Section 1
Introduction

1.1 Project Background

Storm water management is a critical municipal responsibility. The effectiveness and efficiency of storm water management have a direct impact on:

- Public health - polluted and contaminated waters can come into contact with citizens
- Public safety - streets and buildings can become damaged by flood water
- Storm water system planning, design, and construction
- Control and reduction of inflow and infiltration of storm water into the sanitary sewer
- Surface water quality
- Maintenance and enhancement of environmental habitats
- Future development
- Regulatory compliance

The City of New Berlin and the Wisconsin Department of Natural Resources (WDNR) have joined in a cooperative effort to prepare a Storm Water Management Master Plan for New Berlin.

The New Berlin study area incorporates about 37 square miles including the entire City of New Berlin. The study area is located within five major watersheds: the Upper Fox River watershed, the Middle Fox watershed, the Root River watershed, the Muskego-Wind Lakes watershed, and the Menomonee River watershed. These five watersheds are further divided into seven subwatersheds. Table 1-1 presents the drainage areas within each watershed and subwatershed. The study area and watershed boundaries are shown on Figure 1-1.

Each of these major watersheds, except the Middle Fox River, has been designated a *A*priority watershed.@ Because these watersheds incorporate major portions of the region including several governmental entities, the New Berlin Storm Water Management Master Plan must be consistent with, and assist in the implementation of comprehensive flood control and non-point source plans.

Under the Wisconsin Non-point Source Water Pollution Abatement Program, the Wisconsin Department of Natural Resources developed non-point source control plans for several priority watersheds. Each non-point source control plan: assesses

the watershed characteristics including cultural natural resources, surface water, and groundwater features; describes watershed planning methods including evaluation of water quality and aquatic habitat; describes water resource conditions, non-point sources, and water resource objectives for the watershed; describes non-point control needs for urban and rural sources; and describes a detailed program for implementation. The WDNR prepared priority non-point source control plans for the Root River watershed (1980), the Menomonee River watershed (1991), the Upper Fox River watershed (1994), and the Muskego-Wind Lakes watershed (1994). The priority watersheds cover the entire city except for the 3.6 square mile area of the Mill Creek subwatershed within the Middle Fox River watershed. The Middle Fox River watershed is expected to be selected for priority watershed planning in 1999 or 2000.

