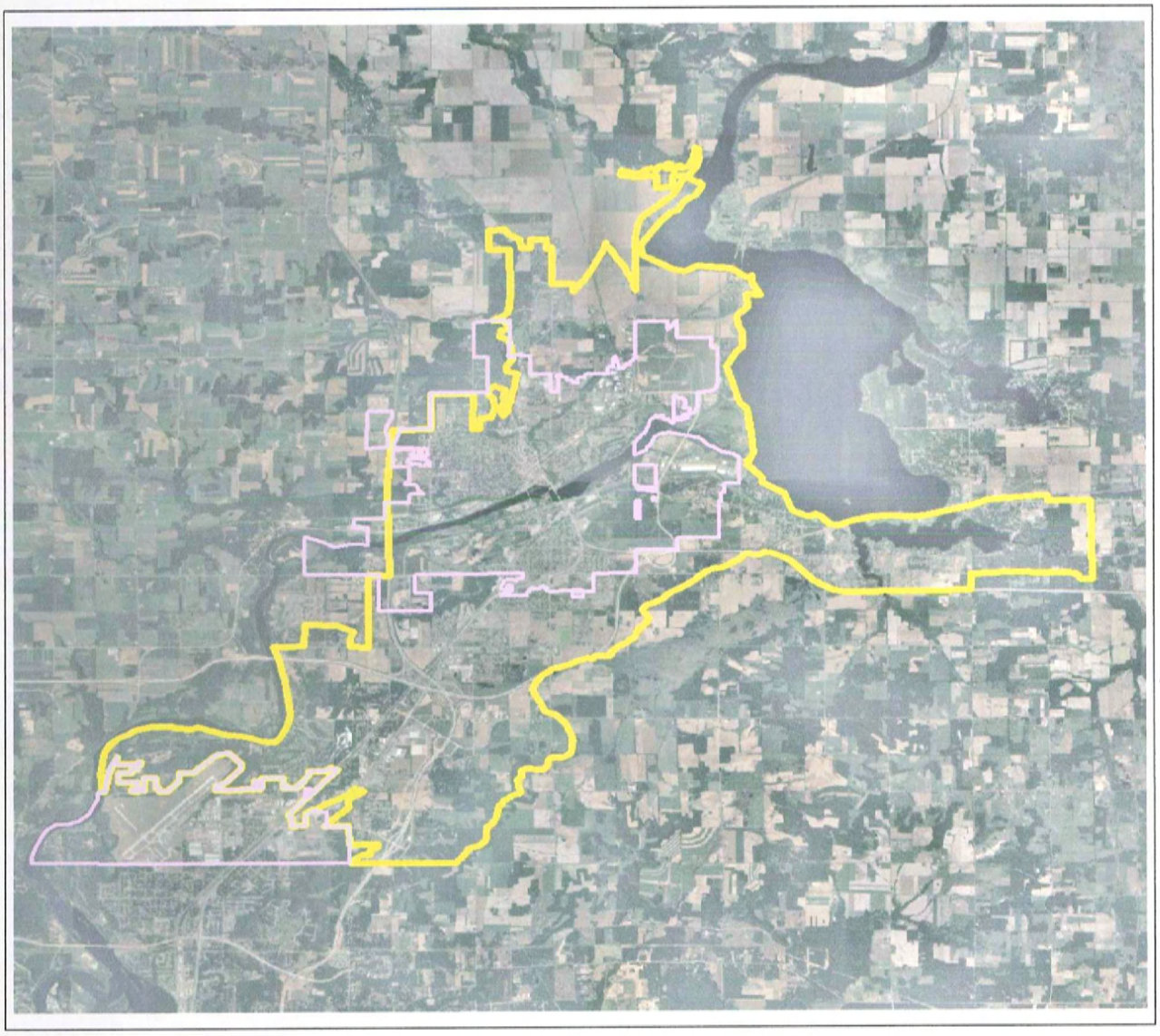
CHIPPEWA FALLS URBAN AREA STORM WATER MANAGEMENT PLAN



CHIPPEWA FALLS URBAN AREA STORM WATER MANAGEMENT PLAN

As Prepared For:

The Village of Lake Hallie

The Town of Eagle Point

The Town of Lafayette

Chippewa County

This plan has been financed through nonpoint pollution control storm water planning grant, #USP-LC21-09000-04, and has been developed to meet requirements of WPDES Permit #WI-S050121-1.

This plan has been prepared with full opportunity for public participation and has been adopted by each municipality following requirements of the Wisconsin Open Meeting Law.

Chippewa County
Land Conservation Committee:

P. Michels, Chair	M. Holte
D. Boettcher	L. Marquardt
J. Dahl	L. Willkom
P. Licht	

Storm Water Planning Technical Advisory Committee:

M. Dahlby	Land Conservation Dept.	P. Lehmann	Village of Lake Hallie
D. Nashold	Land Conservation Dept.	M. Sedlacek	Town of Eagle Point
P. Calabrese	Highway Dept.	D. Staber	Town of Lafayette
R. Kern	Highway Dept.	R. Rubenzer	City of Chippewa Falls
D. Clary	Zoning Dept.	R. Krejci	City of Chippewa Falls
S. Thon	DNR	J. Bakken	Ayres Associates
K. Voss	DNR		

Storm Water Modeling:

Ayres Associates

Plan prepared by:
Chippewa County Land Conservation Department

D. Masterpole
Plan Coordination

J. Schemenauer
Clerical and editorial support

October 10, 2007

TABLE OF CONTENTS

LISTING OF PLAN MAPS

LISTING OF TABLES AND FIGURES

Page

TABLES

FIGURES

LIST OF APPENDIXES AND ASSOCIATED FIGURES AND TABLES

EXECUTIVE SUMMARY

PURPOSE AND OBJECTIVES

Select municipalities in the Chippewa Falls Urban Area are now required to develop and implement a storm water management program to comply with Wis. Adm. Code, Chapter NR 216, and the Wisconsin Pollution Discharge Elimination System, (WPDES Permit #WI-S050121-1).

To meet this obligation, Chippewa County, the Village of Lake Hallie, the Town of Eagle Point and the Town of Lafayette have cooperated to develop a single storm water plan and a joint storm water management program. This joint program will be used to pursue a consistent approach toward managing storm water runoff and flooding in the Chippewa Falls Urban Area.

THE EXISTING CONDITION

A detailed storm water study was conducted to document the physical characteristics of the storm water system, and to estimate the amount of storm water runoff and nonpoint pollution that are now generated in the Chippewa Falls Urban Area.

This study has identified the watersheds that discharge the highest pollutant loads, the location of critical source areas within those watersheds, and the location of seasonally ponded areas that now store and infiltrate runoff.

Results of storm water modeling indicate that:

1. The current development pattern and existing management practices have been very effective in controlling storm runoff and pollutant loads to surface waters. This existing runoff control can be attributed to the flat and sandy characteristics of the landscape, and to the infiltration that occurs in ditch lines and storm water basins.

2. The developed portions of the storm water management area are now in full compliance with the developed urban area performance standards of NR151.13(2). These standards require a 20% pollution reduction by 2008, and a 40% pollution reduction by 2014.

HOW STORM WATER WILL BE MANAGED

Using the storm water study results, a formal planning process was conducted to determine how storm water will be managed as new development occurs.

The following management approach will be applied:

1. The physical characteristics of the landscape make it readily possible for the affected municipalities to stay within the pollution control limits, prescribed in Wis. Adm. Code, Chapter NR 216 and WPDES Permit #S050121-1. To accomplish this, developers will be required to control runoff from new construction as part of the routine site development process.

   It will not be necessary for the municipalities to construct any new municipal storm water facilities or alter any existing facilities to reduce nonpoint pollutant loads from the developed portions of the management area.

2. Storm water runoff and associated pollutant loads will be managed on a watershed basis recognizing the susceptibility and management objectives of the end-receiving waters. When possible, storm water runoff will be managed to maximize infiltration and groundwater recharge, which will in turn limit discharge to surface waters.

3. Management priority will be assigned to areas that directly affect municipal water supplies and to watersheds that contribute runoff to select lakes and streams that warrant special management attention.

4. As development occurs, efforts will be made to maintain surface drainage patterns and the area's capacity for flood storage and groundwater infiltration.

