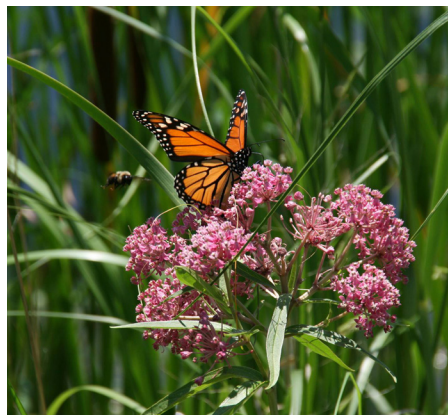


City of Bloomington Local Surface Water Management Plan



Prepared for the City of Bloomington
by Barr Engineering Co.
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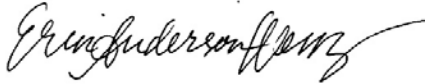
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Certifications

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the Laws of the State of Minnesota.



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May 30, 2018

Date

Acronyms

BMP	Best Management Practices
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
LGU	Local Government Unit
LMRWD	Lower Minnesota River Watershed District
MDH	Minnesota Department of Health
MNDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer System
MSP	Minneapolis-St. Paul International Airport
NMCWD	Nine Mile Creek Watershed District
NPDES	National Pollution Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
P8	Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds
RBWMO	Richfield-Bloomington Watershed Management Organization
RPBCWD	Riley-Purgatory-Bluff Creek Watershed District
SSURGO	Soil Survey Geographic dataset
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TP-40	Technical Paper 40
TP-49	Technical Paper 49
TSS	Total Suspended Solids
UAA	Use Attainability Analyses
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USDA	United States Department of Agriculture

WLA	Waste Load Allocation
WRAPS	Watershed Restoration and Protection Strategy
XPSWMM	Stormwater Management Model (interface by XP Solutions)

Glossary

- **Algae:** simple plants found in water and elsewhere, having no roots, flowers, or seeds; frequently microscopic and may grow in simple colonies (singular: *alga*, *algal*).
- **Aquifer:** saturated permeable geologic unit(s) that can transmit significant quantities of water under ordinary hydraulic gradients.
- **Atlas 14:** the primary source of information regarding rainfall frequency estimates in the Midwest region. Published by the National Oceanic and Atmospheric Administration in 2013, Atlas 14 provides estimates of precipitation depth (i.e., total rainfall in inches) and intensity (i.e., depth of rainfall over a specified period) for durations from 5 minutes up to 60 days. Atlas 14 supersedes publications Technical Paper 40(TP-40) and Technical Paper 49 (TP-49) issued by the National Weather Bureau (now the National Weather Service) in 1961 and 1964.
- **Blooms:** sudden abundant growth of algae, usually consisting of one or a few species, which has the effect of greatly reducing transparency.
- **Buffer:** upland, vegetated areas located adjacent to water resources that reduce adverse impacts from adjacent development and activities.
- **Chlorophyll *a*:** green pigment in plants essential to photosynthesis.
- **Climate change:** a change in global or regional climate patterns, in particular a change apparent from the mid-to-late 20th century onwards.
- **Discharge:** the volume of stream flow passing a point during some period of time; often expressed as cubic feet per second.
- **Erosion:** wearing away of the lands or structures by running water, glaciers, winds, and waves.
- **Erosion control:** the practice of preventing or controlling soil erosion from wind or water.
- **Eutrophic:** “well-nourished”—describes a lake with high nutrient levels that can support a dense growth of algae and other organisms, the decay of which can deplete the shallow waters of oxygen.
- **Eutrophication:** the process of physical, chemical, and biological changes associated with nutrient, organic matter, and silt enrichment and sediment of a lake or reservoir. If the process is accelerated by human influences it is termed cultural eutrophication.

- **Flood elevation:** the highest water elevation of a waterbody reached during a precipitation or runoff event of a specific recurrence interval.
- **Freeboard:** a factor of safety used in flood management, usually expressed as a distance (in feet) between a flood elevation and the lowest entry elevation of a structure.
- **Geology:** the science which treats of the origin, history, and structure of the earth as recorded in the rocks.
- **Groundwater:** water found beneath the soil surface and saturating the strata at which it is located—often connected to lakes.
- **Hydrology:** the applied science concerned with the waters of the earth in all its states: their occurrences, distribution, and circulation through the unending hydrologic cycle of precipitation, consequent runoff, stream flow, infiltration, storage, eventual evaporation, and “re-precipitation.”
- **Infiltration:** the entrance of water into the soil or other porous material through the interstices or pores of a soil or other porous medium.
- **Internal loading:** nutrients or pollutants recycled to a body of water from its sediments.
- **Lake management:** a process that involves study, assessment of problems, and decisions affecting the maintenance of lakes as thriving ecosystems.
- **Land use:** type of development and use of a land area; urban and agriculture are land uses.
- **Land cover:** undeveloped area of landscape with a distinct type of vegetation. Forests and wetlands are land covers.
- **Level of service:** the precipitation frequency for which all runoff will be conveyed through the storm sewer system without surcharging
- **Nonpoint source:** diffuse source of pollutants coming from contaminated underground flow, septic system leakage, and overland runoff to streams and lakes.
- **Nonpoint source pollution:** pollution originating at a variety of non-localized sources, such as street runoff, septic systems, atmospheric deposition, or groundwater.
- **Nutrient:** element or chemical essential to life, including carbon, oxygen, nitrogen, and phosphorus.

- **Permeability:** a measure of a rock or soil's ability to transmit water analogous to hydraulic conductivity.
- **Phosphorus load:** the amount of phosphorus entering a waterbody in a given period of time, usually expressed as a mass load per time period (e.g., pounds per year).
- **Point source:** well-defined source of pollutants, such as a pipe from a municipal wastewater treatment plant or industry.
- **Precipitation:** the total measurable supply of water of all forms of falling moisture, including dew, rain, mist, snow, hail, and sleet—usually expressed as depth of liquid water on a horizontal surface in a day, month, or year, and designated as daily, monthly, or annual precipitation.
- **Recharge:** the process whereby an aquifer receives water.
- **Topography:** the physical features of a district or region, such as are represented on maps, taken collectively; especially, the relief and contour of the land.
- **Use Attainability Analysis (UAA):** a scientific study to assess a waterbody's physical, chemical, and biological conditions relative to the desired beneficial uses that can reasonably be achieved and maintained for a given waterbody and identify management recommendations. A UAA considers observed water quality, estimated water quality under fully developed conditions, and recommends management strategies to achieve water quality goals.
- **Wellhead protection:** the process of mitigating the potential for contamination of a well or well field by instituting controls on land use in the area where the well receives its groundwater.