

**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 2017**

**January 3, 2018**  
*CSOMonthly2017-11.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				Missing Data 11/09 04:00 to 11/09 04:05 Missing Data 11/20 10:25 to 11/20 10:30
6	Sherwood @ Summit	14	None				
7	Nettleton @ Ohio	15	None				
8	A @ Linton	16B	None				
9	7th @ Inland Empire	19	None				Missing data 11/17 09:55 to 11/17 10:05 Missing data 11/17 10:10 to 11/17 10:15
10	3500 High Drive	20	None				
11	Main @ Oak	22B	None				Missing data 11/21 09:20 to 11/21 09:25 Missing data 11/29 13:15 to 11/29 13:20
12	Cedar @ Ide	23	None				
13	Riverside @ Cedar (West)	24A	3	Total	645,480	625	
				11/09	16,286	75	
				11/20	582,786	490	
				11/26	46,408	60	
14	Riverside @ Cedar (East)	24B	None				
15	Cedar @ Main	25	3	Total	27,047	155	
				11/09	4,110	40	
				11/20	17,910	90	
				11/26	5,027	25	

<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 into 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
<b>16</b>	<b>Riverside @ Lincoln</b>	<b>26</b>	<b>6</b>	<b>Total</b>	<b>3,556,503</b>	<b>1,020</b>	
				11/02	474,830	185	
				11/13	70,931	35	
				11/16	186,029	110	
				11/20	2,458,827	585	
				11/26	349,497	60	
				11/28	16,389	45	
<b>17</b>	<b>Arthur @ 5th</b>	<b>33A</b>	<b>1</b>	<b>Total</b>	<b>644</b>	<b>10</b>	
				11/23	644	10	
<b>18</b>	<b>Perry @ 3rd</b>	<b>33B</b>	<b>None</b>				
<b>19</b>	<b>Arthur @ 3rd</b>	<b>33C</b>	<b>1</b>	<b>Total</b>	<b>943</b>	<b>25</b>	
				11/20	943	25	
<b>20</b>	<b>Sprague Ave @ Sprague Wy</b>	<b>33-2</b>	<b>None</b>				
<b>21</b>	<b>Riverside @ Napa/Crestline</b>	<b>34</b>	<b>6</b>	<b>Total</b>	<b>283,683</b>	<b>800</b>	<b>Missing data 11/15 10:10 to 11/15 10:15</b>
				11/09	36,963	80	
				11/13	12,259	55	
				11/16	11,158	60	
				11/20	207,058	460	
				11/26	1,215	25	
				11/28	15,030	120	
<b>22</b>	<b>S. Riverton @ Magnolia</b>	<b>38</b>	<b>None</b>				
<b>23</b>	<b>Rebecca @ Upriver</b>	<b>41</b>	<b>None</b>				
<b>24</b>	<b>Riverton @ Surro</b>	<b>42</b>	<b>None</b>				
<b>25</b>	<b>RPWRF CSO-Related Bypass</b>	<b>N/A</b>	<b>None</b>				<b>Permit Section S13.H</b>
	<b>Monthly Total</b>		<b>20</b>		<b>4,514,300</b>	<b>2,635</b>	<b>No Dry Weather Overflows No RPWRF CSO-Related Bypasses</b>