   This will be done by maintaining the existing drainage network and the storage capacity of surface depressions where ponding and groundwater infiltration now occur. To accomplish this, a storm water management overlay approach will be used to identify and manage sites that are critical to storm water routing, flood storage, and groundwater recharge.

5. The municipalities intend to limit the proliferation of municipality-owned storm water infrastructure and avoid the establishment of a regional storm water utility.

   To accomplish this, storm water runoff will be planned and managed on a site-by-site basis, as parcels are developed or redeveloped. Under this approach, the responsibility for meeting the prescribed runoff control standards will be assigned directly to the developer. These standards will be met through the use of site design and structural best management practices that rely on on-site detention and infiltration.

6. Unless otherwise negotiated by a municipality, the ownership of the structural storm water practices and the responsibility for maintaining them will be assigned to the developer. This custodial responsibility may be retained by the developer or may be transferred to future property owners by way of a recorded title conveyance.

7. The County and municipalities will assure that storm water management practices are properly maintained. This will be accomplished by instituting a routine inspection program to monitor the condition of the privately owned facilities, and by retaining municipal access easements to allow for the public maintenance of these facilities, if necessary.

8. All requirements for construction site erosion control, post construction storm water management, and illicit discharge detection and monitoring will be administered and enforced by Chippewa County through use of a storm water management ordinance. This ordinance will be applied uniformly throughout the area subject to the WPDES permit.

HOW THE MUNICIPALITIES WILL WORK TOGETHER

The municipalities have agreed to institute a joint storm water program which will be managed under a joint WPDES storm water permit.

Under this approach, each municipality will be responsible for making storm water management decisions within its jurisdiction. This responsibility will be carried out within the broader context of its statutory responsibility for land use planning, zoning and subdivision control, construction permitting, and infrastructure management.

Core components of a joint storm water program have been defined, including the individual responsibilities of the County and each cooperating municipality. A Chapter 66.03 intermunicipal agreement will be used to implement the joint storm water management program. This agreement will be augmented by a storm water and construction site ordinance that will apply to the permitted area.

Efforts will be made to coordinate this storm water program with the program efforts of other municipalities in the Chippewa Falls/Eau Claire area that are also subject to state WPDES storm water permit requirements, including the City of Chippewa Falls, City of Altoona, and City of Eau Claire.

SUMMARY AND DISTRIBUTION OF COSTS

There will be additional costs to establish a storm water management program and to meet state WPDES permit requirements. Under the proposed management approach, the direct and indirect costs of meeting program requirements will be distributed between the public and private sectors.

The direct costs of planning and installing storm water best management practices will be incurred by those developing the land. It is anticipated that all storm water related permitting, engineering, and construction costs will be recognized as business expenses and will be passed on to the purchaser of the developed property through the real estate transaction.

The long-term indirect costs of maintaining privately owned storm water facilities will be incurred by the owners (or co-owners) of the parcels that are served by the facilities.

The public costs of implementing and administering this storm water management program will be incurred by the County and by the municipalities that are subject to WPDES Permit #WI-S050121-1. Each municipality will budget and account for its individual costs and program contributions. The public costs of program implementation will be partially offset by permit and service fees that will be charged to applicants, subject to requirements of the storm water ordinance.

To initiate this joint storm water program, the annual levy based program costs are projected for the County and each municipality as follows:

Estimated Annual Tax Levy
Budget Contribution

Municipality	Proportion of Program Costs*	Operating Expenses**	Capital Expenses	Total
Village of Lake Hallie	25%	$ 3,250	-0-	$ 3,250
Town of Lafayette	25%	$ 3,250	-0-	$ 3,250
Town of Eagle Point	20%	$ 2,600	-0-	$ 2,600
Chippewa County	30%	$ 4,000	-0-	$ 4,000
	100%	**$13,100**		**$13,100**

*The proportion of shared program costs for the village and towns are distributed on a per capita basis.

**Anticipated levy based operating expenses, estimated after revenue transfers and fee offsets.

INTRODUCTION

PROJECT BACKGROUND

On December 20, 2002, the Wisconsin Department of Natural Resources (DNR) formally notified municipalities in the Chippewa Falls Urban Area of their individual obligation to apply for a Wisconsin Pollution Discharge Elimination System (WPDES) storm water permit to comply with Wisconsin Administrative Rule NR216.

In response to that notification, the Towns of Eagle Point and Lafayette, the Village of Lake Hallie, and Chippewa County each filed an individual Notice of Intent to apply for the required permits.

In the spring of 2003, representatives of the affected municipalities met and agreed to develop a joint storm water management plan for the Chippewa Falls Urban Area.

To facilitate the planning process, the cooperating municipalities jointly developed and applied for an Urban Nonpoint Source Storm Water Planning Grant, administered through the DNR. The grant application was coordinated through the Chippewa County Land Conservation Department and was filed by Chippewa County on April 15, 2003.

In the fall of 2003, the County and participating municipalities were informed that the grant application was approved. A grant contract to conduct the storm water planning project was entered between the Chippewa County Land Conservation Committee and the DNR on December 1, 2003. The grant contract outlines the responsibilities of the cooperating municipalities and the end products to be developed through the planning process. The schedule of activities used to implement the project is provided in Appendix 1 as Figure 1.

The formal storm water planning process was initiated on January 20, 2004, with establishment of a Technical Advisory Committee (TAC), composed of affected stakeholders. This Technical Advisory Committee met periodically from 2004 through 2006, and provided structured input through the course of the planning process.

In the fall of 2004, the Village of Lake Hallie, acting on behalf of the cooperating municipalities, entered into a subcontract with Ayres Associates to conduct technical elements of the project, including the completion of storm water modeling.

Results of the joint storm water planning project are provided in the PLANNING METHODS AND RESULTS section of this plan. A conceptual outline of a joint storm water management program to meet permit requirements is provided under the sections titled: STORM WATER MANAGEMENT RECOMMENDATIONS and IMPLEMENTATION PLAN.

PURPOSE AND OBJECTIVES

The purpose of the storm water management plan is to:

1. Establish a common approach toward storm water management to encourage consistency among the municipalities in the Chippewa Falls Urban Area.

2. Define an administrative framework and the roles and responsibilities of cooperating municipalities for the purpose of implementing a joint storm water management program.

3. Establish an activity schedule and program budget which can be used by the municipalities to implement a joint storm water management program.

4. Meet requirements of Wisconsin Administrative Rule NR216 and associated requirements of the Wisconsin Pollution Discharge Elimination System; Joint Permit #WI-S050121-1.

PROJECT SETTING

LOCATION

The Chippewa Falls Urban Area constitutes the northern half of the Eau Claire/Chippewa Falls metropolitan area, and is located in Chippewa County in West Central Wisconsin. The storm water management area is situated immediately north and south of the City of Chippewa Falls, and includes a significant portion in the Village of Lake Hallie and minor portions in the Town of Eagle Point and Town of Lafayette. The location of the storm water management area and the project planning boundary are illustrated on Map 1.

The population of the Eau Claire/Chippewa Falls metropolitan area, including that of the incorporated cities and villages and the developing unincorporated areas, is estimated to be approximately 110,000.

The storm water area is located at the center of a major transportation hub, which has recently been formed at the junction of US I-94, US Hwy 53, and US Hwy 29. Given its urban location and proximity to the regional highway networks, significant development is anticipated.

The City of Eau Claire and the City of Chippewa Falls are now in the process of implementing storm water programs to comply with Phase I WPDES storm water permit requirements.

GLACIAL GEOLOGY, PHYSIOGRAPHY, AND SOILS

The storm water management area is situated on glacial deposits, consisting mainly of outwash, which overlay sandstone and granite bedrock. A large part of the project area is situated on the Wissota Terrace of the Chippewa River, a primary land form situated between Chippewa Falls and Eau Claire (Havholm, 1998, Syverson, 2007).

The outwash surface is flat with slopes ranging from 0-2%. The natural surface drainage system is poorly pronounced and composed of a network of shallow, low gradient intermittent channels. Discharge from this drainage network is largely epherial, conveying flow only during the spring snowmelt and other major runoff events.

