NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: Agriculture BMP Effectiveness & Assessment Tool

PRIMARY CONTACT INFORMATION

Entity Name: Lower Platte South NRD on behalf of the Lower Platte River Corridor Alliance

Contact Name: Meghan Sittler

Address: 3125 Portia St., Lincoln, NE 68501-3581

Phone: 402-476-2729

Email: msittler@lpsnrd.org

Partners / Co-sponsors, if any: Nebraska Association of Resources Districts

1. Dollar amounts requested: (Grant, Loan, or Combination)

Grant amount requested. $ 241,500

Loan amount requested. $ Click here to enter text.

If Loan, how many years repayment period? Click here to enter text.

If Loan, supply a complete year-by-year repayment schedule.
Click here to enter text.

2. Permits Needed - Attach copy for each obtained (N/A = not applicable)

Nebraska Game & Parks Commission (G&P) consultation on Threatened and Endangered Species and their Habitat	N/A☒	Obtained: YES☐	NO☐
Surface Water Right	N/A☒	Obtained: YES☐	NO☐
USACE (e.g., 404 Permit)	N/A☒	Obtained: YES☐	NO☐
Cultural Resources Evaluation	N/A☒	Obtained: YES☐	NO☐
Other (provide explanation below)	N/A☒	Obtained: YES☐	NO☐

Click here to enter text.

3. Are you applying for funding for a combined sewer over-flow project?

YES☐ NO☒

If yes, do you have a Long Term Control Plan that is currently approved by the Nebraska Department of Environmental Quality?

YES☐ NO☐

If yes attach a copy to your application. Click here to enter text.

If yes what is the population served by your project? Click here to enter text.

If yes provide a demonstration of need. Click here to enter text.

If yes and you were approved for funding in the most recent funding cycle, then resubmit the above information updated annually but you need not complete the remainder of the application.

4. If you are or are representing an NRD, do you have an Integrated Management Plan in place, or have you initiated one?

N/A☐ YES☒ NO☐

5. Has this application previously been submitted for funding assistance from the Water Sustainability Fund and not been funded?

YES☐ NO☒

If yes, have any changes been made to the application in comparison to the previously submitted application? Click here to enter text.

If yes, describe the changes that have been made since the last application.

Click here to enter text.

No, I certify the application is a true and exact copy of the previously submitted and scored application. (Signature required) Click here to enter text.

6. Complete the following if your project has or will commence prior to next July 1st.

As of the date of submittal of this application, what is the Total Net Local Share of Expenses incurred for which you are asking cost share assistance from this fund? $ 0

Attach all substantiating documentation such as invoices, cancelled checks etc. along with an itemized statement for these expenses. Click here to enter text.

Estimate the Total Net Local Share of Expenses and a description of each you will incur between the date of submittal of this application and next July 1st for which you are asking cost share assistance from this fund.

$ 0

Section B.

DNR DIRECTOR'S FINDINGS

Does your project include physical construction (defined as moving dirt, directing water, physically constructing something, or installing equipment)?

YES☐ NO☒

1(a). If yes (structural), submit a feasibility report (to comply with Title 261, CH 2) including engineering and technical data and the following information:

A discussion of the plan of development (004.01 A);

Click here to enter text.

A description of all field investigations made to substantiate the feasibility report (004.01 B); Click here to enter text.

Maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C); Click here to enter text.

A description of any necessary water and land rights and pertinent water supply and water quality information, if appropriate (004.01 D);

Click here to enter text.

A discussion of each component of the final plan including, when applicable (004.01 E);

Required geologic investigation (004.01 E 1); Click here to enter text.

Required hydrologic data (004.01 E 2); Click here to enter text.

Design criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3). Click here to enter text.

1(b). If no (non-structural), submit data necessary to establish technical feasibility including, but not limited to the following (004.02):

A discussion of the plan of development (004.02 A);

