

Watershed Outlet Monitoring Program

Willow Creek Station Burnsville, MN

Quarterly Report *Preliminary Data* July – September 2009



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Prepared For: Lower Minnesota River Watershed District
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Introduction

The Willow Creek Watershed Outlet Monitoring Program (WOMP) site, located in Burnsville behind the Menards on Highway 13, has been in operation since 1999. The Willow Creek watershed drains more than 5,000 acres of various types of land uses including residential, vacant/agricultural, and commercial properties (Appendix A). This report summarizes the results of flow, precipitation, and water quality for the 3rd quarter of 2009. This data is preliminary and is subject to change until the Metropolitan Council submits the final report for this period.

Flow and Precipitation

Average flow in Willow Creek was 3.35 cubic feet per second (cfs) or 2.17 million gallons per day (mgd) (Table 1). A graph describing quarterly flow and precipitation results is also provided (Figure 1).

Table 1. Average flow and total precipitation at Willow Creek WOMP Station July-September 2009

| Period | Average Flow (cfs/mgd) | Precipitation (inches) | *Average Monthly Precipitation, 1999-2008 (inches) |
|---------------|------------------------|------------------------|--|
| JULY | 0.72/0.47 | 1.65 | 3.30 |
| AUGUST | 7.53/4.87 | 5.44 | 4.35 |
| SEPTEMBER | 0.70/0.45 | 0.50 | 3.33 |
| TOTAL QUARTER | 3.35/2.17 | 7.59 | 10.98 |

*Average monthly precipitation data obtained from the National Weather Service station located near the Willow WOMP site.

