

## SECTION III

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### III. LAND AND WATER RESOURCE INVENTORY

As required in Minnesota Rules Section 8410.0060, this section of the plan provides a general description and summary of the climate, geology, surficial topography, surface and ground water resource data, soils, land use, public utilities services, water-based recreation, fish and wildlife habitat, unique features, scenic areas, and pollutant sources. This section also identifies where detailed information can be obtained for many of these areas of concern.

#### A. Climate and Precipitation

##### 1. Climate

The climate within the Minneapolis/St. Paul metropolitan area is described as a humid continental climate with moderate precipitation, wide daily temperature variations, warm humid summers and cold winters. The total average annual precipitation is approximately 27 inches, of which approximately one-third occurs in the months of June, July and August. The annual snowfall average is about 50 inches and is equivalent to approximately 5 inches of water. Average monthly temperature, precipitation, and snowfall are shown in **Table III-1**.

##### 2. Precipitation

A rainfall event having a 99% chance of occurrence in a 24-hour period is approximately 2.4 inches. A rainfall event having a 1% chance of occurrence in a 24-hour period is approximately 6.0 inches. The 1%, 10-day runoff is 7.2 inches. **Figures III-1** and **III-2** show the 1% rainfall event and the annual normal precipitation within the State of Minnesota. Additional climatological information for the area can be obtained from the U.S. Weather Bureau Technical Paper 40.

#### B. Geology and Topographic Information

##### 1. Geology:

The City of Bloomington is located in southeastern Hennepin County (**Figure III-3**). Total area within the corporate limits is approximately 39 square miles. The northern and western boundaries of the City are generally the surveyed limits of the abutting adjacent cities, while the southern and southeastern boundary is the Minnesota River.

The geomorphology of the City is comprised of Twin Cities glacial till and Glacial River Warren Terrace sand and sediment deposits. Depth of the glacial till, sand, and sediment deposits over bedrock varies from 100 to 300 feet. The initial bedrock formations include Prairie du Chien dolomite, Jordan sandstone, and St. Lawrence and Franconia formations. Composition of the glacial till in the northwest portion of the City includes various forms of till from the Des Moines-Grantsburg Sublobe, including loam, clay loam, and sandy loam.

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The remainder of the City lies in the Glacial River Warren Terrace and consists of sand, gravelly sand, and loamy sand overlain by thin deposits of silt, loam, or organic sediment. Much of this area is now covered in artificial fill and has been developed. The area directly adjacent to the Minnesota River consists of clayey floodplain alluvium.

Bedrock geology is described as Early Paleozoic, sedimentary rock. Three major aquifers are located within the City boundaries: the Prairie Du Chien-Jordan Aquifer, the Franconia-Ironton-Galesville Aquifer, and the Mt. Simon-Hinckley Aquifer. The lowest of the three aquifers is the Mt. Simon-Hinckley. It ranges in elevation from 600-700 feet above sea level in the Bloomington area and is characterized by Mt. Simon & Hinckley Sandstones. It is confined from above by the Eau Claire Formation. Above this, the Franconia-Ironton-Galesville Aquifer ranges in elevation from 700-800 feet above sea level in the Bloomington area. It is composed of the Franconia Formation and Ironton & Galesville Sandstones. The St. Lawrence Formation confines it in most areas. The uppermost aquifer, the Prairie Du Chien-Jordan, ranges in elevation from 700-800 feet above sea level in this area. It is composed of Jordan Sandstone and the Prairie Du Chien Group. In some areas of Bloomington, the St. Lawrence Formation or Franconia Formation are the uppermost bedrock layers. Therefore, the Prairie Du Chien-Jordan aquifer is not present in these areas.

Additional geologic information for areas within the City can be found in the Hennepin County Geologic Atlas, which is available in the Water Resource Library at Public Works.