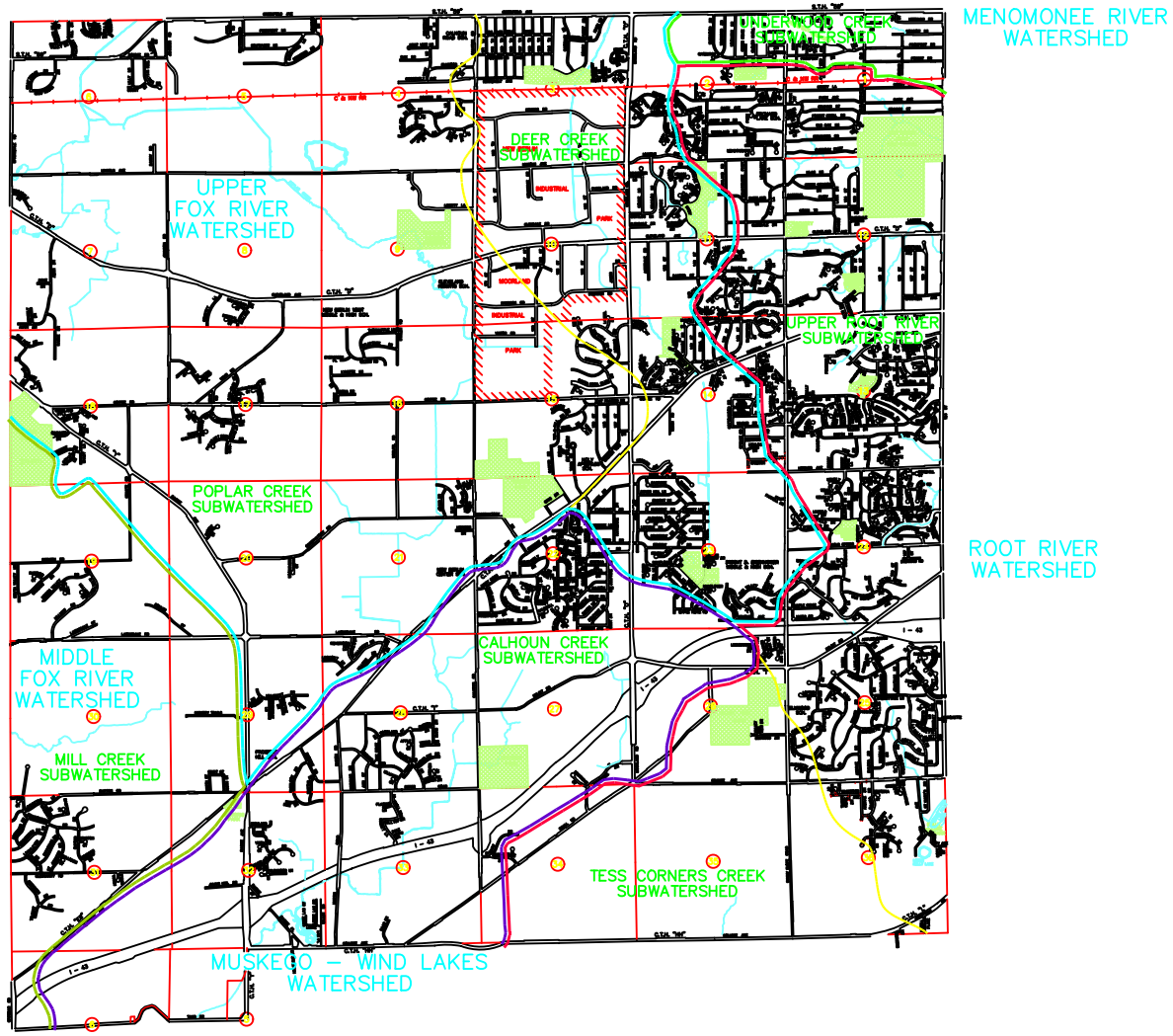

Figure No. 1–1
CITY OF NEW BERLIN
WATERSHED MAP

CDM Camp Dresser & McKee

Table 1-1 Watershed Areas in the City of New Berlin

Watershed ***Subwatershed***	**Area** **(square miles)**	**Percent Total**
Upper Fox River		
Deer Creek	4.7	13
Poplar Creek	12.5	34
subtotal	***17.2***	***47***
Muskego-Wind Lakes		
Calhoun Creek	6.2	17
subtotal	***6.2***	***17***
Middle Fox River		
Mill Creek	3.6	10
subtotal	***3.6***	***10***
Root River		
Upper Root	6.4	17
Tess Corners Creek	2.8	8
subtotal	***9.2***	***25***
Menomonee River		
Underwood Creek	0.6	2
subtotal	***0.6***	***2***
TOTAL	***36.8***	***100***

The Menomonee River, Upper Fox River, Root River, and Muskego - Wind Lakes watershed=s non-point source control plans include the following specific information:

- *Water Resource Objectives:* The overall water resource objective is to contribute to the full attainment of the designated potential recreational and biological uses of the

Menomonee, Upper Fox and Root Rivers, and the Muskego - Wind Lakes. The designated potential recreational and biological uses of each river/lake are as follows.

- Root River Watershed:
  - Upper Root River - limited fish and aquatic life
  - Tess Corners Creek - warm water fish and aquatic life
- Upper Fox River Watershed
  - Poplar Creek - warm water sport fish
  - Tributaries to Poplar Creek - warm water sport fish and forage fish, or limited aquatic life
- Menomonee River Watershed
  - South Branch Underwood Creek - limited to aquatic life
- Muskego - Wind Lakes Watershed
  - Calhoun Creek - warm water sport fish or warm water forage fish

Only the South Branch of Underwood Creek in the Menomonee River watershed is currently fully meeting its potential biological use. The remaining portion of the Menomonee River watershed and the other priority watersheds are currently partially meeting the potential biological use classifications. The WDNR recommends that biological uses be protected in those waters fully meeting their potential, enhanced in those waters partially meeting their potential, and improved in those waters not meeting their potential. In order to achieve the potential uses of the rivers, a 50 to 75 percent reduction in sediment loading, a 30 to 75 percent reduction in nutrient loading, and a 40 to 53 percent reduction in the loading of toxic substances, such as lead, was recommended for the Menomonee, Upper Fox and Root Rivers, and the Muskego - Wind Lakes.

- *Critical Urban Land Uses and Significant Rural Sources:* Critical urban land uses for the City of New Berlin identified within the priority watershed plans include:

  Root River: Industrial, commercial, and planned development

  Upper Fox River: Industrial, commercial shopping malls, and commercial strip areas

  Menomonee River: Industrial, commercial, high density, residential, and planned development

  Muskego-Wind Lakes: Industrial, high density, residential, freeway, and commercial

Significant rural non-point pollution sources identified include barnyard runoff, manure spreading, streambank erosion, and cropland erosion.

