State of Wisconsin
Department of Natural Resources

dnr.wi.gov

Final Report

Targeted Runoff Management Grant Program and Urban Nonpoint Source and Storm Water Management Grant Program

Form 3400-189 (R 11/05)

Notice: This final report is authorized by ss. 281.65 and 281.66, Wis. Stats., and chs. NR 153 and NR 155, Wis. Adm. Code. Personally identifiable information collected will be used for program administration and may be made available to requesters as required under Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Instructions: The grant agreement requires grantees to submit a Final Report 60 days after the end date listed in the grant agreement. This Final Report form must be used in conjunction with the "FINAL REPORT INSTRUCTIONS." The instructions detail how to complete and submit the report to DNR.

1. Grant Type

- ☐ Agricultural - Targeted Runoff Management Grant
- ☐ Urban - Targeted Runoff Management Grant
- ☒ Construction - Urban Nonpoint Source & Storm Water Management Grant
- ☐ Planning - Urban Nonpoint Source & Storm Water Management Grant

2. Grantee & Project Information

Project Name	Grant Number
Highway 12 Catch Basins	**USC-LR10-13255-05**
Governmental Unit Name	Governmental Unit Type (city, village, town, etc.)
Middleton	**City**
Watershed Name	Watershed Code
Six Mile and Pheasant Branch Creeks	**LR10**
DNR Water Management Unit (River System) Name	Water Body Identification Code (WBIC) (if applicable)
Lower Rock	**805900**

s. 303(d) Waterbody? ☒ Yes ☐ No

What pollutant(s) were addressed by the project?

Urban storm water pollution primarily associated with transportation related impervious areas such as roads and parking lots. Pollutant loads are expected to include heavy metals, suspended sediments, hydrocarbons and trash.

For <u>each</u> project site location provide the following: (attach additional sheets if necessary)

Location:		A	B	C	D	E
Minor Civil Division Name		Middleton				
PLSS	Town	7N				
	Range	8E				
	Section	11				
	Quarter	NE				
	Quarter-Quarter	NW				
Latitude		43deg 6' 13" N				
Longitude		89deg 30' 38" W				
Property Owner(s)	Name	City of Middleton				
	Mailing address	7426 Hubbard Ave. Middleton, WI 53562				
Site address *(if different than mailing address)*						

3. Summary of Results

A. Performance Standards and Prohibitions and Other Water Resources Management Priorities

For grants issued in calendar year 2006 or later, complete Tables A and B (following) consistent with the entries on your grant application. For grants issued prior to calendar year 2006, complete Tables A and B, *to the best of your knowledge*, consistent with the entries on your grant application.

Table A. Performance Standards and Prohibitions (per ch. NR 151, Wis. Adm. Code, effective October 1, 2002)

Performance Standard or Prohibition	Units of Measure	Quantity	Measurement Method Used
Sheet, rill and wind erosion	Acres meeting T		
Manure Storage Facilities: New Construction/Alterations	Number of facilities		
	Number of animal units		
Manure Storage Facilities: Closure	Number of facilities		
Manure Storage Facilities: Failing/Leaking Facilities	Number of facilities		
	Number of animal units		
Clean Water Diversions in WQMA	Pollutant load reduction		
	Number of farms with diversions		
	Number animal units		
Nutrient Management on Agricultural Land	Acres planned		
Prohibition: Manure Storage Overflow	Number of facilities		
	Number of animal units		
Prohibition: Unconfined Manure Pile in WQMA	Number of farms		
Prohibition: Direct Runoff From Feedlot/Stored Manure	Pollutant load reduction		
	Number of facilities		
	Number of animal units		
Prohibition: Unlimited Livestock Access	Feet of bank protected		
	Number of farms		
Urban: 20-40% Reduction in Total Suspended Solids (TSS)	Pounds TSS reduced		
	% TSS reduction	**38**	**SLAMM (ver. 9.1)**

