

**CITY OF SPOKANE,
WASHINGTON**

CSO FLOW MONITORING PROJECT

FLOW, FREQUENCY AND DURATION

SEWER MAINTENANCE

**Monthly Report
January 2015**

March 16, 2015
CSOMonthly2015-01

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	2	Total	1,329,847	1,080	
				01/06	28,827	110	
				01/17	1,301,020	970	
3	Columbia @ Downriver	7	1	Total	74,504	110	
				01/18	74,504	110	
4	Nettleton @ York/Buckeye	10	None				
5	Nora @ Pettet	12	1	Total	750,901	380	
				01/17	750,901	380	
6	Sherwood @ Summit	14	1	Total	28,216	80	
				01/18	28,216	80	
7	Nettleton @ Ohio	15	None				
8	A @ Linton	16B	None				
9	7th @ Inland Empire	19	None				
10	3500 High Drive	20	1	Total	37,011	45	
				01/18	37,011	45	
11	Main @ Oak	22B	1	Total	122,377	35	
				01/18	122,377	35	

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	43,469	125	
				01/18	43,469	125	
13	Riverside @ Cedar (West)	24A	1	Total	7,648,289	630	
				01/17	7,648,289	630	
14	Riverside @ Cedar (East)	24B	1	Total	78,493	370	
				01/18	78,493	370	
15	Cedar @ Main	25	1	Total	102,481	235	
				01/17	102,481	235	
16	Riverside @ Lincoln	26	1	Total	3,301,459	515	
				01/17	3,301,459	515	
17	Arthur @ 5th	33A	1	Total	22,420	125	Missing Data 01/29 12:25 to 01/29 12:30
				01/18	22,420	125	
18	Perry @ 3rd	33B	1	Total	2,172,584	130	Missing Data 01/19 15:40 to 01/19 15:45 Missing Data 01/19 15:50 to 01/19 16:00
				01/18	2,172,584	130	
19	Arthur @ 3rd	33C	1	Total	9,624	45	
				01/18	9,624	45	
20	Arthur @ 1st	33D	2	Total	124,100	1,370	
				01/05	7,600	1,135	All-Day Snowmelt; volume estimated from downstream gauge due to construction.
				01/17	116,500	235	Volume estimated from downstream gauge due to construction
21	Riverside @ Napa/Crestline	34	1	Total	3,564,887	500	
				01/18	3,564,887	500	
22	S. Riverton @ Magnolia	38	None				
23	Rebecca @ Upriver	41	1	Total	180,354	400	
				01/17	180,354	400	
24	Riverton @ Surro	42	None				
25	RPWRF CSO-Related Bypass	N/A	None				Permit Section S13.H
	Monthly Total		19		19,591,016	6,175	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
01/01/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1	T	T	1	0.00
01/02/15	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.04	0.00	0.00P	0.05	0.8	1	0.02	0.4	1	0.05
01/03/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.5	2	0.04	0.4	1	0.03
01/04/15	0.01	0.00	0.00	0.00	0.34	0.33	0.04	0.16	0.35	0.06	0.00	0.36	3.6	3	0.34	3.4	2	0.43
01/05/15	0.14	0.88	0.32	0.52	0.08	0.06	0.60	0.50	0.10	0.55	0.61	T	0.0	3	T	0.0	3	0.14
01/06/15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.0	1	0.00	0.0	1	0.00
01/07/15	0.01P	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.0	T	0.00	0.0	T	0.00
01/08/15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00P	T	0.0	T	T	0.0	T	0.00
01/09/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0	T	0.00	0.0	T	0.00
01/10/15	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.01	0.02	0.02	0.00	0.03	0.8	0	0.06	0.3	T	0.04
01/11/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	T	T	1	0.00	0.0	T	0.00
01/12/15	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0	0	0.00	0.0	T	0.00
01/13/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.1	T	T	0.0	T	0.00
01/14/15	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	T	0.00
01/15/15	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01P	0.06	1.0	1	0.07	0.9	1	0.02
01/16/15	0.06P	0.06	0.27	0.06	0.22	0.22	0.31	0.30	0.21	0.30	0.02	0.24	0.6	1	0.25	1.8	2	0.20
01/17/15	0.00	0.46	0.49	0.21	0.38	0.45	0.50	0.50	0.43	0.48	0.28	0.63	0.6	T	0.62	1.5	2	0.53
01/18/15	0.40	0.42	0.44	0.62	0.38	0.39	0.44	0.46	0.41	0.53	0.17	0.33	0.0	0	0.28	0.0	0	0.30
01/19/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
01/20/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
01/21/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00P	0.00	0.0	0	0.00	0.0	0	0.00
01/22/15	0.00	0.00	0.00	0.00	0.11	0.12	0.12	0.13	0.11	0.04	0.00	0.17	2.1	0	0.18	1.2	0	0.13
01/23/15	0.15	0.13	0.16	0.12	0.00	0.00	0.04	0.04	0.00	0.13	0.16	T	0.0	0	M	M	M	T
01/24/15	0.00P	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	T	0.0	0	0.01	0.0	0	T
01/25/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	T	0.0	0	0.00
01/26/15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.0	0	0.00	0.0	0	0.00
01/27/15	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
01/28/15	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01P	T	0.0	0	T	0.0	0	0.00
01/29/15	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0	0.00	0.0	0	0.00
01/30/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	T	T	0.03	T	0	T
01/31/15	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.3	T	T	T	0	0.00
Total	0.79	2.03	1.72	1.55	1.54	1.64	2.11	2.11	1.67	2.12	1.33	1.91	10.4		1.90	9.9		1.87

- 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.