A network of small watersheds is discernable based upon surface topography. Several subwatersheds are internally drained with no apparent surface outlets. The land surface is interspersed by shallow surface depressions which range in size from 0.10 - 2.5 acres. These surface depressions have been observed to be points of short-term ponding and groundwater infiltration. Several of these depressions contain wetlands which meet definitional criteria at lower surface elevations.

Soils in the project area are mapped as part of the Menahga-Friendship and the Billett-Roshold-Osterle Associations. These are characterized as deep, nearly level to sloping, excessively drained to somewhat poorly drained, sandy and loamy soils formed on outwash plains and stream terraces. Individual soil types have surface infiltration rates which range from 0.6 to 2.0 inches/hr. Subsurface infiltration rates range from 6 to 20 inches/hr. (Soil Survey of Chippewa County, Wisconsin, SCS, 1989)

PRECIPITATION

The average annual precipitation for the Chippewa Falls Urban Area is approximately 30.5 inches per year. Of this amount, approximately 25 inches falls during the growing season from April through September. The average monthly rainfall during the summer is approximately 3.5 inches per month, with maximum precipitation occurring in June.

Beginning in late November, most precipitation occurs as snow and accumulates until spring snowmelt. Highest runoff volumes occur in the spring when the snowmelts, the ground is either frozen or saturated, and heavy rains occur (Soil Survey of Chippewa County, Wisconsin, SCS, 1989).

The highest storm intensity occurs during the growing season from June to October (Surface Water Resources of Chippewa County, DNR 1976). The average 24 hour storm events used for storm water management and facility design in the project area range from the one year 2.3 inch design storm, to the 100 year 5.8 inch design storm.

Given the physical nature of the landscape and the distribution of storm events, it can be assumed that during the growing season, the average rainfall storm intensity seldom exceeds the infiltration capacity of the soil, and that storm water runoff in the project area is generated almost exclusively from imperious surfaces.

Flooding occurs seasonally in association with the spring snowmelt event and heavy spring rains, and is generally limited to drainageways, closed surface depressions, and the floodplain of the Chippewa River.

WATER RESOURCES AND SUB-BASINS

The storm water management area drains to five (5) separate water resource management units: Duncan Creek, Lake Wissota, Little Lake Wissota, the Chippewa River, and Lake Hallie. The condition and resource management objectives for each of these water resources has been defined (The Lower Chippewa River Basin Water Quality Management Plan, DNR 1989).

The groundwater system in the project area has been studied extensively. The elevation of the regional watertable ranges from 0 to 80 feet, below the land surface. The general direction and pattern of groundwater flow has been mapped at a scale of 1:100,000. This mapping suggests that groundwater divides coincide closely with major surface watershed boundaries, with localized flow occurring within watersheds toward major surface water outlets (Lippelt, 1988).

Map 1

Location of the Chippewa Falls Urban Area
and Stormwater Planning Area

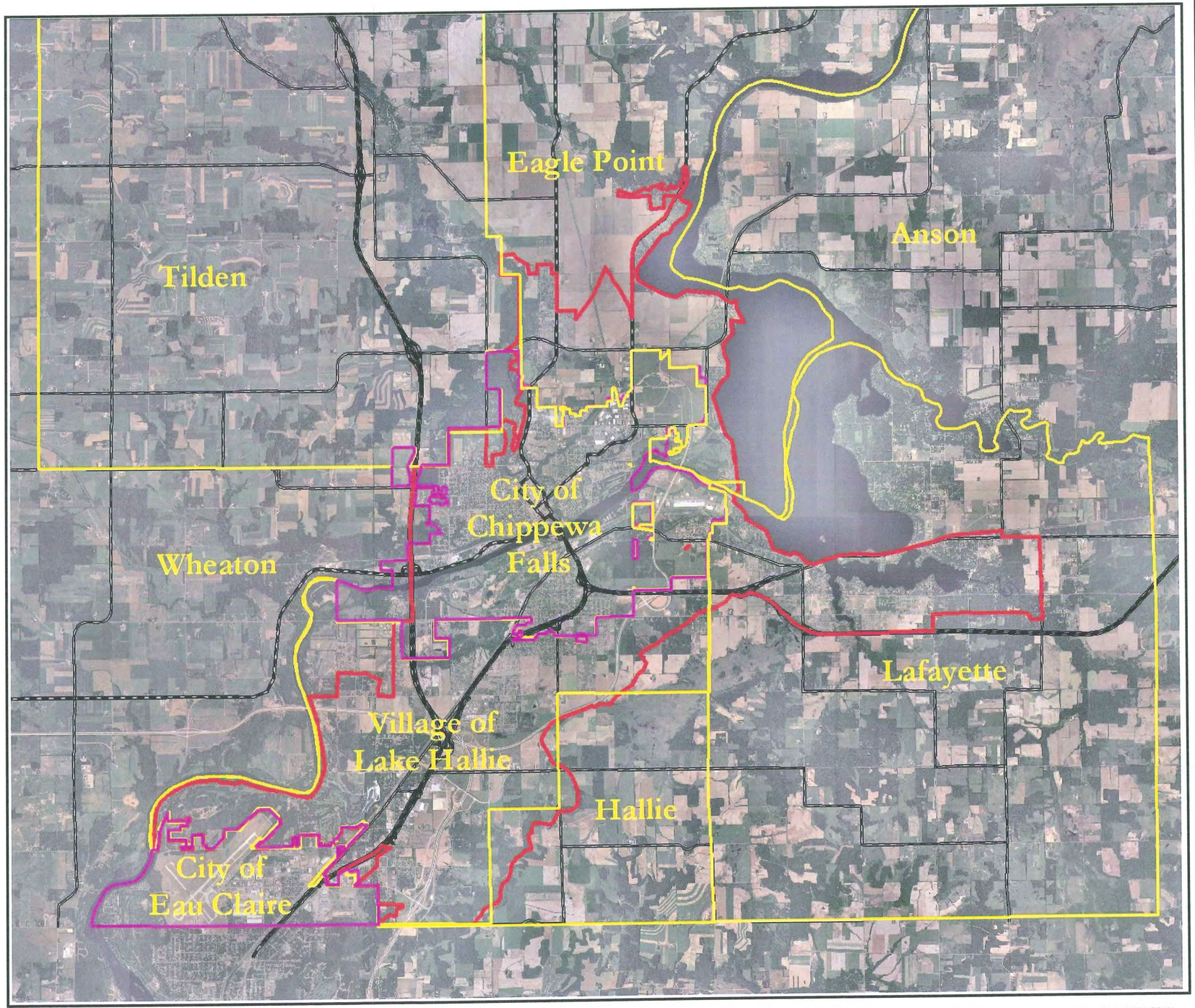
Stormwater Management Area

Roads
- Federal/State
- County

City of Chippewa Falls Boundary

City of Eau Claire Boundary

Towns/Village Boundaries



10000 0 10000 Feet

2005 USDA Photo

Chippewa County
Land Conservation Dept.

January 11, 2007

N

h:\ag\conserv\stormwater Map 1 thinnest (Layout All Roads 1117)

LAND USE

Land use patterns in the project area have been strongly affected by the adjacent urban centers and by the regional highway network.

A well-established commercial strip has been developed along US Hwy 53 and transects the Village of Lake Hallie between the City of Chippewa Falls and the City of Eau Claire. Recently, two (2) cloverleaf interchanges have been added as a part of the US Hwy 29/I-94 highway expansion, and US Hwy 53 bypass project.

Parcels with access to highway frontage are being planned for highway commercial or light industrial use.

High to medium density residential neighborhoods are situated throughout the project area, with more dense development patterns associated with residential subdivisions, located immediately adjacent the City of Eau Claire, the City of Chippewa Falls, and Lake Wissota.

Historically, all development located outside of the City of Chippewa Falls and the City of Eau Claire has occurred using private wells and septic systems, in the absence of municipal sewer/water services. In 1995, prior to incorporation, the Town of Hallie created several water supply districts and installed the infrastructure for a municipal water supply system. This system now serves a significant portion of the Village of Lake Hallie.

At present, no parts of the storm water management area are serviced by a sanitary sewer system. As now planned, all development and redevelopment within the project area will occur on private onsite treatment systems, meeting state administrative rule requirements (Chippewa Falls/Eau Claire Urban Area Sewer Water Service Plan for 2025, WCRPC, 2007).

