

**CITY OF SPOKANE,  
WASHINGTON**

**CSO FLOW MONITORING PROJECT**

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**FLOW, FREQUENCY AND DURATION**

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**SEWER MAINTENANCE**

**Monthly Report  
March 2007**

May 15, 2007  
*CSOMonthly2007-03.doc*

## OVERFLOW EVENTS

Table 1 – Flow-Frequency-Duration, provides a summary of the flow volume calculated for the overflow pipes at each site for each event recorded. The flow calculations are based on flow monitor recorded level and velocity measurements. See Attachment A for a summary of the precipitation volumes.

**Table 1 – Flow-Frequency-Duration**

	Location	CSO#	Freq.	Date of Event <sup>1</sup>	Estimated <sup>2</sup> Total Flow (Gallons)	Event Duration (Minutes)	Comments
1.	AL Parkway Storage (West)	2	None				Missing data 3/13 14:15 to 3/13 14:20
2.	NW Blvd @ Kiernan	6	2	Total	5,942	200	Missing data 3/13 08:25 to 3/13 08:30
				3/19	5,383	120	
				3/24	559	80	
3.	Columbia @ Downriver	7	None				Missing data 3/13 08:15 to 3/13 08:20 Missing data 3/13 14:00 to 3/13 14:05
4.	Nettleton @ York/Buckeye	10	None				Missing data 3/14 07:40 to 3/14 07:45 Missing data 3/15 10:20 to 3/15 11:15
5.	Nora @ Pettet	12	3	Total	21,868	280	Missing data 3/13 09:20 to 3/13 09:25
				3/16	1,746	55	
				3/19	16,822	130	
				3/24	3,300	95	
6.	Sherwood @ Summit	14	1	Total	293	35	Missing data 3/13 09:30 to 3/13 09:35
				3/19	293	35	
7.	Nettleton @ Ohio	15	None				Missing data 3/13 09:40 to 3/13 09:45
8.	A @ Linton	16B	None				Missing data 2/27 10:55 to 3/19 10:50 Due to CSO tank construction.
9.	7 <sup>th</sup> @ Inland Empire	19	None				Missing data 3/6 08:40 to 3/6 08:45
10.	3500 High Drive	20	None				Missing data 3/6 09:15 to 3/6 09:20 Missing data 3/30 12:30 to 3/30 13:25

<sup>1</sup> Designation as an event means that both a level and velocity reading were recorded concurrently. Not all level and velocity readings that were coincident are included in this report, however. The level and velocity readings that appear to be “background noise” from the electronic equipment are not included in the table.

<sup>2</sup> The flows presented in this column are calculated from measurements of velocity and depth of flow by electronic devices inserted in the water stream. These measurements are subject to singular and possibly cumulative errors. These errors result from limitations inherent in the measuring devices and from the introduction of a measuring device in to the physical flow stream. Also, error in velocity and depth measurements may be and typically are introduced by the physical conditions of each site. The flow numbers presented in this table are estimates only.

	Location	CSO#	Freq.	Date of Event <sup>1</sup>	Estimated <sup>2</sup> Total Flow (Gallons)	Event Duration (Minutes)	Comments
11.	Main @ Oak	22B	None				Missing data 3/13 10:15 to 3/13 10:20
12.	Cedar @ Ide	23	1	Total	4,185	60	Missing data 3/13 09:50 to 3/13 09:55
				3/19	4,185	60	
13.	Riverside @ Cedar	24A	1	Total	13,299	35	Missing data 3/13 10:50 to 3/13 10:55
				3/7	13,299	35	
14.	Riverside @ Cedar	24B	None				Missing data 3/13 10:50 to 3/13 10:55
15.	Cedar @ Main	25	1	Total	606	30	Missing data 3/13 10:10 to 3/13 10:15
				3/19	606	30	
16.	Riverside @ Lincoln	26	2	Total	62,318	100	Missing data 3/13 12:25 to 3/13 12:30
				3/7	8,564	20	
				3/19	53,754	80	
17.	Arthur @ 5 <sup>th</sup>	33A	1	Total	588	20	
				3/7	588	20	
18.	Perry @ 3 <sup>rd</sup>	33B	None				Missing data 3/6 13:30 to 3/6 13:35
19.	Arthur @ 3 <sup>rd</sup>	33C	None				Missing data 3/6 13:35 to 3/6 13:40
20.	Arthur @ 1 <sup>st</sup>	33D	3	Total	1,325	1,000	Missing data 3/6 13:45 to 3/6 13:50
				3/7	256	55	
				3/19	769	160	
				3/22	300	785	
21.	Riverside @ Napa/Crestline	34	1	Total	105	15	Missing data 3/6 12:35 to 3/6 12:40
				3/20	105	15	
22.	S. Riverton @ Magnolia	38	None				Missing data 3/6 12:00 to 3/6 12:05
23.	S. Riverton @ Altamont	39	None				Missing data 3/6 11:55 to 3/6 12:00
24.	S. Riverton @ Regal	40	None				Missing data 3/6 11:50 to 3/6 11:55
25.	Rebecca @ Upriver	41	None				Missing data 3/6 11:00 to 3/6 11:05
26.	Riverton @ Surro	42	None				Missing data 3/6 10:50 to 3/6 10:55
	<b>Monthly Total</b>		<b>16</b>		<b>110,529</b>	<b>1,775</b>	<b>No Dry Weather Overflows</b>

