

Project Summary Sheet

Cottonwood Creek Watershed

Lead Project Sponsor - LaMoure County Soil Conservation District
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LaMoure N.D. 58458

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State: North Dakota
HUC: 10160003-070

Watershed: Cottonwood Creek

Project Type
Watershed

Waterbody Type
Lake – Stream

NPS Category
Agriculture

Major Goals:

The primary goal of this project is to reduce the nutrient load being delivered to Lake LaMoure to a point that Harmful Algal Blooms (HAB's) subside or at the very least become less evident.

Project Description:

LaMoure County SCD plans to develop and utilize the Prioritize, Target, and Measure Application (PTMApp) to identify the magnitude and spatial distribution of potential pollution sources across the landscape. Understand how various parts of the watershed contribute sediment, total phosphorous, and total nitrogen loads to Lake LaMoure. Use the application to then identify the highest areas of sediment loading and show the best areas for practices. PTMApp can at this point also determine the measurable water quality benefits for implementing specific practices. Specific practices to implement are then based on their probable benefits at the location of the practice. Outputs from PTMApp can show areas that provide the most bang for your buck and can help target practice locations to provide the most cost-effective ways to create measurable progress. Once possible BMP locations are identified they must be evaluated for their combined effectiveness. PTMApp can generate data to provide feasible locations for implementing practices that will provide measurable water quality improvements for priority resources. By running various scenarios in PTMApp managers can analyze various practices and estimate the largest load reductions for specific areas within the watershed. This makes it possible to implement the best possible practices in the most effective areas.

The LaMoure County SCD also plans to develop an annual plan of operation for the hypolimnetic drawdown system to deal with in-lake nutrient concerns. ND Game and Fish will also be approached to consider possible tactics that can be implemented to control nutrient resuspension in the lake caused by the out of control carp population.

FY17 SECTION 319 FUNDS REQUESTED: \$262,200

Match: \$176,600

Total Costs: \$437,000

319 Funded Full Time Personnel: 0.5 FTE

2.0 Statement of Need:

2.1 Although the Cottonwood Creek Watershed has been under implementation in the past to reduce phosphorous inputs need is still being recognized for additional nutrient reduction.

Most recently Lake LaMoure proved to be a source of great public scrutiny this past summer. High levels of algal born Cyanotoxin had the public very concerned and the local health department on high alert. Warnings were put in place so the public would be aware of the issue and utilize the lake accordingly. ND Dept. of Health standards require a warning when levels exceed 10 ug/l. Several samples exceeded this and in one case the level exceeded 1,000 ug/l. See table 1 for specific sample results. Nutrients originating within the watershed are without a doubt contributing to the extensive algal blooms.

In lake concerns are also on the rise with a strong carp population making their presence known. Resuspension of nutrients within Lake LaMoure is an issue at this time. LaMoure County Soil Conservation District staff plan to partner with the local Lake Association and the ND Game and Fish to pursue alternatives to control the population of carp in the lake.

The high value of crops over the past 10 to 15 years has been the cause of increased interest in crop production. This has led to several thousand acres of CRP, pasture/rangeland, and marginal riparian areas being converted back to farmland that is highly susceptible to erosion. In many cases it is also in very close proximity to Cottonwood Creek. One example can be seen in figure 1.

This is why Lamoure County and the LaMoure County Soil Conservation District have both recently contributed substantial funds in excess of \$15,000 to the development of the PTMApp. Through the use of this application practices can be placed in specific high impact areas. The days of multi-million dollar federal programs like CRP are a thing of the past. A new avenue must be pursued to spend the dollars that are available in the most practical way possible. PTMApp gives us this luxury.

A portion of the abilities that PTMApp brings to the table is already available to us in the form of mapping what is called the Streampower Index. This mapping gives us the ability to identify high risk areas in the watershed by delineating areas that are highly susceptible to erosion. Simple ground truthing can give project staff the ability to approach producers that can make big differences in the watershed with smaller contributions. Figures 2 and 3 show a small example of how this mapping looks. It is the belief of the managers in LaMoure County that this data can be used to more effectively convince producers that a practice is of great benefit not only to them but Lake LaMoure and the natural resources.



Figure 1. Waterway erosion on a tributary of Cottonwood Creek.