Table B. Other Water Resources Management Priorities

I. Agricultural Areas	Units of Measure	Quantity	Measurement Method Used
Buffers	Feet of bank protected		
	Number of farms		
Streambank	Tons of bank erosion reduced		
	Feet of bank protected		
Other (specify)			
II. Developed Urban Areas	**Units of Measure**	**Quantity**	**Measurement Method Used**
Urban: 20-40% Reduction in TSS	Pounds TSS reduced		
	% TSS reduction	**38**	**SLAMM (ver. 9.1)**
Infiltration	% Pre-development stay-on volume		
	Cubic feet stay-on volume		
Peak flow discharge	Change in cubic feet per second		
Protective areas	Feet of bank protected		
Fueling & maintenance areas	Oily sheen presence		
Streambank	Tons of bank erosion reduced		
	Feet of bank protected		
Other (specify)			
III. Planning	Units of Measure	Quantity	Measurement Method Used
Quantify how implementation of the planning project decreased storm water impacts on state waters (*i.e.*, storm water plan, I & E plan, *etc.*)	Municipalities planned for		
	Acres planned for		
Document/track progress made in implementing the planning product (*i.e.*, ordinance, utility district evaluation/formation, storm water management plan information & education, *etc.*)	Municipalities planned for		
	Acres planned for		
Other (specify)			

B. Project Results Narrative

With completion of the USH 12 Bypass project, the Wisconsin Dept. of Transportation offered to resurface former USH 12 (now Parmenter St.) prior to jurisdictionally transferring it to the City of Middleton. The City desired to do much more than a simple resurfacing of the road, and included a storm sewer system to alleviate flooding due to the poorly functioning ditches, as well as providing bicycle and pedestrian facilities. Since the drainage area includes gas stations, car dealerships and vehicle maintenance areas as well as an arterial street, a Best Management Practice to control pollution from this urbanized area was sought. Initial considerations included the use of street inlet bags or a sediment basin. Due to space constraints, the sediment basin could not be constructed within the available land. The frequent maintenance needed with inlet bags made this option unattractive from a cost-benefit viewpoint. After considering several types of catch basin control structures, the City decided to install a BaySaver system. It was desired that the system be able to effectively remove 20%-40% of the total suspended solids. An illustration of the BaySaver components, as well as information related to the operation, inspections, and maintenance is attached.

The grant application commitment anticipated a 20%-40% reduction in TSS. While it was the City's original design intent to meet a 40% reduction in TSS, in an e-mail message of Dec. 13, 2005, Michelle Gerrits of WisDOT indicated that we only needed 20% TSS removal for this project based on her interpretation of NR151 and the nature of this project. The original WinSLAMM version 8.5 modeling indicated we would meet the 20% requirement, with an expected 22% reduction in TSS. For the contributary area, ditches behind the proposed sidewalks and ditches located further upstream on the project were expected to help bring the TSS removal rate up an additional 2%. When the SLAMM model was updated to the newer version 9.1, the data was run again to use a more detailed input of the BaySaver unit. The newer version of WinSLAMM indicated that the BaySaver system was expected to achieve a 38% TSS removal rate.

The majority of storm sewer and BaySaver construction was completed in the summer of 2006, and the system was operational throughout the duration of construction until completion in mid-November. On November 9, 2006, I met with Carolyn Betz for a final inspection of the BaySaver. We looked into the primary and storage manholes, and reviewed the operation of the BaySaver. The contractor is responsible for the initial cleaning of the structure manholes, at which point the BaySaver will be fully accepted by the City.

Because of the significant changes in the area (USH 12 Bypass construction, storm sewer vs. ditches, bridges vs. box culverts, addition of some swales) the City did not conduct any pre- and post-project monitoring of this project to try to document BaySaver related changes in habitat, fisheries, or biological or chemical conditions in the receiving waters. Instead, our goal was to treat the storm water runoff as well as possible given the constraints of available space and budget. In addition to the anticipated removal of suspended solids, the BaySaver is expected to trap oils, floatables, and miscellaneous debris.

In addition to the SLAMM modeling requirements, Part 3 of the grant agreement stipulates that the City has committed to implement:

1. a pollution prevention I & E program for the City;
2. a nutrient management plan for municipally-owned properties; and
3. a stormwater permit tracking system.

All three of the above requirements are included in the City's annual WPDES permit. A copy will be made available upon request.

4. Satisfaction of Notice Requirements (if applicable)

If cost sharing for this project was offered under a formal notice to achieve compliance with performance standards or prohibitions, provide information for each notice in the table below.

Notice Information				Notice Satisfaction Information		
				Satisfied?		
Notice Type	Issue Date	From (Name)	To (Name)	Yes	No	Date Letter Sent
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	

5. Summary of Project Challenges

Since the installation of the BaySaver system was desired by the City and covered by a DNR grant, but the construction was included in a WisDOT contract, I suspect this grant situation was fairly rare. One of the early questions came up that it wasn't clear how we could best satisfy the requirements for DNR final design review, contract bid reviews, etc. when those processes were largely controlled by the DOT instead of the City. Fortunately, our grant coordinator, Carolyn Betz, was able to guide me through that part of the process.