The next step in implementing the Water Quality Management Plan for the Lower Platte River Corridor is developing the Agriculture (Ag) BMP Effectiveness and Assessment Tool. This tool will assist in implementing Management Initiative 1 of the Plan. The planning process for this project was initiated in July 2013. Limited information is available on ag BMPs and their pollutant removal effectiveness. Currently, "The Agricultural BMP Handbook for Minnesota" created by the Minnesota Department of Agriculture (MDA) is being used as a reference. A webinar was scheduled with Houston Engineering in April 2014 for them to demonstrate the ag BMP Assessment and Tracking Tool created for the MDA. This webinar demonstrated the Agriculture BMP: effectiveness component, tracking component and assessment tool of the MDA BMP Database. Additionally, the Nebraska Association of Resources Districts hosted a webinar in May 2015 presented by Houston Engineering demonstrating new methods in utilizing high resolution geospatial data that allow water resource managers to develop detailed information about localized hydrology, pollutant loading, and conservation practice placement. The LPRCA has been selected as the pilot area because of the availability of LiDAR data and because they will have a Water Quality Management Plan approved by NDEQ. Additionally, USGS collects real time water quality data on the Platte River and the Platte River in this area is also a part of the Water Quality Monitoring Network and the Nebraska Watershed Network. The water quality data that is continually being collected helps support the effort of this project. The Plan has identified 6 priority watersheds with the highest pollutant load to begin focused efforts to improve water quality. Four of the 6 priority watersheds with the highest pollutant load also have the most conservation practices being implemented. This indicates BMPs are not being placed in the correct location, the proper BMP to address the pollutant of concern was not used, or that a BMP has reached its lifespan and is no longer as effective as it once was. The next step for LPRCA is to prioritize BMP placement on the landscape and this project fulfills that need. Additionally, since this plan is in the process of being approved by EPA the LPRCA will be eligible for 319 funding in the future and are ready to implement on the ground projects.

A description of field or research investigations utilized to substantiate the project conception (004.02 B); The LPRCA has been involved with a number of projects and is continually collecting data to help assist in their management efforts. The projects within the LPRCA build off of each other and have led to the development of this project. A few of the projects the LPRCA has been involved with include: Environmental Suitability Assessment (ESA), Water quality Monitoring Network, Watershed Management Plan, Cumulative Impact Study and the Nebraska Watershed Network. The Lower Platte River Corridor ESA was a multi-phase project that developed a planning framework for responsible, consistent, and sustainable development in the Lower Platte River Corridor. The Water Quality Monitoring Network is an on-going collaboration with USGS which collects, displays, and analyzes water quality data at sites along the Platte River and its tributaries during the growing season. This data helps the LPRCA and other stakeholders, better understand the challenges of maintaining and improving the water quality in the Platte River. The Cumulative Impact Study examined the cumulative effects of activities and practices in the LPRC over time and their impact on the terrestrial and aquatic habitats of the Platte River. The Nebraska Watershed Network is a partnership with UNO and engages high school students and community groups in region-wide water quality monitoring. The students/citizens perform rapid water quality tests to determine e-coli, atrazine and nitrate loads along with other nutrients. The project has multiple benefits including engaging youth and the general public in water quality issues in the Platte River and provides an additional dataset to further understand contaminant loads within the Platte River and its tributaries.

A description of the necessary water and/or land rights, if applicable (004.02 C); There will be no need to acquire land or water rights for this project. This project focuses on developing a tool that will be used to determine ag BMP effectiveness and BMP placement on the landscape. This tool will be used in the future to implement projects that will construct on the ground projects.

A discussion of the anticipated effects, if any, of the project upon the development and/or operation of existing or envisioned structural measures including a brief description of any such measure (004.02 D).

There will be no anticipated effects on existing structures. As stated previously, this project develops a computer based tool that will be used to assess, evaluate and implement future on the ground projects.

2. Provide evidence that there are no known means of accomplishing the same purpose or purposes more economically, by describing the next best alternative.

   This project will provide load reduction estimates based on a literature review of previous research. Also, it is adapting an existing tool to Nebraska, rather than re-developing an entirely new tool. This approach is more cost effective than doing new research or developing a new model. Since this project is based off of similar work already completed in Minnesota, the associated costs will be lower.

3. Document all sources and report all costs and benefit data using current data, (commodity prices, recreation benefit prices, and wildlife prices as prescribed by the Director) using both dollar values and other units of measurement when appropriate (environmental, social, cultural, data improvement, etc.). The period of analysis for economic feasibility studies shall be fifty (50) years or with prior approval of the Director, up to one hundred (100) years [T261 CH 2 (005)].

   Thousands of acres in the Lower Platte River Valley are irrigated and considered prime agricultural land. According to Cornhusker Economics in 2015 the average value per acre of farmland in the east portion of the state was $7,100. The Lower Platte River Corridor (LPRC) has approximately 456,450 acres of agriculture land with a total valuation of approximately $3.2 billion.

