CITY OF SPOKANE, WASHINGTON

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

Monthly Report
October 2015

December 14, 2015
CSOMonthly2015-10

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**	**5**	**10**	**Missing data 10/16 08:55 to 10/16 09:00 Missing data 10/19 07:05 to 10/23 13:50 due to construction Missing data 10/23 14:20 to 10/23 14:25**
				10/01	1	10	Dry Weather Overflow due to construction-related bypass pumping
3	**Columbia @ Downriver**	**7**	**1**	**Total**	**22,270**	**40**	**Missing Data 10/13 13:50 to 10/13 14:50**
				10/31	22,270	40	
4	**Nettleton @ York/Buckeye**	**10**	**None**				
5	**Nora @ Pettet**	**12**	**1**	**Total**	**287,237**	**90**	
				10/31	287,237	90	
6	**Sherwood @ Summit**	**14**	**1**	**Total**	**4,817**	**25**	
				10/31	4,817	25	
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 10/14 10:35 to 10/14 10:40**

[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
12	**Cedar @ Ide**	**23**	**1**	**Total**	**7,985**	**70**	
				10/31	7,985	70	
13	**Riverside @ Cedar (West)**	**24A**	**1**	**Total**	**1,246,065**	**145**	
				10/31	1,246,065	145	
14	**Riverside @ Cedar (East)**	**24B**	**1**	**Total**	**2,810**	**40**	
				10/31	2,810	40	
15	**Cedar @ Main**	**25**	**1**	**Total**	**65,235**	**75**	
				10/31	65,235	75	
16	**Riverside @ Lincoln**	**26**	**1**	**Total**	**1,258,372**	**115**	
				10/31	1,258,372	115	
17	**Arthur @ 5th**	**33A**	**1**	**Total**	**4,791**	**50**	
				10/31	4,791	50	
18	**Perry @ 3rd**	**33B**	**1**	**Total**	**694,524**	**50**	**Missing data 10/20 11:15 to 10/20 11:35**
				10/31	694,524	50	
19	**Arthur @ 3rd**	**33C**	**1**	**Total**	**11,478**	**55**	
				10/31	11,478	55	
20	**Arthur @ 1st**	**33D**	**1**	**Total**	**26,842**	**70**	
				10/31	26,842	70	
21	**Riverside @ Napa/Crestline**	**34**	**1**	**Total**	**415,641**	**100**	
				10/31	415,641	100	
22	**S. Riverton @ Magnolia**	**38**	**None**				
23	**Rebecca @ Upriver**	**41**	**1**	**Total**	**60,425**	**95**	
				10/31	60,425	95	
24	**Riverton @ Surro**	**42**	**None**				**Missing data 10/26 11:45 to 10/26 11:50**
25	**RPWRF CSO-Related Bypass**	**N/A**	**None**				**Permit Section S13.H**
	Monthly Total		**15**		**4,108,497**	**1,030**	**No Dry Weather Overflows** **No RPWRF CSO-Related Bypasses**

Table 2 – Rainfall Summary[3]

	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**
10/01/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/02/15	-	-	-	-	-	-	-	-	-	-	-	T	-	-	T	-	-	T
10/03/15	0.01	-	-	0.02	-	-	-	-	0.03	-	-	0.06	-	-	0.01	-	-	0.10
10/04/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/05/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/06/15	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/07/15	0.08	0.08	0.08	0.11	0.06	-	0.10	0.07	0.08	0.08	0.10P	0.09	-	-	0.11	-	-	0.07
10/08/15	0.01	-	-	-	-	-	-	-	-	-	0.01	T	-	-	T	-	-	-
10/09/15	-	-	-	-	-	-	-	-	-	-	-	T	-	-	T	-	-	-
10/10/15	0.20	0.09	0.08	0.06	0.07	0.04	0.06	0.06	0.07	0.07	0.07	0.07	-	-	0.04	-	M	0.06
10/11/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
10/12/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
10/13/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
10/14/15	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
10/15/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
10/16/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
10/17/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-
10/18/15	0.03	0.03	0.01	0.02	0.03	0.01	0.01	0.01	0.04	-	0.01	0.01	-	-	0.01	-	M	0.05
10/19/15	-	0.01	-	-	-	-	-	-	-	0.01	P	T	-	-	T	-	-	-
10/20/15	-	0.01	0.01	0.01	-	-	-	-	-	-	-	T	-	-	-	-	-	-
10/21/15	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-
10/22/15	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/23/15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/24/15	-	-	-	-	-	-	-	-	-	-	-	T	-	-	T	-	-	-
10/25/15	0.01	-	0.01	-	-	-	-	-	-	-	-	0.02	-	-	0.03	-	-	0.01
10/26/15	0.02	0.04	-	0.03	0.03	0.01	0.05	0.01	0.05	0.03	0.02	0.08	-	-	0.19	-	-	0.04
10/27/15	0.15	0.02	0.03	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.02	0.02	-	-	T	-	-	-
10/28/15	0.13	0.05	0.05	0.10	0.03	0.05	0.10	0.04	0.04	0.06	0.07	0.13	M	-	0.17	-	-	0.08
10/29/15	0.08	0.14	0.15	0.11	0.10	0.10	0.10	0.11	0.12	0.13	0.11	0.05	-	-	0.03	-	-	0.10
10/30/15	0.20	0.16	0.13	0.11	0.15	0.12	0.10	0.12	0.14	0.13	0.11P	0.13	-	-	0.11	-	-	0.14
10/31/15	0.51P	0.62	0.51	0.65	0.59	0.57	0.66	0.50	0.66	0.55	0.64	0.48	-	-	0.65	-	-	0.65
Total	**1.43**	**1.25**	**1.06**	**1.23**	**1.08**	**0.91**	**1.19**	**0.94**	**1.24**	**1.08**	**1.16**	**1.14**	**0.0**		**1.35**	**0.0**		**1.30**

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	23rd & 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.**