Assembly	1.94	51
6	Kiernan @ NW Blvd.	14.12	34
7	Columbia Circle	0.81	13
10	Cochran @ Buckeye	0.27	7
12	Nora @ Pettet	9.65	35
14	Sherwood @ Summit	0.86	17
15	Nettleton @ Ohio	4.47	34
16a	“A” St. @ Linton	0.01	0
16b	“A” St. @ Linton	0.50	12
18	1 st St. @ “A” St.	0.00	1
19	Under FW Bridge	0.00	0
20	High Dr. near 33 rd	0.55	3
22	Main @ Oak St.	0.00	0
23	Cedar @ Ide	1.69	18
24a	Cedar @ Riverside	2.12	3
24b	Cedar @ Riverside	0.00	0
25	Cedar @ Main	0.35	19
26	Lincoln @ Spokane Falls	19.73	15
33a	5 th @ Arthur	0.00	0
33b	3 rd @ Perry	2.30	5
33c	3 rd @ Arthur	0.12	11
33d	1 st @ Arthur	2.03	42
34	Riverside @ Napa/Crestline	11.78	13
38	Magnolia @ S. Riverton	0.28	10
39	Altamont @ S. Riverton	1.06	34
40	Regal @ S. Riverton	1.45	32
41	Rebecca @ Upriver Dr.	0.52	11
42	Surro @ S. Riverton	0.31	7
Total		78.64	468

1 From 1994 Combined Sewer Overflow Reduction Plan, City Project No. 13918, Table 7-1.

2 With Snow Melt.

The annual frequency and volume depicted on this table is based upon a simulation of actual rainfall data over a ten-year period (1979 thru 1988). Precipitation data was used to calibrate the model to the monitored flows recorded for the 1994 Plan.

3) Combined Sewer Overflows:

In accordance with the requirements of the City of Spokane's NPDES Permit for combined sewer overflow discharges, summarized below are the frequencies, volumes and durations of CSO events recorded from January 1 through December 31, 2003. It is estimated that a **total of 45.1 million gallons** of wet weather induced combined sewage discharged to local receiving waters over these twelve months. These discharges were all associated with snowmelt and/or rain events and distributed across twenty-one (21) of the 24 permitted CSO outfalls as shown below.

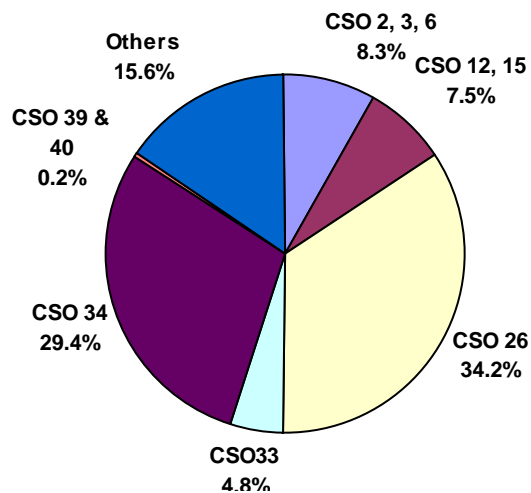
Discharges at the ten (10) priority CSO regulator sites accounted for 80 percent of the total overflow volume measured.

Detailed information on individual CSO events is provided in Appendix "A" to this report.

Dry weather overflows occurred in 2003 as follows: CSO 12 on January 6 and April 23; CSO 14 on August 5 and 7; CSO 15 on April 12; CSO 16B on February 1; and CSO 25 on seventeen (17) occasions from May 27 to August 17. The events at CSOs 12, 14, 15 and 16B resulted from apparent

obstructions at these weirs. The recurring problem at CSO 25 was attributed to root intrusion causing intermittent blockage of the downstream connecting pipe and flow to back up into the diversion structure. Nearby construction activities upstream, may have contributed. CSO 25 overflows were sporadic and tended to clear themselves between inspections, hence only two were observed. Despite increased inspection frequency, some events occurred between inspections and were discovered when the monitoring data was analyzed for the monthly reports. The roots were discovered and removed in July. An overflow telemetry alarm was installed in September and no subsequent dry weather alarms occurred. Review of the 2003 monitoring data for this Report revealed additional dry weather overflows at CSO 25, yet the total volume is now estimated to be lower than first reported to Ecology. Revised monthly reports will be posted on the City's website.

In addition to the events above, two (2) minor dry weather overflow events resulted from maintenance. Flushing of the line upstream of CSO 25 caused an event at that site and flushing debris out of the CSO 40 Regulator caused an event there. The City added another manhole near CSO 40 to improve maintenance access. Continued tracking of these minor upsets continues to provide collection system staff valuable information to help protect the regulator structures during routine maintenance operations. About 1,500 gallons overflowed as a result of unforeseen system response to routine maintenance during dry weather in FY 2003. (See Appendix "B")



Regarding the CSO Sampling Plan, the goal to sample two (2) times during high river flow was not achieved in 2003, owing partly to ambiguous criteria in the Plan and partly to divided City priorities between sampling for CSO purposes and sampling for separated stormwater purposes. The priority for CSO sampling was re-established in 2003 and revisions to the CSO Sampling Plan made by the City were approved by Ecology. The goal to sample five (5) times during low river flow was achieved in 2003.

