

**CITY OF SPOKANE,
WASHINGTON**

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
January 2008**

March 14, 2008
CSOMonthly2008-01.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				Missing data 1/2 08:30 to 1/2 08:35
2.	NW Blvd @ Kiernan	6	2	Total	69,346	455	Missing data 1/2 08:50 to 1/2 08:55
				1/4	68,831	395	
				1/13	515	60	
3.	Columbia @ Downriver	7	None				Missing data 1/2 08:40 to 1/2 08:45
4.	Nettleton @ York/Buckeye	10	None				Missing data 1/2 09:10 to 1/2 09:15
5.	Nora @ Pettet	12	2	Total	42,962	320	Missing data 1/2 09:20 to 1/2 09:25
				1/4	38,049	220	
				1/14	4,913	100	
6.	Sherwood @ Summit	14	2	Total	2,301	430	Missing data 1/2 09:30 to 1/2 09:35
				1/3	2,015	365	
				1/14	286	65	
7.	Nettleton @ Ohio	15	None				
8.	A @ Linton	16B	None				Missing data 1/11 08:45 to 1/11 09:05
9.	7 th @ Inland Empire	19	None				Missing data 1/7 09:10 to 1/7 09:15 Missing data 1/17 13:45 to 1/17 14:30
10.	3500 High Drive	20	None				
11.	Main @ Oak	22B	None				Missing data 1/2 11:00 to 1/2 11:05

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.

	Location	CSO#	Freq.	Date of Event ¹	Estimated ² Total Flow (Gallons)	Event Duration (Minutes)	Comments
12.	Cedar @ Ide	23	2	Total	33,975	175	Missing data 1/3 13:50 to 1/3 13:55
				1/3	31,967	125	
				1/10	2,008	50	
13.	Riverside @ Cedar	24A	1	Total	47,256	160	Missing data 1/2 14:15 to 1/2 14:20
				1/4	47,256	160	
14.	Riverside @ Cedar	24B	None				Missing data 1/2 14:15 to 1/2 14:20 Missing data 1/3 09:25 to 1/3 10:55
15.	Cedar @ Main	25	1	Total	503	25	Missing data 1/2 10:55 to 1/2 11:00
				1/4	503	25	
16.	Riverside @ Lincoln	26	2	Total	205,117	140	Missing data 1/2 12:40 to 1/2 12:45
				1/4	204,236	130	
				1/14	881	10	
17.	Arthur @ 5 th	33A	None				Missing data 1/7 14:05 to 1/7 14:10
18.	Perry @ 3 rd	33B	None				
19.	Arthur @ 3 rd	33C	None				
20.	Arthur @ 1 st	33D	1	Total	1,385	90	Missing data 1/24 10:10 to 1/24 10:35
				1/4	1,385	90	
21.	Riverside @ Napa/Crestline	34	1	Total	364,692	120	Missing data 1/7 14:20 to 1/7 14:25
				1/4	364,692	120	
22.	S. Riverton @ Magnolia	38	None				Missing data 1/7 12:20 to 1/7 12:25
23.	S. Riverton @ Altamont	39	None				Missing data 1/7 12:10 to 1/7 12:15
24.	S. Riverton @ Regal	40	None				Missing data 1/7 12:00 to 1/7 12:05
25.	Rebecca @ Upriver	41	1	Total	6,417	60	Missing data 1/7 11:45 to 1/7 11:50
				1/4	6,417	60	
26.	Riverton @ Surro	42	None				Missing data 1/30 15:00 to 1/30 15:10 Missing data 1/31 09:10 to 1/31 09:20
	Monthly Total			15	773,954	1,975	No 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
01/01/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	4	0	0	7
01/02/08	0	0	0	OM	0	0	0.01	0	0	0	OP	0.01	T	3	0.07	1	7
01/03/08	0.08	0.29	0.17	OM	0.03	0.02	0.03	0.02	0.02	0.02	0.41	0.05	0.3	3	0.01	T	8
01/04/08	0.12	0.09	0.05	OM	0.1	0.11	0.1	0.08	0.12	0.12	0.12	0.12	0	2	0.11	0	5
01/05/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	T	0	0	3
01/06/08	0.03	0.01	0	OM	0.06	0.12	0.24	0.08	0.09	0.21	0.05	0.15	1.6	T	0.23	4.2	2
01/07/08	0.01	0	0	OM	0.03	0.05	0.07	0.05	0.03	0.09	0.01	0.11	1.8	2	0.1	2.3	7
01/08/08	0	0	0	OM	0.22	0.3	0.39	0.26	0.28	0.39	0	0.44	5.4	7	0.42	5.4	9
01/09/08	0	0	0	OM	0.19	0.15	0.15	0.15	0.2	0.18	0	0.13	2.2	8	0.14	2.2	15
01/10/08	0.27	0.72	0.24	OM	0.05	0.08	0.08	0.08	0.08	0.12	0.03	0.09	1.2	6	0.08	1.2	15
01/11/08	0.05	0.01	0.13	OM	0.01	0	0.01	0	0	0	0.22	0.01	0	5	T	0	15
01/12/08	0.06	0.1	0.03	OM	0.05	0.03	0.04	0.04	0.04	0	0.12	0.06	0.1	3	0.05	0.1	14
01/13/08	0.01	0	0.01	OM	0	0	0	0	0	0	0.01	T	0	3	T	0	12
01/14/08	0.07	0.09	0.02	OM	0.09	0.08	0.13	0.07	0.1	0.1	0.13	0.06	0.2	2	0.1	0.3	11
01/15/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	1	0	0	11
01/16/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	1	0	0	10
01/17/08	0	0	0	OM	0	0	0	0	0	0	0	T	T	1	0	0	10
01/18/08	0.01	0	0	OM	0	0	0	0	0	0	0	0	0	1	0	0	9
01/19/08	0	0	0	OM	0.11	0.08	0.08	0.08	0.11	0.11	0	0.12	2.3	1	0.08	2	9
01/20/08	0	0	0.01	OM	0.04	0.05	0.08	0.08	0.02	0.09	0	0.08	2	5	0.05	1.4	10
01/21/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	5	0	0	11
01/22/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	4	0	0	11
01/23/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	4	0	0	11
01/24/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	4	0	0	10
01/25/08	0	0.01	0	OM	0	0	0	0	0	0	0	0	0	4	0	0	10
01/26/08	0.05	0	0	OM	0.92	0.73	0.61	0.78	0.89	0.88	0	0.58	6	4	0.48	7.5	10
01/27/08	0.23	0	0	OM	0.67	0.55	0.53	0.57	0.82	0.66	0.32	0.54	7.7	8	0.49	7.1	16
01/28/08	0	0	0	OM	0	0	0	0	0	0	0	0	0	13	0	0	21
01/29/08	0	0	0	OM	0.17	0.16	0.21	0.17	0.2	0.22	0.01	0.13	1.5	13	0.22	3.5	23
01/30/08	0	0	0	OM	0.04	0.03	0.03	0.04	0.07	0.04	0	0.04	0.9	13	0.02	0.3	23
01/31/08	0.14	0.51	0.01	OM	0.28	0.17	0.18	0.26	0.35	0.39	0.67	0.46	6.8	20	0.17	2.8	25
Total	1.13	1.83	0.67	0	3.06	2.71	2.97	2.81	3.42	3.62	2.1	3.18	40.0		2.82	41.3	

- 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.