Cyanotoxin levels at Lake LaMoure summer of 2016

Date	Site Description	Result	Unit
7/11/2016	Lake Lamoure Boat Ramp	0.172	ug/L
7/11/2016	Lake Lamoure Swimming Beach	3.095	ug/L
7/20/2016	Lake Lamoure Boat Ramp	10.755	ug/L
7/20/2016	Lake Lamoure Swimming Beach	0.594	ug/L
7/26/2016	Lake Lamoure Boat Ramp	31.109	ug/L
7/26/2016	Lake Lamoure Swimming Beach	38.017	ug/L
8/2/2016	Lake Lamoure Boat Ramp	22.981	ug/L
8/2/2016	Lake Lamoure Swimming Beach	1.953	ug/L
8/9/2016	Lake Lamoure Boat Ramp	87.663	ug/L
8/9/2016	Lake Lamoure Swimming Beach	41.159	ug/L
8/23/2016	Lake Lamoure Boat Ramp	12.090	ug/L
8/23/2016	Lake Lamoure Swimming Beach	4.210	ug/L
8/29/2016	Lake Lamoure Swimming Beach	4.430	ug/L
8/29/2016	Lake Lamoure Boat Ramp	1314.290	ug/L

Table 1. Cyanotoxin levels



Figure 2. Stream Power Index showing high priority locations in the watershed.

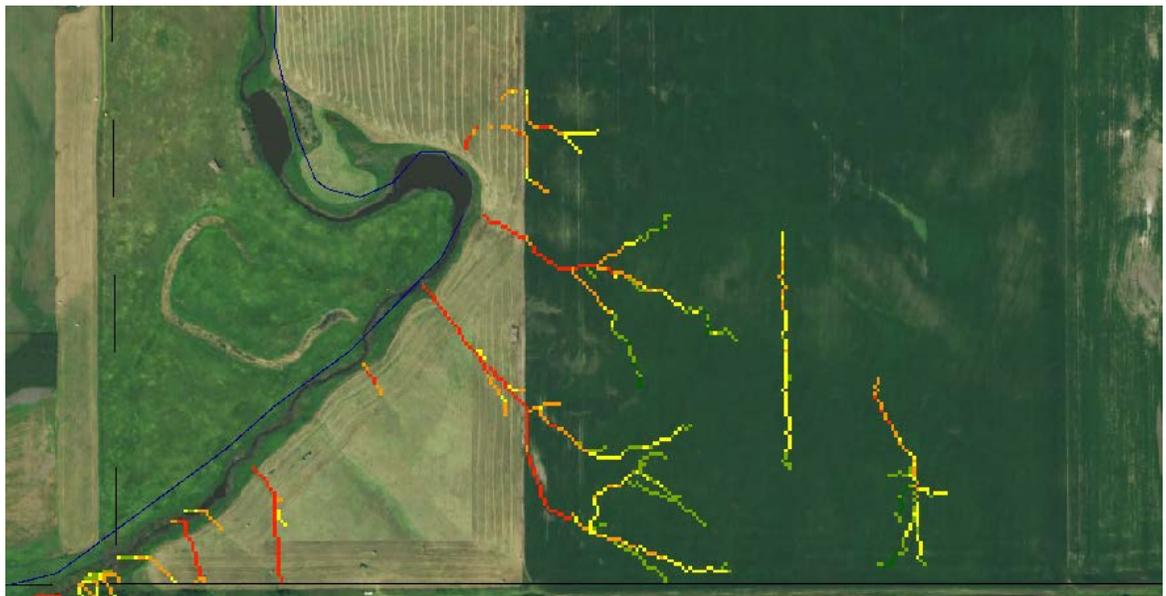


Figure 3. Stream Power Index highlights areas of especially erosive soils and contour.

2.2 Lake LaMoure is a reservoir located on the Cottonwood Creek, south of the city of LaMoure in LaMoure County, North Dakota. It has an earthen dam with a concrete outlet, emergency spillway, and hypolimnetic drawdown system. The reservoir was created in 1973. It has a surface area of 495 acres, a maximum depth of 36.5 feet, and a volume of 7,755 acre feet at full pool. Lake LaMoure was created primarily for water-based recreation in an area of the state with few natural lakes. Cottonwood Creek, an intermittent stream is the primary tributary to Lake LaMoure.

