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MISSISSIPPI
WATERSHED
MANAGEMENT
ORGANIZATION

2022 65th Ave Annual Report





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2022 65th Ave Annual Report

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Front Cover

Photo credit: Mississippi Watershed Management Organization

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Mississippi Watershed Management Organization

Monitoring Activities Summary

The Mississippi Watershed Management Organization has been working in partnership with the West Mississippi Watershed Management Commission to collect stormwater data at the 65th Avenue site. This annual report contains a summary of monitoring activities, including information about maintenance, number of quality samples, and quantity data. A brief summary of the quantity and quality data, along with the data tables, will be provided.

Over the course of 2022, the MWMO monitoring team collected 23 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, 19 were baseflow samples and the remaining 4 were from rain events.

Regular maintenance is performed monthly to inspect, clean, and calibrate stormwater monitoring equipment. This is done via entering the storm tunnel and physically cleaning debris off of the area-velocity (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 monthly for a total of 12 times in 2022.

Water quantity data is collected continuously over the course of the year. In 2022, there was a brief interruption in this continuous data due to an AV sensor issue. No level or velocity data was recorded from 09/13/2022 through 09/22/2023. On 09/22/2022 the AV sensor was replaced and quantity data collection resumed.

Data Analysis Summary

The MWMO staff collects both water quantity and water quality data at the 65th Avenue monitoring site. 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 2022 were 0.06 and 2.09 feet, respectively. The minimum and maximum water velocities recorded were 0 and 14.5 feet per second (fps), respectively. From 5/15/2022 to 5/21/2022, river tailwater was backed up to the area-velocity sensor in the storm tunnel, resulting in higher-than-normal water level readings. This could have been due to the 1.75 inches of rain received between 5/8/2022 and 5/12/2022 which caused the river level to rise dramatically.

The tables below show both monthly and yearly total stormwater volumes, in cubic feet (ft³), for 2022 at the 65th Avenue monitoring site.

| Monthly Totals | ft³ |
|-----------------------|-----------------------|
| January | 909,701 |
| February | 1,600,729 |
| March | 9,722,037 |
| April | 10,399,646 |
| May | 12,639,921 |
| June | 8,015,144 |
| July | 9,887,219 |
| August | 20,647,358 |
| September | 4,318,007 |
| October | 2,836,964 |
| November | 5,663,071 |
| December | 6,167,093 |

| Yearly Totals | ft³ |
|----------------------|-----------------------|
| Year Total Baseflow | 73,398,525 |
| Year Total Eventflow | 19,409,812 |
| Year Total | 92,806,895 |

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 1.30 milligrams per liter (mg/L), respectively. Average total suspended solids was 16.2 mg/L. Average chloride concentration was 284.3 mg/L. There was a spike in chloride on 2/28/2022 with a concentration of 2530 mg/L. This is likely due to road salt being washed into the tunnel during a snow melt event, as temperatures were above freezing that day. Average E. coli level was 182 MPN/100mL. There was a spike in E. coli on 5/11/2022 with a level of 6300 MPN/100mL. This was likely due to the storm event on 5/11/2022 which brought 1.5" of rainfall, causing more E. coli to be carried into the tunnel by runoff.

The MWMO staff measures water clarity using a Secchi tube. Average transparency was 84 centimeters. The MWMO staff also monitors dissolved oxygen (DO) levels using a YSI multiparameter water quality meter. Average DO in the winter months (January through March) was 12.32 mg/L, while average DO in the non-winter months was 9.58 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.

The following sections contain the full water quality and quantity data from 2022 at the 65th Avenue monitoring site.