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TABLE III-1

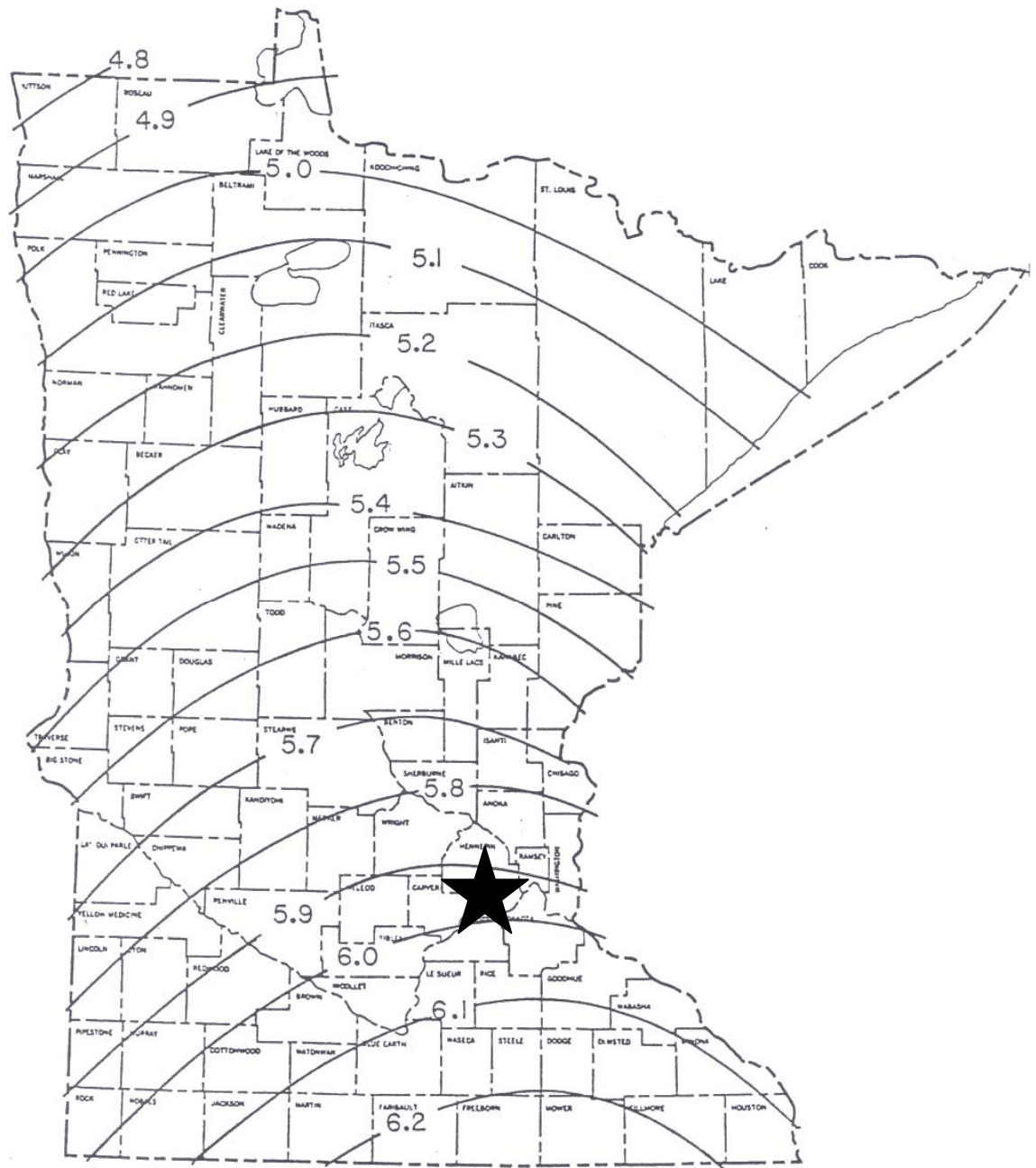
AVERAGE MONTHLY TEMPERATURE, PRECIPITATION,  
AND SNOWFALL DATA FOR MINNEAPOLIS/ST. PAUL METROPOLITAN AREA  
(1971-2000)

<u>Month</u>	<u>Average Temp. F°</u>	<u>Precip. inches</u>	<u>Snowfall inches</u>
January	11.5	1.04	13.5
February	18.7	0.79	8.2
March	30.5	1.86	10.4
April	46.1	2.31	3.1
May	58.4	3.24	0.1
June	68.1	4.34	0
July	73.1	4.04	0
August	70.8	4.05	0
September	60.9	2.69	0
October	49.4	2.11	0.6
November	32.9	1.94	10.0
December	<u>19.2</u>	<u>1.00</u>	<u>10.0</u>
<b>Annual Average:</b>	45.1	<b>Total:</b> 29.41	<b>Total:</b> 55.9