- *Recommended Pollution Control Measures: A*Core@ urban management measures recommended to achieve pollutant reductions included construction erosion controls, early spring street sweeping, leaf and lawn management, pet waste handling and disposal, used oil management, stream bank erosion control, and storm water management of new development. Each Priority Watershed Plan recommended a level of pollution control equivalent to providing wet detention (ponds) for 100 percent of the critical urban land uses. Recommended non-point source pollution control measures include grassed swales, infiltration basins and trenches, wet detention ponds, construction erosion controls, streambank stabilization, and agricultural land management practices and livestock controls.

To assist in implementation of the Non-point Source Plans the WDNR provides local assistance grants to communities. The City of Berlin received a local assistance grant from the WDNR to assist in funding the development of this storm water management plan. This planning effort is intended to assist in the implementation of the Non-point Source Control Plans for the Menomonee, Upper Fox, and Root Rivers, and the Muskego - Wind Lakes.

1.2 Purpose and Scope

The purpose of this Storm Water Management Master Plan for New Berlin is to:

- control storm water drainage and flooding in the primary system, such as in major storm sewers, natural streams and channels, and manmade channels,

- improve water quality from non-point sources, and

- assist New Berlin in their municipal permitting application and compliance efforts.

The development of the Storm Water Management Master Plan for the City of New Berlin includes the following tasks:

- Establishing objectives which are compatible with the WDNR priority watershed plans. Objectives are the goals that the plan will be designed to achieve. Project objectives are developed for water quality improvement, drainage and flood control, effective storm water management, erosion and sedimentation control, and environmentally sensitive area protection. The plan objectives and supporting criteria are presented in Section 2 of this report.

- Establishing a storm water advisory group including representatives from the City of New Berlin, WDNR, Wisconsin Department of Transportation (WDOT), and interested citizens. The primary role of the group is to guide the planning process by involvement in the plan and to support the plan recommendations.

- Providing guidance to New Berlin regarding the WDNR municipal storm water permit regulations including permit application options and requirements.

- Inventory of existing conditions related to the drainage system and land use including a review of available information from New Berlin, Waukesha County, Southeastern Wisconsin Regional Planning Commission (SEWRPC), WDOT, and WDNR, as well as field inventories of drainage culverts and storm sewers, stream channels, and wetlands. The project setting and storm water management system are described in Sections 3 and 4 of this report, respectively.

- Reviewing the storm water management plans prepared for the Deer Creek watershed and the Westridge area to identify recommendations to incorporate into the Storm Water Management Master Plan. Recommendations from the storm water management plans prepared by others are presented in Section 9 of this report.

- Conducting hydrologic-hydraulic analysis to develop peak flow conditions and to identify major storm water drainage and flooding problem areas. The hydrologic-hydraulic analysis methodology and results are presented in Section 5 of this report.

- Conducting water quality analysis to estimate the pollutant loadings to the major receiving streams within the project area. The water quality analysis methodology and results are presented in Section 6 of this report.

- Conducting an evaluation of regional storage sites to mitigate the cumulative impact of existing and future development in an area. The regional storage evaluation and results are presented in Section 8 of this report.

- Developing storm water management options to mitigate identified major flooding problems, provide sufficient capacity for storm water flows, reduce pollutant loadings to the receiving waters, and improve receiving water quality. The major flooding and water quality problem areas are identified in Section 7 and storm water management options are presented in Section 8 of this report.

- Develop a recommended storm water management master plan that consists of three elements: urban land development guidelines, flood control options, and water quality improvement recommendations. In addition, the three tasks listed below are included:

    - Develop an operation and maintenance program for the City=s open channels, culverts, and detention facilities. The program will identify needed maintenance procedures and activities, establish a priority and schedule for maintaining individual system components and define program management needs.

    - Developing a prioritization system based on property damage, inconvenience, cost, and other factors, and outline procedures to address resident complaints and concerns about drainage or pollution problems.

- Developing a storm water management ordinance for the City of New Berlin. The ordinance will be based on the model ordinances prepared by the Waukesha County Department of Parks and Land Use and by the WDNR, but will be tailored to the City of New Berlin=s specific needs and conditions. The ordinance will be drafted in coordination with the City, WDNR, and the Advisory Group.

The recommended storm water management plan is presented in Section 9.

- Develop an implementation strategy for the recommended storm water management master plan. A schedule is developed to prioritize the recommended measures for implementation and funding. The implementation strategy is presented in Section 10.