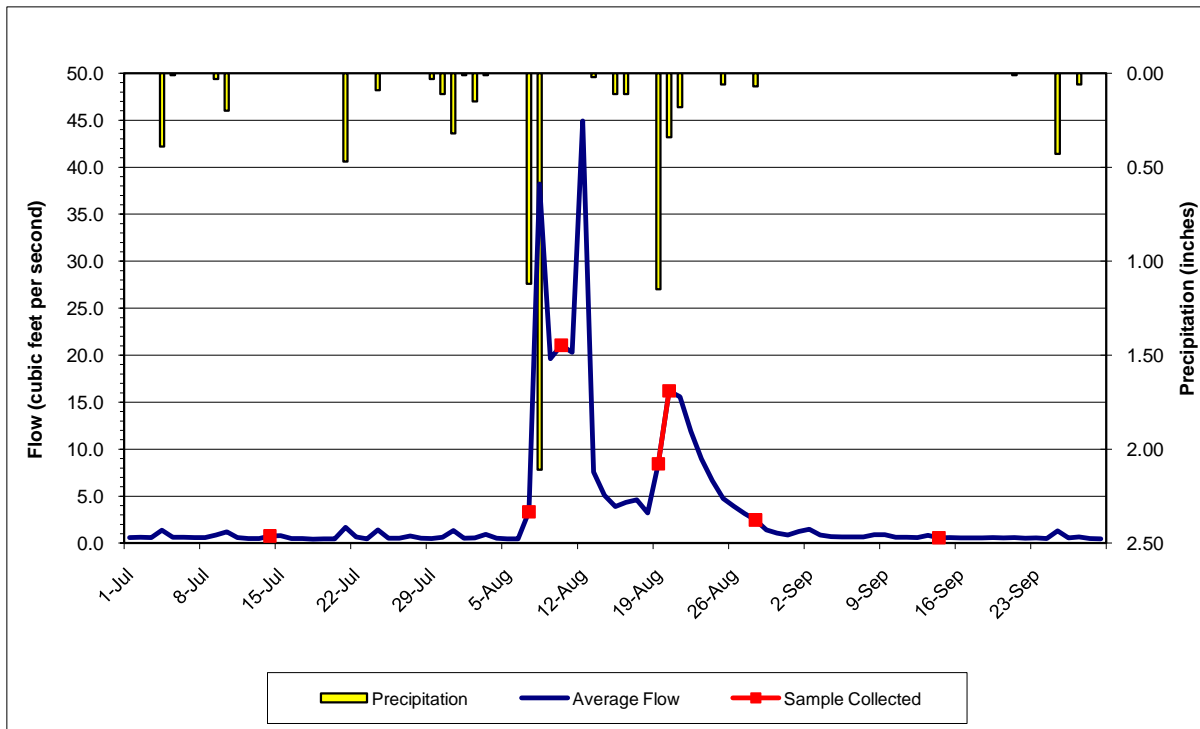


Figure 1. Flow and precipitation data from the Willow WOMP Station July-September 2009

Water Quality

Two event flow composite samples (8/7/09, 8/19/09), and three base flow grab samples (7/14/09, 8/28/09, 9/14/09) were collected from the Willow WOMP Station during the 3rd quarter of 2009.

Overall, water quality during the third quarter was good with most parameters below the state standard (in compliance with standards) or near ecoregion means (Table 2). However, conductivity and *E. coli* results continue to exceed ecoregion means or state standards (highlighted red). These exceedances are likely an artifact of soil types and the highly urbanized nature of the Willow Creek watershed.

Table 2. Average concentrations at Willow Creek WOMP Station April-June 2009 (for comparison purposes) and July-September 2009.

| Parameter | 2 nd Quarter 2009 Mean Concentration | 3 rd Quarter 2009 Mean Concentration | Notes – 3 rd quarter results |
|-------------------------------------|---|---|---|
| Alkalinity | 220.8 mg/L CaCO ₃ | 174.9 mg/L CaCO ₃ | Typical for freshwater; higher during low flow |
| Biological Oxygen Demand (2.7 mg/L) | 1.6 mg/L | 1.6 mg/L | Below ecoregion mean |
| Cadmium | 0.50 ug/L | 0.50 ug/L | In compliance with state standard |
| Chloride (230 mg/L) | 145 mg/L | 92 mg/L | In compliance with state standard |
| Chlorophyll-a | 2.8 ug/L | 6.5 ug/L | Low level |
| Chromium | 5.7 ug/L | 4.2 ug/L | In compliance with state standard |
| Conductivity (297.7 umMHOs) | 1164 mMHOS | 665 mMHOS | Above ecoregion mean, higher during low flow |
| Copper | 2.03 ug/L | 1.67 ug/L | In compliance with state standard |
| <i>E. coli</i> (126 MPN/100mL) | 320 MPN/100mL | 384 MPN/100mL | Exceeds state standard |
| Hardness | 331 mg/L CaCO ₃ | 210 mg/L CaCO ₃ | Considered hard water; very hard during low flow |
| Lead | 0.10 ug/L | 0.14 ug/L | In compliance with state standard |
| Nickel | 5.6 ug/L | 4.72 ug/L | In compliance with state standard |
| Nitrogen Ammonia (200 ug/L) | 58 ug/L | 57 ug/L | Below ecoregion mean |
| Nitrate + Nitrite (0.16 mg/L) | 0.21 mg/L | 0.16 mg/L | At ecoregion mean |
| Phosphorus, Total (0.13 mg/L) | 0.048 mg/L | 0.086 mg/L | Below ecoregion mean |
| Suspended Solids (13.7 mg/L) | 3.6 mg/L | 24.1 mg/L | Above ecoregion mean, due to elevated storm samples |
| Turbidity (25 NTU) | 3.6 NTU | 4.3 NTU | In compliance with state standard |
| Zinc | 4.3 ug/L | 6.4 ug/L | In compliance with state standard |

mg/L = milligrams per liter or parts per million (ppm)