Source: State Climatology Office for the Minneapolis/St. Paul Airport

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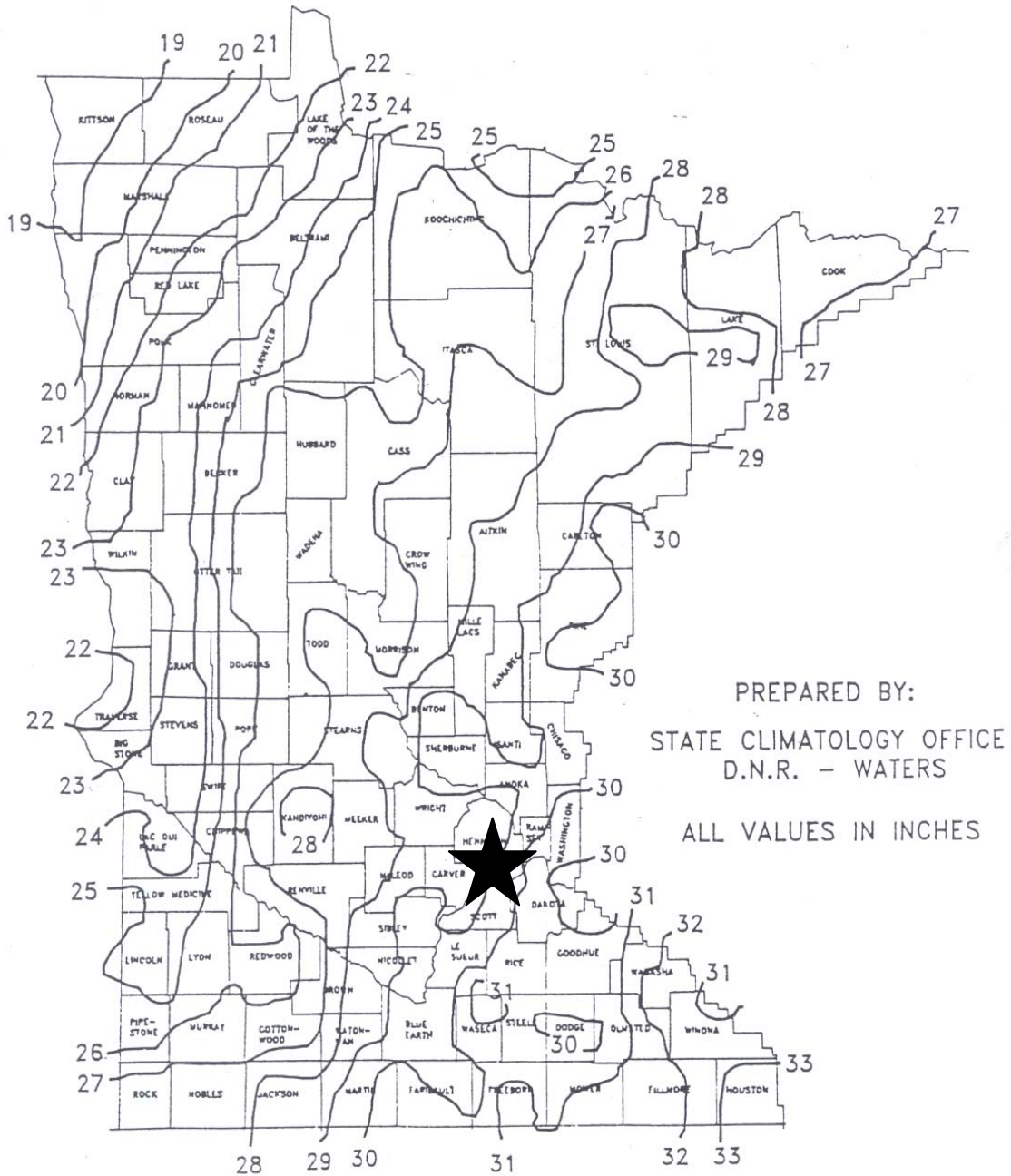
Figure III-1. 1% Chance Rainfall Event within the State of Minnesota.



Source: Hydrology Guide for Minnesota

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Figure III-2. Annual Normal Precipitation with the State of Minnesota.



PREPARED BY:  
STATE CLIMATOLOGY OFFICE  
D.N.R. - WATERS  
ALL VALUES IN INCHES

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Figure III-3  
City Location Map

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### 2. Topography:

Topography in Bloomington is characterized by three landscape units: highlands, outwash plain, and river valley. These landscape units were the result of the retreat of the Wisconsin glacier over 10,000 years ago. The highlands area is concentrated in the northwest and western portions of Bloomington. The outwash plain covers the majority of central and east Bloomington, while the river valley incorporates those lands adjacent to the Minnesota River. Topography, in contours indicating 50-foot increases in elevation, is shown on **Figure III-4**.

Surface drainage basins in the City are a result of variations in topography and are reflected in the three different landscape units. Surface drainage basins coincide with the boundaries of the Watershed Districts that are shown in **Figure II-1**. These drainage basins represent the downstream section of two major water bodies: the Minnesota River, extending from western Minnesota, and Nine Mile Creek, extending from northwest Hennepin County. As downstream sections, there is an effect on the water quality and quantity based on upstream practices in the areas of flood control, environmental protection, and erosion and sedimentation control.

Several drainage basins within Bloomington have no natural surface outlet and drain into the ground water system or through storm sewers.

### C. Surface Water Resource Data

Available surface water resource data within the City is summarized in this section. Detailed information has been included either in the appendices to this report or has been identified by reference and is available in the Water Resource Library at Bloomington Public Works.

The hydrologic system of the City consists of wetlands, streams, and major water bodies. Extensive documentation on wetlands is contained in the Wetland Protection and Management Plan and in **Section III.C.1**.

#### 1. Wetlands

A Wetland Protection and Management Plan was completed for areas above the Minnesota River bluff line by the City in 1997 in accordance with Minnesota Rules 8420.0650. The plan inventoried approximately 300 wetlands using a slightly modified version of the Minnesota Routine Assessment Methodology for Evaluating Wetland Functions as permitted under the WCA rules. A second assessment was completed for areas within the Minnesota River Valley during 1999.

