

CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
July 2016**

August 12, 2016
CSOMonthly2016-07

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.

Table 1 – Flow-Frequency-Duration

Line No.	Regulator Location	CSO No.	Freq.	Date of event ¹	Estimated Total Flow (Gallons) ²	Event Duration (Min. of Overflow)	Comments
1	AL Parkway Storage (West)	2	None				
2	NW Blvd @ Kiernan	6	None				
3	Columbia @ Downriver	7	None				
4	Nettleton @ York/Buckeye	10	None				
5	Nora @ Pettet	12	1	Total	4,040	10	
				07/22	4,040	10	
6	Sherwood @ Summit	14	None				
7	Nettleton @ Ohio	15	None				Missing data 07/31 12:00 to 07/31 12:05
8	A @ Linton	16B	None				
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	None				
11	Main @ Oak	22B	None				
12	Cedar @ Ide	23	None				
13	Riverside @ Cedar (West)	24A	None				Missing data 07/08 12:55 to 07/08 13:00
14	Riverside @ Cedar (East)	24B	None				
15	Cedar @ Main	25	1	Total	6,194	15	
				07/22	6,194	15	

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.

Line No.	Regulator Location	CSO No.	Freq.	Date of event ¹	Estimated Total Flow (Gallons) ²	Event Duration (Min. of Overflow)	Comments
16	Riverside @ Lincoln	26	3	Total	153,598	65	Missing data 07/23 16:00 to 07/23 16:05 Missing data 07/23 18:00 to 07/23 18:05 Missing data 07/24 02:00 to 07/24 02:05 Missing data 07/24 08:00 to 07/24 08:05 Missing data 07/24 10:00 to 07/24 10:05 Missing data 07/24 16:00 to 07/24 16:05
				07/09	4,689	20	
				07/16	48,375	20	
				07/22	100,534	25	
17	Arthur @ 5th	33A	1	Total	1,649	15	Missing data 07/20 09:00 to 07/20 09:05
				07/16	1,649	15	
18	Perry @ 3rd	33B	None				
19	Arthur @ 3rd	33C	2	Total	2,223	20	
				07/16	1,117	10	
				07/22	1,106	10	
20	Arthur @ 1st	33D	None				
21	Riverside @ Napa/Crestline	34	1	Total	141,829	50	
				07/22	141,829	50	
22	S. Riverton @ Magnolia	38	None				
23	Rebecca @ Upriver	41	1	Total	110,575	60	
				07/22	110,575	60	
24	Riverton @ Surro	42	None				
25	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
	Monthly Total		10		420,108	235	No Dry Weather Overflows No RPWRF CSO-Related Bypasses

Table 2 – Rainfall Summary³

	1004	343	344	Shadle	Hartson	CityHall	Joe_Albi	RkwdVsta	Station8	W_Drive	Nora&Pet	GEG			NWS			SFF
Date	Rain	Snow	Dpth	Rain	Snow	Dpth	Rain											
07/01/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/02/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/03/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/04/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/05/16	0.02P	-	-	-	-	0.04	-	-	0.05	-	0.01	0.01	-	-	-	-	-	0.05
07/06/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/07/16	-	-	-	-	-	-	-	-	-	-	-	T	-	-	0.01	-	-	T
07/08/16	0.05	0.06	0.04	0.04	0.04	0.03	0.04	0.06	0.04	0.05	0.04	0.03	-	-	0.02	-	-	0.07
07/09/16	0.20	0.12	0.14	0.12	0.12	0.11	0.15	0.19	0.11	0.11	0.11	0.14	-	-	0.24	-	-	0.09
07/10/16	-	-	-	-	-	-	-	-	-	-	OP	-	-	-	T	-	-	-
07/11/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/12/16	0.07P	-	-	0.02	-	0.02	0.15	0.02	0.01	0.03	0.02	0.02	-	-	M	M	M	0.03
07/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	M	M	-
07/14/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	M	M	-
07/15/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/16/16	0.01	0.11	0.03	0.01	0.13	0.02	0.02	0.25	0.10	0.02	0.01	T	-	-	0.01	-	-	0.13
07/17/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/18/16	-	-	-	-	-	-	-	0.02	-	-	-	T	-	-	-	-	-	-
07/19/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/20/16	OP	-	-	-	-	-	-	-	-	-	OP	-	-	-	-	-	-	-
07/21/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
07/22/16	0.05	0.11	0.09	0.11	0.28	0.23	0.10	0.18	0.86	0.12	0.20	0.07	-	-	0.11	-	M	0.90
07/23/16	-	-	-	0.01	-	-	-	-	0.01	-	-	-	-	-	-	-	M	-
07/24/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
07/25/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
07/26/16	-	-	-	0.03	-	0.02	-	0.04	0.02	-	0.01	T	-	-	-	-	M	0.04
07/27/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
07/28/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
07/29/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
07/30/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
07/31/16	-	-	-	-	-	-	-	-	-	-	OP	-	-	-	-	-	-	-
Total	0.40	0.40	0.30	0.34	0.57	0.47	0.46	0.76	1.20	0.33	0.40	0.27	0.0		0.39	0.0		1.31

- 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
SFF	Spokane Felts Field

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.