Given its location within the Eau Claire/Chippewa Falls metropolitan area and the regional highway network, it is anticipated that there will be significant development and ongoing redevelopment in the storm water management project area.

This development has began to occur as larger-scale commercial retail at the junction of major interchanges. During this same period, there have been a number of new residential subdivisions which have been platted in the project area.

These development trends are expected to continue and possibly accelerate as economic development and growth occurs.

PLANNING METHODS AND RESULTS

PUBLIC INVOLVEMENT AND PARTICIPATION

A public outreach program was introduced at the onset of the planning process to notify the public of the requirements of the WPDES Storm Water Permit and of opportunities for public participation.

As part of the planning process, a Technical Advisory Committee (TAC) was created to assist in the development of the storm water program. The TAC was composed of elected representatives from the affected municipalities, state and local agencies, and industry stakeholders. An outline of the TAC Committee charge and representation is provided in Appendix 1, as Figure 2.

All TAC meetings were noticed and posted in compliance with the Wisconsin Open Meetings Law. The notices, agendas, and minutes from all public meetings and hearings, and the purpose of each meeting, as conducted as part of the storm water planning process, are on file.

Additional opportunities for public involvement will be provided through periodic reviews of the storm water management program. These revisions will be initiated by the Chippewa County Land Conservation Committee on a five (5) year basis to coincide with scheduled WPDES permit renewals.

PUBLIC EDUCATION AND OUTREACH

A public storm water education program has been developed to meet the prescribed requirements of the WPDES storm water permit. An outline of the public education and outreach program, including recommended educational messages, target audiences, and delivery mechanisms is provided in Appendix 2, as Table 1.

To pursue greater efficiency in educational outreach, an intermunicipal working agreement has been developed between Chippewa County and other WPDES permitted municipalities in the Eau Claire/Chippewa Falls Urban Area. This agreement is provided in Appendix 2, as Figure 1.

Efforts will be made to work through this agreement to establish the necessary institutional arrangements to implement a single coordinated storm water education and outreach program to service all permitted municipalities.

STORM SEWER SYSTEM MAP

A storm sewer systems map has been created to meet the prescribed requirements of the WPDES permit. This map and its associated databases will be routinely maintained and used to support ongoing storm water management program efforts.

To create the storm sewer map, a free-standing geographic information system (GIS) was developed using ArcView 3.2 software and digital maps maintained by Chippewa County.

This core GIS was then refined by using field data that was collected to complete the illicit discharge and storm water modeling elements of this plan. The resulting storm water GIS and its associated data are provided on a compact disc (CD) as Appendix 3.

This GIS was used to generate Map 2. Map 2 illustrates the location of the storm water planning boundary, current land cover, surface water features, and contributing watersheds.

STORM WATER QUALITY MANAGEMENT MODELING

A field review was conducted to verify the accuracy of current land use data and to document existing hydrology. As part of this review, the location of surface drainageways and areas of seasonal ponding were documented during the spring snowmelt events of 2005 and 2006. As part of this same inventory process, the location, size, and condition of existing structural storm water best management practices (BMPs) were also documented.

A pollutant loading analysis was then conducted by Ayres Associates using the SLAMM runoff model and model policy guidance, provided by the Department of Natural Resources (6/6/05). To do this, two (2) model runs were conducted.

An initial "No Controls" model run was conducted to estimate the mass load of Total Suspended Solids (TSS), which could be anticipated assuming curb and gutter (pipe) drainage with no storm water controls or best management practices (BMPs).

For comparison, a second "With Controls" model run was conducted to estimate the load of Total Suspended Solids (TSS), which could be anticipated based upon the physical characteristics of the existing storm sewer system and upon the extent of existing storm water controls.

An overview of each of these modeling scenarios follows. Full documentation of model assumptions, inputs, and results has been submitted and is available as part of the planning record.

Model Run #1 - "No Controls"

This model run estimates "worst case scenario" pollutant loads for existing land use conditions, assuming direct hydrologic connections and no BMPs to provide storm water treatment. The results provide a baseline condition and are used under the WPDES permit process to determine the extent of pollution control, which will be needed in the urbanized portion of the project area to comply with the pollution reduction requirements for "developed urban areas", as established in NR 151.13(2).

In conducting the "No Controls" model run, the following assumptions were made:

1. The model run establishes the total pollutant load for existing land uses without recognition of any existing BMPs.

2. The DNR modeling guidance (6/6/05) was followed to determine what lands were included and excluded from the modeled area.

3. The pollutant source area data for the model's prescribed land use categories were those recognized as being representative of urban areas in Wisconsin. The Wisconsin Standard Land Use input files were used.

4. The drainage type was assumed to be "curb and gutter" in "fair" condition.

Model Run #2 - "With Controls"

This model run estimates the current extent of nonpoint pollution runoff and is based upon documented land uses, the physical characteristics of the storm water drainage system, and the type and location of storm water best management practices (BMPs) that are in the project area.

In conducting the "With Controls" model run, the following assumptions were made:

1. The model run establishes the total pollutant load for existing land uses with recognition of existing BMPs.

2. The DNR model guidance (6/6/05) was followed to determine what lands were included and excluded from the modeled area.

3. Field-collected source area data for each land use were used.

4. The drainage type was determined by field inventory and was verified as meeting the definitions for disconnectedness, as defined in SLAMM training guidance.

Results of the Field Inventory and Watershed Runs

Results of the modeling effort under the "No Controls" and the "With Controls" conditions are provided in Table 1. Model results are reported by watershed and show the volume of runoff with and without controls, the runoff pollutant loads reported as Total Suspended Solids (TSS) and particulate phosphorus, and the percent of runoff and pollutant load reduction that can be attributed to existing conditions.

The relative volume and distribution of the current nonpoint pollution load, as modeled for each watershed under the existing "With Controls" conditions, is shown on Map 3.

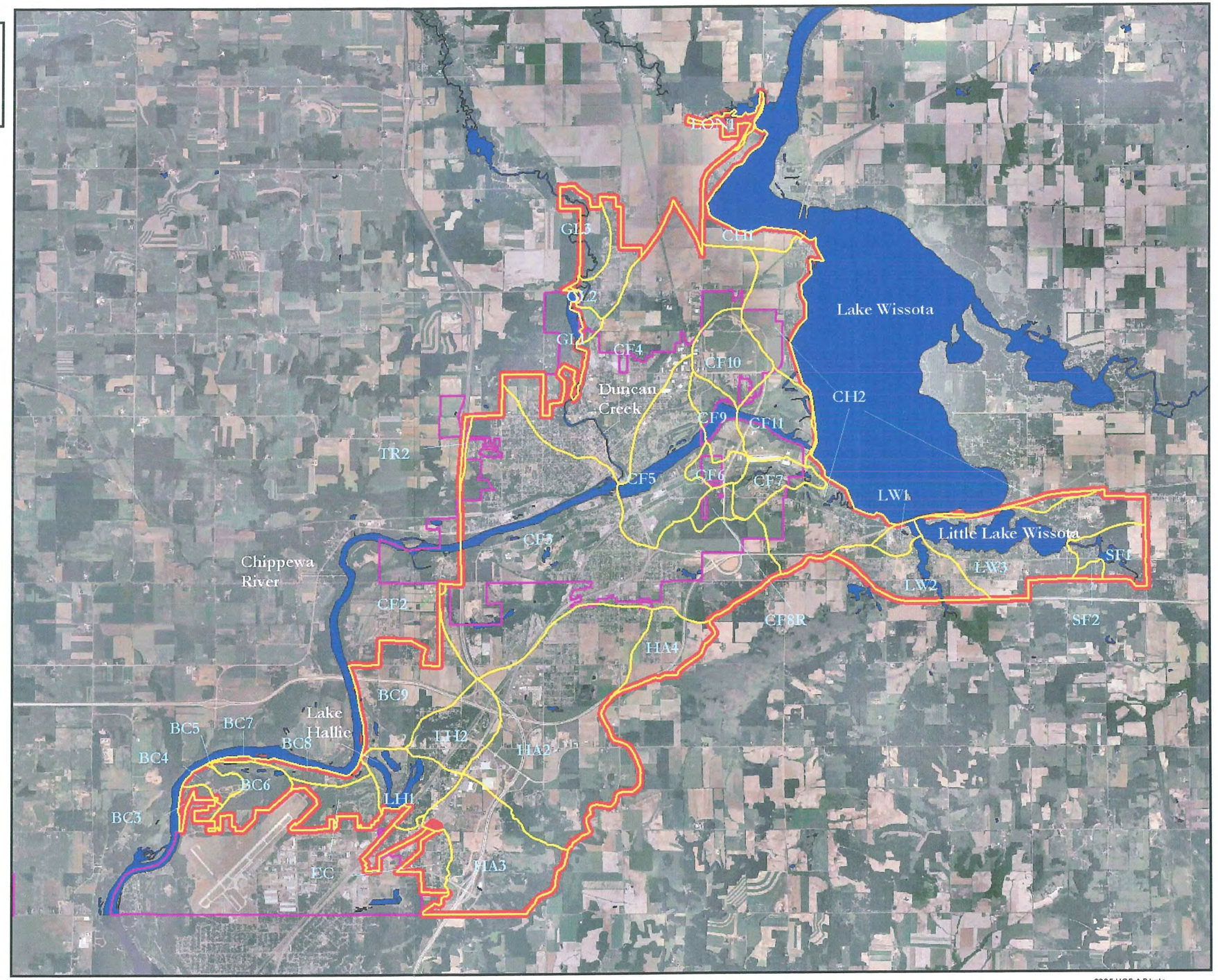
The documented locations of areas of seasonable ponding and storm water best management practices, as determined through the field inventory process, are shown on Map 4.