2022 Stormwater Sample Data - 65th Avenue-outfall

| Station | Sample Start | Sample End | Sample Reason | Sample Type | Air Temperature (°F) | Water Temperature (°C) | Conductivity (µS/cm) | Dissolved Oxygen (mg/L) | pH | Salinity (ppt) | Specific Conductivity (µS/cm) | Transparency (cm) | Alkalinity (mg/L) | Ammonia Nitrogen (mg/L) |
|----------|------------------|------------------|---------------|-------------|----------------------|------------------------|----------------------|-------------------------|------|----------------|-------------------------------|-------------------|-------------------|-------------------------|
| 65th Ave | 01/04/2022 09:00 | 01/04/2022 09:00 | Base | Grab | 23 | 2.3 | 1012 | 12.39 | 8.15 | 0.9 | 1787 | 85 | | |
| 65th Ave | 02/15/2022 08:55 | 02/15/2022 08:55 | Base | Grab | 15 | 0.8 | 1472 | 13.2 | 7.93 | 1.39 | 2739 | 60 | | 0.76 |
| 65th Ave | 02/28/2022 16:50 | 02/28/2022 16:50 | Melt | Grab | | | | | | | | | | 1.08 |
| 65th Ave | 03/01/2022 09:10 | 03/01/2022 09:10 | Base | Grab | 32 | 5.3 | 1476 | 11.36 | 8.63 | 1.21 | 2363.7 | 57 | | |
| 65th Ave | 03/22/2022 11:55 | 03/23/2022 20:40 | Rain | Composite | | | | | | | | | | |
| 65th Ave | 04/05/2022 08:05 | 04/05/2022 08:05 | Base | Grab | 37 | 5.2 | 802 | 11.86 | 7.7 | 0.64 | 1290 | > 100 | | 0.28 |
| 65th Ave | 04/06/2022 02:10 | 04/06/2022 08:17 | Rain | Composite | 30 | | | | | | | | 61 | 0.32 |
| 65th Ave | 05/03/2022 08:10 | 05/03/2022 08:10 | Base | Grab | 46 | 9.4 | 733 | 10.75 | 7.4 | 0.52 | 1044 | > 100 | | |
| 65th Ave | 05/11/2022 19:30 | 05/12/2022 01:40 | Rain | Composite | 68 | | | | | | | | | |
| 65th Ave | 06/07/2022 07:50 | 06/07/2022 07:50 | Base | Grab | 58 | 16.7 | 1229 | 8.74 | 7.3 | 0.74 | 1459 | 78 | | |
| 65th Ave | 07/05/2022 09:15 | 07/05/2022 09:15 | Base | Grab | 74 | 21.6 | 1273 | 8.34 | 6.4 | 0.68 | 1361 | > 100 | 265 | 0.18 |
| 65th Ave | 08/02/2022 08:50 | 08/02/2022 08:50 | Base | Grab | | 19.9 | 1381 | 8.79 | 7.5 | 0.77 | 1531 | > 100 | 291 | 0.21 |
| 65th Ave | 08/06/2022 07:55 | 08/06/2022 17:55 | Rain | Composite | 63 | | | | | | | | | |
| 65th Ave | 08/16/2022 08:45 | 08/16/2022 08:45 | Base | Grab | 71 | 18.6 | 996 | 8.23 | 7.4 | 0.57 | 1136 | > 100 | 215 | 0.24 |
| 65th Ave | 09/06/2022 08:30 | 09/06/2022 08:30 | Base | Grab | 70 | 20.7 | 1358 | 8.59 | 7.0 | 0.75 | 1481 | 66 | | |
| 65th Ave | 09/20/2022 08:45 | 09/20/2022 08:45 | Base | Grab | 73 | 17.9 | 1311 | 8.69 | 7.2 | 0.77 | 1528 | > 100 | 303 | 0.13 |
| 65th Ave | 09/20/2022 08:46 | 09/20/2022 08:46 | Base | Grab | | | | | | | | | 313 | 0.14 |
| 65th Ave | 10/18/2022 08:55 | 10/18/2022 08:55 | Base | Grab | 25 | 8.8 | 1014 | 10.37 | 7.4 | 0.74 | 1469 | 76 | 303 | 0.19 |
| 65th Ave | 11/01/2022 08:20 | 11/01/2022 08:20 | Base | Grab | 45 | 13.0 | 1136 | 9.56 | 7.3 | 0.75 | 1475 | > 100 | 300 | 0.18 |
| 65th Ave | 12/06/2022 13:35 | 12/06/2022 13:35 | Base | Grab | 25 | 5.1 | 956 | 11.41 | 7.3 | 0.77 | 1541 | 49 | | |
| 65th Ave | 12/06/2022 13:36 | 12/06/2022 13:36 | Base | Grab | | | | | | | | | | |



