

CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
July 2007**

September 10, 2007
(Revised: November 16, 2007)
CSOMonthly2007-07revised.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 ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
1.	AL Parkway Storage (West)	2	None				
2.	NW Blvd @ Kiernan	6	1	Total	237	80	Missing data 7/2 09:00 to 7/2 09:05
				7/19	237	80	
3.	Columbia @ Downriver	7	None				Missing data 7/18 12:55 to 7/18 14:40 Missing data 7/31 08:40 to 7/31 09:10
4.	Nettleton @ York/Buckeye	10	None				
5.	Nora @ Pettet	12	2	Total	110,267	235	Missing data 7/2 09:50 to 7/2 09:55 Missing data 7/23 10:00 to 7/23 10:40
				7/13	108,227	90	
				7/19	2,040	145	
6.	Sherwood @ Summit	14	None				Missing data 7/2 10:00 to 7/2 10:05
7.	Nettleton @ Ohio	15	None				Missing data 7/23 10:10 to 7/23 10:45
8.	A @ Linton	16B	None				Missing data 7/2 13:05 to 7/2 13:10
9.	7 th @ Inland Empire	19	None				Missing data 7/10 08:15 to 7/10 08:20 Missing data 7/25 14:00 to 7/25 14:10
10.	3500 High Drive	20	None				Missing data 7/10 10:35 to 7/10 10:40
11.	Main @ Oak	22B	None				

¹ 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.

² 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 ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
12.	Cedar @ Ide	23	1	Total	35,404	215	Missing data 7/15 13:25 to 7/16 09:50
				7/13	35,404	215	
13.	Riverside @ Cedar	24A	1	Total	39,656	35	
				7/13	39,656	35	
14.	Riverside @ Cedar	24B	1	Total	2,303	20	Missing data 7/2 13:20 to 7/2 13:25
				7/13	2,303	20	
15.	Cedar @ Main	25	2	Total	26,660	1,285	Missing data 7/23 13:00 to 7/23 13:45
				7/13	22,986	35	
				7/30	3,674	1,250	Dry Weather Overflow; DOE letter sent 8/3
16.	Riverside @ Lincoln	26	2	Total	1,040,158	70	
				7/13	1,035,315	50	
				7/19	4,843	20	
17.	Arthur @ 5 th	33A	1	Total	4,948	30	Missing data 7/26 08:35 to 7/26 08:45 Missing data 7/27 08:55 to 7/27 09:40
				7/13	4,948	30	
18.	Perry @ 3 rd	33B	None				
19.	Arthur @ 3 rd	33C	1	Total	556	10	Missing data 7/10 12:55 to 7/10 13:00 Missing data 7/13 08:50 to 7/13 09:15 Missing data 7/26 07:55 to 7/26 08:30
				7/13	556	10	
20.	Arthur @ 1 st	33D	2	Total	4,719	180	
				7/13	3,964	40	
				7/19	755	140	
21.	Riverside @ Napa/Crestline	34	None				Missing data 7/10 12:35 to 7/10 12:40 Missing data 7/12 14:15 to 7/12 14:50
22.	S. Riverton @ Magnolia	38	1	Total	10,967	55	
				7/13	10,967	55	
23.	S. Riverton @ Altamont	39	1	Total	649	10	Missing data 7/10 12:20 to 7/10 12:25
				7/13	649	10	
24.	S. Riverton @ Regal	40	1	Total	1,334	40	Missing data 7/10 12:10 to 7/10 12:15
				7/30	1,334	40	Dry Weather Overflow; DOE letter sent 8/3

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	Location	CSO#	Freq.	Date of Event ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
25.	Rebecca @ Upriver	41	1	Total	2,119	25	Missing data 7/5 13:20 to 7/5 14:35 Missing data 7/10 12:05 to 7/10 12:10 Missing data 7/12 09:35 to 7/12 10:10
				7/13	2,119	25	
26.	Riverton @ Surro	42	None				Missing data 7/10 11:55 to 7/10 12:00 Missing data 7/12 10:25 to 7/12 11:05
	Monthly Total		18		1,279,977	2,290	2 Dry Weather Overflows

Table 2 – Rainfall Summary³

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
07/01/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/02/07	0.02	0.02	0.01	0	0.03	0	0.01	0.03	0.07	0.02	0.02	0.03	0	0	0	0	0
07/03/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/04/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/05/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/06/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/07/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/08/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/09/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/10/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/11/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/12/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/13/07	0.03	0.04	0.1	0	0.04	0.44	0.02	0.21	0.02	0.05	0.11	0.05	0	0	T	0	0
07/14/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/15/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/16/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/17/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
07/18/07	0.02	0	0	0	0	0	0	0	0	0.01	0	0.06	0	0	0.07	0	0
07/19/07	0.32	0.4	0.34	0.12	0.39	0.32	0.42	0.34	0.59	0.47	0.33	0.28	0	0	0.22	0	0
07/20/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/21/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
07/22/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/23/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/24/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/25/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/26/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/27/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/28/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/29/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/30/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07/31/07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.39	0.46	0.45	0.12	0.46	0.76	0.45	0.58	0.68	0.55	0.46	0.43	0.0		0.29	0.0	

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

Table 3 – Rain Gauges

1004	Airway Heights
343	23 rd & 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

³ 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.