   The lower Platte River is also a frequent recreation destination for more than 50 percent of the state's population. More than 3 million people visit the parks and recreation areas within the LPRC each year, generating more than $30 million in annual income for the state. Along with being a premier recreation destination the LPRC is one of the state's leading tourist draws. The corridor area has two state parks, six state recreation areas, an aquarium, canoe launch sites, youth camps, wildlife clubs, museums, marinas, trail networks, golf courses, and a variety of other tourism activities and destinations. Visitors to tourists attractions in Nebraska spent $2.8 billion in 2002 with each dollar spent contributing $2.70 to the states economy. Five of the top 25 tourist attractions in Nebraska are located in or near the Corridor.

The lower Platte River also serves as an important habitat and nesting site for a variety of waterfowl and on average 46 bald eagles winter along the Platte River. Highly varied river flows account for a great diversity of habitats and fish species. Approximately 48 fish species, including the federally endangered pallid sturgeon have been documented in the lower Platte River. Studies done on angler use, angler interest, and economic values of fishing in the lower Platte River found that anglers fished an average of 41 days a year on the river and were most affected by water quality, water quantity, and the presence of natural beauty.

In 2000, the estimated value for mineral production within Nebraska was more than $161 million. Aggregates mined from the Corridor include construction sand and gravel, Portland cement, crushed limestone, lime, masonry cement, and industrial sand and gravel. Mining work is planned with a clear understanding of the necessity for resource conservation and reclamation. The results of successful reclamation projects can be seen throughout the housing subdivisions, state parks and lakes, golf courses, wetlands, and wildlife refuges of the Lower Platte River Corridor.

Nebraska's two largest metropolitan areas get their drinking water supplies from the alluvial aquifer of the Lower Platte River. In fact, more than half the state's population relies on this aquifer for drinking water. It's difficult to put a price tag on such a valuable resource.

1. Describe any relevant cost information including, but not limited to the engineering and inspection costs, capital construction costs, annual operation and maintenance costs, and replacement costs. Cost information shall also include the estimated construction period as well as the estimated project life (005.01). The project has been split into two objectives. Objective one will identify ag BMP effectiveness research that has been completed in Nebraska or surrounding states with similar landscapes. The outcome of this task will be a database that will house general information on each Ag BMP including: the associated NRCS Practice Code, expected life span of a BMP, limitations and potential hindrances to applying the practice. The outcome of this task will also be used in goal two for adapting the Prioritization, Targeting and Measuring Application (PTMApp) tool to Nebraska watersheds and as an educational tool. This objective will help fulfill the requirements of identifying Best Management Practices under Initiative 1 of the LPRCA Management Plan Implementation. The total costs associated with objective 1 is $105,108. Objective 1 should be completed within 1 year. Objective two will adapt an existing tool (PTMApp) to Nebraska watersheds and conservation practice design standards to aid in surface water quality implementation plans and evaluation. The PTMApp uses

water quality related products derived from high resolution topographic data collected using LiDAR technology to model and identify sources of sediment, total phosphorus, and total nitrogen and the loads associated with runoff. The tool will also be able to determine the feasibility of achieving a water quality goal. An additional outcome will be a graphic illustration used to engage landowners in opportunities for additional practices. This objective helps fulfill the requirements of inventorying current land treatment practices and identification of best management practices under Initiative 1 of the LPRCA Management Plan Implementation. The next step in implementing the Management Plan is determine the existing loads of the pollutants of concern within the study area in order to determine the appropriate load reductions and determine the best BMPs to meet the desired goals and objectives set forth in the Plan and this objective will do just that. The total costs associated with objective 2 is $201,158. Objective 2 should be completed within 2 years. Both objectives can be worked on simultaneously. There is also an annual hosting fee of $5,000. The Project total comes to $311,266 with $250,000 of that total being requested in grant funds.

2. Only primary tangible benefits may be counted in providing the monetary benefit information and shall be displayed by year for the project life. In a multi-purpose project, estimate benefits for each purpose, by year, for the life of the project. Describe any intangible or secondary benefits separately. In a case where there is no generally accepted method for calculation of primary tangible benefits describe how the project will increase water sustainability, such that the economic feasibility of the project can be approved by the Director and the Commission (005.02). There is no generally accepted method for calculating tangible benefits. The tool being developed by this project will help answer this by ”measuring” the effectiveness of BMPs and conservation practices by cost and expected load reductions benefits at the resource of concern within the watershed. For example, if there is $150,000 to spend, what is the best annual sediment load reduction at the resource of concern (lake or river)? PTMApp will be able to look at the benefits of existing practices and determine how well the practices are protecting the resource of concern. The tool will also be able to determine the feasibility of achieving a water quality goal.

