

**CITY OF SPOKANE,  
WASHINGTON**

**CSO FLOW MONITORING PROJECT**

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**FLOW, FREQUENCY AND DURATION**

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**SEWER MAINTENANCE**

**Monthly Report  
November 2018**

**December 7, 2018  
(Revised July 16, 2019)**  
*CSOMonthly2018-11\_revised.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 <sup>1</sup>	Estimated Total Flow (Gallons) <sup>2</sup>	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	None				
6	Sherwood @ Summit	14	None				
7	Nettleton @ Ohio	15	None				
8	A @ Linton	16B	None				Missing data 11/28 09:55 to 11/28 10:00 Missing data 11/28 10:50 to 11/28 10:55
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	None				

<sup>1</sup> 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.

<sup>2</sup> 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 <sup>1</sup>	Estimated Total Flow (Gallons) <sup>2</sup>	Event Duration (Min. of Overflow)	Comments
11	Main @ Oak	22B	None				Missing data 11/02 12:25 to 11/02 12:30 Missing data 11/03 22:40 to 11/03 22:45 Missing data 11/04 03:10 to 11/04 03:15 Missing data 11/04 18:15 to 11/04 18:20 Missing data 11/05 08:45 to 11/05 08:50 Missing data 11/06 23:45 to 11/06 23:50 Missing data 11/13 15:10 to 11/13 15:15 Missing data 11/16 04:30 to 11/16 04:35 Missing data 11/17 21:45 to 11/17 21:50 Missing data 11/19 00:15 to 11/19 00:20 Missing data 11/19 01:55 to 11/19 02:00 Missing data 11/19 11:50 to 11/19 11:55 Missing data 11/20 09:15 to 11/20 09:20 Missing data 11/21 09:00 to 11/21 09:05 Missing data 11/22 06:35 to 11/22 06:40 Intermittent missing data 11/25 07:20 to 11/30 18:25 sensor to be replaced
12	Cedar @ Summit	23-1	None				
13	Riverside @ Cedar (West)	24A	None				
14	Riverside @ Cedar (East)	24B	None				
15	1st @ Adams	24-1	None				
16	Cedar @ Main	25	None				Missing data 11/09 15:30 to 11/09 15:35 Missing data 11/13 11:00 to 11/13 11:05 Missing data 11/14 14:15 to 11/14 14:20 Missing data 11/27 10:30 to 11/27 10:35
17	Riverside @ Lincoln	26	3	Total	7,306,697	1,440	
				11/04	139,641	55	
				11/22	5,449,161	1,090	
				11/30	1,717,895	295	
18	Perry @ 3rd	33B	None				Outfall plugged as of 11/13; No further data. 33B will not appear on future reports. 33B now regulated downstream at 33-1.
19	Arthur @ 3rd	33C	None				Missing data 11/01 09:10 to 11/01 09:15 Missing data 11/09 15:20 to 11/19 15:30 Missing data 11/13 14:00 to 11/14 05:15 Missing data 11/14 09:20 to 11/14 10:35
20	Liberty Park (west end)	33-1	None				

Line No.	Regulator Location	CSO No.	Freq.	Date of event <sup>1</sup>	Estimated Total Flow (Gallons) <sup>2</sup>	Event Duration (Min. of Overflow)	Comments
21	Sprague Ave @ Sprague Wy	33-2	None				
22	Riverside @ Napa/Crestline	34	1	Total	31,888	80	Missing data 11/21 10:35 to 11/21 10:40
				11/23	31,888	80	
23	S. Riverton @ Magnolia	38-1	None				
24	Rebecca @ Upriver	41	None				
25	Riverton @ Surro	42	None				
26	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
	<b>Monthly Total</b>		<b>4</b>		<b>7,338,585</b>	<b>1,520</b>	<b>No Dry Weather Overflows No RPWRF CSO-Related Bypasses</b>