Wetland inventories have been completed by U.S. Fish and Wildlife Service as published on the National Wetland Inventory Maps, and by the Minnesota Department of Natural Resources as published in their Protected Waters and Wetlands Map. The City of Bloomington has also completed an inventory map as part of the Wetland Protection and Management Plan. These wetland inventories are shown on **Figures III-5a, III-5b, and III-5c**. A copy of the Wetland Protection and Management Plan is available in the Water Resources Reference Library at Public Works.

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Figure III-4

Elevation Above Mean Sea Level NOTE : elevation map needs to be in color



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### 2. **Major Bodies of Water**

There are several major bodies of water in Bloomington which deserve special attention due to their size, location, and characteristics. These water bodies are the Minnesota River and associated wetlands, Nine Mile Creek, Anderson Lakes, Bush Lake, Upper and Lower Penn Lakes, Hyland Lake, Oxboro Lake, Smith Pond, and Normandale Lake.

### 3. **Hydrologic Modeling (Water Quantity)**

The City's hydrologic/hydraulic system consists of the Minnesota River, Nine-Mile Creek, lakes, ponds, wetlands, and storm sewer pipe systems. The City is divided into 22 subwatershed areas, which are shown on **Figure III-6**. An XP-SWMM based hydrologic/hydraulic computer model has been developed for many of the subwatersheds in the City, including those identified in **Figure III-14**.

### 4. **Water Quality**

A P8 model was completed for many of the subwatersheds in the City as identified in **Figure III-14**. A Pollutant Loading Assessment will be completed in 2007 under the NPDES permit nondegradation requirements.

### D. **Flood Insurance Studies**

A Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) was completed for areas within the City in 1981. The Flood Insurance Study consisted of a study report, a set of floodway and floodplain delineation maps, and a set of FIRM maps. This study provides the basis for floodplain management regulations and is included in **Appendix B**. The Flood Insurance Rate Maps are available in the Water Resource Library.

The Flood Insurance Study was revised with updated mapping effective September 2, 2004. Subsequently, on December 31, 2005, a preliminary Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) Report for Hennepin County and Incorporated Areas was provided to the City for comments.

The flood hazard information presented to the City was revised based on a study performed by a contractor working for FEMA. The updated mapping also incorporates past map actions such as Letters of Map Revisions (LOMRs) and Letters of Map Amendment (LOMAs). These revisions will be superseded when the DFIRM panels become effective.

This study provides the basis for floodplain management regulations, including the Flood Hazard Overlay District Sec. 19.38.02 of City Code. The Study and Flood Insurance Rate Maps are available in the Water Resources Library and are incorporated by reference.

### E. **Flood Problem Areas**

Historical data regarding high water levels and other surface water management information within the City are contained in the following drainage reports/studies:

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**Table III-2. City of Bloomington Inventory of City Drainage Reports / Studies**

Date Completed	Name of Report	Author
11/1/64	Review of Proposal by State of MN Water Pollution Control Commission for Classification and Standards for the Lower Minnesota River	Rohlich, Polkowski, Boyle
11/1/64	Report on Groundwater Inflow Lower MN River	Douglas Barr
3/1/67	Feasibility Study Mt. Normandale Lake and Marsh Lake (Upper Nine Mile Creek)	Barr Engineering
9/1/67	Report of the Marsh Lake Study Committee to Planning Commission	Author Undocumented
5/1/70	Marsh Lake Plan	Marsh Lake Development Committee
11/1/71	Hydrological Study of Hyland-Bush-Anderson Lakes	Barr Engineering
3/17/72	Storm Water Runoff at Hyland Lake Park	Hennepin County Park Reserve District
6/1/73	Preliminary Design Mt. Normandale Lake (Upper Nine Mile Creek)	Barr Engineering
3/1/75	Hyland Lake Water Quality Study	Hennepin County Park Reserve District / Riley Purgatory Creek WD/Barr Engineering
8/1/75	Hyland Lake Restoration Preliminary Design	Hennepin County Park Reserve District/Barr Engineering
7/11/77	Ponds North of 84th Street between France and Normandale (Skriebakken)	COB
11/14/77	Draft Report Part 1 Rainstorm of August 30 - 31, 1977	COB
9/1/78	Hydrologic and Hydraulic Analysis of the Oxboro Lake to Nine Mile Creek Storm Water System	Barr Engineering
12/28/78	Smith Pond Wright's Lake Storm Sewer System	Barr Engineering
12/28/78	Hydrologic and Hydraulic Analysis James Avenue Storm Sewer System	Barr Engineering
7/1/80	Engineer's Report 105th Street Construction	Nine Mile Creek WD/Barr Engineering
5/1/81	Draft Feasibility Study St. Edward's Pond	COB
6/1/81	Stadium Area Storm Drainage Study	TKDA
2/1/83	Storm Water Management Plan Normandale Center Area (Upper Nine Mile Creek)	Barr Engineering
3/17/86	MOA FEIS	COB & BRW, Inc.
3/20/86	Storm Sewer at 99th and Grand Avenue (Hopkins D.A.)	COB