2022 Stormwater Sample Data - 65th Avenue-outfall continued

| Station | Sample Start | Sample End | Carbonaceous Biological Oxygen Demand 5-day (mg/L) | Chemical Oxygen Demand (mg/L) | Chloride (mg/L) | Dissolved Phosphorus (mg/L) | Ortho Phosphate (mg/L) | Total Phosphorus (mg/L) | E. coli (MPN/100mL) | Hardness (mg/L CaCO3) | Total Kjeldahl Nitrogen (mg/L) | Nitrate (mg/L) | Nitrite (mg/L) |
|----------|------------------|------------------|---|--|--------------------|-----------------------------------|------------------------------|-------------------------------|------------------------|-----------------------------|---|-------------------|-------------------|
| 65th Ave | 01/04/2022 09:00 | 01/04/2022 09:00 | | | 388.0 | | 0.03 | 0.11 | 921 | | 2.30 | | |
| 65th Ave | 02/15/2022 08:55 | 02/15/2022 08:55 | | | 716.0 | | 0.12 | 0.27 | 326 | | 1.80 | | |
| 65th Ave | 02/28/2022 16:50 | 02/28/2022 16:50 | | | 2530.0 | | 0.19 | 0.45 | | | 4.20 | | |
| 65th Ave | 03/01/2022 09:10 | 03/01/2022 09:10 | | | 588.0 | | 0.06 | 0.19 | 308 | | 1.50 | | |
| 65th Ave | 03/22/2022 11:55 | 03/23/2022 20:40 | | | 93.7 | | 0.04 | 0.18 | 208 | | 1.20 | | |
| 65th Ave | 04/05/2022 08:05 | 04/05/2022 08:05 | | | 278.0 | | 0.02 | 0.08 | 51 | | 1.20 | | |
| 65th Ave | 04/06/2022 02:10 | 04/06/2022 08:17 | | 28 | 126.0 | < 0.02 | 0.01 | 0.08 | | 84 | 0.91 | 0.36 | < 0.06 |
| 65th Ave | 05/03/2022 08:10 | 05/03/2022 08:10 | | | 240.0 | | 0.01 | 0.06 | 38 | | 1.10 | | |
| 65th Ave | 05/11/2022 19:30 | 05/12/2022 01:40 | | | 81.9 | | 0.05 | 0.23 | 6300 | | 1.80 | | |
| 65th Ave | 06/07/2022 07:50 | 06/07/2022 07:50 | | | 308.0 | | 0.02 | 0.07 | 33 | | 1.30 | | |
| 65th Ave | 07/05/2022 09:15 | 07/05/2022 09:15 | 1.5 | 20 | 255.0 | 0.07 | 0.05 | 0.10 | 111 | 383 | 0.96 | 0.94 | < 0.06 |
| 65th Ave | 08/02/2022 08:50 | 08/02/2022 08:50 | 0.7 | < 15 | 316.0 | 0.08 | 0.06 | 0.08 | 144 | 436 | 0.80 | 1.39 | < 0.06 |
| 65th Ave | 08/06/2022 07:55 | 08/06/2022 17:55 | | | 101.0 | | 0.06 | 0.20 | | | 1.20 | | |
| 65th Ave | 08/16/2022 08:45 | 08/16/2022 08:45 | 2.1 | 25 | 197.0 | 0.07 | 0.05 | 0.10 | | 305 | 1.00 | 0.80 | < 0.06 |
| 65th Ave | 09/06/2022 08:30 | 09/06/2022 08:30 | | | 264.0 | | 0.03 | 0.09 | 18 | | 0.94 | | |
| 65th Ave | 09/20/2022 08:45 | 09/20/2022 08:45 | 1.0 | 16 | 282.0 | < 0.02 | 0.02 | ~ 0.03 | | 386 | 0.67 | 1.22 | 0.09 |
| 65th Ave | 09/20/2022 08:46 | 09/20/2022 08:46 | 1.2 | 18 | 272.0 | < 0.02 | 0.03 | ~ 0.04 | | 365 | 0.66 | 1.21 | 0.09 |
| 65th Ave | 10/18/2022 08:55 | 10/18/2022 08:55 | 1.2 | 17 | 288.0 | < 0.02 | 0.01 | ~ 0.05 | | 361 | 0.71 | 1.32 | < 0.06 |
| 65th Ave | 11/01/2022 08:20 | 11/01/2022 08:20 | 1.5 | < 15 | 293.0 | < 0.02 | 0.02 | 0.05 | 23 | 347 | 0.79 | 1.22 | < 0.06 |
| 65th Ave | 12/06/2022 13:35 | 12/06/2022 13:35 | | | 297.0 | | 0.03 | 0.09 | < 1 | | 1.10 | | |
| 65th Ave | 12/06/2022 13:36 | 12/06/2022 13:36 | | | 302.0 | | 0.03 | 0.08 | | | 1.10 | | |