2.3

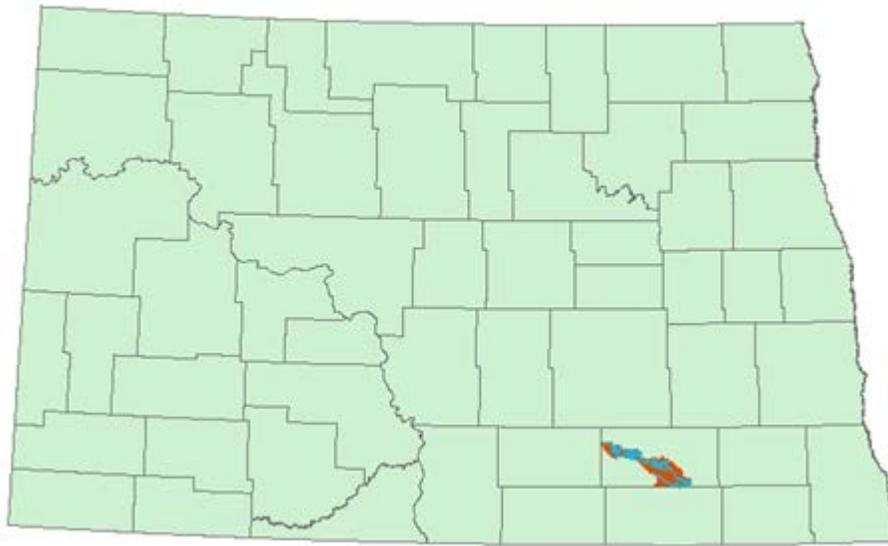


Figure 4: Map of Cottonwood Creek watershed in the State of North Dakota

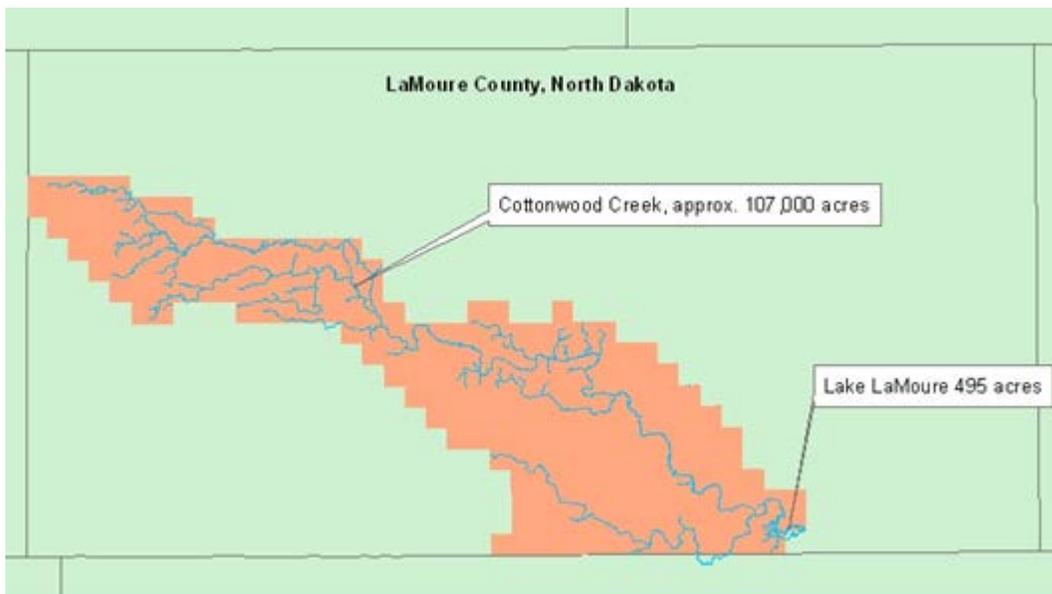


Figure 5: Map of Cottonwood Creek Watershed and Lake LaMoure in LaMoure County

2.4 The entire watershed for Lake LaMoure covers approximately 107,000 acres which is characterized by highly fertile uplands, primarily used for rowcrop, small grain and livestock production. The predominate soils in the watershed are Barnes-Svea loam. These soils are formed on slopes of 3 to 6 percent and are deep, medium textured, well to moderately well drained, very fertile, and possess high moisture holding capabilities. Typically, Barnes/Svea loams are resistant to wind erosion but moderately susceptible to water erosion.

In addition to the agricultural lands, other potential sources of pollution in the watershed include seasonal camping facilities adjacent to the lake, wastewater treatment systems for the city of Jud and the Fairview Colony, and construction activities within close proximity of Cottonwood Creek.

One hundred percent of Lake LaMoure is publicly owned. Public facilities around the lake are excellent and include a boat ramp, parking, toilets, swimming beach, picnic grounds, playground, and public camping areas. In addition, approximately 50 seasonal camping sites are maintained and utilized extensively by local citizens. Access to the lake is excellent by county and state roads.