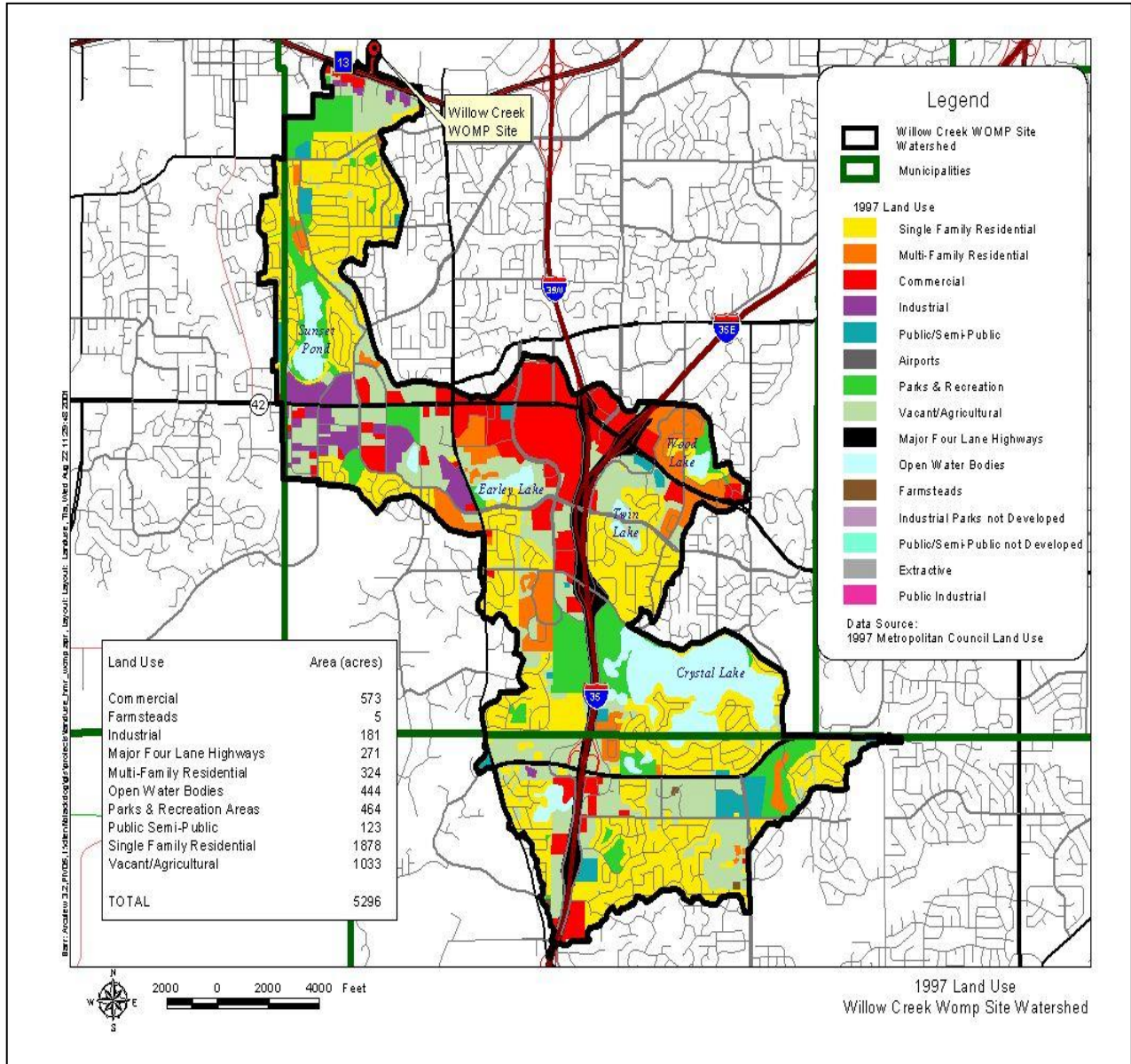
ug/L = micrograms per liter or parts per billion (ppb)

mMHO = micromhos or micorseimens

CFU = colony forming units

NTU = nephelometric turbidity units

Appendix A



Watershed and land use information provided by Metropolitan Council Environmental Services.