

**STORM WATER MASTER PLAN UPDATE**  
**2004**  
**City of Prairie du Chien, Wisconsin**

## TABLE OF CONTENTS

<u>Description</u>	<u>Page</u>
Introduction and Scope .....	1
Project List .....	2
Impact of Current DNR Storm Water Regulations.....	7
Funding Strategy.....	8
Summary and Recommendations.....	9

**Figure 1      Project Location**

**Table 1      Project Summary**

**Appendix A      Existing Plans & Cost Estimates**

**Appendix B      Runoff Management Rules**

**Appendix C      Funding Programs**

**CITY OF PRAIRIE DU CHIEN  
STORM WATER MASTER PLAN UPDATE – 2004**

**I. INTRODUCTION AND SCOPE**

In 1993, Vierbicher Associates, Inc. prepared a Storm Water Master Plan for a large area within the City of Prairie du Chien. The scope of the Master Plan was to address problems with poor drainage with the existing infrastructure and the lack of adequate drainage for areas experiencing growth. The portion of the city included in the study area was generally east of Marquette Road and south of Washington Avenue, and the area between Glenn Street and Campion Boulevard west of Marquette Road to the Mississippi River.

The plan identified a number of improvements needed for both developed areas and undeveloped areas. In the following years, up through 1999, many of the recommended improvements were completed, particularly in the undeveloped areas.

In the spring and summer of 2004, heavy rainfall events lead to flooding in several areas of the city. Debris, ranging from grass and leaves to brush and old telephone poles, blocked drainage ditches and interceptor intakes, leading to breaches and flooding in several neighborhoods. The facilities may have been able to accommodate the flow from a hydraulic standpoint, but could not handle the debris. The heavy runoff from saturated soils also pointed out inadequacies of the existing drainage system.

The City authorized this report to identify current problem areas, and develop a list of potential projects and costs. The entire city is included in this update. We met with City staff to list the locations where problems occur, and the type of problem, e.g., debris, inadequate capacity, no outlet. We also revisited the needs list from the 1993 Master Plan to determine what has been completed and which projects remain. We have included a section on funding, which explores currently available grants, Tax Incremental Financing, and creation of a storm water utility. Finally, the projects have been prioritized, based on input by City staff and officials.

## II. PROJECT LIST

The following list provides the general magnitude of the scope and preliminary cost of identified projects. The location of each project is shown in Figure 1. Before implementation of specific projects, a more detailed cost estimate and analysis of the area and alternatives should be completed. The costs shown assume materials and construction by an outside contractor. If projects are partially or completely constructed by City forces, the cash outlay may be less.

### A. Infrastructure Improvements

**1. NORTHEAST AREA** – The area north of East Blackhawk Avenue and east of Marquette Road, approximately 140 acres, has no outlet for drainage. This includes part of the bluff, a field, a residential area, and an industrial area. Storm water currently infiltrates in the field, French drains, infiltrator structures, and a retention basin. Existing storm sewer on McLeod Street does flow into the 48-inch interceptor on Cedar Street to the river, but it is shallow and runs at minimum slope until west of the railroad tracks, so it can not be re-laid to gain more depth. The following projects address this area.

**1a. Design Homes/Bennett Hardwoods** – Much of Design Homes surface drains west to STH 35 where it infiltrates in the ditches, or drains to the storm sewers on State and McLeod Streets. If water builds up in the STH 35 ditches, an outlet to the Cedar Street storm sewer should be constructed (described as Project **6**). There is a drainage problem at Bennett Hardwoods, primarily by the office along McLeod Street. This area is very flat, as are the storm sewers that run along McLeod Street, so water does not readily drain away. A drainage ditch should be constructed along the west side of the Bennett Hardwoods property, from McLeod Street south to the existing retention basin. The runoff from Bennett Hardwoods would then all flow to this expanded retention basin/ditch. If the water level were to rise above 632.5', water would begin to flow into the McLeod Street storm sewer, preventing basin overtopping. An existing 12-inch storm sewer that runs east of State Street along McLeod is very flat and shallow, resulting in standing water at the east end of McLeod Street. This main could be replaced by extending a new main east from the manhole at State/McLeod intersection to the east end of McLeod, and constructing appropriate inlets. Cost - \$17,000.