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Date Completed	Name of Report	Author
1/1/88	Storm Water Management Analysis Colorado Pond Drainage Basin	Barr Engineering
1/1/88	Storm Water Management Analysis Penn Lake Drainage Basin	Barr Engineering
1/1/88	Property Damage and Flood Elevation Comparisons	COB
1/20/88	Smith Pond-Wrights Lake Drainage Study	TKDA
1/25/88	Drainage Analysis for the York-Nine Ponds Area	Eugene A. Hickok
1/25/88	Summary Storm Water Management Analysis	Author Undocumented
1/27/88	Storm Water Management Analysis Brookside Area	Author Undocumented
1/27/88	Storm Water Management Analysis Skriebakken Pond	Author Undocumented
5/2/88	Storm Sewer Report (Rain Storm of July 23 - 24, 1987)	COB
6/14/88	Feasibility Study Diversion of Richfield Storm Sewer into I-494 Storm Sewer (Smith Pond)	TKDA
1/1/89	Lower Valley Bank Stabilization and Restoration Engineer's Report (Lower Nine Mile Creek)	Barr Engineering
12/1/90	Storm Water Management Analysis Oxboro Lake Drainage Basin	Barr Engineering
4/1/91	I-494 Reconstruction Preliminary Draft Water Resources Technical Report	BRW
7/1/91	I-35W EIS Water Resources Special Study	SRF Consulting
6/22/92	Analysis of Alternatives for Storm Sewer Improvements 8800 Block of Lyndale Avenue (Oxboro)	COB
4/1/97	Bush Lake Outlet Project Engineer's Report	Barr Engineering
Undated	Report on Permanent Ponding Areas	COB
1/12/98	Nine Mile Creek UAA	Barr Engineering
8/1/00	XPSWMM/P8 Analysis of Smith Ponds/Wright's Lake	WSB & Associates, Inc.
8/1/00	XPSWMMP/P8 Analysis of Riley Purgatory DA	WSB & Associates, Inc.
10/30/00	I-494 Reconstruction Final EIS Review Draft	SRF Consulting
4/1/01	AUAR Airport South	SRF Consulting
9/1/01	Nine Mile Creek/Bloomington UAA	Barr Engineering
4/1/02	Bush Lake UAA	Barr Engineering
8/1/02	Hampshire Pond Drainage District Modeling Summary	Barr Engineering
4/1/04	Bloomington Culvert Replacement Project Engineer's Report	Barr Engineering
1/1/05	Normandale Lake UAA	Barr Engineering
1/1/06	Oxboro Lake Hydrologic and Hydraulic Modeling	Barr Engineering

These studies and the results of the hydrologic/hydraulic modeling efforts in the City are available in the Water Resource Library at Public Works. Many of the improvements discussed in these studies have been implemented or have been given special attention during the design process for new development, re-development, and City projects.

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Additional drainage-related information can be found in various documents such as the I-35 W EIS.

### F. Water Quality Data

#### 1. Overview

Water quality data for the City has been obtained from City of Bloomington annual monitoring reports and the Environmental Data Access from the Minnesota Pollution Control Agency (MPCA). The information from the MPCA contains data obtained from volunteer monitors as well as the information from the Storage and Retrieval Database (STORET) water quality database. This database is utilized by participating agencies to compile water quality testing data and is almost entirely used for the storage of water quality parameters. The MPCA information is available at:

[www.pca.state.mn.us/data/edaWater/index.cfm](http://www.pca.state.mn.us/data/edaWater/index.cfm).

A variety of water quality studies have been completed for the City. Many of these studies are listed in **Table III-2** and are also available in the Water Resource Library at Public Works.

The Nine Mile Creek Watershed District and Metropolitan Council operate monitoring stations along Nine Mile Creek at three locations in Bloomington – West 78<sup>th</sup> Street (NMCWD), West 98<sup>th</sup> Street (NMCWD), and West 106<sup>th</sup> Street (Met Council).

**Figure III-7** shows the location of City monitoring sites that have been used in the past or are currently being used to collect water quality or quantity data. **Figure III-8** shows the existing and proposed structural BMPs that are being used or will be used to implement improvements to the water quality within the City.

#### 2. Water Quality Modeling Data

To provide additional information on existing and future water quality within the City, an urban water quality model was developed. The computer program used to model water quality within the City is the "Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds" referred to as the P8 Urban Catchment Model.

The P8 urban water quality model predicts the generation and transportation of stormwater runoff pollutants within the City. This model can estimate pollutant loadings, concentrations, and removal efficiencies for basins subject to single or continuous rainfall events. The model will simulate the performance of a variety of treatment devices, including swales, buffer strips, detention ponds, flow splitters, infiltration basins, and general devices.