Map 2

Current Land Cover, Surface Water Features, and Watersheds

N

- Stormwater Management Area
- Subwatersheds
- City Limits
- Waterbodies



Chippewa County
Land Conservation Dept

May 6, 2007

Table 1

AYRES ASSOCIATES

Summary of Slamm Model Results

Chippewa County Joint Stormwater Management Plan

(Output Based on Field Verified Land Use with Drainage and Outfall Controls)

Explanatory Note #1

Explanatory Note #2

Basin Name	Basin Area (acres)	Runoff Before Controls (c.f.)	Runoff After Controls (c.f.)	Percent Runoff Reduction	TSS Before Controls (lbs)	TSS After Controls (lbs)	Percent Solids Reduction	TSS Concentration (lbs/acre)	Particulate Phosphorous Before Controls (lbs)	Particulate Phosphorous After Controls (lbs)	Percent Particulate Phosphorous Reduction	Particulate Phosphorous Concentration (lbs/acre)	Filterable Phosphorous Before Controls (lbs)	Filterable Phosphorous After Controls (lbs)	Percent Filterable Phosphorous Reduction	Filterable Phosphorous Concentration (lbs/acre)
BC3	70.74	1157157	0	100%	25735.0	0.0	100%	0.0	59.4	0.0	100%	0.00E+00	8.3	8.3	0%	0.1175
BC4	95.5	1561933	0	100%	34743.0	0.0	100%	0.0	80.2	0.0	100%	0.00E+00	11.2	11.2	0%	0.1176
BC5	0.95	15536	0	100%	345.6	0.0	100%	0.0	0.8	0.0	100%	0.00E+00	0.1	0.1	0%	0.1175
BC6	80.21	1338959	50244	96%	28978.6	322.6	99%	4.0	66.8	0.7	99%	8.16E-03	9.4	9.4	0%	0.1173
BC7	16.16	264662	0	100%	5886.0	0.0	100%	0.0	13.6	0.0	100%	0.00E+00	1.9	1.9	0%	0.1177
BC8	67.43	1266293	94912	93%	24179.0	617.0	97%	9.2	55.1	1.1	98%	1.70E-02	7.9	7.9	0%	0.1167
BC9	528.6	9758479	1405277	86%	161051.0	9029.3	94%	17.1	362.2	18.2	95%	3.45E-02	64.2	64.2	0%	0.1214
CF2	5.01	69650	0	100%	1298.0	0.0	100%	0.0	1.4	0.0	100%	0.00E+00	0.5	0.5	0%	0.0929
CF3	767.13	14841848	566061	96%	204101.0	3681.0	98%	4.8	396.6	6.8	98%	8.92E-03	91.5	91.5	0%	0.1192
CF4	436.84	8823360	1165000	87%	125994.6	7575.0	94%	17.3	197.6	14.1	93%	3.22E-02	43.8	43.8	0%	0.1004
CF5	0.21	3432.5	0	100%	76.4	0.0	100%	0.0	0.2	0.0	100%	0.00E+00	0.0	0.0	0%	0.1175
CF6	17.95	306438	7702	97%	6502.9	50.1	99%	2.8	15.0	0.1	99%	5.19E-03	2.1	2.1	0%	0.1173
CF7	43.6	706029	0	100%	15556.7	0.0	100%	0.0	35.0	0.0	100%	0.00E+00	5.1	5.1	0%	0.1159
CF8r	9.49	155233	0	100%	3452.0	0.0	100%	0.0	8.0	0.0	100%	0.00E+00	1.1	1.1	0%	0.1175
CF9	5.49	89804	0	100%	1996.8	0.0	100%	0.0	4.6	0.0	100%	0.00E+00	0.6	0.6	0%	0.1175
CF10	16.74	548481	520434	5%	3852.1	3345.0	13%	199.8	7.9	6.8	15%	4.05E-01	1.8	1.8	0%	0.1046
CF11	26.29	485962	0	100%	16980.0	0.0	100%	0.0	38.5	0.0	100%	0.00E+00	3.7	3.7	0%	0.1392
CH1	291.9	4774837	0	100%	106191.0	0.0	100%	0.0	245.2	0.0	100%	0.00E+00	34.3	34.3	0%	0.1175
CH2	799.52	14848048	866354	94%	275906.0	5634.0	98%	7.0	622.1	10.5	98%	1.31E-02	94.5	94.5	0%	0.1182
EC	416.48	9231070	1249450	86%	148536.1	8120.1	95%	19.5	326.1	15.1	95%	3.63E-02	47.9	47.9	0%	0.1150
GL1	45.34	940125	114887	88%	16068.0	746.8	95%	16.5	36.2	1.4	96%	3.06E-02	5.3	5.3	0%	0.1160
GL2	238.36	4522620	326754	93%	141539.2	2124.2	98%	8.9	323.7	4.0	99%	1.66E-02	27.8	27.8	0%	0.1166
GL3	101.02	1652461	0	100%	36751.0	0.0	100%	0.0	84.8	0.0	100%	0.00E+00	11.9	11.9	0%	0.1176
HA2	1458.03	28385952	1493480	95%	405894.7	9677.0	98%	6.6	767.5	22.4	97%	1.54E-02	169.2	169.2	0%	0.1160
HA3	377.18	10512367	1086408	90%	119862.2	7051.0	94%	18.7	225.6	13.3	94%	3.54E-02	44.6	44.6	0%	0.1181
HA4	111.51	1866807	0	100%	15851.0	0.0	100%	0.0	100.4	0.0	100%	0.00E+00	13.5	13.5	0%	0.1214
LH1	284.2	5238902	329293	94%	102002.8	2141.0	98%	7.5	232.4	4.0	98%	1.40E-02	33.2	33.2	0%	0.1167
LH2	442.71	9225852	865308	91%	128167.9	5627.0	96%	12.7	279.3	10.5	96%	2.36E-02	54.6	54.6	0%	0.1234
LON1	73.71	1599633	222548	86%	25968.0	1447.0	94%	19.6	58.2	2.7	95%	3.65E-02	8.5	8.5	0%	0.1157
LW1	86.39	1799612	218519	88%	30597.0	1421.0	95%	16.4	68.9	2.6	96%	3.06E-02	10.0	10.0	0%	0.1160
LW2	462.14	9031336	785538	91%	149714.0	5095.0	97%	11.0	340.1	9.7	97%	2.09E-02	56.2	56.2	0%	0.1215
LW3	737.32	15662915	1822184	88%	263528.3	11840.3	96%	16.1	591.3	22.1	96%	3.00E-02	85.7	85.7	0%	0.1162
SF1	172.39	3074266	145907	95%	62167.0	948.6	98%	5.5	142.3	1.8	99%	1.02E-02	20.2	20.2	0%	0.1171
SF2	38.64	632064	0	100%	14057.0	0.0	100%	0.0	32.4	0.0	100%	0.00E+00	4.5	4.5	0%	0.1175
TR2	21.96	443791	0	100%	13593.0	0.0	100%	0.0	29.3	0.0	100%	0.00E+00	3.4	3.4	0%	0.1567
TOTALS	**8347.14**	**164835915**	**13336260**	**92%**	**2717123**	**86493**	**97%**	10.4	**5848.6**	**167.9**	**97%**	2.01E-02	**978.3**	**978.3**	**0%**	0.1172

Explanatory Note #1 - "Total Acres in the Watershed" is the total developed acres in the watershed that are located within the boundary of the Storm Water Management Area (SMA).