**1b. Future development south of Washington** – This area does not currently drain anywhere, and the low point is at the east end of existing Washington Street. Current DNR storm water

regulations will require storm water detention for development. While some of the drainage from higher elevations could be detained and then discharged to storm sewers on Blackhawk Avenue, it may be best to construct a retention basin at the low point east of Washington Street, similar to Godden pit, where storm water would infiltrate. It is assumed the cost of the retention pond would be borne by the developer. Cost - \$55,000.

**1c. North Dousman & State French drains** – These drains are slow to seep, resulting in standing water in the streets. The area is too low to drain into any existing storm sewers. The options are to construct a deeper storm sewer west to the river, or pipe these drains to a future retention basin that would be constructed to the east (see above). Cost - \$75,000.

**1d. Future outlet to river** - Although it would be possible to construct a new, deeper, conventional interceptor to the river, perhaps along Washington Street, this would be an expensive solution for a relatively small area, since it would require approximately 3,400 feet of main and street replacement. The cost for an open-cut sewer is estimated at over \$500,000. If an outlet from the retention/detention basin is needed or desired in the future, a more cost-effective solution would be to install a smaller pipe, 15 to 18-inch diameter, to the river by means of horizontal directional drilling (HDD). The HDPE pipe could be installed deep, without disturbing the street and other utilities above. Cost - \$300,000.

**2. AREA NORTH OF GODDEN PIT** – The following projects are in areas that lead directly to Godden Pit. It should be noted that in the original Master Plan, a future outlet for Godden Pit was identified as a project. Although more storm water has been directed to Godden Pit over the last 10 years, the seepage capacity seems to remain the same, such that the water level does not appear to be rising. This would indicate that the proposed outlet may not need to be a high priority in the near future.

**2a. Drainage ditch east of Jackson** – In the spring of 2004, a heavy rainfall event occurred after a wet spring had saturated the ground. In addition to high runoff, this resulted in a great deal of debris being carried along the drainage way. The debris consisted of vegetation, branches, large tree limbs and trunks (deadfall), and even old fence posts and telephone poles that washed out of the steep, wooded watershed. The debris plugged the interceptor intake and culverts in the drainage way by Jackson Street. The high flow quickly built up and breached the side berms, causing floodwater laden with mud and debris to flood the adjacent

residential area. Enlarging the ditch will create additional storage/detention volume, and allow for additional infiltration. Installing debris control structures and improving the culverts near Jackson Street will catch large debris coming down from the bluffs during heavy rainfall events, preventing the plugging of culverts and the interceptor intake. Cost - \$90,000. (The estimate used for a grant application in September 2004 is included in Appendix A.)

**2b. Interceptor intake east of Fillmore** – The intake to the interceptor is susceptible to plugging with grass, debris, and trash, resulting in the ditch overflowing. Because the recently constructed interceptor is approximately six feet lower than the existing ditch, it is proposed to lower and widen the existing drainage way to increase capacity, storage volume, and eliminate above ground berms that are susceptible to breaching. Debris control structures and culvert improvements will prevent plugging that contributed to berm failure. Cost - \$115,000. (The estimate used for a grant application in September 2004 is included in Appendix A.)

**2c. Webster/Madison** – Flooding occurred at the south end of Madison Street, which accepts flow from a swale along Webster Street. No storm sewer is in place in this new development. The swale along Webster has been cleaned out. As this area develops, storm sewer should be installed along the Dunn Street ROW to collect runoff from Madison Street and future development south of Webster. Cost - \$60,000.

**3. Alley east of Michigan between Pine & Frederick** – This alley was reconstructed in 2004, but drainage flows east across the ground to the railroad. In order to provide better drainage, approximately 900 feet of storm sewer would be installed to connect to the existing 48-inch interceptor main on Cedar Street. Cost - \$30,000.

**4. North Main/West Cedar intersection** – This portion of Main Street is lower than the rest of the street, so when the river level rises, Main Street must be closed. The proposal is to raise approximately 200 feet of street one foot, so it will be passable at the 18-foot river stage. Cost - \$22,000.

**5. Washington Street between North Main and bridge** – This portion of Washington Street is lower than the rest of the street, so when the river level rises, Washington Street to the island must be closed. The

proposal is to raise approximately 200 feet of street one foot, so it will be passable at the 18-foot river stage. Cost - \$22,000.

