SOUTH WASHINGTON WATERSHED DISTRICT

Mississippi River Tributaries

Map 1: Mississippi River Monitoring Sites

SWWD's East Mississippi watershed is named after the former East Mississippi Watershed Management Organization which managed the area prior to consolidating with SWWD. The East Mississippi watershed consists of Newport, St. Paul Park, Grey Cloud Island Township, and small portions of the Cities of Woodbury and Cottage Grove. The watershed lies along the Eastern bank of the Mississippi River on the Western edge of SWWD and drains to the river through an extensive and aging storm sewer network. SWWD monitors two sites in this area, Newport Glen Road (1,426 acres) and Newport 4th Ave (1,396 acres).

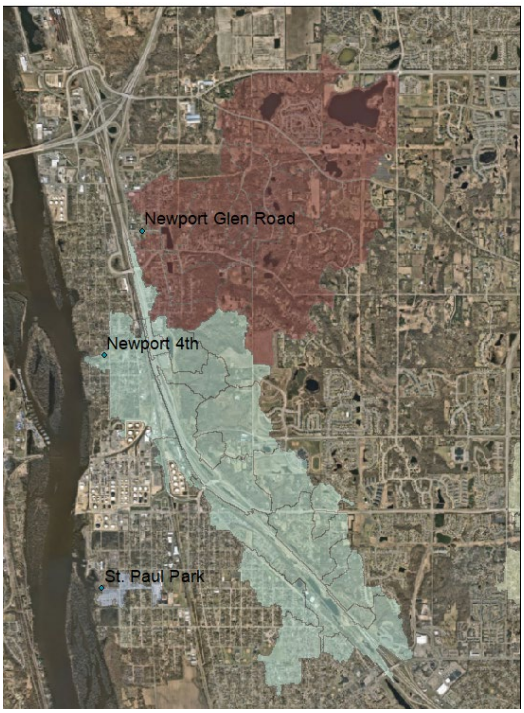
The Central Ravine watershed drains a large portion of Cottage Grove. The 2,720 acre watershed is largely built out with an extensive storm sewer system that was constructed prior to current Watershed District standards.

This report summarizes the monitoring results for the East Mississippi and Central Ravine watersheds which collectively represent areas tributary to the Mississippi River. SWWD's monitoring programs are based on a Regional Assessment approach. By following a regional approach, monitoring is focused on key resources and watershed outlets throughout the District. Regional Assessment Locations for the East Mississippi and Central Ravine watersheds are Newport, St. Paul Park, and Central Draw storm sewer locations.

Regional Assessment sites consist of automated sampling equipment that collects data necessary to calculate annual loading rates of various pollutants. Monitoring results for the Newport, St. Paul Park, and Central Ravine regional assessment sites are presented individually below.

Newport

Municipality: Newport
Watershed Area: 1,426 Acres (Glen Rd), 1,394 acres (4th Ave)
SWWD Maximum Allowable Phosphorus Load: 0.22 lbs/ac/yr



Map 2: Newport Regional Assessment Sites

SWWD currently monitors two sites in Newport (Map 2). The Newport Glen Road site monitors outflow from the Glen Road pond which includes drainage from much of Newport above the bluff. It also includes portions of Woodbury however; those parts of the watershed rarely discharge. Newport Glen Road is a regional assessment site which the District uses to track long-term changes in watershed runoff characteristics.

The Newport 4th Ave site monitors a large watershed consisting of Newport residential neighborhoods, the highway 61 corridor, and portions of Cottage Grove above the bluff. The District is monitoring the 4th Ave site as part of an effort to identify and design a water treatment practice at the site. Data will continue to be collected following any project to determine treatment effectiveness.

Annual loading data for previous years is summarized in Tables 2 (Glen Road) and 3 (4th Ave). Runoff and pollutant yields remained elevated in 2021 likely indicating that the storm system and groundwater remain elevated after a prolonged wet period. Despite those results though, no significant trends have emerged since monitoring began in 2006, except for chloride load which has increased dramatically, reflecting de-icing operations. Additionally, TSS loading rates at the Newport sites have always met allowable TSS loads (112.5-169 lbs/ac/yr) under the South Metro Mississippi River TSS TMDL.

Other pollutants—primarily copper, lead, and zinc—are routinely elevated. High levels of heavy metals most likely reflects a relative lack of treatment in the existing stormwater system which was largely built prior to current standards. Any future re-development would be subject to more stringent stormwater standards and would likely make a significant reduction in the pollutant levels at the Newport monitoring sites. Water quality data is available through the SWWD office.