2.5 Nutrients and sediments, originating on agricultural lands, have been identified as the primary NPS pollutants impacting water quality in LaMoure County and threatening the long-term benefits of the resource in the County. To reduce the cumulative effects of these pollutants, LaMoure Co. SCD will provide technical assistance for farm unit conservation planning and expand their I/E program to place more emphasis on specific NPS pollution issues. Through these efforts the project sponsors plan to 1) Improve the water quality that is delivered to Lake LaMoure by reducing NPS pollutants. 2) Document improvements as BMP's are installed by implementing the changes in PTMApp which will provide measurable data to track the project effectiveness. 3) Increase public awareness of the impacts of and solutions to NPS pollution. Funds provided through various USDA programs and the Section 319 program will be utilized to support the implementation of BMP's and scheduled I/E activities.

3.0 Project description

3.1 Goals for the project

The primary goal of this project is to decrease the nutrient load being delivered to Lake LaMoure to a point that Harmful Algal Blooms (HAB's) subside or at the very least become less evident. This will be accomplished through the following objectives and tasks.

Objective (1):

LaMoure County SCD staff plan to develop and utilize the Prioritize, Target, and Measure Application (PTMApp) to identify the magnitude and spatial distribution of potential pollution sources across the landscape. Understand how various parts of the watershed contribute sediment, total phosphorous, and total nitrogen loads to Lake LaMoure. Use the application then to identify the highest areas of sediment loading and show the best areas for practices. PTMApp can at this point also

determine the measurable water quality benefits for implementing specific practices. Specific practices to implement are then based on their probable benefits at the location of the practice. Outputs from PTMApp can show areas that provide the most bang for your buck and can help target practice locations to provide the most cost-effective ways to create measurable progress. Once possible BMP locations are identified they must be evaluated for their combined effectiveness. PTMApp can generate data to provide feasible locations for implementing practices that will provide measurable water quality improvements for priority resources. By running various scenarios in PTMApp LaMoure County SCD personnel can identify scenarios to implement the best, targeted solutions. PTMApp can analyze various practices and estimate the largest load reductions for specific areas within the watershed. This makes it possible to implement the best possible practices in the most effective areas.

Task 1: Employ a Resource Conservationist.

Product: 0.5 FTE Watershed Conservationist

Cost: \$161,000 (\$32,200/yr)

Task 2: Contact landowners/operators to assist in conservation plan development and implementation. Plan to install over the next four year period practices that will decrease the nutrient load delivered to Lake LaMoure. See the 2016 cost share guidelines which can be found in the NPS Task Force Online Binder for a list of approved BMP's that can be used for this purpose. Other programs will be used to provide cost share assistance for practices. ie. EQIP and continuous signup CRP. The 319 BMP Team will be utilized for construction engineering and follow-up.

Product: Develop 20 contracts through the 319 program during the project period. Also assist in directing producers to the proper programs needed to serve their needs like EQIP, CRP, or existing OHF programs (Pheasants Forever, Delta Waterfowl, Fish and Wildlife, Game and Fish etc.)

Total Cost: \$250,000

Task 3: Conduct follow up contacts to assist with conservation plan updates and monitor O&M of Section 319 cost shared practices.

Product: Database of BMP's applied.

Cost: Included in Task 1 cost.

Objective (2):

Reduce the availability of internally stored nutrients in Lake LaMoure.

Task 4: Develop an annual plan of operation for the hypolimnetic drawdown system. Through careful evaluation of lake stratification by measurement of temperature and Dissolved Oxygen profiles within the lake staff will operate the hypolimnetic drawdown system and develop a plan for future users.

Product: Annual schedule/procedure for the operation of the hypolimnetic drawdown system.

Cost: \$3,500

Objective (3):

To take full advantage of the PTMApp and the ½ FTE that come with this proposal the sponsors also plan to begin developing other watersheds in the area. The watershed Conservationist will be called on to develop PTMApp across both Dickey and LaMoure Counties to assess needs. These needs will then be quantified and alternatives pursued by the project sponsor for future endeavors.

Task 5: Develop PTMApp maps and data to allow for the development of possible projects (if needed) within Bear Creek, Bonehill Creek, and Maple River Watersheds.

Product: Maps and Data to support any needs within these watersheds

Costs: \$12,000

Objective (4):

Increase the public's understanding of the impacts of and solutions to NPS pollution.