2022 Stormwater Sample Data - 65th Avenue-outfall continued

| Station | Sample Start | Sample End | Sulfate (mg/L) | Total Biological Oxygen Demand 5- day (mg/L) | Total Cadmium (ug/L) | Total Chromium (ug/L) | Total Copper (ug/L) | Total Lead (ug/L) | Total Nickel (ug/L) | Total Zinc (ug/L) | Total Dissolved Solids (mg/L) | Total Organic Carbon (mg/L) | Total Suspended Solids (mg/L) | Volatile Suspended Solids (mg/L) |
|----------|------------------|------------------|-------------------|--|----------------------------|-----------------------------|---------------------------|-------------------------|---------------------------|-------------------------|--|--------------------------------------|--|---|
| 65th Ave | 01/04/2022 09:00 | 01/04/2022 09:00 | | | | | | | | | | | 5 | ~ 2 |
| 65th Ave | 02/15/2022 08:55 | 02/15/2022 08:55 | | | | | | | | | | | 6 | 3 |
| 65th Ave | 02/28/2022 16:50 | 02/28/2022 16:50 | | | | | | | | | | | 91 | 42 |
| 65th Ave | 03/01/2022 09:10 | 03/01/2022 09:10 | | | | | | | | | | | 8 | 4 |
| 65th Ave | 03/22/2022 11:55 | 03/23/2022 20:40 | | | | | | | | | | | 56 | 23 |
| 65th Ave | 04/05/2022 08:05 | 04/05/2022 08:05 | | | | | | | | | | | 4 | < 3 |
| 65th Ave | 04/06/2022 02:10 | 04/06/2022 08:17 | 14.6 | | | | | | | | 298 | 4.2 | 12 | 6 |
| 65th Ave | 05/03/2022 08:10 | 05/03/2022 08:10 | | | < 0.10 | < 1.00 | 1.60 | < 0.50 | 1.40 | 6.80 | | | 4 | 3 |
| 65th Ave | 05/11/2022 19:30 | 05/12/2022 01:40 | | | | | | | | | | | 67 | 27 |
| 65th Ave | 06/07/2022 07:50 | 06/07/2022 07:50 | | | | | | | | | | | 3 | < 3 |
| 65th Ave | 07/05/2022 09:15 | 07/05/2022 09:15 | 90.9 | 1.7 | | | | | | | 784 | 4.8 | < 3 | < 3 |
| 65th Ave | 08/02/2022 08:50 | 08/02/2022 08:50 | 76.3 | 0.8 | | | | | | | 863 | 3.0 | < 3 | < 3 |
| 65th Ave | 08/06/2022 07:55 | 08/06/2022 17:55 | | | | | | | | | | | 53 | 17 |
| 65th Ave | 08/16/2022 08:45 | 08/16/2022 08:45 | 55.5 | 2.1 | | | | | | | 641 | 7.1 | < 3 | < 3 |
| 65th Ave | 09/06/2022 08:30 | 09/06/2022 08:30 | | | | | | | | | | | 3 | < 3 |
| 65th Ave | 09/20/2022 08:45 | 09/20/2022 08:45 | 73.8 | 1.4 | < 0.10 | < 1.00 | 2.30 | < 0.50 | 2.10 | 7.00 | 872 | 3.0 | < 3 | < 3 |
| 65th Ave | 09/20/2022 08:46 | 09/20/2022 08:46 | 74.4 | 1.4 | < 0.10 | < 1.00 | 2.30 | < 0.50 | 1.50 | 12.00 | 864 | 3.1 | < 3 | < 3 |
| 65th Ave | 10/18/2022 08:55 | 10/18/2022 08:55 | 74.6 | 1.3 | < 0.10 | < 1.00 | < 5.00 | < 0.50 | 1.50 | < 5.00 | 849 | 2.7 | < 3 | < 3 |
| 65th Ave | 11/01/2022 08:20 | 11/01/2022 08:20 | 74.3 | 1.6 | | | | | | | 832 | 2.9 | < 4 | < 4 |
| 65th Ave | 12/06/2022 13:35 | 12/06/2022 13:35 | | | | | | | | | | | 3 | < 3 |
| 65th Ave | 12/06/2022 13:36 | 12/06/2022 13:36 | | | | | | | | | | | 3 | < 3 |

Water Quantity Data

| | |
|--|--------------------------|
|  | 65th Ave Level (ft) |
|  | 65th Ave Discharge (cfs) |