**Table 2 – Rainfall Summary<sup>3</sup>**

Date	1004 Rain	343 Rain	344 Rain	Shadle Rain	Hartson Rain	CityHall Rain	Joe_Albi Rain	RkwdVsta Rain	Station8 Rain	W_Drive Rain	Nora&Pet Rain	GEG Rain	Snow	Dpth	NWS Rain	Snow	Dpth
03/01/07	0	0.01	0	0	0	0	0	0	0	0	0	0	T	T	T	T	3
03/02/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03/03/07	0.02	0.03	0.03	0.02	0	0	0	0	0	0	0.04	0	0.02	0.1	0.02	T	2
03/04/07	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	2
03/05/07	0	0	0	0	0	0	0	0	0	0	0	0	T	0	T	0	1
03/06/07	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/07/07	0	0	OP	0	0.09	0	0	0.15	0.08	0	0	0	0.01	0	T	0	0
03/08/07	0	0	OM	0	0	0	0	0	0	0	0	0	T	0	0	0	0
03/09/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/10/07	0.05	0.04	OM	0.06	0.07	0.05	0.07	0.05	0.07	0.02	0.06	0	0.04	0	0.07	0	0
03/11/07	0.01	0.04	OM	0.02	0.03	0.02	0.02	0.04	0.03	0.02	0.02	0	0.01	0	0.01	0	0
03/12/07	0.01	0.01	OM	0	0.01	0.01	0	0	0.03	0.01	0.01	0	0.01	0	T	0	0
03/13/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/14/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	T	T	0
03/15/07	0.01	0.01	OM	0	0	0	0	0	0	0.01	0	0	0.05	0	0.08	0	0
03/16/07	0.19	0.21	OM	0.23	0.19	0.16	0.16	0.18	0.19	0.22	0.23	0	0.12	0	0.12	0	0
03/17/07	0.01	0	OM	0	0	0	0	0	0	0	0	0	T	0	0.01	0	0
03/18/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/19/07	0.03	0.09	OM	0.11	0.1	0.09	0.12	0.08	0.1	0.2	0.11	0	0.2	0	0.25	0	0
03/20/07	0.19	0.14	OM	0.1	0.14	0.1	0.11	0.11	0.22	0.18	0.13	0	0.02	0	0	0	0
03/21/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/22/07	0.04	0.08	OM	0.06	0.08	0.06	0.07	0.06	0.08	0.08	0.07	0	0.07	0	0.05	0	0
03/23/07	0.03	0	OM	0	0	0	0	0	0	0	0.01	0	T	0	T	0	0
03/24/07	0.06	0.08	OM	0.12	0.12	0.12	0.17	0.1	0.16	0.13	0.16	0	0.13	0	0.18	0	0
03/25/07	0.04	0.15	OM	0.08	0.13	0.11	0.08	0.12	0.15	0.19	0.11	0	0.14	0	0.08	0	0
03/26/07	0.07	0	OM	0	0	0	0	0	0	0	0	0	T	0	T	0	0
03/27/07	0.18	0.16	OM	0.13	0.09	0.07	0.19	0.07	0.08	0.15	0.15	0	0.18	0	0.22	0	0
03/28/07	0.01	0	OM	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0
03/29/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/30/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/31/07	0	0	OM	0	0	0	0	0	0	0	0	0	0	0	T	0	0
<b>Total</b>	<b>0.97</b>	<b>1.05</b>	<b>0.03</b>	<b>0.94</b>	<b>1.05</b>	<b>0.79</b>	<b>0.99</b>	<b>0.96</b>	<b>1.19</b>	<b>1.21</b>	<b>1.1</b>	<b>0.00</b>	<b>1.0</b>		<b>1.09</b>	<b>0.0</b>	

- E - Erroneous data
- M - Missing data
- P - Partial missing data
- T - Trace of rain/snow

**Table 3 – Rain Gauges**

1004	Airway Heights
343	23 <sup>rd</sup> & Ray
344	Division & Manito
Shadle	Shadle Water Tower (was 345)
Hartson	Ray & Hartson (was 346)
CityHall	City Hall (was 347)
Joe_Albi	Joe Albi Stadium
RkwdVsta	Rockwood Vista
Station8	Fire Station 8, Rebecca & Mission
W_Drive	West Drive Reservoir
Nora&Pet	Nora & Pettet
GEG	Spokane Airport
NWS	National Weather Service – Spokane

<sup>3</sup> Some rain gauges are heated. Consequently they will tend to record snow melt immediately as rain. The rain gauges that are not heated will typically register snow melt when it actually melts.