

Final Report

Agricultural Targeted Runoff Management & Notice of Discharge Grant Programs

Form 3400-189A (R 8/15)

Page 1 of 7

NOTICE: This document is required under s. 281.65, Wis. Stats., and chs. NR 153 and 154, Wis. Adm. Code. A final project report must be submitted as part of the final reimbursement request. Personally identifiable information contained in this form will be used for determining reimbursement eligibility in the Targeted Runoff Management and Notice of Discharge Grant Programs and will not be used for any other purpose.

INSTRUCTIONS: Send the completed, electronic copy of this form and all attachments to the Department of Natural Resources (DNR) Region Nonpoint Source Coordinator. Please read all instructions prior to completion.

Grant Type

Select Grant Type Large Scale Non Total Maximum Daily Load (TMDL)

Project Name & Location

Project Name

Implementation Of Agricultural BMPs In The Dunes Lake Watershed

Grant Number

TRC-L-TK06-15000-12B

Governmental Unit Name

Door County Soil and Water Conservation Department

County

Door

Watershed Name

Dunes Lake

12-Digit HUC

040301020109

Project Contact Name

William E. Schuster

Phone Number

(920) 746-2214

E-mail Address

WSchuster@co.door.wi.us

☒ For a project with multiple site locations, an aerial photo map is attached with each site location labeled.

Site Location - 1

Name of Cost-Share Recipient

Ploor, Abraham & Kristi

Animal Units

115

Nearest Receiving Waterbody

Lily Bay Creek

Township

28

Range

26

E / W

E

Section

24

Quarter

NW

Quarter/Quarter

SW

Latitude

44.8849

Longitude

-87.8849

Compliance Requirements - 1

Chs. NR 151 or 243 Wis. Adm. Code
Notice Type

NR 151

Notice letter
attached

☒

Compliance achieved? If no,
explain in site information

☒ Yes ☐ No

Compliance determination
letter attached

☒

☒ Attached is a copy of the written statement the County provided to the landowner and cost-share recipient of the landowner's obligation to maintain compliance with performance standards & prohibitions on cropland and livestock facilities addressed by the cost-share agreement. Compliance at these sites must be maintained in perpetuity regardless of future cost sharing. The County has also placed a copy of this written statement in the County files.

Summary of Results - 1

Best Management Practice Installed	Quantity	Unit of Measure	Performance Standard/Prohibition Addressed	Total Installation Cost	Load Reduction		
					Phosphorus lbs/yr	Nitrogen lbs/yr	Sediment Tons/yr
Manure Storage Systems	1	No.	Code(s) 4,11,12	\$112,109.0 ₊	145.3	645.6	-
Barnyard Runoff Control Systems	1	No.	Code(s) 12	\$66,860.74 ₊	*	*	-

Site Location Attachment - 1

Check the box if the required information for the site is attached:

☒ Photos of pre-and post-implementation of BMP(s)

☒ Load reduction modeling documents

☒ Aerial photo map of site with BMPs labeled

☐ Water quality monitoring results/summary, if applicable

Site Information - 1

Narrative space will expand to fit

The Ploor farm currently raises beef, buying calves and finishing them for market. Animals are of various ages/sizes on the site, typically amounting to ~200 animals yielding ~115 animal units.

The farm did not have a long term manure storage. The barnyard runoff use to drain to Summerville, Emmet and Longrie soils having a soil depth of 1-3'. Animals use to have unlimited access to drylot areas during periods where ice, snow and saturation exist. Also roof runoff was not fully diverted from contacting manure on the barnyard and contributes to

Final Report

Agricultural Targeted Runoff Management &
Notice of Discharge Grant Programs

Form 3400-189A (R 8/15)

Page 2 of 7

saturated conditions in shallow bedrock areas. The Institute area has a history of periodic well contamination.

Due to the high solids nature of the beef manure being generated, a solid manure storage design was chosen so manure could be scraped directly from the barnyard. Design capacity is for 180 days in the storage with additional space for stacking below the roofed barnyard.

