

CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
August 2010**

September 27, 2010
CSOMonthly2010-08

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 Total Flow (Gallons) ²	Duration Event (Minutes)	Comments
1	AL Parkway Storage (West)	2	None				
2	NW Blvd @ Kiernan	6	None				Missing Data 08/02 14:50 to 08/02 14:55 Missing Data 08/21 03:00 to 08/21 03:05
3	Columbia @ Downriver	7	None				Missing Data 08/31 09:50 to 08/31 09:55
4	Nettleton @ York/Buckeye	10	None				Missing Data 08/16 09:00 to 08/16 09:05 Missing Data 08/31 09:55 to 08/31 10:00
5	Nora @ Pettet	12	1		1,500	180	Missing Data 08/09 13:15 to 08/09 13:20 Missing Data 08/16 09:05 to 08/16 09:10 Missing Data 08/23 14:10 to 08/23 14:15 Missing Data 08/31 10:00 to 08/31 10:05
				08/30	1,500	180	Gallons and time are estimated; DWO letter sent to Ecology on 09/07
6	Sherwood @ Summit	14	None				Missing Data 08/02 09:20 to 08/02 09:25 Missing Data 08/31 10:00 to 08/31 10:05
7	Nettleton @ Ohio	15	None				Missing Data 08/02 11:30 to 08/02 11:35 Missing Data 08/31 10:05 to 08/31 10:10
8	A @ Linton	16B	None				Missing Data 08/31 10:15 to 08/31 10:20
9	7th @ Inland Empire	19	None				Missing Data 08/09 08:10 to 08/09 08:15 Missing Data 08/31 09:20 to 08/31 09:25
10	3500 High Drive	20	None				Missing Data 08/02 09:35 to 08/02 09:40 Missing Data 08/09 08:50 to 08/09 08:55 Missing Data 08/23 14:10 to 08/23 14:15 Missing Data 08/31 09:20 to 08/31 09:25
11	Main @ Oak	22B	None				Missing Data 08/02 09:15 to 08/02 09:20 Missing Data 08/31 09:00 to 08/31 09:05

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.

August 2010

	Location	CSO	Freq	Date of event ¹	Estimated Total Flow (Gallons) ²	Duration Event (Minutes)	Comments
12	Cedar @ Ide	23	None				Missing Data 08/02 09:15 to 08/02 09:20 Missing Data 08/09 13:25 to 08/09 13:30 Missing Data 08/23 14:00 to 08/23 14:05 Missing Data 08/31 10:05 to 08/31 10:10
13	Riverside @ Cedar	24A	None				Missing Data 08/23 14:00 to 08/23 14:05 Missing Data 08/31 09:05 to 08/31 09:10
14	Riverside @ Cedar	24B	None				Missing Data 08/09 08:20 to 08/09 08:25 Missing Data 08/16 07:50 to 08/16 08:00 Missing Data 08/23 13:55 to 08/23 14:00 Missing Data 08/31 09:05 to 08/31 09:10
15	Cedar @ Main	25	None				Missing Data 08/09 13:30 to 08/09 13:35
16	Riverside @ Lincoln	26	None				Missing Data 08/02 09:10 to 08/02 09:15 Missing Data 08/16 09:20 to 08/16 09:25 Missing Data 08/23 13:55 to 08/23 14:00 Missing Data 08/31 10:10 to 08/31 10:15
17	Arthur @ 5th	33A	None				Missing Data 08/23 14:30 to 08/23 14:35 Missing Data 08/31 09:30 to 08/31 09:45
18	Perry @ 3rd	33B	None				Missing Data 08/31 09:35 to 08/31 09:40
19	Arthur @ 3rd	33C	None				
20	Arthur @ 1st	33D	None				Missing Data 08/02 09:40 to 08/02 09:45 Missing Data 08/09 13:00 to 08/09 13:05 Missing Data 08/31 09:45 to 08/31 09:50
21	Riverside @ Napa/Crestline	34	None				Missing Data 08/02 09:45 to 08/02 09:50 Missing Data 08/16 08:30 to 08/16 08:35 Missing Data 08/23 14:20 to 08/23 14:25
22	S. Riverton @ Magnolia	38	None				Missing Data 08/09 09:00 to 08/09 09:05 Missing Data 08/16 08:25 to 08/16 08:30 Missing Data 08/31 09:30 to 08/31 09:35
23	S. Riverton @ Altamont	39	None				Missing Data 08/24 09:20 to 08/24 09:25
24	S. Riverton @ Regal	40	None				CSO 40 under Construction Missing Data 08/04 13:10 to 08/04 14:20 Missing Data 08/31 09:40 to 08/31 13:35 Missing Data 08/31 14:20 to 08/31 14:25
25	Rebecca @ Upriver	41	None				Missing Data 08/16 08:05 to 08/16 08:10 Missing Data 08/31 09:15 to 08/31 09:20
26	Riverton @ Surro	42	None				Missing Data 08/16 08:20 to 08/16 08:25 Missing Data 08/31 09:25 to 08/31 09:30
	Monthly Total		1		1,500	180	1 Dry Weather Overflow

Table 2 – Rainfall Summary³

	1004	343	344	Shadle	Hartson	CityHall	Joe Albi	RkwdVsta	Station8	W_Drive	Nora&Pet	GEG			NWS		
Date	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Snw	Dpth	Rain	Snw	Dpth
08/01/10	0	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/02/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/03/10	0	0	0	0	0	0	0	0	0	0E	0	0	0	0	0	0	0
08/04/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/05/10	0	0.12	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0
08/06/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/07/10	0	0	0	0	0	0.02	0	0	0	0	0	T	0	0	T	0	0
08/08/10	0.04	0.05	0.05	0.02	0.05	0.04	0.01	0.05	0.05	0.03	0.05	0.03	0	0	0.01	0	0
08/09/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/10/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/11/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/12/10	0.02	0	0	0.01	0	0.01	0	0.01	0	0.02	0	0.02	0	0	0.01	0	0
08/13/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
08/14/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/15/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/16/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/17/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/18/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/19/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/20/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/21/10	0	0	0	0	0	0	0	0	0	0	0	T	0	0	0.01	0	0
08/22/10	0	0	0	0	0	0	0	0	0	0	0	T	0	0	T	0	0
08/23/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/24/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/25/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/26/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/27/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/28/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	T	0	0
08/29/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/30/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/31/10	0.12	0M	0.13	0.14	0.2	0.18	0.19	0.14	0.2	0.15	0.17	0.16	0	0	0.2	0	0
Total	0.18	0.18M	0.18	0.17	0.25	0.25	0.2	0.2	0.25	0.3E	0.05	0.21	0.0		0.23	0.0	

- 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 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.