3. All benefit and cost data shall be presented in a table form to indicate the annual cash flow for the life of the proposal, not to exceed 100 years (005.03). Currently there is no benefit and cost data available for this project. Essentially a sub-goal of this project is to better identify the benefit and costs of BMPs on a watershed or programmatic basis.

4. In the case of projects for which there is no generally accepted method for calculation of primary tangible benefits and if the project will increase water sustainability, the economic feasibility of such proposal shall be demonstrated by such method as the Director and the Commission deem appropriate (005.04).

Currently there is not an immediate cost-benefit analysis available. Essentially a sub-goal of this project is to better identify the benefits and cost-savings on a watershed or programmatic basis.

4. Provide evidence that sufficient funds are available to complete the proposal. Lower Platte South NRD holds and administers finances for the LPRCA. The LPRCA has budgeted $200,000 specifically for this project in the next fiscal year. Additionally, the LPRCA holds additional reserve funds to be able to bridge expenses with reimbursable costs.

5. Provide evidence that sufficient annual revenue is available to repay the reimbursable costs and to cover OM&R (operate, maintain, and replace).

Lower Platte South NRD holds and administers finances for the LPRCA. The LPRCA has budgeted $200,000 specifically for this project in the next fiscal year. Additionally, the LPRCA holds additional reserve funds to be able to bridge expenses with reimbursable costs. Maintenance of the project via site hosting can be budgeted for by the LPRCA in the upcoming years following its completion.

6. If a loan is involved, provide sufficient documentation to prove that the loan can be repaid during the repayment life of the proposal.

There is no loan involved with this project.

7. Describe how the plan of development minimizes impacts on the natural environment.

This project focuses on developing a tool that will allow us as natural resource managers to better make management decision dealing with nonpoint source pollution. The development of this tool has no impact on the natural environment. However, the outcome of this project will be a tool that will benefit the environment in the future.

8. Explain how you are qualified, responsible and legally capable of carrying out the project for which you are seeking funds.

The LPRCA and LPSNRD carry out multiple projects focused on a diversity of resources included water quality and land management. The LPSNRD Board of Directors has approved the submission of the application. LPSNRD and the LPRCA have successfully managed grants from federal, state and local sources and have staff fully capable of carry out all administration and technical oversight.

9. Explain how your project considers plans and programs of the state and resources development plans of the political subdivisions of the state.

The LPRCA has strong working relationships with 3 NRDs and 6 state agencies dedicated to working with people to protect the long-term vitality of the Lower Platte River Corridor. All three NRDs have approved Groundwater Management Plans, the Lower Platte South and Papio Missouri River NRDs have approved Voluntary Integrated Management Plans (IMPs) and the Lower Platte Basin is currently working on a Basin Wide Plan. All of these plans are taken into consideration when developing projects in an effort to compliment the work that has already been done in existing plans.

10. Are land rights necessary to complete your project?

YES☐ NO☒

If yes, provide a complete listing of all lands involved in the project.

Click here to enter text.

If yes, attach proof of ownership for each easements, rights-of-way and fee title currently held.

Click here to enter text.

If yes, provide assurance that you can hold or can acquire title to all lands not currently held.

Click here to enter text.

11. Identify how you possess all necessary authority to undertake or participate in the project. The Lower Platte South NRD Board of Directors have approved the submission of this grant request and therefore have approved the potential initiation of the project if funding is approved.

12. Identify the probable environmental and ecological consequences that may result as the result of the project. This project won't have any direct environmental or ecological consequences. However, the project will have a positive environmental and ecological impact after its development by allowing natural resource managers to better address nonpoint source pollution and implement proper conservation practices.

Section C.

NRC SCORING

In the NRC's scoring process, points will be given to each project in ranking the projects, with the total number of points determining the final project ranking list.

The following 15 criteria constitute the items for which points will be assigned. Point assignments will be 0, 2, 4, or 6 for items 1 through 8; and 0, 1, 2, or 3 for items 9 through 15. Two additional points will be awarded to projects which address issues determined by the NRC to be the result of a federal mandate.