The initial calibration of this model corresponds to values measured under the Nationwide Urban Runoff Program, or NURP. Specific calibration of this model for the City will require water quality monitoring data for

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selected areas in the City. Without calibration of the model to site-specific data, predictions for specific parameter concentrations, flows, and loadings will be less precise. However, the relative predictions concerning the removal efficiency of a basin by particle size will be unaffected by calibration.

The results of the P8 water quality modeling effort are available in the Water Resources Library at Public Works. It should be noted that the actual stage-storage data for treatment basins utilized in this analysis are consistent with the volume between the NWL and the HWL from the XP-SWMM Hydrologic Modeling effort for the 1% chance rainfall event.

The P8 water quality modeling results include:

- Estimations of water quality parameters.
- Average treatment efficiency of storm water detention basins within the City.
- Water quality parameters including:
  - Total suspended solids (TSS)
  - Total phosphorous (TP)
  - Total Kjeldahl nitrogen (TKN)
  - Copper (Cu)
  - Lead (Pb)
  - Zinc (Zn)
  - Hydrocarbons (HC)
  - Chemical oxygen demand (COD)
  - Biological oxygen demand (BOD).

The concentrations of individual water quality parameters estimated by the P8 water quality model may vary significantly with values obtained from field monitoring. This inconsistency is due to the extreme variation in water quality parameter concentrations from individual subwatersheds. However, the estimated removal efficiencies of treatment basins would be comparable to the removal efficiencies determined from field investigations. Monitoring results and additional information on the P8 water quality modeling effort is available in the Water Resources Library.

### **G. Flood Hazard Overlay District and Shore Area Regulation**

The City has adopted a Flood Overlay District and Shore Area Regulations which can be found in **Appendix G**. The DNR Public Waters/Wetlands are shown on **Figure III-5b**. The floodplain map is shown on **Figure III-12**.

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### H. Ground Water Appropriations

Within the City, groundwater wells partially serve the City and private water needs. Each of these wells has a groundwater appropriation permit from the DNR. Figure III-9 shows the locations of the DNR permitted groundwater appropriation sites within the City, including the six municipal wells.

### I. Ground Water Resource Data

Groundwater resource data for areas within the City are available by reviewing the contents of three reports. A brief description of the content in these documents is provided below. These documents are available at the Public Works Resource Library.

1. The Hennepin County Geologic Atlas completed in 1989 contains information on aquifers, general depth to ground water table, and areas sensitive to ground water pollution.
2. The Draft Hennepin County Groundwater Plan, completed March, 1994 contains information about ground water within the County. City of Bloomington Wellhead Protection Plan Parts 1 & 2, completed April, 2004 contains specifics on the six municipal wells in the city as well as the delineated Wellhead Protection Area (WHPA) and Drinking Water Supply Management Area (DWSMA) boundaries as required by Minnesota Rule 4720.

### J. Soils Information

The hydrologic soil classification map, **Figure III-10**, shows the distribution of soils based on soil consistency and infiltration rates. The four soil classifications are defined as follows:

**Group A** - These soils have high infiltration rates even when thoroughly wetted. The infiltration rates range from 0.3 to 0.5 inches per hour. These soils consist chiefly of deep, well drained to excessively drained sands and gravel. Group A soils have a high rate of water transmission, therefore resulting in a low runoff potential.

**Group B** - These soils have moderate infiltration rates ranging from 0.15 to 0.30 inches per hour when thoroughly wetted. Group B soils consist of deep moderately well to well drained soils with moderately fine to moderately coarse textures.

**Group C** - These soils have slow infiltration rates ranging from 0.05 to 0.15 inches per hour when thoroughly wetted. Group C have moderately fine to fine texture.

**Group D** - These soils have very slow infiltration rates ranging from 0 to 0.05 inches per hour when thoroughly wetted. Group D soils are typically clay soils with high swelling potential, soils with high permanent water table, soils with a clay layer at or near the surface, or shallow soils over nearly impervious material.

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The City contains Group A, B, C, and D soils. Roughly one-half of the City is composed of artificial fill over glacial outwash. The remainder of the City consists of Peaty Muck-Hayden-Burnsville association, Hayden-Peaty Muck association, Esterville-Dickman-Dakota, and Mixed Alluvial Land-Marsh-Chaska association soils. These associations contain a mix of Group A, B, C, and D soils. In general, wetland, lake, and marsh areas contain Group D soils. Well drained upland areas generally consist of Group A and B soils.

The Peaty Muck-Hayden-Burnsville association and the Hayden-Peaty Muck association developed in glacial till, contain moderately fine to moderately coarse textured soils, and are characterized by well-drained hilly soils and poorly-drained organic soil depressions.