To minimize excess liquids, the manure storage and barnyard areas are roofed to shed water. This will allow the farm to manage manure with their existing equipment and minimize the size of storage, as no clean water will be collected.

1. The purpose of the Manure Storage System is to store manure and manure runoff when the ground is frozen, snow covered, or saturated with water. Stored manure shall be applied in accordance with a SWCD approved Nutrient Management Plan. Manure shall not be field spread unless injected or incorporated in the soil according to the conservation plan and a SWCD approved nutrient management plan.
2. The purpose of the Barnyard Runoff System is to intercept and divert clean rainwater and snow melt away from yard areas using engineered roof runoff system with drip and surface water diversions.

*Load Reduction Modeling

The STEPL load reduction model was used to determine the pollutant reduction achieved with the installation of Best Management Practices (BMPs). For this site a holistic system of BMPs were installed on the farmstead, more specifically on the Feedlot, and are listed above. Since STEPL does not allow the combined BMPs- Calculated feature on Feedlots to show multiple BMPs that were actually installed, the Waste Management System BMP was chosen to represent the zero runoff and properly diverted clean water system that was installed.

☒ DNR may use this site as a success story to meet state and federal reporting needs.

Site Location - 2							
Name of Cost-Share Recipient S&S Ag. Enterprise, Randy Schmidt					Animal Units NA	Nearest Receiving Waterbody Geisel Creek	
Township 28	Range 27	E / W E	Section 7	Quarter NE	Quarter/Quarter SW	Latitude 44.9141	Longitude -87.2653
Compliance Requirements - 2							
Chs. NR 151 or 243 Wis. Adm. Code Notice Type NR 151		Notice letter attached ☒	Compliance achieved? If no, explain in site information ☒ Yes ☐ No			Compliance determination letter attached ☒	
☒ Attached is a copy of the written statement the County provided to the landowner and cost-share recipient of the landowner's obligation to maintain compliance with performance standards & prohibitions on cropland and livestock facilities addressed by the cost-share agreement. Compliance at these sites must be maintained in perpetuity regardless of future cost sharing. The County has also placed a copy of this written statement in the County files.							
Summary of Results - 2							
Best Management Practice Installed	Quantity	Unit of Measure	Performance Standard/Prohibition Addressed	Total Installation Cost	Load Reduction		
Waterway Systems	2	Acres	Code(s) 1	\$1,100.00	Phosphorus lbs/yr 2.6	Nitrogen lbs/yr 10.4	Sediment Tons/yr 1.2
Critical Area Stabilization	2	Acres	Code(s) 1	\$424.75	-	-	-

Final Report

Agricultural Targeted Runoff Management & Notice of Discharge Grant Programs

Form 3400-189A (R 8/15)

Page 3 of 7

Site Location Attachment - 2

Check the box if the required information for the site is attached:

- ☒ Photos of pre-and post-implementation of BMP(s) ☒ Load reduction modeling documents
☒ Aerial photo map of site with BMPs labeled ☐ Water quality monitoring results/summary, if applicable

Site Information - 2

Narrative space will expand to fit

Since 2010 this site has had significant nutrient and sediment disposition issues. This site is directly up slope from a WDNR delineated wetland in which Geisel Creek meanders through. Geisel Creek is approximately five mile long stream that flows through a landscape that is predominantly agriculture and wetlands. Geisel Creek outlets into Dunes Lake which then flows into Shivering Sands Creek finally discharging to Lake Michigan.

In recent years, concern has been growing regarding significant ecological changes within Geisel Creek, Dunes Lake and Shivering Sands Creek and the quality of the water discharging to Lake Michigan. Evidence suggests that the lower reaches of Geisel Creek and Dunes Lake are experiencing accelerated eutrophication through addition of excess phosphorus and nitrogen nutrients.

With the installation of the Grassed Waterway System and Critical Area Stabilization at this site there is a significant reduction of nutrient and sediment disposition to the adjoining wetland complex and Geisel Creek.

Load Reduction Modeling

The STEPL load reduction model was used to determine the pollutant reduction achieved with the installation of Best Management Practices (BMPs).