Task 6: Organize and conduct I/E events focusing on NPS pollution control within agricultural areas and coordinate them with ongoing state/federally sponsored I/E programs.

Product: 4 workshops, 4 tours/demonstrations and 5 informational meetings.

Cost: \$2,000

Task 7: Prepare newsletter articles, and work with local media to promote the project and disseminate information on water quality and NPS pollution control.

Product: Minimum of 5 newsletter articles and 5 news releases.

Cost: \$1000

Task 8: Complete semi-annual, annual and final project reports to update the GRTS. These will be provided to NDDH, EPA, and all sponsors and interested individuals.

Product: Annual/semiannual and 1 final report.

Cost: Included in Task 1.

3.3 See attached Milestone Table

3.4 Permits: All necessary permits will be acquired.

These may include CWA Section 404 permits. Project sponsors will work with NDDH to determine if National Pollution Elimination System permits are needed. Cultural resource will be approached through the local NRCS personnel trained to

make the determinations that are required. If the local staff cannot assist with this private reviewers will be hired to complete the work.

3.5 Appropriateness of the lead sponsor

LaMoure County Soil Conservation District (LCSCD) will be the lead sponsor. LaMoure County SCD has sponsored several other 319 projects. The LCSCD's annual and long range plans help to prioritize and guide the field service of staff. The LCSCD has legal authorization to employ personnel and receive and expend funds. They have a track record for personnel management and addressing conservation issues for their constituency.

4.0 Coordinating Plan

4.1 Cooperating organizations, roles, arguments

1. LaMoure County SCD - The LCSCD will be the signer of the Section 319 contract and be the lead agency responsible for administration. They will provide office space, clerical assistance, access to equipment, and supplies as well as annual financial support. The LCSCD board will oversee implementation of the scheduled project activities, and provide for staff time if feasible. The LCSCD will also be the primary supervisors of the watershed conservationist and all Section 319 funded activities.
2. The 319 BMP Team will assist in the completion of engineering for projects within the watershed.
3. Natural Resources Conservation Service (NRCS) - The NRCS will provide day to day assistance in conservation planning, plan writing, contract writing, and technical assistance for construction and installation of planned BMP's approved through any USDA program ie, EQIP, CSP, CRP, etc. Standards and Specifications for approved BMP's will be provided by local NRCS personnel from the NRCS Technical Guide.
4. North Dakota State Department of Health (NDDH) - The NDDH will oversee 319 funding. It will provide the sponsor over sight to ensure proper management and expenditure of Section 319 funds. They will assist NRCS and LCSCD personnel in the review of O&M requirements for section 319 cost shared BMP's.
5. Farm Services Agency (FSA) - Programs available through FSA will be pursued for cost share assistance.
6. North Dakota Extension Service (EXT) - Local personnel and educational materials will be utilized to compliment the projects I / E activities. This will include such things as specific BMP publications and assistance with workshops and field tours. The specific role of EXT will be dependent on the type of I / E activity being implemented and availability of staff and materials.
7. North Dakota Game and Fish Department - (NDGFD) -NDGFD will support the Lake LaMoure Watershed Project by providing technical assistance to oversee lake management.
8. LaMoure Recreation Board - The LaMoure Recreation Board supports this project and will assist with in-lake issues.

5.0 EVALUATION AND MONITORING PLAN

- PTMApp will be used to track effectiveness of all applied BMP's.
- See attached Operation and Maintenance agreement which will be part of every long term cost share agreement.

6.0 BUDGET

6.1 Budget Table

6.2 Funding Budget

7.0 Public Involvement

- The lake association has agreed to assist with in-lake issues. They will be involve with hypolimnetic operation and possible carp reduction efforts.

3.3

Milestone Table for Cottonwood Creek Watershed

Task/Responsible Organizations		Output	Qty.	Year 1 2017		Year 2 2018		Year 3 2019		Year 4 2020		Year 5 2021	
Objective 1													
Task 1	Employ Resource Conservationist	Conservationist	1	x									
Task 2	Assist in plan development	Long term plans	20		x	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Task 3	Follow-up contacts to assist with plan updates	Database of BMPs applied	1							xxx		xxx	xxx
Objective 2													
Task 4	Develop plan for hypolimnetic drawdown system	Reduce nutrient concentration			xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
Objective 3													
Task 5	Develop PTMApp maps and data	Develop PTMApp in neighboring watersheds			xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
Objective 4													
Task 6	Organize & conduct I / E events	Workshops, tours & info. Mtgs.	13		xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Task 7	Promotion of project	Newsletters & direct mailings	10	xxx	xxx								
Task 8	Complete reports	annual/final reports			x		x		x		x		x

