

CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
February 2017**

March 8, 2017
CSOMonthly2017-02.docx

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	1	Total 02/15	301,501 301,501	220 220	
3	Columbia @ Downriver	7	None				
4	Nettleton @ York/Buckeye	10	None				
5	Nora @ Pettet	12	2	Total 02/15 02/19	128,258 99,105 29,153	350 275 75	
6	Sherwood @ Summit	14	None				
7	Nettleton @ Ohio	15	None				
8	A @ Linton	16B	None				
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	None				
11	Main @ Oak	22B	None				Missing data 02/08 09:30 to 02/08 09:35 Missing data 02/17 12:45 to 02/17 12:50
12	Cedar @ Ide	23	None				
13	Riverside @ Cedar (West)	24A	3	Total 02/09 02/15 02/18	12,801,441 319,117 10,028,778 2,453,546	4,895 310 3,185 1,400	Missing data 02/24 10:45 to 02/24 10:50
14	Riverside @ Cedar (East)	24B	None				Missing data 02/17 11:50 to 02/17 11:55
15	Cedar @ Main	25	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.

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	7,366,981	3,555		
					02/09	360,939	470	
					02/15	5,916,660	2,290	
					02/18	1,089,382	795	
17	Arthur @ 5th	33A	1	Total	1,175	50		
					02/16	1,175	50	
18	Perry @ 3rd	33B	1	Total	43,228	15	Missing data 02/15 13:30 to 02/15 13:25	
					02/20	43,228	15	
19	Arthur @ 3rd	33C	None					
20	Sprague Ave @ Sprague Wy	33-2	None					
21	Riverside @ Napa/Crestline	34	3	Total	7,358,811	6,340		
					02/09	5,904	235	
					02/15	5,807,032	3,260	
					02/18	1,545,875	2,845	
22	S. Riverton @ Magnolia	38	None					
23	Rebecca @ Upriver	41	3	Total	70,252	645		
					02/06	5,994	155	
					02/15	54,351	435	
					02/20	9,907	55	
24	Riverton @ Surro	42	None					
25	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H	
	Monthly Total		17		28,071,647	16,070	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	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Snow	Dpth	Rain	Snow	Dpth	Rain
02/01/17	X	-	-	-	-	X	-	-	-	-	-	-	-	6	-	-	10	-
02/02/17	X	-	-	-	-	X	-	-	-	-	-	-	-	6	-	-	10	-
02/03/17	X	-	-	-	0.01	X	-	0.73	0.36	-	-	0.73	6.90	12	0.52	4.40	10	0.69
02/04/17	0.05P	-	0.01	-	0.22	X	0.07	0.28	0.43	0.09	0.01	0.14	1.70	13	0.11	0.80	14	0.14
02/05/17	0.04P	0.20	0.50	0.35	0.33	X	0.20	0.53	0.34	0.44	0.06	0.38	3.10	12	0.27	3.20	13	0.39
02/06/17	0.06P	0.44	0.40	0.51	0.04	X	0.41	0.06	0.06	0.37	0.40	0.05	T	12	0.04	-	16	0.06
02/07/17	X	0.01	-	-	-	X	-	-	-	-	0.01	-	-	10	-	-	14	-
02/08/17	X	-	-	-	0.16	X	0.01	0.25	0.24	-	-	0.39	2.10	10	0.31	2.00	14	0.29
02/09/17	0.06P	0.51	0.90	0.48	0.32	X	0.85	0.59	0.28	0.87	0.58	0.28	T	12	0.28	-	15	0.34
02/10/17	X	-	0.01	-	-	X	0.24	-	-	0.34	0.49	-	-	7	-	-	13	-
02/11/17	X	-	-	-	-	X	-	-	-	0.02	-	-	-	5	-	-	12	-
02/12/17	X	-	-	-	-	X	-	-	-	-	-	-	-	5	-	-	12	-
02/13/17	X	-	-	-	-	X	-	-	-	0.01	-	-	-	5	-	-	12	-
02/14/17	X	-	-	-	-	X	-	-	-	0.01	-	-	-	5	-	-	12	-
02/15/17	X	0.67	0.67	0.75	0.54	X	0.81	0.93	0.58	0.70	0.73	0.74	-	5	0.90	-	12	0.60
02/16/17	X	0.58	0.50	0.40	0.53	X	0.37	0.75	0.42	0.47	0.36	0.44	-	1	0.31	-	9	0.50
02/17/17	X	0.17	0.08	0.02	0.11	X	0.01	0.09	0.02	0.05	X	0.02	-	1	T	-	9	0.04
02/18/17	X	0.20	0.17	0.19	0.13	X	0.17	0.21	0.15	0.18	X	0.17	T	1	0.17	T	9	0.18
02/19/17	0.18P	0.10	0.11	0.21	0.07	X	0.25	0.15	0.07	0.16	X	0.17	0.20	1	0.08	T	9	0.08
02/20/17	0.29	0.20	0.23	0.34	0.18	X	0.26	0.33	0.19	0.23	X	0.30	T	1	0.26	T	5	0.22
02/21/17	0.23	0.35	0.31	0.23	0.24	X	0.22	0.36	0.22	0.30	X	0.25	1.60	1	0.30	0.90	5	0.29
02/22/17	0.01	0.04	0.03	0.02	-	X	0.03	-	-	0.04	X	0.01	0.20	1	T	T	5	T
02/23/17	-	-	-	-	-	X	-	-	-	-	X	T	0.10	T	-	-	5	-
02/24/17	0.01	0.03	0.01	0.01	0.02	X	-	-	-	-	X	0.04	0.60	T	0.02	0.90	5	0.04
02/25/17	-	0.01	0.01	-	-	X	-	-	-	-	X	T	T	T	T	T	5	T
02/26/17	0.12	-	0.03	0.02	0.07	X	0.12	0.07	0.06	0.12	X	0.25	2.90	-	0.18	1.90	5	0.10
02/27/17	-	-	-	-	0.02	X	0.06	0.01	0.02	0.05	X	0.03	0.40	3	0.02	1.00	7	0.08
02/28/17	0.01	-	0.01	-	-	X	0.01	-	-	-	X	-	-	3	-	-	7	-
Total	1.06P	3.51	3.98	3.53	2.99	0X	4.09	5.34	3.44	4.45	1.73P	4.39	19.80		3.77	15.10		4.04

- 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.