- ☒ DNR may use this site as a success story to meet state and federal reporting needs.

Site Location - 3

Name of Cost-Share Recipient Stoeger, Charles and Melissa					Animal Units NA	Nearest Receiving Waterbody Geisel Creek	
Township 28	Range 26	E / W E	Section 1	Quarter SW	Quarter/Quarter SE	Latitude 44.9231	Longitude -87.2835

Compliance Requirements - 3

Chs. NR 151 or 243 Wis. Adm. Code Notice Type NR 151	Notice letter attached ☒	Compliance achieved? If no, explain in site information ☒ Yes ☐ No	Compliance determination letter attached ☒
☒ Attached is a copy of the written statement the County provided to the landowner and cost-share recipient of the landowner's obligation to maintain compliance with performance standards & prohibitions on cropland and livestock facilities addressed by the cost-share agreement. Compliance at these sites must be maintained in perpetuity regardless of future cost sharing. The County has also placed a copy of this written statement in the County files.			

Summary of Results - 3

Best Management Practice Installed	Quantity	Unit of Measure	Performance Standard/Prohibition Addressed	Total Installation Cost	Load Reduction		
					Phosphorus lbs/yr	Nitrogen lbs/yr	Sediment Tons/yr
Critical Area Stabilization	4.38	Acres	Code(s) 2	\$3,053.15	4.3	15.9	2.4

Site Location Attachment - 3

Check the box if the required information for the site is attached:

- ☒ Photos of pre-and post-implementation of BMP(s) ☒ Load reduction modeling documents
☒ Aerial photo map of site with BMPs labeled ☐ Water quality monitoring results/summary, if applicable

Site Information - 3

Narrative space will expand to fit

This site is composed of multiple sub-watersheds and tributaries that form the source of Geisel Creek. Geisel Creek is approximately five mile long stream that flows through a landscape that is predominantly agriculture and wetlands. Geisel Creek outlets into Dunes Lake which then flows into Shivering Sands Creek finally discharging to Lake Michigan.

The operator previously farmed right up to the streams leaving minimal vegetation that negatively impacted the stream bank integrity. Critical Area Stabilization/Tillage Setbacks were implemented at four different locations within this project area. This BMP prevent tillage operations from destroying the stream banks which drastically reduces soil deposition and nutrient loading into the stream. These Critical Area Stabilization/Tillage Setbacks will remain in place for perpetuity.

Load Reduction Modeling

The STEPL load reduction model was used to determine the pollutant reduction achieved with the installation of Best Management Practices (BMPs). This site was divided into four sub-watershed (Stoeger W3, Stoeger W4, Stoeger W5, Stoeger W6) to document the site specific pollutant reduction of each Critical Area Stabilization/Tillage Setback. STEPL does not have Critical Area Stabilization/Tillage Setbacks as a BMP, therefore the comparable Filter Strip BMP was used.

☒ DNR may use this site as a success story to meet state and federal reporting needs.

Additional Project Information and/or Comments

Dunes Lake is an undeveloped, 80 acre shallow lake and wetland complex located approximately 0.85 miles inland of Lake Michigan. The lake is an impounded drainage lake that formed as Pleistocene glacial activity distributed till and lake sediments within a Paleozoic bedrock valley to form a post glacial bay of Lake Michigan; the lake formed as the bay became separated from Lake Michigan by coastal sand deposition and subsequent ridge, swale and dune formation.

Surface water enters this complex primarily through Geisel Creek, an approximately five mile long stream that flows through a landscape that is predominantly agriculture and wetlands. Shivering Sands Creek drains Dunes Lake and discharges to Lake Michigan. The surface watershed contributing to the Geisel Creek, Dunes Lake and Shivering Sands area comprises approximately 7,220 acres, with 63% of the land use designated as agricultural. Groundwater contribution comes from both from springs that drain to the lake and from diffuse groundwater discharge. The area of the delineated zone of groundwater contribution comprises approximately 5,570 acres with 64% of the land use designated as agricultural.