Notes:

1. The responses to one criterion ***will not*** be considered in the scoring of other criteria. Repeat references as needed to support documentation in each criterion as appropriate. The 15 categories are specified by statute and will be used to create scoring matrixes which will ultimately determine which projects receive funding.

2. There is a total of 69 possible points, plus two bonus points. The potential number of points awarded for each criteria are noted in parenthesis. Once points are assigned, they will be added to determine a final score. The scores will determine ranking.

3. The Commission recommends providing the requested information and the requests are not intended to limit the information an applicant may provide. An applicant should include additional information that is believed will assist the Commission in understanding a proposal so that it can be awarded the points to which it is entitled.

Complete any of the following (15) criteria which apply to your project. Your response will be reviewed and scored by the NRC. Place an N/A (not applicable) in any that do not apply, an N/A will automatically be placed in any response fields left blank.

1. Remediates or mitigates threats to drinking water;

1. Describe the specific threats to drinking water the project will address.
2. Identify whose drinking water, how many people are affected, how will project remediate or mitigate.
3. Provide a history of issues and tried solutions.
4. Provide detail regarding long range impacts if issues are not resolved.

While this project's primary focus is on assessing the pollutant removal effectiveness of agriculture Best Management Practices (ag BMPs) that address nonpoint source pollution, many of these BMPs have positive impacts on protecting groundwater and drinking water supplies. Nitrogen is an essential nutrient for plant growth, including crop production. To optimize crop production, supplemental nitrogen is applied to crop fields in both organic and inorganic forms. Nitrogen movement beyond the crop root zone can cause negative impacts to groundwater. Nitrates in Nebraska's groundwater reported in the Agrichemical Contaminant Database can be a concern in some areas of the state. Since 2002, the percentages of groundwater samples that exceed the 10 mg/l maximum contaminant level for drinking water have increased from 27% to 33%. This statistic is important as nearly 88% of Nebraska's residents, including almost all rural residents, use groundwater as a source of drinking water (NDEQ 2012). Public water supply systems (PWS) are required to serve drinking water to their customers under 10 mg/l Nitrate-N, the federal drinking water standard.

The Platte River aquifer is unconfined and hydraulically connected with the Platte River with the largest source of water to the aquifer coming from vertical recharge (NDNR, 2013). The surface water and groundwater relationship in this area is important because multiple well fields and supply wells occur within this area. These include the Metropolitan Utilities District (MUD) Platte west well field, the Lincoln Water System (LWS) well field near Ashland, Nebraska, and the local village and city water supply wells. More than 60 percent of the state's population lives within 30 miles of the lower Platte River corridor and depend on the Platte River for their water supply. This increases the importance of preventing surface water and groundwater contamination.

The lower Platte River making up the corridor is split into two segments (LP1-10000 and LP1-20000) within Title 117-Nebraska Surface Water Quality Standards. Both segments are considered to be Warmwater Aquatic Life Class A streams and are assigned the Public and Agriculture Water Supply, Primary Contact Recreation and Aesthetic beneficial uses. The lower Platte River, because of its beneficial uses

assigned to it, must meet certain narrative and numerical water quality criteria. The lower Platte River has been assigned the public drinking water supply beneficial use and more than 50 percent of state's population, 1.882 million people, relies on the river for drinking water.

Scientific evidence suggests that the implementation of nonpoint source management BMPs will result in pollutant load reductions to surface water along with improve groundwater quality and reduce groundwater nitrate concentrations. Load reductions are highly variable due to site-specific conditions such as land use, management practice(s) selected and soil variability, lag time, hydrogeological conditions, climate, and microbial activity. This project will develop a tool that will evaluate ag BMPs and their effectiveness at reducing pollutant loads.

Nitrate is one of the most common groundwater contaminants and high nitrate levels in drinking water have negative effects on human health. High nitrates can cause methemoglobinemia or blue baby syndrome, a condition found in infants less than six months. Pregnant women, adults with reduced stomach acidity, and people deficient in the enzyme that changes methemoglobin back to normal hemoglobin are all susceptible to methemoglobinemia. Methemoglobinemia causes a decreased availability of oxygen in the blood, resulting in oxygen starvation of the brain and to the tissues. Symptoms of methemoglobinemia include bluish color of the skin-particularly around the eyes and mouth, headache, dizziness, weakness or difficulty breathing. As a result of these negative effects on human health U.S. Environmental Protection Agency (EPA) adopted a drinking water standard of 10 mg/l. Additionally, farm animals, mainly hogs and cattle, are also affected by high nitrate concentrations. Piglets have about the same tolerance for nitrates as human infants and have been known to die from methemoglobinemia caused by high nitrate levels in their mother's milk (Adelman, 1985).