The Esterville-Dickman-Dakota association is a glacial outwash deposit of moderately coarse and medium-textured soils underlain by sand and gravel. This association is nearly level to hilly and has moderately rapid to rapid permeability.

The Mixed Alluvial Land-Marsh-Chaska association is located directly adjacent to the Minnesota River and is subject to flooding. It contains organic marsh areas and moderately coarse textured to moderately fine textured soils that formed in alluvium.

Additional information on the geology and soil for the City is included in the Hennepin County Geologic Atlas and Hennepin County Soil Survey available at the Water Resource Library at Public Works.

### **K. Land Use and Public Utilities Services**

Existing land use and the Land Use Guide Plan for areas within the City are described in the Land Use element of the Bloomington Comprehensive Plan. The existing land use map includes residential, public/quasi-public/conservation, commercial, industrial/warehouse, and vacant while the land use guide plan adds more detail to the above designations. **Figure III-13** is a representation of the Land Use Guide Plan (updated 9/29/06).

Public utility services available for lands within the City have also been clearly described in the Utilities Element of the City's Comprehensive Plan.

The City contains approximately 52 Individual Sewage Treatment Systems (ISTS). Many of these systems are located along the Minnesota River bluff. These systems are inspected and permitted as outlined in the City of Bloomington Comprehensive Sanitary Sewer Plan and according to Minnesota Rules 7080.

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### L. **Public Areas for Water Based Recreation and Access**

The Minnesota River and associated wetlands, Nine Mile Creek, Lower and Upper Penn Lakes, Bush Lake, Anderson Lakes, Oxboro Lake, Smith Pond, Girard Lake, Normandale Lake, Long Meadow Lake, and Hyland Lake are the primary water bodies that are used for either active or passive water-based recreation in the City. A fishing pier at Smith Pond and a fishing pier and a boat launch are located at Lower Penn Lake, Hyland Lake, and Bush Lake. Public boat launches provide water access at Bush Lake, Lower Penn Lake, Normandale Lake, and the Minnesota River.

The Minnesota Valley National Wildlife Refuge (MVNWR) covers most of the area directly adjacent to the Minnesota River in Bloomington. It contains Long Meadow Lake, which is a riverine marsh re-stocked with fish by the floodwaters of the Minnesota River. The Wildlife Refuge has trails for passive, non-contact recreation in addition to the boating and fishing recreation offered on the Minnesota River. Environmental education opportunities are also available at the MVNWR.

### M. **Fish and Wildlife Habitat**

Many areas in Bloomington provide habitat for a variety of small mammals, reptiles, birds, amphibians, and insects. Maintenance of habitat for wildlife species is important in maintaining ecological stability in Bloomington's natural areas. The wetland inventory found in the City's Wetland Protection and Management Plan assesses floral diversity, wildlife habitat, and fisheries habitat for each wetland.

The City's Comprehensive Plan identifies areas of wildlife habitat, travel corridors, and crossing areas. These areas are predominantly located along the Minnesota River Valley, the Nine Mile Creek corridor, and within the Anderson, Bush, and Hyland Lakes complex.

**Appendix D** contains information obtained from the DNR Natural Heritage database. This data indicates there is a variety of unique fish and wildlife habitat within the City, much of which is located along the Minnesota River, Anderson Lake, Bush Lake, and Hyland Park Reserve. Additionally, Hyland, Lower Penn, Smith, and Bush Lakes have been stocked with fish by the DNR. Five lakes in the City have been classified by the DNR according to the report entitled "An Ecological Classification of Minnesota Lakes with Associated Fish Communities" completed by the DNR in 1992. The following outlines the lakes and the DNR fisheries management classification:



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**Table III-3.** DNR Fisheries Ecological Management Classification

<b>Water Body</b>	<b>DNR PWI Number</b>	<b>DNR Fisheries Ecological Management Classification</b>	<b>Fish Species Present based on Classification*</b>
Anderson Lake	62P	44	BLB, BG, BC
Bush Lake	47P	38	WS, YB, PS, BC, YP, WA
Hyland Lake	48P	43	WS, BG, BC, YP, WA
Lower Penn	4P	44	BLB, BG, BC
Normandale Lake	1045P	43	WS, BG, BC, YP, WA

\*BC=black crappie; BG=bluegill; BLB=black bullhead; PS=pumpkinseed; YB=yellow bullhead; YP=yellow perch; WA=walleye; WS=white sucker

**N. Unique Features and Scenic Areas**

The City of Bloomington has many natural areas, water resources, and regional parks. Some of these areas contain rare and endangered species and special habitats. **Appendix C** contains information from the DNR Natural Heritage Database outlining the rare and endangered species and special habitats within the City. The City has no wild and scenic areas as defined by the State.