Door County Soil & Water Conservation Department (SWCD) conducted a four-year study of observed ecological changes, i.e. eutrophication, to Geisel Creek, Dunes Lake and Shivering Sands Creek.

Eutrophication is the process in which lakes receive nutrients (phosphorus and nitrogen) and sediment from the surrounding watershed and become more fertile and shallow. This generally is a natural, slow-aging process for a water body, but human activity sometimes greatly speeds up the process.

Finding from study:

1. Approximately 88% of the water that flows into Dunes Lake is from groundwater.
2. Approximately 7.5% of the water that flows into Dunes Lake is associated with surface water runoff.
3. Approximately 1% of the water that flows into Dunes Lake is from the Sevastopol's Sanitation treatment pond discharge.

4. Phosphorus and Nitrogen inputs to Dunes Lake: Agriculture and treatment ponds were determined to be the largest contributors
5. Sanitation pond discharge ~23% Phosphorus ~1% Nitrogen
6. Surface water runoff ~11% Phosphorus ~7% Nitrogen
7. Groundwater contributions ~66% Phosphorus ~92% Nitrogen
8. Nearly 50% of the phosphorus is settling in Dunes Lake and more than 65% of the nitrogen, yet discharge amounts to Lake Michigan via Shivering Sands Creek are still significant.

Additional accomplishments:

Upon completion of this project, all cropland within the surface watershed and the zone of groundwater contribution to the Dunes Lake system are operated within the requirements of an approved Nutrient Management Plan. These plans dictate the location, amount and timing of the placement of nutrients on cropland; this includes both commercial fertilizers and manure. Control of these factors will limit application rates to the needs of the crops planned and avoid excess nutrients that will enter ground and surface water systems as well as avoid application of nutrients during periods of high risk for runoff and avoid locations that will serve as conduits to ground and surface water systems. Proper nutrient management planning also reduce sediment delivery as proper crop rotation planning will allow for operation within tolerable soil loss rates.

Sevastopol Sanitary District discontinued pond discharge to a dry streambed which threatened the local drinking water aquifer.

County staff coordinated efforts to educate landowners on how to reduce phosphorous use in the watershed and efforts continue.

Sevastopol school coordinated efforts to educate students/families on how to reduce phosphorous use in the watershed and Eliminated soaps detergents containing high phosphorous from the school.

All private onsite waste treatment system inspections have been completed in the water shed by the end of 2015.

Feasibility study for a possible third treatment cell was completed for the Sevastopol Sanitation District.

Next Steps:

1. Form a Dunes Lake "Friends Group" to involve local landowners and residents in project progress, promote restoration activities, and provide more opportunity for future grant funding support.
2. Explore public access and parking opportunities.
3. Explore the possibility of preparing for a third cell passive treatment system.
4. Potentially construct the third cell passive treatment system and additional discharge options.
5. Promote dredging activities to restore Dunes Lake habitat and clear fish passage obstructions.

Final Report

Agricultural Targeted Runoff Management &
Notice of Discharge Grant Programs

Form 3400-189A (R 8/15)

Page 7 of 7

Grantee Certification

A responsible government official (authorized signatory) must authorize and date the final report form prior to submittal to DNR.

I certify that, to the best of my knowledge, the project is complete and the information contained in this final report and attachments are correct and true.

Name of Authorized Government Official	Title of Authorized Government Official	Date
William E. Schuster	County Conservationist	01/29/2016

For DNR Use Only

☒ Received complete reports with all attachments ☐ Practices implemented were consistent with the grant agreement

Comments about this project:

Project narrative above includes activities not funded through the TRM grant. Significant underspending with approximately 2/3 of grant award remaining at the end of the project.

Site 2 is a cropped field owned by a private landowner but operated by a WPDES permitted CAFO S&S Ag. Enterprise, Randy Schmidt, who was the cost share recipient.

Name of Region Nonpoint Source Coordinator	Date
Erin Hanson	02/08/2016

Send the Final Report and attachments to the Community Financial Assistance Grants Manager and to the Runoff Management Grant Coordinator. Keep a printed copy for the Region file.