**6. East Cedar/3M parking lot** – 3M is proposing to install an inlet in their parking area and drain it to the storm manhole on Cedar Street, at no cost to the City. The Design Homes Site and much of the 3M site drain to a low area west of STH 35, which does not have an outlet, but seeps away. If drainage along STH 35 becomes a problem, the storm sewer could be extended east to drain the highway ditches. Cost - \$17,000.

**7. Illinois/Wisconsin & Iowa** – The addition of approximately 4 inlets to the existing storm sewer in these intersections is proposed to improve local drainage. Cost - \$6,000.

**8. Illinois/Webster** – The culverts & ditches along the railroad fill in, resulting in poor drainage. After being cleaned out, apron endwalls could be installed and concrete poured in the ditch bottom to prevent it from sloughing back in. Cost - \$3,500.

**9. Marquette/Taylor/Mooney** – A plan and estimate to eliminate this open ditch was prepared in 2001, and is included in Appendix A. The existing ditch is flat, and tends to silt in, further restricting flow from the storm sewers to the north and east. A 36-inch culvert across the railroad has also been covered. Construction of the improvements as described in the 2001 memo would eliminate the ditch, be more easily maintained, and provide more flow capacity. Cost - \$30,000.

**10. Taylor/S. Ohio to Dousman Street & intersection flooding** – Although there are two 24-inch storm sewer pipes draining the Taylor/Ohio intersection and numerous inlets, the two blocks of Taylor Street from Ohio to Dousman flood because the streets are too flat to move water west to the inlets quickly enough. It is proposed that storm sewer be extended approximately 400 feet east to the Dousman intersection, and several inlets be constructed there to pick up drainage. Cost - \$26,000.

**11. South Main between Glenn & Wells** – The placement of fill west of Main Street is blocking drainage. Since this street area will ultimately be filled by construction of the USH 18 bypass by DOT, no action by the City is recommended.

**12. Marquette/Wells to Parrish** – Water builds up in the street, causing flooding. There is adequately-sized storm sewer along Marquette Road, but it appears that there may not be enough inlets, particularly on the west side. Approximately four new inlets, constructed over existing mains or leads, would reduce the street flooding. This project could be

implemented by the City, or it could be a part of the future DOT project.  
Cost - \$6,000.

**13. 13<sup>th</sup> Street cul-de-sac** – French drains leading from the inlet are creating voids, causing street damage. The drains are working, but should be dug up and exposed, so that filter fabric or other barriers may be placed over openings that are allowing soil to enter. Cost - \$750.

**14. Broadway/16<sup>th</sup> & 17<sup>th</sup> Streets** – These French drains are causing standing water. They could be piped approximately 500 feet west to 15<sup>th</sup> Street. Cost - \$25,000.

**15. Fowler/16<sup>th</sup> Streets** – These French drains are causing standing water. A new storm sewer would be run from the cul-de-sac to 16<sup>th</sup> Street, connect to the inlets at that intersection, and then run south to Parrish to connect those inlets. An alternate route that should be considered would run west to the existing storm sewer on 15<sup>th</sup> Street. Cost - \$41,000.

**16. Parrish cul-de-sac** – Connect drain to interceptor on 19<sup>th</sup> Street.  
Cost - \$3,500.

**17. Parrish ROW east of 22<sup>nd</sup> Street** – The swale that should direct runoff along the right-of-way and to the Campion detention basin is filled in, allowing water to flow onto private property to the south. A defined swale, approximately 400 feet long, should be graded to keep water within the ROW. Cost - \$2,000.

**18. LaPointe between 11<sup>th</sup> & Marquette** – This area is seeing new development, but has no storm sewer. Future storm drainage should be coordinated with the DOT for the USH 18 bypass project. Storm sewer would likely run to the new detention basin south of LaPointe, or to existing storm sewer east on LaPointe. Cost - \$60,000.

**19. Bloyer Parkway** – The portion of roadway constructed by Pellock and Fastenal needs additional storm sewer with an outlet. The original plan was to extend storm sewer to the south as the road was extended, but future construction of an overpass by DOT will reroute Bloyer Parkway. This road may become a cul-de-sac. If so, it may be best to slope the cul-de-sac to the south. No action is recommended until the DOT proposes area drainage for its project.

