



Protect it. Pass it on.

MISSISSIPPI  
WATERSHED  
MANAGEMENT  
ORGANIZATION

# 2023 65<sup>th</sup> Ave Annual Report





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## **2023 65th Ave Annual Report**

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### **Front Cover**

Photo credit: Mississippi Watershed Management Organization

# **2023 65th Ave Annual Report**

Mississippi Watershed Management Organization

# Monitoring Activities Summary

The Mississippi Watershed Management Organization (MWMO) has been working in partnership with the West Mississippi Watershed Management Commission (WMWMC) to collect stormwater data in the 65th Avenue stormwater tunnel since 2020. This annual report contains a summary of monitoring activities, including information about maintenance, quantity data, and number of water quality samples. A brief summary of the quantity and quality data, along with the data tables, is provided.

The monitored stormwater tunnel is 78” in diameter and discharges to the Mississippi River at 65th Avenue in Brooklyn Center. The monitoring site is located approximately 450 feet upstream from the outfall, at the intersection of 65th Avenue North and Riverwood Lane. Installed monitoring equipment includes an ISCO automated sampler, an area-velocity (AV) sensor, a conductivity sensor and a solar powered telemetry system. The monitoring equipment is either installed in a cabinet about 10 feet away from a manhole over the stormwater tunnel or inside the tunnel.

Over the course of 2023 the MWMO monitoring team collected 17 water quality samples at the 65th Avenue monitoring site. Samples are categorized as either baseflow (an ISCO pumped grab sample of standard conditions within the storm tunnel) or as rain event samples (collected in ISCO bottles over the course of a storm event and composited). Of these samples, 12 were baseflow samples and the remaining 5 were from rain or snowmelt events.

Regular maintenance is performed monthly to inspect, clean, and calibrate stormwater monitoring equipment. This is done by entering the storm tunnel and physically cleaning debris off the AV and conductivity sensors. The equipment is inspected for any damages, and a manual water level measurement is taken to calibrate the AV sensor and ensure that water quantity data is accurate. A water quality sonde reading is also taken during maintenance to calibrate the conductivity sensor. This process was performed a total of 13 times in 2023, approximately once a month.

Water quantity data is collected continuously over the course of the year.

# Data Analysis Summary

The MWMO staff collects both water quantity and water quality data at the 65th Avenue monitoring site.

## ***Water Quantity***

Water quantity data consists of both water level and velocity measurements which are then used to calculate water volume.

The minimum and maximum water levels recorded at 65th Avenue in 2023 were 0.2 and 4.55 feet, respectively. The minimum and maximum water velocities recorded were 0 and 15.24 feet per second (fps), respectively. From 4/15/2023 to 5/1/2023, Mississippi River tailwater was backed up to the area-velocity sensor in the storm tunnel, resulting in higher-than-normal water level readings. The high-water levels in the Mississippi River during this time were a result of a combination of melt of abnormally deep snowpack throughout the Upper Mississippi River watershed, a wetter than average spring, and late season winter storms.<sup>1</sup>

The tables below show both monthly and yearly total stormwater volumes, in cubic feet (ft<sup>3</sup>), for 2023 at the 65th Avenue monitoring site. 2023 was a very dry year with 86% of total flow considered baseflow.

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<sup>1</sup> National Weather Service, La Crosse, WI, Weather Forecast Office. Mississippi River Flood of 2023. National Weather Service.  
<https://www.weather.gov/arx/flood2023#:~:text=Major%20to%20moderate%20flooding%20impacted,Why%20so%20much%20water%3F>.

### Monthly Stormwater Volumes

<b>Monthly Totals</b>	<b>Volume (ft<sup>3</sup>)</b>
January	7,527,854
February	11,177,569
March	21,793,401
April	34,530,126
May	18,550,032
June	18,899,526
July	11,887,027
August	18,622,459
September	32,649,841
October	76,472,385
November	17,342,465
December	18,628,727

### Yearly Stormwater Volumes

<b>Yearly Totals</b>	<b>Volume (ft<sup>3</sup>)</b>
Year Total Baseflow	247,016,939
Year Total Event flow	41,064,474
Year Total	288,081,413

## ***Water Quality***

The MWMO staff takes regular grab samples at the 65th Avenue monitoring site to test for a variety of water quality parameters. All water quality testing is done by the Metropolitan Council Environmental Services Laboratory.

Average total phosphorus and average total kjeldahl nitrogen were 0.13 and 1.2 milligrams per liter (mg/L), respectively. Average total suspended solids were 13.4 mg/L. Average chloride concentration was 432.8 mg/L. Average E. coli level was 131.3 MPN/100mL.

The MWMO staff measures water clarity using a Secchi tube. Average transparency was 78.7 centimeters. The MWMO staff also monitors dissolved oxygen (DO) levels using a YSI multiparameter water quality meter. Average DO in the winter/spring months (January- May, November, December) was 11.6 mg/L, while average DO in the summer/fall months was 7.5 mg/L. Dissolved oxygen concentration is inversely related to water temperature meaning that colder water is able to hold more dissolved oxygen than warmer water. This can explain some of the seasonal variation in DO values.

The following sections contain the full water quality and quantity data from 2023 at the 65th Avenue monitoring site. Excel spreadsheets of water quality and quantity data are also available.