Table 2: Loading Summary for Newport Glen Rd Pond

Year	April-Oct Precipitation (in)	Runoff Yield (cu ft runoff/in precip)	April-Oct TP (lbs)	TP Yield (lbs/in precip)	April-Oct TSS (lbs)	TSS Yield (lbs/ in precip)	April-Oct Chloride (lbs)	Chloride Yield (lbs/in precip)
2006	18	54,998	12	0.7	3,276	182	2,781	155

2007	21.8	142,750	55	2.5	9,343	428	8,369	383
2008	17.3	143,775	36	2.1	16,349	944	15,086	871
2009	19.7	72,759	14	0.7	5,934	302	5,338	272
2010	27.7	76,280	30	1.1	53,451	1931	6,763	244
2011	23.7	235,551	54	2.3	44,038	1858	16,785	708
2012	19.5	267,652	49	2.5	182,916	9381	20,829	1,068
2013	24.3	289,639	61	2.5	48,200	1980	38,099	1,565
2014	30.4	355,080	91	3.0	14,968	492	41,737	1,373
2015	28	334,732	75	2.7	17,126	611	35,030	1,251
2016	33.2	304,168	74	2.2	16,371	493	37,690	1,136
2017	26	538,421	107	4.1	18,672	719	65,285	2,514
2018	28.1	433,580	99	3.5	12,844	457	50,257	1,788
2019	30.4	435,170	84	2.8	12,645	416	53,513	1,760
2020	21.7	769,921	126	5.6	16,002	713	65,131	2,902
2021	14.7	1,036,169	110	7.5	13,245	903	56,507	3,852
2022	19	824,444	106	6.1	11,757	673	53,837	3,080

Note: Reported loads and rates are scaled to reflect an April through October growing season.

Table 3: Loading Summary for Newport 4th Ave

Year	April-Oct Precipitation (in)	Runoff Yield (cu ft runoff/in precip)	April-Oct TP (lbs)	TP Yield (lbs/in precip)	April-Oct TSS (lbs)	TSS Yield (lbs/ in precip)	April-Oct Chloride (lbs)	Chloride Yield (lbs/in precip)
2018	28.1	505,950	121	4.3	28,483	1,014	26,241	934
2019	30.4	1,092,141	261	8.6	59,229	1,948	89,083	2,930
2020	21.7	580,994	121	5.6	36,325	1,674	28,504	1,314
2021	14.7	793,552	84	5.7	25,907	1,762	17,047	1,160
2022	19	516,850	72	3.8	17,008	895	17,005	895

Note: Reported loads and rates are scaled to reflect an April through October growing season.

St. Paul Park

Municipality: St. Paul Park Watershed Area: 30 acres
SWWD Maximum Allowable Phosphorus Load: 0.22 lbs/ac/yr

Map 3: St. Paul Park Regional Assessment Location

The St. Paul Park site (Map 3) monitors discharge to the Mississippi River. This station serves as a regional assessment location for the City of St. Paul Park and provides baseline water quality and quantity data for runoff flowing into the Mississippi River.

Annual loading data for St. Paul Park is summarized in Table 4. No consistent trends have emerged since monitoring began in 2006. However, TP loading rates typically exceed SWWD's TP standard and TSS loading typically exceed allowable TSS loads (112.5-169 lbs/ac/yr) under the South Metro Mississippi River TSS TMDL. Runoff yields are highly variable, potentially indicating illicit discharge or inflow infiltration of the storm sewer network. Recently, portions of this watershed have developed, providing added stormwater control and treatment. SWWD will continue to monitor the watershed to see if added controls improve discharge to the river.

In addition to TP and TSS, SWWD monitors runoff for various pollutants, several of which (copper, lead, and zinc) are routinely elevated. Any future re-development would be subject to more stringent stormwater standards and would likely make a significant reduction in the pollutant levels at the St. Paul Park monitoring site. Water quality data is available through the SWWD office.

Table 4: Annual Loading Summary for the St. Paul Park Regional Assessment Location