**20. Miscellaneous inlet & manhole replacement** – The City is aware that a number of existing inlets are deteriorated and in poor shape. After completion of the structure inventory and mapping, a list of structures to be replaced can be created. The estimated cost is \$1,500 per structure.

## **B. Administrative Tasks**

- 1. Update Storm Sewer Map** – Although not an infrastructure project, this step is important for the storm water system. The City does not have a complete or current storm sewer map, which makes maintenance and planning very difficult and inefficient. Part of the City’s storm sewer system was inventoried and mapped as a part of the 1993 Master Plan. As time permits, City staff and/or street crew should locate, inspect, and inventory all remaining structures in the city. This information can then be used to complete a storm sewer map component of the City’s GIS. Cost - \$3,500.
- 2. Adopt Storm Water Ordinance** – A local erosion control and storm water ordinance would strengthen the City’s ability to control runoff, which ultimately impacts the storm drainage system. The ordinance would expand on the current DNR regulations as described in the following section. Cost - \$3,000.
- 3. Create Storm Water Management Utility (SMU)** – A storm water management utility would manage storm water and provide for a more equitable means of funding storm drainage system projects. The SMU is described in more detail in the funding strategy section of this report. Cost - \$15,000.

## **III. IMPACT OF CURRENT DNR STORM WATER REGULATIONS**

Changes to the Wisconsin Administrative Code, specifically NR 151 RUNOFF MANAGEMENT, and NR 216 STORM WATER DISCHARGE PERMITS, will have an impact on storm drainage within the city beginning in 2004. The regulations apply to construction, development, or redevelopment disturbing one or more acres, and are intended to control erosion, reduce peak runoff, and promote infiltration. Affected projects must prepare an Erosion Control Plan, a Storm Water Management Plan, and submit a Notice of Intent to the DNR. Construction of detention or retention basins is generally required to comply with these regulations. This is beneficial to the City, in that it reduces the impact on existing or proposed City infrastructure. An information bulletin and fact sheet on runoff management rules are included in Appendix B.

## **IV. FUNDING STRATEGY**

Following is a discussion of potential sources for storm water projects. The summary included within Section V. identifies potential funding sources for recommended projects.

### **A. Tax Incremental Financing (TIF)**

The City of Prairie du Chien has seven Tax Incremental Districts (TIDs). Storm sewer improvements are an eligible TIF expenditure provided the project serves the TID. With the recent changes to the TIF law extending the expenditure period, the City can look some of the existing TIDs for funding.

### **B. Storm Water Utility**

A Storm Water Management Utility (SMU) is a special district created by a municipality for the purpose of managing and funding storm water systems. A SMU operates in a similar manner to electric, water, or wastewater utilities. Users pay for the services provided, which in this case includes effective flood control and water quality protection.

A utility fee is charged to all customers within the utility district based on an estimate of their use of storm water facilities. With a SMU, everyone pays their fair share of the cost for storm water management. As such, SMU fees are viewed as a more equitable way of distributing the cost to install, operate, and maintain storm water facilities.

Prairie du Chien proposed to create a SMU about 10 years ago. At that time, the SMU district was to include the entire City plus the watersheds around the City. A new proposal to create a SMU should limit the boundary to the City limits.

A SMU can be used to fund all storm water related projects.

### **C. Grants**

There are a number of grant programs that are potentially available to fund storm water management projects. Many communities similar to Prairie du Chien are able to obtain grant funds. We recommend the City proactively investigate grants and pursue applications as appropriate.

Preliminarily, we have identified the following grant programs for the City to pursue.

- WisDNR Urban Nonpoint Source and Storm Water Grant
- WisDNR Nonpoint Targeted Runoff Management Program
- FEMA Hazard Mitigation Grant Program

- WisDNR Clean Water Fund
- CDBG Public Facilities for Economic Development

A summary for each of the above programs is included in Appendix C.

## **V. SUMMARY AND RECOMMENDATIONS**

A summary of the proposed projects is shown in Table 1. We recommend the City confirm the priority of the projects, determine which may be completed by city forces, and incorporate projects into capital improvement planning and budgeting.

The inventory and inspection of structures should be completed as soon as possible. The project list should be modified, if necessary, to reflect what may be discovered during the inventory.

The City should adopt a Storm Water and Erosion Control Ordinance.

The City should create a Storm Water Utility.

This report was prepared by William P.E. Nelson, PE.