**Table 2 – Rainfall Summary<sup>3</sup>**

	343	344	Shadle	Hartson	CityHall	Joe_Albi	RkwdVsta	Station8	W_Drive	Nora&Pet	Lincoln	Northeast	GEG			NWS			SFF
Date	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Rain	Snow	Dpth	Rain	Snow	Dpth	Rain
11/01/18	0.29	0.27	0.28	0.26	0.26	0.27	0.41	0.29	0.26	0.26	0.27	0.27	0.18	-	-	0.19	-	-	0.27
11/02/18	0.04	0.03	0.01	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.04	0.03	-	-	0.03	-	-	0.03
11/03/18	0.08	0.07	0.07	0.09	0.07	0.08	0.12	0.06	0.07	0.07	0.08	0.07	0.07	-	-	0.08	-	-	0.06
11/04/18	0.09	0.09	0.10	0.09	0.08	0.09	0.12	0.09	0.09	0.09	0.08	0.08	0.05	-	-	0.05	-	-	0.08
11/05/18	-	-	-	-	-	X	-	-	-	-	-	-	T	-	-	T	-	-	T
11/06/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	T	-	-	-
11/07/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
11/08/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
11/09/18	-	-	-	0.05	0.06	X	0.09	0.05	0.04	-	0.03	-	0.06	1.10	-	0.03	0.50	1.00	0.02
11/10/18	0.03	-	0.01	-	-	X	-	-	0.01	0.01	-	0.02	-	-	1.00	-	-	T	-
11/11/18	-	-	-	-	-	X	-	-	-	-	-	0.01	-	-	T	-	-	-	-
11/12/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
11/13/18	0.04	0.08	0.01	-	-	X	-	-	-	0.02	-	-	-	-	-	-	-	-	-
11/14/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
11/15/18	0.05	0.04	0.03	0.02	0.03	X	0.01	0.01	0.03	0.03	0.02	0.03	0.03	-	-	0.02	-	-	0.03
11/16/18	-	-	0.01	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	T
11/17/18	-	-	-	-	-	X	-	-	-	0.01	-	-	-	-	-	-	-	-	-
11/18/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
11/19/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
11/20/18	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
11/21/18	0.01	0.03	-	0.01	-	X	-	-	-	0.01	-	-	0.01	-	-	T	-	-	0.01
11/22/18	0.34	0.31	0.39	0.29	0.34	0.43	0.41	0.26	0.38	0.35	0.36	0.27	0.36	-	-	0.36	-	-	0.24
11/23/18	0.29	0.25	0.34	0.59	0.44	0.24	0.72	0.64	0.40	0.36	0.50	0.30	0.35	0.60	-	0.26	0.30	T	0.67
11/24/18	0.22	0.04	0.05	-	0.01	-	-	-	0.01	0.06	0.01	0.27	T	T	1.00	-	-	-	0.02
11/25/18	0.15	0.08	-	-	-	-	-	-	-	0.01	-	0.02	-	-	-	-	-	-	-
11/26/18	0.20	0.40	0.17	0.13	0.16	0.12	0.21	0.11	0.16	0.16	0.16	0.14	0.13	-	-	0.17	-	-	0.17
11/27/18	0.43	0.40	0.34	0.32	0.35	0.32	0.51	0.27	0.37	0.33	0.41	0.37	0.30	-	-	0.29	-	-	0.26
11/28/18	0.25	0.18	0.12	0.13	0.11	0.11	0.15	0.12	0.14	0.12	0.10	0.11	0.13	-	-	0.19	-	-	0.20
11/29/18	0.08	0.07	0.07	0.05	0.08	0.05	0.09	0.04	0.08	0.07	0.09	0.08	0.07	-	-	0.04	-	-	0.06
11/30/18	0.18	0.13	0.22	0.11	0.18	0.14	0.21	0.15	0.22	0.19	0.19	0.14	0.19	0.90	-	0.19	0.10	-	0.17
Total	2.77	2.47	2.22	2.17	2.19	1.87P	3.08E	2.12	2.29	2.17	2.33	2.22	1.96	2.60	2.00	1.90	0.90	1.00	2.29

E – Erroneous data

M – Missing Data

P – Partial Missing data

T – Trace of rain/snow

X – Out of Service

<sup>3</sup> 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.

**Table 3 – Rain Gauges**

343	23 <sup>rd</sup> & 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
Lincoln	Lincoln Rd Lift Station
Northeast	Northeast Lift Station
GEG	Spokane Airport
NWS	National Weather Service – Spokane
SFF	Spokane Felts Field