One construction problem that we encountered was that the contractor requested consideration of changing the shape and volume of both the primary and storage manholes for the BaySaver system. Apparently, the local BaySaver distributor could not make precast rectangular structures of the size needed, and requested a change to round structures. While we worked with Carolyn Betz and Kevin Kirsch to get timely approval of this idea for the contractor, in the end the contractor found a different precast supplier, and constructed the structures per the original design.

I don't know that I would have done anything differently for this project. I think the BaySaver will provide one of the most cost effective pollution prevention solutions that is available. Similarly, I don't have any specific recommendations that would help the DNR oversee the grant program. That being said, if some way to streamline and minimize the reporting paperwork could be found, that would be appreciated.

6. Additional Information about the Project (optional)

The mailing to me of this final report form did not include instructions for how to complete it. The first page of the final report form indicates that such instructions are necessary. While I was eventually able to find instructions on the DNR web site, it took some searching. I would recommend that future mailings of the final report form include the instructions.

7. Planning Product (UNPS&SW - Planning Projects only)

☐ Check here if a printed copy of the planning product (e.g., plans, ordinances, analyses) was sent to your DNR Regional Nonpoint Source Coordinator.

Name of Document	Date(s) effective	Date Submitted to NPS Coordinator

8. Grantee Certification:

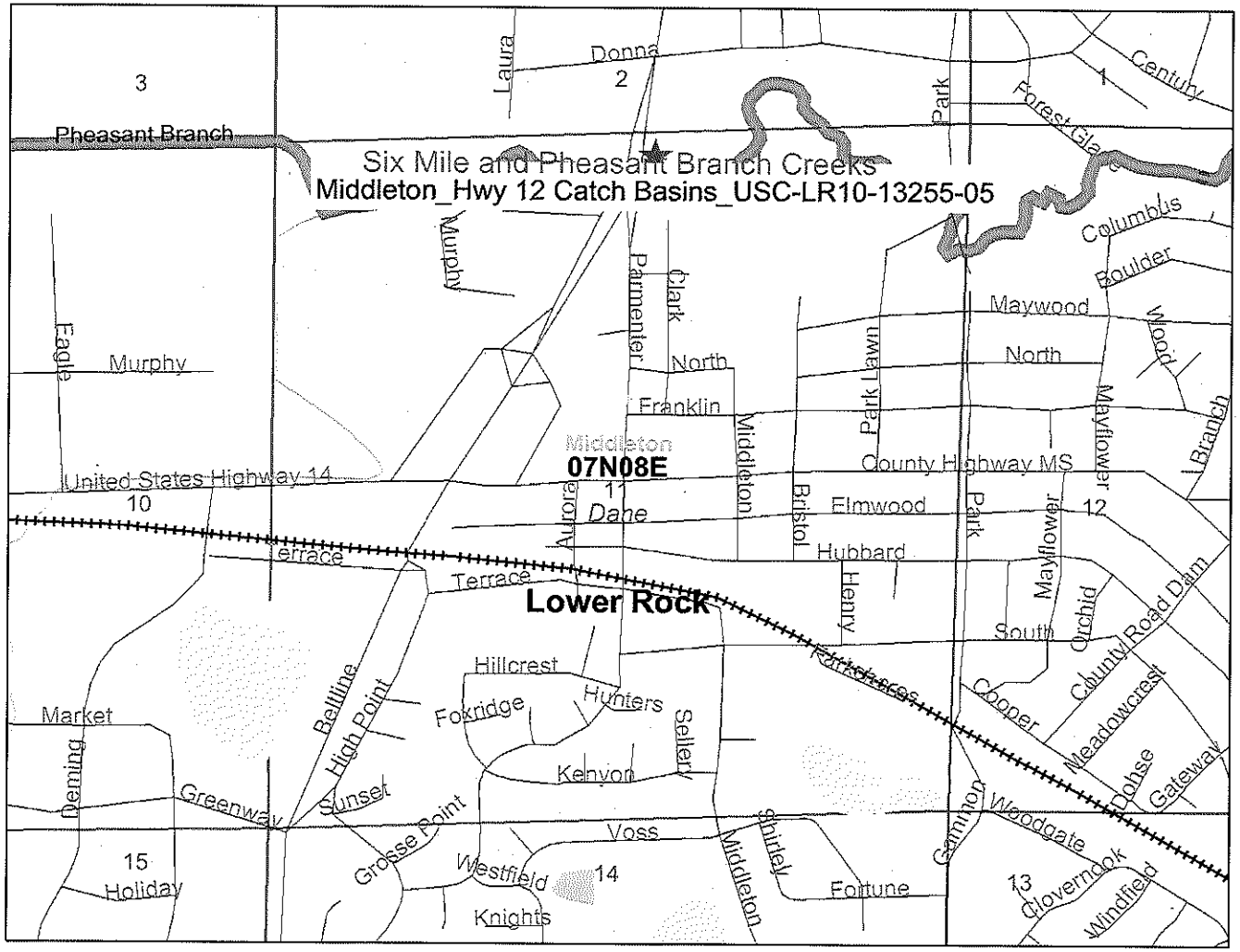
☒ Check here to certify that, to the best of your knowledge, the information contained in this report is correct and true.