Year	April-Oct Precipitation (in)	Runoff Yield (cu ft runoff/in precip)	April-Oct TP (lbs)	TP Yield (lbs/in precip)	April-Oct TSS (lbs)	TSS Yield (lbs/in precip)	April-Oct Chloride (lbs)	Chloride Yield (lbs/in precip)
2006	18.3	36,044	8	0.4	4,339	237	141	8
2007	22.4	48,774	13	0.6	8,656	386	237	11
2008	19.8	33,132	9	0.5	8,463	428	179	9
2009	19.8	63,416	14	0.7	13,746	696	395	20
2010	31.1	59,704	22	0.7	19,343	622	455	15
2011	22.4	107,862	25	1.1	69,452	3,103	750	33
2012	18.1	43,329	9	0.5	32,600	1,805	272	15
2013	21.9	67,083	18	0.8	17,157	784	674	31
2014	28.8	89,842	21	0.7	12,351	429	1,840	64
2015	23.6	48,979	13	0.6	8,553	363	326	14
2016	31.8	33,613	14	0.5	12,915	405	368	12
2017	26	76,034	23	0.9	14,502	559	694	27
2018	28.1	38,098	15	0.5	9,541	340	162	6
2019	30.4	27,151	20	0.7	14,429	475	302	10
2020	21.7	28,228	14	0.5	7,360	242	94	3
2021	14.7	67,243	13	0.9	5,282	371	172	12
2022	19	28,077	7	0.4	3,533	187	89	5

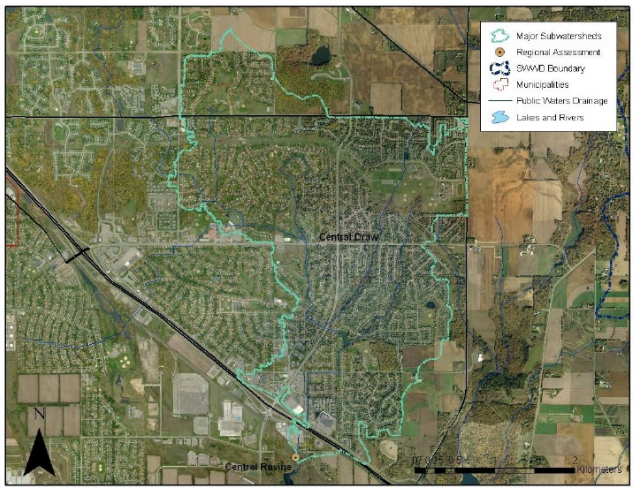
Note: Reported loads and rates are scaled to reflect an April through October growing season.

Central Ravine

Municipality: Cottage Grove Watershed Area: 2,720 Acres
SWWD Maximum Allowable Phosphorus Load: 0.22 lbs/ac/yr

The Central Ravine regional assessment monitoring station (Map 4) was established in 2009 and is used to assess the 2,720 acre Central Draw watershed. The Central Draw watershed is largely built out with an extensive storm sewer system that was constructed prior to current Watershed District standards.

The primary purpose of the Central Ravine site is to assess the water quality of water draining out of the Central Ravine watershed and evaluate the effectiveness of various water quality improvement projects planned for the Central Ravine. Ultimately, this site



Map 4: Central Ravine Monitoring Site

will drain additional runoff flowing out of SWWD's Northern Watershed following completion of SWWD's planned Central Draw Emergency Overflow. Water flowing through the Central Ravine station discharges into a large wetland complex before ultimately draining to the Mississippi River.

Annual loading data is summarized in Table 5. Runoff, total phosphorus, and total suspended solids are all generally stable. TP and TSS loading rates routinely meet SWWD and applicable TMDL allowable loading rates.

Table 5: Annual Loading Summary for the Central Ravine Regional Assessment Location

Year	April-Oct Precipitation (in)	Runoff Yield (cu ft runoff/in precip)	April-Oct TP (lbs)	TP Yield (lbs/in precip)	April-Oct TSS (lbs)	TSS Yield (lbs/in precip)	April-Oct Chloride (lbs)	Chloride Yield (lbs/ in precip)
2009	27.5	417,139	114	4.2	59,500	2,164	7,029	256
2010	31.2	810,750	280	9	237,424	7,601	10,020	321
2011	24.9	376,330	99	4	417,460	16,764	6,954	279
2012	18.2	600,861	155	8.5	284,869	15,623	4,171	229
2013	19.7	518,856	183	9.3	353,442	17,967	5,333	271
2014	35.2	762,277	409	11.6	254,340	7,223	21,631	614
2015	28	768,216	227	8.1	141,696	5,059	8,545	305
2016	31.1	797,833	229	6.9	96,622	2,904	8.770	264
2017	26	789,492	239	9.2	117,418	4,518	18,449	710
2018	28.1	697,165	205	7.3	74,357	2,648	13,183	469
2019	30.4	719,477	203	6.7	68,343	2,248	39,715	1,306
2020	21.7	702,883	294	9.7	75,648	2,488	31,694	1,043
2021	14.7	270,937	88	2.9	33,540	1,103	14,861	489
2022	19	376,413	80	4.6	23,767	1,358	7,423	424

Note: Reported loads and rates are scaled to reflect an April through October growing season.