Solutions to nitrate contamination problems in Nebraska can be divided into two types: 1) concentrate on treatment of the problem at its source, which involves controlling the amount of nitrogen leached from the cropland with ag BMPs, 2) treat the water to remove nitrates after contamination has occurred.

Taking preventative actions to protect groundwater is more cost effective than taking remediation actions to clean up contaminated groundwater. For example, in 1993 Creighton built a Reverse Osmosis (RO) Plant to address high nitrates and has spent approximately $5.3 million for construction and operation and maintenance (excluding engineering and equipment) of the plant over 20 years. The RO plant has approximately a 20 year life and typically needs to be rebuilt after that. More than $5.3 million was spent to remediate contaminated water for a town of 1,120 people. Creighton residents are spending an additional $236/person/year to treat their drinking water.

There are a number of agencies that invest in conservation to protect soil health and surface and groundwater quality. The Natural Resources Conservation Service (NRCS) Environmental Quality Incentive Program (EQIP) is a voluntary program that

provides financial and technical assistance to agricultural producers to help plan and implement conservation practices that address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved tor created wildlife habitat (USDA-NRCS, 2013).The NDEQ Section 319 program provides financial assistance for the prevention and abatement of nonpoint source water pollution (NDEQ). From 2009-2012 the NRCS EQIP program and the NDEQ 319 program obligated an estimated $85.58M and $4.67M, respectively, in Nebraska for conservation practices. On average an estimated $30.08M is being spent annually on Ag BMPs in Nebraska. According to the 2010 United States Census there are 1,826,341 people in Nebraska (Census, 2014) and in 2016 the population is estimated at 1,896,190 people. Just looking at these two cost share programs available and the estimated population in Nebraska we are spending approximately $15.86/person/year to protect our drinking water supply. This is a pretty crude estimate but gives us a general idea that taking preventative measures is more cost effective than remediation.

All of these previously discussed points show the long range impacts of not protecting our drinking water supply could be detrimental to our economy and the residents of Nebraska.

5. Meets the goals and objectives of an approved integrated management plan or ground water management plan;

1. Identify the specific plan that is being referenced including date, who issued it and whether it is an IMP or GW management plan.
2. Provide the history of work completed to achieve the goals of this plan.
3. List which goals and objectives of the management plan the project provides benefits for and how the project provides those benefits.

This project supports the goals and objectives of the Water Quality Management Plan for the Lower Platte River Corridor Alliance. In September 2012, LPRCA submitted a Nonpoint Source Pollution Management Project Application to NDEQ for funding under the State's Non-Point Source Water Quality (Section 319) Program. The watershed management portion of this study was funded allowing for the development of, the Lower Platte River Watershed-Water Quality Management Plan. The overarching vision for the development of the Plan is to gain an understanding of select surface water constituent contributions to and distributions within the LPRCA to improve and protect water quality in the lower Platte River.

The following goals have established for the Plan: Goal 1- Identify management actions based on the results of the data gathering that would provide direction for implementation of management measures to improve surface water quality, Goal 2- Reduce point sources of E. coli by establishing a mechanism to provide for voluntary on-site wastewater upgrades. This project supports Goal 1 of the Water Quality Management Plan.

The Plan focuses on five parameters for analysis: total phosphorus, total nitrogen, sediment, atrazine, and E. coli bacteria. The existing loads of these parameters within the study area will be determine so that appropriate load reductions can be determined, based on best management practices (BMPs) to meet the desired goals and objectives set forth for the Plan. Additionally, point and non-point pollution sources were identified to determine existing pollutant contributions. The management plan has identified management measures that will occur on a watershed specific basis as well across the entire LPRCA. These management measures were grouped into Management Initiatives for implementation.

This project supports the next step, Management Initiative 1, in implementing the Plan for the LPRCA. Management Initiative 1-Best Management Practice Identification, will be performed for Priority 1 Watersheds. This project would utilize the Plan, LiDAR collected for the LPRCA, and other water quality information to develop a GIS-based best management practice tool. The goal of this project is to adapt an existing tool to Nebraska with information on ag BMPs for agriculture producers and conservationists to use to address local nonpoint source pollution and water quality issues.