**O. Pollutant Source Locations**

Pollutant source location information from the MPCA is shown on **Figure III-11** and available at the MPCA website at: [www.pca.state.mn.us/backyard/neighborhood.html](http://www.pca.state.mn.us/backyard/neighborhood.html). The information on the figure identifies sites that currently have or previously have had leaking underground tanks. Many of these sites have been cleaned up or are in the process of being cleaned up. The MPCA should be contacted for site specific details

The Master Entity List combines 14 state and federal pollutant lists and systems. Four of the 14 primary inventory lists are as follows:

- **National Priorities List (NPL).** A listing of hazardous waste sites which represent a significant threat to public health or the environment and are priorities for remedial action.
- **Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS).** The USEPA database of potential or actual hazardous wastes nationwide.
- **Permanent List of Priorities (PLP).** A state listing of verified hazardous waste sites.
- **Brownfield.** MPCA Site Assessment sites where real or perceived contamination stops further development.

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The City promotes a program with Hennepin County to ensure that household solid or liquid waste is disposed of properly. This promotion includes providing information to homeowners on proper disposal and/or use of yard waste in an environmentally responsible manner. The program also educates residents on the proper disposal of household waste including waste oil, paints, and solvents. The drop-off site for household hazardous wastes is the South Hennepin Recycling and Problem Waste Drop-Off Center at 1400 West 96<sup>th</sup> Street. The City also publishes information pertaining to recycling, lawn care, hazardous waste and water quality on its website.

**P. NPDES Phase II**

The City has submitted their National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Program permit and developed a Storm Water Pollution Prevention Program (SWPPP). Phase II requires municipal separate storm sewer systems (MS4's) in urban areas with populations over 10,000 and under 100,000 to obtain an NPDES permit. Permits for construction sites greater than one acre also require a permit, as well as certain categories of industrial activities that are covered under Phase II. More information regarding this program is included in **Appendix D**.

**Q. Impaired Waters**

The City contains three waterbodies currently listed on the State's 303d list. State and Federal laws define that once a waterbody is listed as impaired, stressors causing the impairment must be identified and remediation efforts including development of total maximum daily loads (TMDL) for identified pollutants need to be initiated. As TMDL's for the reach or waterbody in the City are completed, the City along with all other industries, construction sites and others needing a stormwater permit will be required to submit Stormwater Pollution Prevention Plans that incorporate the TMDL standards the as part of permit requirements. Impaired Waters, as listed by the State, located within or adjacent to the City of Bloomington are shown in **Figure III-5b**.

The following is a list of the waterbodies included on the State's 303(d) List located within or adjacent to the City of Bloomington:

**Table III-4.** Waterbodies included on the 303(d) List located within or adjacent to the City of Bloomington (Source: MPCA)

Reach	Description	Year listed	Affected use	Pollutant or stressor	Target start	Target completion
Minnesota River	RM 22 to Mississippi R	94	Aquatic recreation	Fecal coliform	2008	2011
Minnesota River	RM 22 to Mississippi R	98	Aquatic consumption	Mercury Water Column	1999	2011
Minnesota River	RM 22 to Mississippi R	98	Aquatic consumption	MercuryFCA	1999	2011

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<b>Reach</b>	<b>Description</b>	<b>Year listed</b>	<b>Affected use</b>	<b>Pollutant or stressor</b>	<b>Target start</b>	<b>Target completion</b>
Minnesota River	RM 22 to Mississippi R	02	Aquatic consumption	PCB FCA	2002	2015
Minnesota River	RM 22 to Mississippi R	96	Aquatic life	Turbidity	2008	2011
Bush	Lake or Reservoir	98	Aquatic consumption	MercuryFCA	1999	2011
Nine Mile Creek	Headwaters to Minnesota R	04	Aquatic life	Chloride	2005	2009
Nine Mile Creek	Headwaters to Minnesota R	04	Aquatic life	Fish IBI	2005	2009
Nine Mile Creek	Headwaters to Minnesota R	02	Aquatic life	Turbidity	2005	2009

The Clean Water Act requires the MPCA to identify and restore impaired waters. It is ultimately the responsibility of the MPCA to complete and submit TMDLs to the EPA. Stakeholder involvement in the development of TMDL implementation plans is critical.

## SECTION III

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Figure III-5a National Wetland Inventory Map

## SECTION III

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Figure III-5b DNR Public Waters, Impaired Waters and Wetlands Inventory

## SECTION III

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Figure III-5c City of Bloomington Wetland Protection and Management Plan Wetland Inventory Map

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Figure III-6  
Subwatershed Delineation Map

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Figure III-7  
Water Quality Monitoring Location Map



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Figure III-8  
Existing and Proposed Trap Manholes, Sediment Basins, and Forebays

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Figure III-9  
MDNR Water Appropriations Map

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Figure III-10  
Soils Classification Map

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Figure III-11  
Pollutant Sources Location Map

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Figure III-12  
Floodplain Map

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### III-13 Landuse Guide Plan

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### III- 14 City Stormwater Modeling

## SECTION III

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Figure III-15



## SECTION III

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Figure III-16