6.1 BUDGET TABLE FOR COTTONWOOD CREEK WATERSHED PROJECT

	2017	2018	2019	2020	2021	Total Cost
EPA 319 Funds	52400	52400	52400	52400	52400	
Subtotal	52400	52400	52400	52400	52400	262000
<hr/>						
Other Federal Funds						
1) NDDH (TA)	1000	1000	1000	1000	1000	
2) NRCS (TA)	1000	1000	1000	1000	1000	
3) NRCS (EQIP)	0	2000	2000	2000	2000	
4) FSA (CRP)	5000	5000	5000	5000	5000	
Subtotal	7000	9000	9000	9000	9000	43000
<hr/>						
State / Local Match						
1) Game & Fish Dept. (TA)	1000	1000	1000	1000	1000	
2) LaMoure Co. SCD (TA & FA)	15000	15000	15000	15000	15000	
4) LaMoure Recreation Board (TA)	250	250	250	250	250	
5) Landowners (TA & FA)	20000	20000	20000	20000	20000	
Subtotal	36250	36250	36250	36250	36250	181250
Total Budget	95650	97650	97650	97650	97650	486250

FA: Financial Assistance

TA: Technical Assistance

NRCS: Natural Resources Conservation Service

NDDH: North Dakota Department of Health

FSA: Farm Services agency

Section 319 Cost Share Agreement Provisions
(Attach to Producer's CPO)

Each undersigned person agrees to participate in the Conservation Plan Schedule of Operations (CPO) and to comply with the following terms set forth and approved by the Section 319 Project Sponsors for the period covered by this agreement. The terms are as follows:

- The conservation and/or environmental practices identified herein address all the major nonpoint source pollution (NPS) concerns on the identified land units and will directly or indirectly improve the water quality and beneficial use conditions in the watershed project area. The specific corrective measures needed to reduce identified NPS pollution impacts to water quality and beneficial uses of the targeted waterbody are contained in the Conservation Plan Schedule of Operations (CPO) approved by the Section 319 Project Sponsors. All practices shall be performed according to the CPO and in accordance with the Natural Resources Conservation Service (NRCS) standards and specifications or alternative standards approved by the ND NPS Program that are in effect at the time the practice is performed. The practices shall be maintained for their normal lifespans even though the agreement has expired. Section 319 cost-share assistance for eligible practices will be issued upon completion of the practice and as scheduled in the agreed upon CPO or subsequently revised CPO approved by the cooperating producer/operator and Section 319 Project Sponsors.
- The undersigned person recognizes that the implementation of some practices in the CPO may result in the generation of eligible in-kind match. The in-kind match value of the specific practices scheduled in the undersigned's CPO has been reviewed with Section 319 project staff. Based on the information reviewed and contained in the CPO, the undersigned agrees to donate the in-kind match as scheduled in the CPO to the Section 319 Project Sponsors to support technical assistance provided by the project.
- Application for payment of Section 319 cost share assistance obligated for the completed practices scheduled under this agreement will be made on the ND NPS Program "Application for Payment" form which upon approval by the Section 319 Project Sponsors will become part of this agreement.
- Each undersigned person is jointly and severally responsible for compliance with the terms and conditions of this agreement as to the conservation and environmental problems that will be addressed by corrective measures identified in the CPO on the specified land units on which the undersigned is an owner and/or operator and for refund of payments determined in accordance with the following regulations for failure to comply with the terms and conditions of this agreement.
 - The undersigned voluntarily destroys the practice(s) installed.
 - The undersigned voluntarily relinquish control and/or title to the land on which the installed practices have been established and the new owner and/or operator of the land does not agree in writing to properly maintain the practices installed for the remainder of its specified lifespan and/or continue to fulfill the remaining contract requirements.
 - Practice failure is determined by sponsors to be caused primarily by the fault of the undersigned.
 - Any part of the CPO that is not followed or completed as scheduled will be a contract violation and refund of all cost shared items will be collected depending on the violation hearing and ruling of the Section 319 Project Sponsors, unless advance notification and revision of the CPO is completed prior to the scheduled contract completion date.

I certify that I have read and understand the provisions listed above:

Signature: _____ Date: _____