In addition to the Plan there are other plans in place that overlap the LPRC and support the LPRCA mission and the projects they implement. The Lower Platte Basin is working on a Basin Wide Plan, the Lower Platte South (LPS) NRD and the Papio-Missouri (Papio) NRD have approved Voluntary Integrated Management Plans (IMPs), and the LPSNRD, Papio NRD, and LPNNRD all have approved Groundwater Management Plans.

The LPRCA has worked on multiple projects which has led to the development of this Plan. For example, LPRCA has partnered with the Center for Advanced Land Management Information Technologies (CALMIT) gathering data using hyperspectral remote sensing focused on observations of vegetation, surface water and soils. This data gathering was an attempt to identify warm water discharges that can indicate NPS pollution from the large number of on-site wastewater treatment systems or other conduits along the river. This information will help identify NPS pollution in target watersheds that have been identified as key contributors to a particular impairment.

In addition, LPRCA is partnered with the United States Geological Survey (USGS) to provide continuous monitoring of stream-flow characteristics and to increase the awareness and education of water contaminants in recreational waters. This data is

used to compute real-time concentrations of water-quality constituents in the Platte River such as suspended sediments, total nitrogen, and total phosphorus.

Both of these projects and partnerships have led to the development of the Plan and this project.

4. Contributes to water sustainability goals by increasing aquifer recharge, reducing aquifer depletion, or increasing streamflow;

List the following information that is applicable:

1. The location, area and amount of recharge;
2. The location, area and amount that aquifer depletion will be reduced;
3. The reach, amount and timing of increased streamflow. Describe how the project will meet these objectives and what the source of the water is;
4. Provide a detailed listing of cross basin benefits, if any.

This project contributes to the goals of the Water Sustainability Fund to remediate or mitigate threats to drinking water, promote the goals and objectives of groundwater management plans, contribute to multiple water supply management goals including agriculture uses, recreational benefits, wildlife habitat, conservation, and preservation of water resources, provide increased water productivity and enhance water quality.

Although the focus of this project is addressing NPS pollution and there are no numbers available on the amount of recharge this project will provide, scientific evidence suggests that NPS pollution BMPs will improve groundwater quality and reduce groundwater nitrate concentrations. While most ag BMPs address soil and nutrient runoff that protects streams and lakes from degradation these practices can have multiple benefits to the ecosystem. For example buffer strips use permanent vegetation to enhance certain ecological functions by creating stable and productive soils, providing cleaner water, enhancing wildlife populations, protecting crops and livestock, enhancing aesthetics and recreation opportunities, and creating sustainable landscapes (EPA). Additionally, conservation tillage leaves crop residue on the soil surface which reduces runoff and soil erosion, conserves soil moisture, helps keep nutrients and pesticides on the field and improves soil, water, and air quality (EPA).

5. Contributes to multiple water supply goals, including, but not limited to, flood control, agricultural use, municipal and industrial uses, recreational benefits, wildlife habitat, conservation of water resources, and preservation of water resources;

1. List the goals the project provides benefits.
2. Describe how the project will provide these benefits
3. Provide a long range forecast of the expected benefits this project could have versus continuing on current path.

The lower Platte River making up the corridor is split into two segments (LP1-10000 and LP1-20000) within Title 117-Nebraska Surface Water Quality Standards. Both segments are considered to be Warmwater Aquatic Life Class A streams and are assigned the Public and Agriculture Water Supply, Primary Contact Recreation and Aesthetic beneficial uses. The lower Platte River, because of its beneficial uses assigned to it, must meet certain narrative and numerical water quality criteria. The lower Platte River has been assigned the public drinking water supply beneficial use and more than 50 percent of state's population relies on the river for drinking water.

Along with supporting the beneficial uses listed in Title 117 this project has positive impacts on the following water supply goals: flood control, agricultural use, recreational benefits, wildlife habitat, conservation of water resources, and preservation of water resources.

Researching all BMPs is too time intensive and unrealistic. Instead research will be done to identify the top 20 ag BMPs used to address nonpoint source pollution and detailed information will be collected on those BMPs. Many of these ag BMPs have positive impacts on both surface water and groundwater quality and benefit other ecological functions. For example buffer strips use permanent vegetation to enhance certain ecological functions by creating stable and productive soils, providing cleaner water, enhancing wildlife populations, protecting crops and livestock, enhancing aesthetics and recreation opportunities, and creating sustainable landscapes (EPA).