Explanatory Note #2 - SLAMM Model output reported as "Filterable Phosphorus" is commonly referred to as "Dissolved Phosphorus" when used in water resource management applications.

Map 3

Relative Volume and Distribution of Nonpoint Pollutant Loads Delivered to Surface Outfalls, Illustrated by Subwatershed

N

Stormwater Management Area

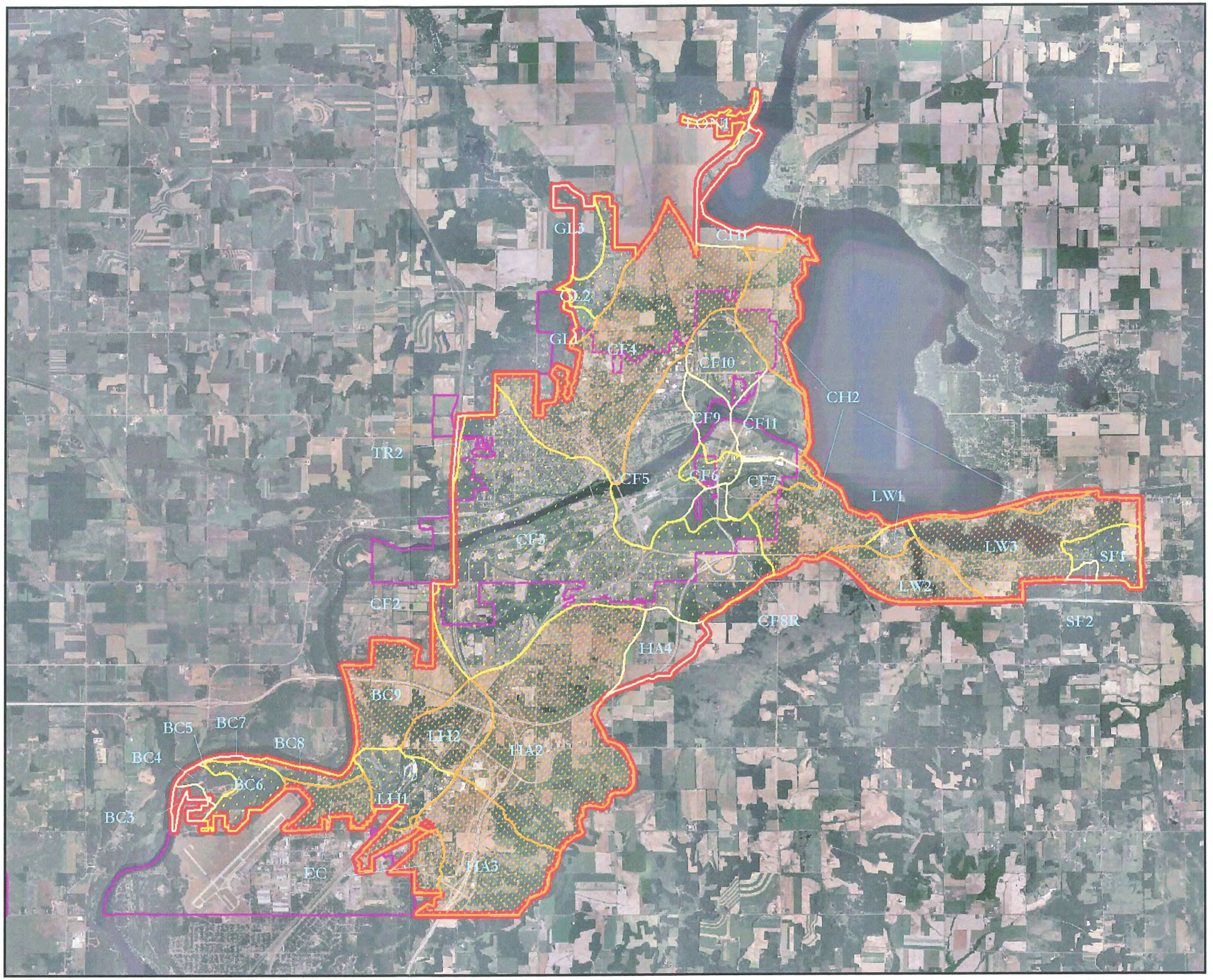
Subwatersheds

City Limits

0 lbs. TSS
0 lbs. P

1 - 5,000 lb. TSS
1 - 10 lb. P

5,001 - 12,000 lb. TSS
11 - 25 lb. P



10000 0 10000 Feet

2005 USDA Photo

h:\Pub\Dan\Hallie-Lafayette\Map 3 apr (Joan's 11x17)

Chippewa County
Land Conservation Dept

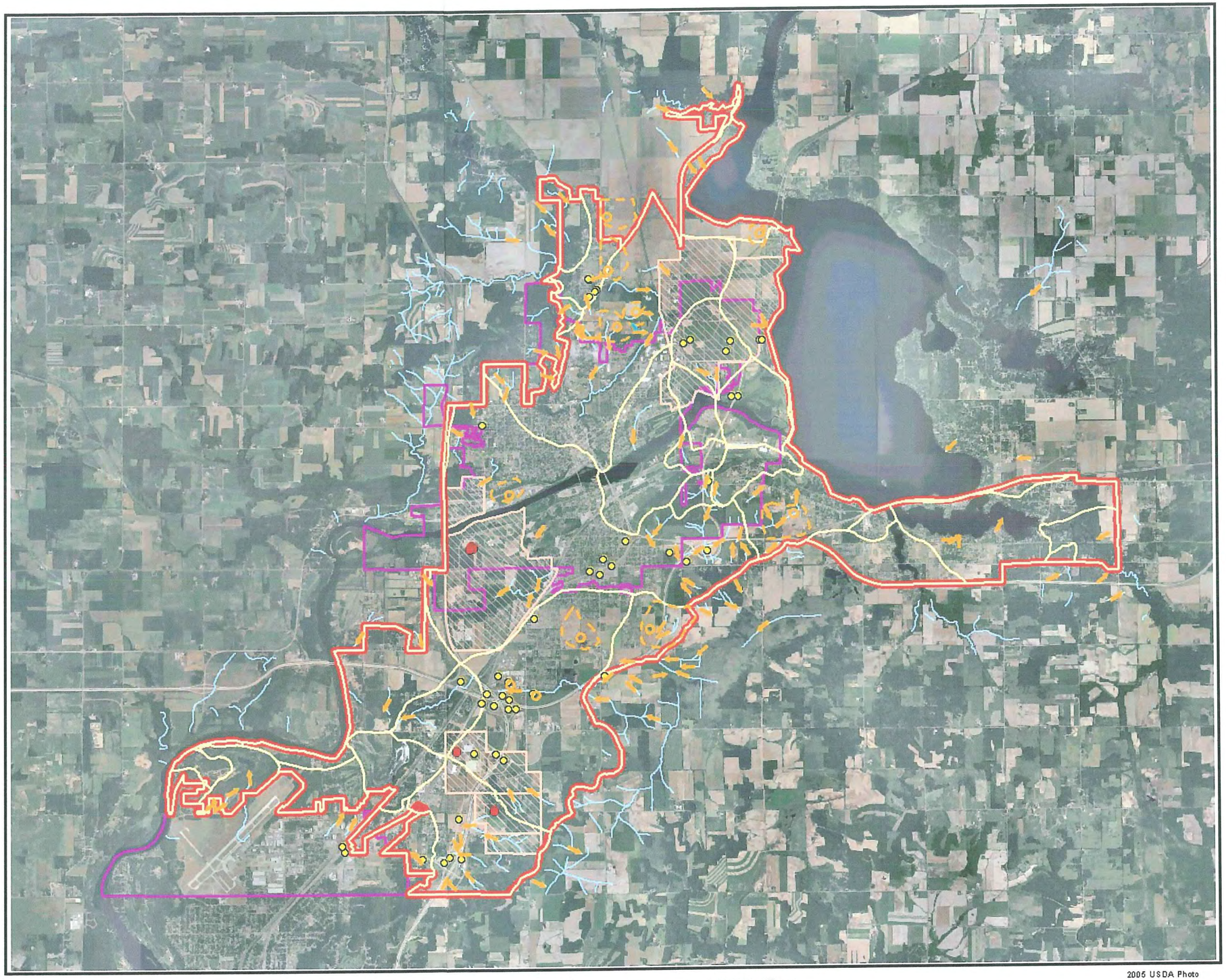
December 6, 2006

Map 4

Stormwater Routing, Locations of Stormwater Ponding, and Stormwater Best Management Practices; Chippewa Falls Urban Area