**Summary of Monitored
CSO Frequencies & Volumes**

January 2003 through December 2003

CSO OUTFALL	UPSTREAM REGULATOR ID²	MONITORED CSO VOLUME (gallons)	MONITORED CSO FREQUENCY (No. of Occurrences)	MONITORED CSO DURATION (minutes)
02	02	0	0	0
03	03B	Not monitored in 2003		
	03C	0	0	0
	Total:	0	0	
06	06	3,740,425	24	6,205
07	07	256,748	14	2,295
10	10	135,967	10	1,400
12	12	3,254,487	34	9,590
14	14	171,527	20	8,126
15	15	113,772	11	1,035
16	16A	Not monitored in 2003		
	16B	393,017	11	13,405
	Total:	393,017	11	
18	18	All flow diverted to 16B		
19	19	0	0	0
20	20	Not monitored until Oct 2003; no 4 th qtr overflows		
22	22B	9,832	2	35

CSO OUTFALL	UPSTREAM REGULATOR ID ²	MONITORED CSO VOLUME (gallons)	MONITORED CSO FREQUENCY (No. of Occurrences)	MONITORED CSO DURATION (minutes)
23	23	1,486,057	20	3,030
24	24A	3,968,857	20	4,765
	24B	20,276	9	725
	Total:	4,169,133	33	
25	25	435,148	44	12,985
26	26	15,395,755	24	4,585
33	33A	18,039	6	590
	33B	1,831,053	5	300
	33C	14,724	4	230
	33D	306,293	28	21,250
	Total:	2,170,109	38	
34	34	13,232,036	18	3,235
38	38	53,444	14	3,885
39	39	23,854	5	670
40	40	71,273	21	3,605
41	41	131,801	10	845
42	42	0	0	0
TOTAL:		45,064,385	354	

1. Tabulated information compiled from flow monitoring data collected between January 2003 and December 2003.
2. Ten (10) priority flow monitoring sites identified in **BOLDFACE** type.

4) CSO Control Projects Completed in 2003:

CSO NPDES BASIN NO.	LOCATION OF IMPROVEMENT	WATER BODY	CONTROL METHOD
26	Central Business District & surrounding area	Spokane River	I/I – Line repair and seal
26	Cowley Creek at 7 th & Division – Construction	Spokane River	System Reconfiguration – inflow reduction
26	Big Easy – Sprague & Lincoln	Spokane River	Flow Control – Private storm detention tank
26	Blue Chip Condo. at 1 st & Adams	Spokane River	Flow Control – Private storm detention tank
26	Davenport Hotel – Post & Sprague	Spokane River	Flow Control – Reduce pumping rate from private storm detention & retention tank
34	Lincoln Heights Sub-basin – 25 th to 34 th Ave. & Ray St. to S.E. Blvd.	Spokane River	Flow Control – Storm separation and connection to Retention/Detention Pond
All* (50% done)	City of Spokane Interceptor System (Design Layout)	Spokane River Latah Creek	Flow Control – Begin Multi-year Large Line inspection program

** Project began in 2003. Inspection Program uses sonic or other remote sensing equipment to assess the condition of the main interceptors and trunks, thus allowing for accurate modeling and calibration of the system as well as identification of projects to maintain and/or restore capacity for future sanitary and combined sewer flows.*

The City of Spokane previously completed nearly \$50 million in capital improvements to reduce combined overflows to the Spokane River through the separation of the north side of town with new storm sewer projects, constructed during the period of 1983 – 1992. This has reduced combined sewer overflows on average by an estimated 491 million gallons per year. This represents an 86% reduction of volume. The City’s achievements for FY 2003 are detailed above.

This table lists the CSO Control projects scheduled for 2004:

CSO NPDES BASIN NO.	LOCATION OF IMPROVEMENT	WATER BODY	CONTROL METHOD
26	Deaconess Parking and Doctors Bldg	Spokane River	Flow Control – private storm detention tank
26	Center Place (old Newberry's)	Spokane River	Partial Separation & Flow Control – private storm detention tank
26	St. Ann Childrens' Center	Spokane River	Flow Control – private storm detention tank
26	Starbucks (2 nd & Division)	Spokane River	Partial Separation & Flow Control – private storm detention tank
26	Former "Gold Coin Grocery" Bldg, 3 rd & Division	Spokane River	Flow Control – private storm detention tank
26	American West Bank, Sprague & Browne	Spokane River	Flow Control – private storm detention tank
26	Havermale Center Sprague & Browne	Spokane River	Flow Control – private storm detention tank
16a/16b/18	Riverside and Clarke	Spokane River	Design/begin constructing 192,000 gallon in-line storage facility (est. \$2.5M.) Eliminate CSO Outfalls #16a and #18
16a	Riverside and Clarke	Spokane River	Separated existing storm inlet from combined sewer
All* (50% left)	City of Spokane Interceptor System (Design Layout)	Spokane River Latah Creek	Flow Control – Begin Multi-year Large Line inspection program

** Inspection Program begun in 2003 will continue in 2004, depending on availability of adequate equipment and contractors to inspect the remaining large pipes with high or deep flows. See previous table's footnote for project description.*

Appendix “A”

Detailed CSO Event Information
Monthly Reports
January through December - FY 2003

Individual copies of the CSO monthly reports are available at www.spokanewastewater.org or by calling City of Spokane Wastewater Management at (509) 625-7900.

Appendix “B”

Maintenance & Customer Service Summary

January through December - FY 2003

(One (1) page)

CSO	Date	Overflow	Duration	Activity	
CSO25	08/26/2003	1,293	25	Hydroing	
CSO40	11/04/2003	196	35	Hydroing to clear obstruction	