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

	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
11/01/17	OP	0.04	0.03	0.03	0.05	0.05	0.03	0.05	X	0.05	0.05	0.04	-	-	0.05	-	-	0.06
11/02/17	OP	0.21	0.20	0.15	0.16	0.17	0.19	0.27	X	0.14	0.13	0.10	-	-	0.26	-	-	0.18
11/03/17	0.01P	0.05	0.06	0.03	0.09	0.05	-	0.20	0.31	0.10	0.03	0.15	1.00	-	0.09	T	-	0.19
11/04/17	OP	0.04	0.01	-	0.05	0.13	0.05	0.09	0.11	0.12	0.07	0.08	2.70	T	0.04	0.70	-	0.12
11/05/17	OP	0.01	-	-	0.22	0.36	0.08	0.47	0.38	0.13	0.02	0.33	3.20	2	0.43	4.40	3	0.29
11/06/17	OP	-	-	0.09	-	0.07	0.17	-	0.12	0.21	0.05	0.02	0.30	3	0.01	0.20	5	0.01
11/07/17	OP	-	-	-	-	-	0.01	-	-	0.01	-	T	T	2	-	-	3	-
11/08/17	0.01P	0.03	0.01	0.01	-	0.03	0.08	-	0.01	0.08	0.13	-	-	2	-	-	3	-
11/09/17	0.03P	0.72	0.68	0.58	0.20	0.29	0.42	0.32	0.30	0.43	0.75	0.26	-	1	0.21	-	3	0.25
11/10/17	0.01P	0.07	0.06	0.10	0.05	0.11	0.08	0.10	0.09	0.10	0.11	0.09	-	-	0.08	-	T	0.08
11/11/17	OP	0.01	0.01	0.01	0.01	-	-	-	0.03	-	0.01	T	T	-	0.01	-	-	-
11/12/17	OP	-	-	-	-	-	-	-	-	-	-	0.01	T	-	T	-	-	-
11/13/17	0.02P	0.16	0.16	0.12	0.17	0.13	0.11	0.18	0.15	0.15	0.15	0.14	T	-	0.06	-	-	0.12
11/14/17	OP	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	-	T
11/15/17	0.01P	0.05	0.04	0.06	0.02	0.10	0.12	0.11	0.10	0.07	0.11	0.09	-	-	0.14	-	-	0.09
11/16/17	0.04P	0.26	0.18	0.23	0.20	0.15	0.16	0.23	0.20	0.23	0.15	0.14	T	-	0.13	-	M	0.16
11/17/17	OP	-	-	-	-	-	-	-	-	-	-	T	-	-	-	-	M	-
11/18/17	OP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/19/17	0.01P	0.01	-	0.02	-	0.03	0.06	0.01	0.03	0.02	0.05	0.03	T	-	0.05	-	-	0.02
11/20/17	0.06P	0.57	0.50	0.41	0.51	0.43	0.38	0.75	0.45	0.51	0.43	0.44	T	-	0.39	-	-	0.34
11/21/17	0.07P	0.42	0.40	0.38	0.35	0.43	0.40	0.57	0.40	0.45	0.40	0.44	-	-	0.44	-	-	0.36
11/22/17	OP	0.01	0.01	0.02	0.01	-	0.02	0.03	0.01	0.02	0.03	0.01	-	-	T	-	-	T
11/23/17	OP	0.13	0.14	0.12	0.12	0.12	0.09	0.18	0.15	0.15	0.12	0.12	-	-	0.06	-	-	0.14
11/24/17	OP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/25/17	OP	0.07	0.05	0.05	0.03	0.05	0.04	0.06	0.07	0.06	0.06	0.05	-	-	0.04	-	-	0.06
11/26/17	OP	0.10	0.12	0.14	0.09	0.12	0.14	0.12	0.10	0.14	0.14	0.15	-	-	0.18	-	-	0.09
11/27/17	OP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/28/17	OP	0.25	0.16	0.19	0.24	0.19	0.21	0.27	0.20	0.22	0.19	0.18	T	-	0.21	0.40	-	0.19
11/29/17	OP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	T	-
11/30/17	OP	0.02	0.01	0.01	-	-	-	-	-	-	0.01	0.01	T	-	0.03	T	-	T
<b>Total</b>	<b>0.27P</b>	<b>3.23</b>	<b>2.83</b>	<b>2.75</b>	<b>2.57</b>	<b>3.01</b>	<b>2.84</b>	<b>4.01</b>	<b>3.21P</b>	<b>3.39</b>	<b>3.19</b>	<b>2.88</b>	<b>7.20</b>		<b>2.91</b>	<b>5.70</b>		<b>2.75</b>

- 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 <sup>rd</sup> & Ray
344	Div ision & Manito
Shadle	Shadle Water Tower (was 345)
Hartson	Ray & Hartson (was 346)
City Hall	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

<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.