Type or print Name and Title of Authorized Representative certifying here.

Shawn Stauske, City Engineer

Signature of Authorized Representative	Date
Shawn Stauske	**December 20, 2006**

Middleton_Cty_Hwy 12 Catch Basins_TUSC-LR10-13255-05



0 1500 3000 4500 ft.

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Legend

- Railroads
- Local Roads
- NR104 Lines
- Trout Stream Lines
- Class 1
- Class 2
- Class 3
- Outstanding and Exceptional Waters
- Exceptional
- Outstanding
- PRF Sensitive Areas of Lakes
- ASNRI Outstanding and Exceptional Streams
- ORW
- ORW
- ERW
- ASNRI Outstanding and Exceptional Lakes
- ERW
- ORW
- ORW
- ASNRI Wild and Scenic Rivers
- ASNRI Trout Streams
- Class I Trout
- Class II Trout
- Class III Trout
- ASNRI Wild Rice Streams
- ASNRI Wild Rice Areas
- ASNRI Quality Wetland Streams

N

Scale: 1:15,440

BaySaver® Separation System

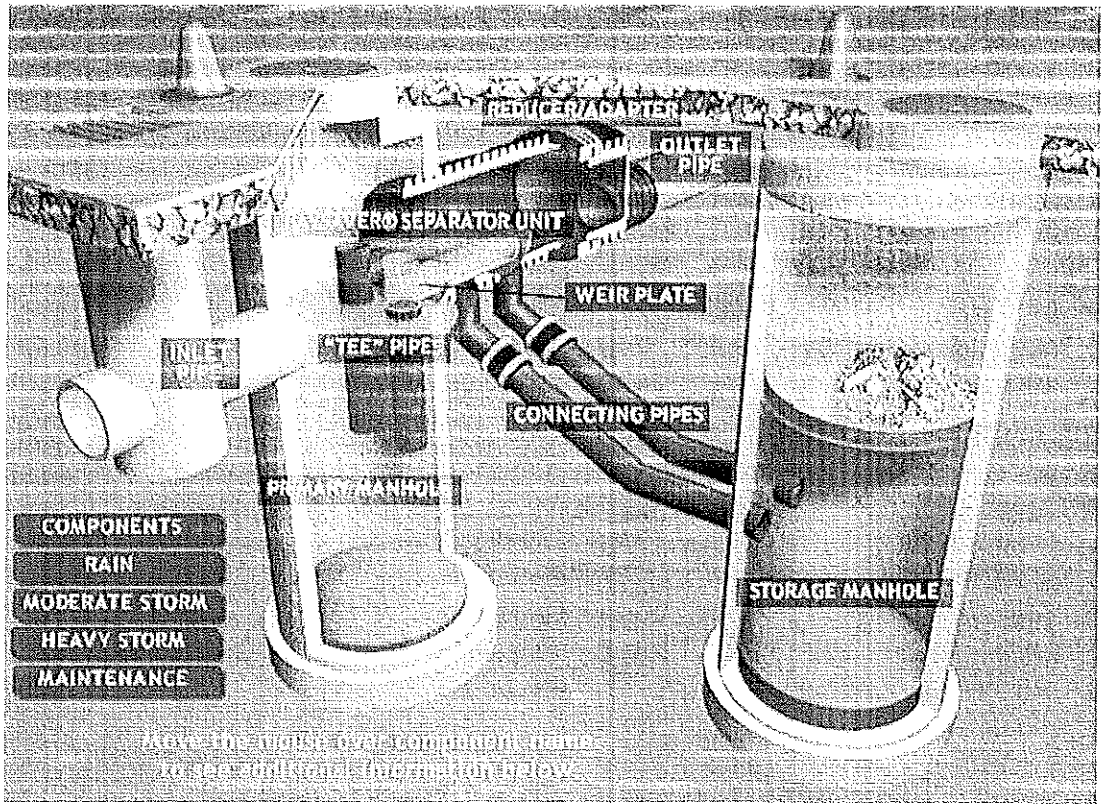
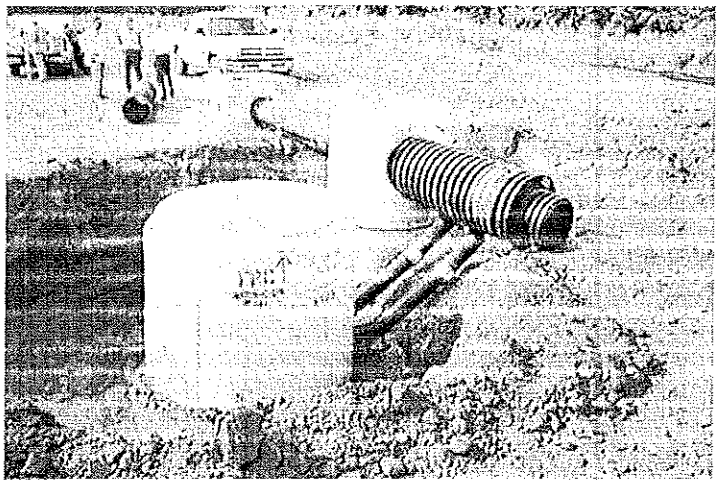


