

**CITY OF SPOKANE,  
WASHINGTON**

**CSO FLOW MONITORING PROJECT**

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**FLOW, FREQUENCY AND DURATION**

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**SEWER MAINTENANCE**

**Monthly Report  
May 2009**

June 25, 2009  
*CSOMonthly2009-05.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				
2.	NW Blvd @ Kiernan	6	None				Missing data 5/4 09:15 to 5/4 09:20
3.	Columbia @ Downriver	7	None				Missing data 5/4 08:55 to 5/4 09:00
4.	Nettleton @ York/Buckeye	10	None				Missing data 5/4 10:05 to 5/4 10:10
5.	Nora @ Pettet	12	2	Total	12,090	330	Missing data 5/4 10:25 to 5/4 10:30
				5/4	5,687	185	
				5/13	6,403	145	
6.	Sherwood @ Summit	14	1	Total	1,432	115	Missing data 5/4 10:40 to 5/4 10:45 Missing data 5/19 12:40 to 5/19 12:55
				5/14	1,432	115	
7.	Nettleton @ Ohio	15	None				Missing data 5/4 10:55 to 5/4 11:00
8.	A @ Linton	16B	None				Missing data 5/4 14:05 to 5/4 14:10
9.	7 <sup>th</sup> @ Inland Empire	19	None				
10.	3500 High Drive	20	None				Missing data 5/11 09:05 to 5/11 09:15 Missing data 5/26 09:00 to 5/26 09:10
11.	Main @ Oak	22B	None				Missing data 5/4 13:35 to 5/4 13:40
12.	Cedar @ Ide	23	1	Total	729	30	Missing data 5/4 11:25 to 5/4 11:30
				5/14	729	30	

<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
13.	Riverside @ Cedar	24A	1	Total	909	70	Missing data 5/4 14:30 to 5/4 14:35
				5/14	909	70	
14.	Riverside @ Cedar	24B	None				Missing data 5/4 14:35 to 5/4 14:40
15.	Cedar @ Main	25	1	Total	198	25	
				5/5	198	25	
16.	Riverside @ Lincoln	26	2	Total	228,031	225	Missing data 5/4 12:45 to 5/4 12:50
				5/4	101,678	95	
				5/13	126,353	130	
17.	Arthur @ 5 <sup>th</sup>	33A	None				Missing data 5/11 15:10 to 5/11 15:15 Missing data 5/26 11:20 to 5/26 11:25
18.	Perry @ 3 <sup>rd</sup>	33B	None				
19.	Arthur @ 3 <sup>rd</sup>	33C	None				Missing data 5/11 15:05 to 5/11 15:10 Missing data 5/26 10:50 to 5/26 10:55
20.	Arthur @ 1 <sup>st</sup>	33D	2	Total	3,470	115	Missing data 5/11 15:20 to 5/11 15:25 Missing data 5/26 11:00 to 5/26 11:05
				5/4	1,806	45	
				5/13	1,664	70	
21.	Riverside @ Napa/Crestline	34	2	Total	52,135	60	Missing data 5/26 10:40 to 5/26 10:45
				5/6	51,120	40	
				5/14	1,015	20	
22.	S. Riverton @ Magnolia	38	None				Missing data 5/26 10:35 to 5/26 10:40
23.	S. Riverton @ Altamont	39	None				Missing data 5/11 14:05 to 5/11 14:10
24.	S. Riverton @ Regal	40	None				
25.	Rebecca @ Upriver	41	None				
26.	Riverton @ Surro	42	None				Missing data 5/11 11:10 to 5/11 11:15
	<b>Monthly Total</b>		<b>12</b>		<b>298,994</b>	<b>970</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
05/01/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/02/09	0.06	0.05	0.03	0.05	0.04	0.05	0.07	0.05	0.04	0.08	0.06	0.08	0	0	0.12	0	0
05/03/09	0.08	0.1	0.05	0.1	0.11	0.09	0.09	0.1	0.12	0.1	0.12	0.05	0	0	0.08	0	0
05/04/09	0.18	0.18	0.08	0.14	0.18	0.18	0.18	0.18	0.3	0.28	0.18P	0.18	0	0	0.36	0	0
05/05/09	0.03	0.09	0.07	0.02	0.09	0.04	0.03	0.08	0.09	0.14	0.04	0.04	0	0	0.01	0	0
05/06/09	0.14	0.24	0.13	0.13	0.2	0.18	0.2	0.17	0.32	0.29	0.17	0.14	0	0	0.21	0	0
05/07/09	0	0	0	0	0	0	0	0	0.02	0	0	T	0	0	0.09	0	0
05/08/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/09/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/10/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/11/09	0	0.04	0.01	0	0.03	0.01	0	0.01	0.08	0.01	0	T	0	0	T	0	0
05/12/09	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
05/13/09	0.17	0.13	0.07	0.1	0.14	0.11	0.15	0.13	0.26	0.27	0.13	0.21	0	0	0.25	0	0
05/14/09	0.24	0.33	0.14	0.22	0.32	0.22	0.29	0.31	0.47	0.35	0.22	0.23	0	0	0.15	0	0
05/15/09	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/16/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/17/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/18/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/19/09	0	0	0	0	0	0	0	0	0	0.01	0	T	0	0	T	0	0
05/20/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
05/21/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/22/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/23/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/24/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/25/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/26/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/27/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/28/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/29/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/30/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/31/09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0.91</b>	<b>1.16</b>	<b>0.58</b>	<b>0.76</b>	<b>1.11</b>	<b>0.88</b>	<b>1.01</b>	<b>1.03</b>	<b>1.7</b>	<b>1.53</b>	<b>0.92</b>	<b>0.93</b>	<b>0.0</b>		<b>1.27</b>	<b>0.0</b>	

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

**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.