2023 Stormwater Sample Data - 65th Avenue Outfall

Station	Sample Start	Sample End	Measuring program	Sample Type	Air Temperature (°F)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Specific Conductance (µS/cm)	Salinity (ppt)	pH	Transparency (cm)
65th Ave. Outfall	01/03/2023 09:15	01/03/2023 09:15	Base	Grab	25	4.0	11.88	1174.0	1962	0.99	7.7	72
65th Ave. Outfall	02/07/2023 09:40	02/07/2023 09:40	Base	Grab	28	6.0	10.81	2978.0	4678	2.50	7.4	25
65th Ave. Outfall	02/13/2023 15:20	02/14/2023 03:40	Melt	Composite	12							
65th Ave. Outfall	02/14/2023 12:00	02/14/2023 19:45	Rain	Composite	12							
65th Ave. Outfall	03/07/2023 08:53	03/07/2023 08:53	Base	Grab	28	3.0	12.51	1440.0	2486	1.27	9.1	62
65th Ave. Outfall	03/16/2023 07:10	03/16/2023 16:55	Rain	Composite								
65th Ave. Outfall	04/05/2023 08:25	04/05/2023 08:25	Base	Grab	30	2.5	12.57	523.0	915	0.45	7.6	49
65th Ave. Outfall	04/07/2023 13:35	04/07/2023 16:40	Melt	Composite	55							
65th Ave. Outfall	05/02/2023 08:35	05/02/2023 08:35	Base	Grab	45	8.2	10.67	861.0	1270	0.64	8.0	94
65th Ave. Outfall	05/14/2023 02:05	05/14/2023 07:05	Rain	Composite								
65th Ave. Outfall	06/06/2023 08:20	06/06/2023 08:20	Base	Grab	71	20.6	7.04	1406.0	1535	0.77	7.8	86
65th Ave. Outfall	07/18/2023 08:45	07/18/2023 08:45	Base	Grab		17.4	8.83	1412.0	1650	0.84	8.0	100
65th Ave. Outfall	08/01/2023 08:25	08/01/2023 08:25	Base	Grab		22.7	6.96	1057.0	1107	0.55	7.8	100
65th Ave. Outfall	09/05/2023 08:45	09/05/2023 08:45	Base	Grab	80	19.8	7.75	1475.0	1637	0.83	7.9	96
65th Ave. Outfall	10/03/2023 08:25	10/03/2023 08:25	Base	Grab	70	19.3	7.08	486.4	525	0.25	7.4	95
65th Ave. Outfall	11/07/2023 09:40	11/07/2023 09:40	Base	Grab	40	8.0	10.81	895.0	1323	0.66	8.0	100
65th Ave. Outfall	12/08/2023 08:50	12/08/2023 08:50	Base	Grab		5.8	12.06	988.0	1559	0.79	8.0	65



2023 Stormwater Sample Data - 65th Avenue Outfall

Station	Sample Start	Sample End	Chloride (mg/L)	E. coli (MPN/100 mL)	Total Kjeldahl Nitrogen (mg/L)	Dissolved Phosphorus (mg/L)	Ortho Phosphate (mg/L)	Total Phosphorus (mg/L)	Total Suspended Solids (mg/L)
65th Ave. Outfall	01/03/2023 09:15	01/03/2023 09:15	414.0	45	1.30		0.01	~ 0.04	< 3
65th Ave. Outfall	02/07/2023 09:40	02/07/2023 09:40	1580.0	308	1.70		0.03	0.12	11
65th Ave. Outfall	02/13/2023 15:20	02/14/2023 03:40	462.0		1.70		0.05	0.11	14
65th Ave. Outfall	02/14/2023 12:00	02/14/2023 19:45	164.0		2.00	0.05		0.31	86
65th Ave. Outfall	03/07/2023 08:53	03/07/2023 08:53	608.0	124	1.40		< 0.01	~ 0.04	3
65th Ave. Outfall	03/16/2023 07:10	03/16/2023 16:55	1190.0						50
65th Ave. Outfall	04/05/2023 08:25	04/05/2023 08:25	216.0	57	1.20		0.03	0.08	7
65th Ave. Outfall	04/07/2023 13:35	04/07/2023 16:40	196.0		1.10			0.08	8
65th Ave. Outfall	05/02/2023 08:35	05/02/2023 08:35	247.0	16	0.90		< 0.01	~ 0.04	4
65th Ave. Outfall	05/14/2023 02:05	05/14/2023 07:05	588.0		0.89	< 0.02		0.06	9
65th Ave. Outfall	06/06/2023 08:20	06/06/2023 08:20	279.0	80	1.12		0.03	0.14	4
65th Ave. Outfall	07/18/2023 08:45	07/18/2023 08:45	305.0	185	0.74		0.05	0.10	3
65th Ave. Outfall	08/01/2023 08:25	08/01/2023 08:25	212.0	55	0.87		0.07	0.14	4
65th Ave. Outfall	09/05/2023 08:45	09/05/2023 08:45	304.0	224	0.84		0.07	0.12	4
65th Ave. Outfall	10/03/2023 08:25	10/03/2023 08:25	84.3	144	1.04		0.09	0.51	4
65th Ave. Outfall	11/07/2023 09:40	11/07/2023 09:40	256.0	178	0.90		< 0.01	0.07	6
65th Ave. Outfall	12/08/2023 08:50	12/08/2023 08:50	252.0	159	1.18		< 0.01	< 0.05	8

# 2023 65th Ave Water Quantity