Photo of BaySaver manholes and separator unit installed. Storage manhole is in foreground and primary manhole is in background. Note connecting pipes between separator unit and storage manhole. Photo from www.baysaver.com



BaySaver System Operation (from www.baysaver.com)

When rain falls on an impervious surface, the runoff carries with it the oils, floatables (trash and debris) and sediments that have built up since the last storm. In the past, some thought that the first ten minutes of precipitation mobilized the majority of these oils and sediments. This phenomenon is referred to as the "first flush." Many of our competitors designed their BMPs around the low flows associated with first flush. New studies[1] indicate that designing to treat only the first flush may no longer be valid because these relatively low flows do not mobilizea significant amount of the total pollutant load. We designed the BaySaver Separation System to treat throughout the entire storm, not just the first flush.

To treat the entire storm, the BaySaver Separation System matches the treatment flow rate and path to the incoming flow rate. During the first flush, the BaySaver treats the entire volume of influent water through both manholes in series. As flow rates increase, the BaySaver enters into maximum treatment flow. During this phase, the BaySaver diverts water containing free oils, fine sediments, and floatables, to the storage manhole for secondary treatment while the primary manhole treats and cleans the remaining flow. During peak design flow, gravity removes large suspended solids in the primary manhole. A portion of the flow passes through the storage manhole for further treatment. Portions in both manholes pass straight through the system thus avoiding resuspension of materials previously collected. This direct flow path for a portion of the water assures that the BaySaver will not back up the overall piping system.

[1]Studies by University of Alabama; City of Portland, Oregon; City of Austin, Texas; University of Texas. For more information, please contact BaySaver.

BaySaver System Inspections (from www.baysaver.com)

One of the advantages of the BaySaver Separation System is that it offers unobstructed access for pollutant inspection and removal. By opening either manhole cover, trapped pollutants can easily be seen from the surface, making confined space entry unnecessary. Inspection can be performed though visual observation and by measuring sediment levels.

Normally when the accumulated sediments in either structure reach a height of two feet from the manhole floor maintenance should be performed on the system.

The maintenance cycle is typically falls into an annual pattern given normal loadings and sizing. Inspection of the system is recommended quarterly for the first year or more to determine the appropriate cycle based on site characteristics.

BaySaver System Maintenance (from www.baysaver.com), revised by City of Middleton

1. The City will contract with Jacobus Environmental Services (purchased by Safety-Kleen Systems, Inc. on December 11, 2006) to remove and dispose of the oils and water from the storage manhole.
2. Following removal of the oily water by others, the City will use their vactor truck to remove all of the residual water and sediment from the storage manhole.
3. Using their vactor truck or a submersible pump, the City will pump the bulk of the water from the middle of the primary manhole into the clean storage manhole. This will allow re-use of the clean water from the primary manhole, and will recharge the storage manhole.
4. Using their vactor truck, the City will remove all of the remaining water and sediment from the primary manhole.
5. Sediment and water in the vactor truck tank will taken to the City garage facility and deposited onto the sediment pile that is accumulated from the street sweeper and from cleaning other catch basins. When sufficient sediments are accumulated, the sediments will be taken to the landfill, consistent with current practice.
6. The primary manhole will be filled with water.