N

- Stormwater Management Area
- Subwatersheds
- City Limits
- Internally Drained Watershed Areas
- Seasonally ponded areas
- Wellhead Protection Zones
- Municipal Wells
- Drainageways
- Flow Routing
- Stormwater Best Management Practices



10000 0 10000 Feet

2005 USDA Photo

h:\Pub\Dan\Hallie-Lafayette\Map 4.apr (Joan's 11x17)

Chippewa County
Land Conservation Dept

December 5, 2006

MODEL ANALYSIS

To determine the extent of current compliance with the developed urban area performance standards of NR151.13(2), the pollutant loads associated with the baseline "No Controls" conditions were compared to those documented under the "With Controls" conditions. This comparison provides the percent of current pollutant load reduction, which can be attributed to current hydrologic conditions and existing best management practices (BMPs).

For permit purposes, this modeled load reduction may be applied toward the pollution reduction requirements for developed portions of the project area, as established in Wisconsin Administrative Rule NR216.

Results of the modeling effort support the following conclusions:

1. Given the physical features of the landscape, distributed land use pattern, and the disconnected nature of the storm water drainage system, the developed portions of the project area now generate relatively minor volumes of storm water and nonpoint source pollution, as compared to the adjoining incorporated areas with curb and gutter and storm sewer infrastructure.

2. The amount of storm water runoff and nonpoint pollution generated in the project area varies by location. The modeling effort has identified the location of critical source areas where pollution control can be most effective, and the location of watersheds which contribute the highest pollutant loads to surface waters.

3. The existing surface drainage network and structural storm water management practices have been very effective in reducing the pollutant load of Total Suspended Solids and Total Phosphorus delivered to surface waters.

    A. Modeling results indicate that within the project area as a whole, approximately 92% of the runoff and 97% of the Total Suspended Solids load is being controlled by the physical nature of the existing MS4 drainage network and existing storm water management facilities.

    B. The watersheds which generate the highest pollutant loads are those that have a higher proportion of their area dedicated to industrial and commercial uses. These watersheds are largely situated along the STH 124/US Hwy 53 commercial corridor and are internally drained with no direct channel connection to surface waters.

    C. The load of Total Suspended Solids to surface waters of high management concern, including Duncan Creek, Little Lake Wissota, and Lake Hallie, range from 5,000 - 12,000 lbs./yr. The loads of dissolved phosphorus delivered to these surface waters range from 11-25 lbs.

4. The developed portions of the storm water management area are now in full compliance with the developed urban area performance standards of NR151.13(2), which require a 20% pollution reduction by 2008, and a 40% pollution reduction by 2014.

   This is due in large part to storm water infiltration which occurs in storm water retention basins situated in sandy soils.

5. The storm water planning inventory and modeling effort have identified the location of internally drained areas, and areas where ponding routinely occurred during spring, snowmelt conditions.

   These areas now serve to store and infiltrate runoff. It is reasonable to assume that these areas provide important points of groundwater recharge and serve to reduce flood perks.

ILLICIT DISCHARGE AND ELIMINATION

An illicit discharge program has been developed to detect and remove illicit discharges to the road ditch network (MS4). This program will be jointly implemented by the permitted municipalities.

Under the joint approach, the responsibility for monitoring and detecting illicit discharges will be assigned to the municipality that is currently responsible for routine street and highway maintenance. The responsibility for eliminating and, if necessary, regulating the sources of illicit discharges when detected, will be assigned to the Chippewa County Zoning Department. The responsibility for monitoring storm water discharges at storm water outfalls will be assigned to the Chippewa County Land Conservation Department.

The specific responsibilities of each municipality and agency under the illicit discharge detection and elimination program will be incorporated into a Chapter 66.03 intermunicipal working agreement, which has been developed to implement the joint storm water program.

The core elements of the illicit discharge program, including procedures for illicit discharge detection, monitoring, and enforcement will be incorporated into a construction site and post construction storm water ordinance which will apply to the storm water management area.

Identification of Major and Minor Outfalls

To initiate the illicit discharge program, the location of all road ditch surface water connections were mapped to identify the points of potential storm water discharge. A field review of these mapped connections was then conducted to document the size, physical construction, and condition of each outfall. A list of "major outfalls" subject to WPDES monitoring requirements was then generated using definitional criteria, listed in Wisconsin Administrative Code NR216.

Results of the outfall inventory show that there are twelve (12) major outfalls which discharge to five (5) unique water resource units, as defined by the Department of Natural Resources. In addition to these major outfalls, four (4) minor outfalls were identified as being important in ongoing water resource management efforts. These minor outfalls receive direct discharge from existing storm water ponds, or have the immediate potential to become major outfalls based upon anticipated development.

The location of all major and minor outfalls in the project area, and the extent of the contributing ditch network (MS4) is shown on Map 5.

Inventory of Illicit Discharges and Initial Field Screening of Major Outfalls

Using the list of major storm water outfalls, an initial dry season field screening was conducted during a dry weather period from May 24-26, 2006.

As part of the screening process, information was collected to describe the characteristics of each major outfall using photographs and a standardized data collection form. When present, the volume and properties of the dry weather discharge were documented using a narrative description.

As part of this process, the ditch lines and storm sewers, which convey runoff to each of the major storm water outfalls, were then mapped. Each of the contributing reaches of the road ditch networks were inspected to detect any observable sources of illicit discharge. Specific efforts were made to document any points where a ditch line connects to a piped storm water conveyance by way of a drop inlet or storm water drain.

Results of Illicit Discharge and Outfall Screening

The location and physical characteristics of each major and minor outfall, and the results of the illicit discharge detection inventory and dry weather outfall screening process, are summarized in Table 2.

Results of the initial inventory and screening process showed no illicit connections or sources of illicit discharge to any of the ditch lines which convey runoff to waters of the state.

Results of the dry weather screening process documented a base flow discharge at only one (1) of the sixteen (16) outfalls (#CF 10-4). That discharge was determined to be attributed to an air coolant discharge currently regulated through an active WPDES permit.

Ongoing Detection and Outfall Monitoring

A free-standing database has been created for each major outfall to support ongoing illicit discharge monitoring and outfall screening.

Each municipality will conduct a routine inspection of road ditch lines under its jurisdiction to detect illicit discharges. Inspections of the road drainage network will be scheduled to coincide with the routine evaluations of municipal road surfaces, completed under the Wisconsin Pavement Assessment Program (PACER). Results of these illicit discharge detection inspections will be recorded on an attachment to standardized PACER forms. These records will be filed annually with Chippewa County to facilitate WPDES reporting.

The Chippewa County Land Conservation Department will conduct an annual dry weather evaluation of each major outfall. These dry weather inspections will be scheduled to coincide with the annual inspections of the road ditch networks conducted by the municipalities.

The need for water sampling will be evaluated based upon the frequency of observed discharges at each outfall. Water quality sampling will be limited to that necessary to meet WPDES permit requirements or to document the storm water pollutant load in support of a specific water resource management initiative.

CONSTRUCTION SITE POLLUTION CONTROL AND POST CONSTRUCTION STORM WATER MANAGEMENT

Chippewa County, acting on behalf of the affected municipalities, will develop, implement, and enforce a program to reduce the discharge of sediment from construction sites and to control the quality of storm water discharges from areas being developed and redeveloped.

This storm water management program will be implemented through a combined construction site pollution control and storm water management ordinance. This ordinance will be based upon state model ordinances to meet the prescribed requirements and standards of NR216, NR151, and the WPDES permit.

This ordinance will be created to augment and be consistent with similar ordinances, previously adopted by Eau Claire County, the City of Chippewa Falls, and the Town of Lafayette.

Under the proposed management approach, the responsibilities for ordinance administration and enforcement will be delegated to the Chippewa County Zoning Department. Technical support, including responsibility for storm water plan review and infrastructure-based construction inspection, will be delegated to the Chippewa County Land Conservation Department. To avoid redundancy, the County will coordinate its efforts, plan review, and inspection with the City of Chippewa Falls and appropriate state regulatory agencies when joint jurisdictions apply.

Responsibility for administration of the erosion control provisions of the Uniform Dwelling Code (UDC), during the subsequent development phases, will be administered by the Chippewa County Zoning Department and will be conducted as part of the routine sanitary and construction permitting process.

An outline of agency responsibilities at each phase of the development process is provided in Table 3.

The jurisdictional coverage of this storm water ordinance will extend to the corporate boundaries of each municipality, unless a more confined boundary is requested by the municipality. To encourage consistency, adjoining towns in the urbanizing area (Wheaton and Anson), that participate in County Comprehensive Zoning, will be provided the opportunity to have the ordinance applied to their jurisdiction.

To meet WPDES permit requirements, this ordinance will be drafted before August 1, 2007, to be considered for adoption before October 1, 2007, with an effective date of implementation of January 1, 2008. A copy of a draft ordinance is provided in Appendix 4.

Map 5

Major Stormwater Outfalls and Roads Subject To Illicit Discharge Monitoring; Chippewa Falls Urban Area

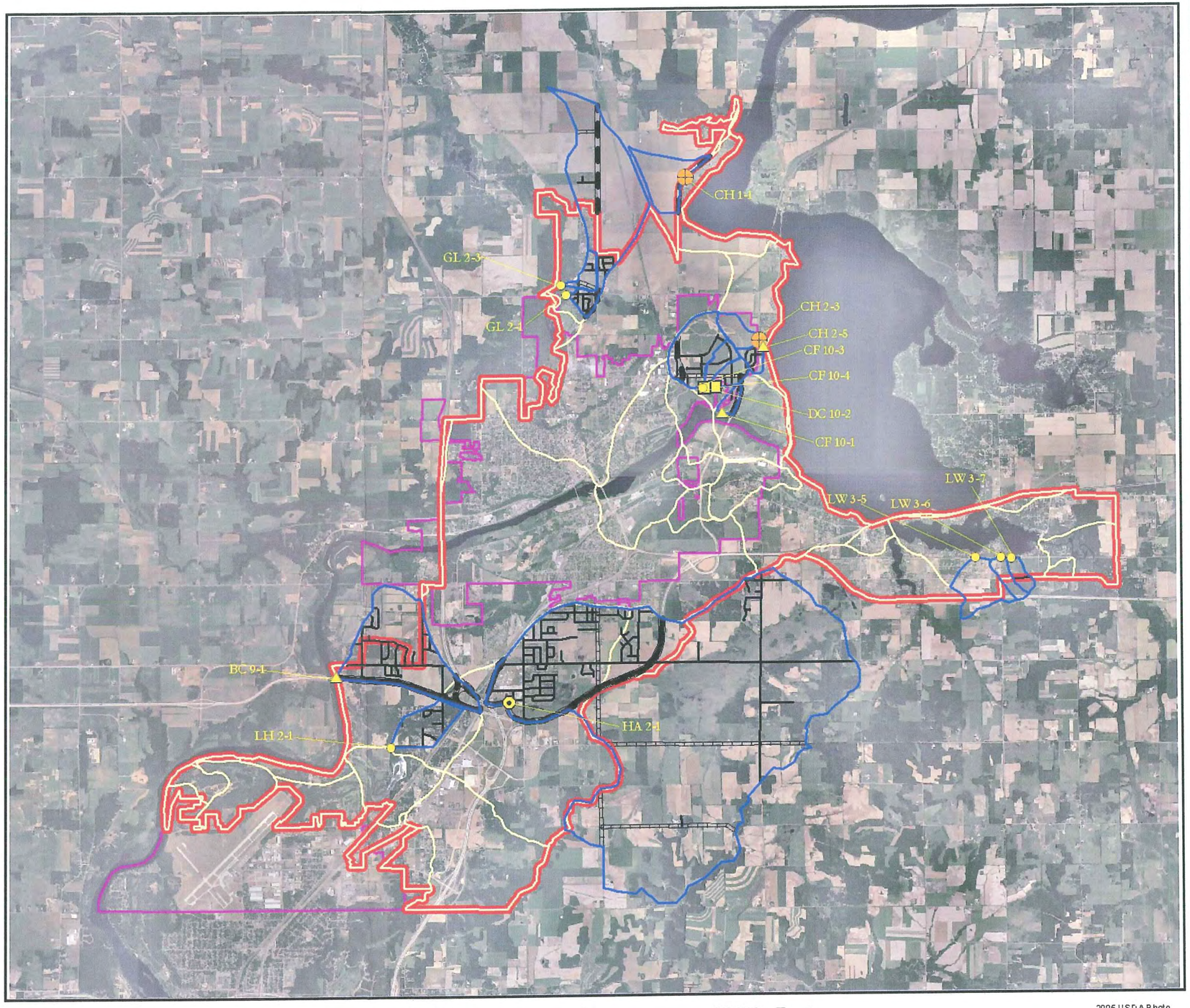
N

Outfalls Subject To Monitoring
- Surface Water Outfall
- Groundwater Outfall
- Surface Water BMP Outlet
- Surface Water WPDES Permit
- Potential Future Outfall

Roads Within Major Outfall Watersheds
- Federal / State
- County
- Township
- City / Village

- Stormwater Management Area
- Major Outfall Watersheds
- Subwatersheds

- City of Chippewa Falls
- Eau Claire City Limits



Chippewa County
Land Conservation Dept.

December 12, 2006

h:\ag\conserv\stormwater Map 5_labels.apr (Layout All Roads 1117)

Table 2

LCD 12/12/06

RESULTS OF THE ILLICIT DISCHARGE DETECTION AND STORMWATER OUTFALL INVENTORY DRY WEATHER SCREENING PROCESS

OUTFALL ID	SUB-BASIN	RECEIVING WATER	DNR MNGT CLASS	OUTFALL DESCRIPTION	OUTFALL SIZE/TYPE	ILLICIT DISCHARGE TO MS4	STORMWATER DISCHARGE AT OUTFALL
MAJOR							
GL2-1	Glen Loch	Duncan Creek	Exceptional	Storm Main	Ditch line	No	Dry
GL2-3	Glen Loch	Duncan Creek	Exceptional	Road Ditch - Cty S	36"	No	Dry
CF10-1	Chippewa River	Chippewa River		BMP Outfall - Hwy 178	12"	No	Seepage Baseflow
CF10-2	Chippewa River	Chippewa River		Escarpment Channel	48"	No	Dry
CH2-5	Wissota	Lake Wissota		BMP Outfall - Cty I	24"	No	
LW3-5	Wissota	Little Lake Wissota	303d	Escarpment Channel	12"	No	Dry
LW3-6	Wissota	Little Lake Wissota	303d	Escarpment Channel	12"	No	Dry
LW3-7	Wissota	Little Lake Wissota	303d	Escarpment Channel	12"	No	Seepage Baseflow
LH2-1	Lake Hallie	Lake Hallie	303d	Remnant Channel	(2) - 48"	No	Dry
BC9-1	Chippewa River	Chippewa River		BMP Outfall - Hwy 29	48"	No	Seepage Baseflow
HA2-1	Hallie	Groundwater	Wellhead	Depression	Depression	No	Seasonable Infiltration
MINOR							
CF10-3	Chippewa River	Chippewa River	WPDES	ES	12"		<0.1 CFS
CF10-4	Chippewa River	Chippewa River	WPDES		12"		<0.1 CFS
CH1-1	Chippewa River	Chippewa River		Escarpent Channel	12"	No	Potential Future
CH2-3	Wissota	Lake Wissota		Escarpent Channel	12"	No	Potential Future

H:/Admin/Sec/Stormwater/Stormwater Plan/Tables/Table 2.xls