4. Maximizes the beneficial use of Nebraska's water resources for the benefit of the state's residents;

1. Describe how the project will maximize the increased beneficial use of Nebraska's water resources.

2. Describe the beneficial uses that will be reduced, if any.
3. Describe how the project provides a beneficial impact to the state's residents.

The lower Platte River making up the corridor is split into two segments (LP1-10000 and LP1-20000) within Title 117-Nebraska Surface Water Quality Standards. Both segments are considered to be Warmwater Aquatic Life Class A streams and are assigned the Public and Agriculture Water Supply, Primary Contact Recreation and Aesthetic beneficial uses. The lower Platte River, because of its beneficial uses assigned to it, must meet certain narrative and numerical water quality criteria. The lower Platte River has been assigned the public drinking water supply beneficial use and more than 50 percent of state's population relies on the river for drinking water. This project will assist in restoring the water quality in the Platte River to meet water quality standards and support its beneficial uses.

Additionally, the Platte River is a frequent recreation destination for more than 50 percent of the state's population. Activities within the LPRCA include but not limited to: camping, fishing, hiking, hunting, biking, swimming, canoeing, boating, wildlife watching, and picnicking. More than 3 million people visit the parks and recreational areas within the corridor each year, generating more than $30 million in annual income for the state.

The combination of Nebraska's residence relying on the Platte River for their drinking water supply and the number of recreation area visitors within the LPRCA has a significant impact on a large number of Nebraska residents.

4. Is cost-effective;

1. List the estimated construction costs, O/M costs, land and water acquisition costs, alternative options, value of benefits gained.
2. Compare these costs to other methods of achieving the same benefits.
3. List the costs of the project.
4. Describe how it is a cost effective project or alternative.

Taking preventative actions to protect groundwater and surface is more cost effective than taking remediation actions to clean up contaminated groundwater. For example, in 1993 Creighton built a Reverse Osmosis (RO) Plant to address high nitrates and has spent approximately $5.3 million for construction and operation and maintenance (excluding engineering and equipment) of the plant over 20 years. The RO plant has

approximately a 20 year life and typically needs to be rebuilt after that. More than $5.3 million was spent to remediate contaminated water for a town of 1,120 people. Creighton residents are spending an additional $236/person/year to treat their drinking water.

There are a number of agencies that invest in conservation to protect soil health and surface and groundwater quality. The Natural Resources Conservation Service (NRCS) Environmental Quality Incentive Program (EQIP) is a voluntary program that provides financial and technical assistance to agricultural producers to help plan and implement conservation practices that address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved tor created wildlife habitat (USDA-NRCS, 2013).The NDEQ Section 319 program provides financial assistance for the prevention and abatement of nonpoint source water pollution (NDEQ). From 2009-2012 the NRCS EQIP program and the NDEQ 319 program obligated an estimated $85.58M and $4.67M, respectively, in Nebraska for conservation practices. On average an estimated $30.08M is being spent annually on Ag BMPs in Nebraska. According to the 2010 United States Census there are 1,826,341 people in Nebraska (Census, 2014) and in 2016 the population is estimated at 1,896,190 people. Just looking at these two cost share programs available and the estimated population in Nebraska we are spending approximately $15.86/person/year to protect our drinking water supply. This is a pretty crude estimate but gives us a general idea that taking preventative measures is more cost effective than remediation.

There is little to no documentation out there saying what our return of investment for these conservation practices are. This tool will help provide us those answers and inform ag producers and natural resource managers which management practice will provide the greatest pollutant load reduction per dollar spent.

5. Helps the state meet its obligations under interstate compacts, decrees, or other state contracts or agreements or federal law;

1. Identify the interstate compact, decree, state contract or agreement or federal law.
2. Describe how the project will help the state meet its obligations under compacts, decrees, state contracts or agreements or federal law.
3. Describe current deficiencies and document how the project will reduce deficiencies.

This project's implementation will result in the reductions towards meeting the TMDL for e-coli loads within the lower Platte River. TMDLs are required for all waterbodies that have been included in Category 5 Of Nebraska's Surface Water Quality Integrated

Report. The TMDL was issued and approved by EPA in 2007. Once a TMDL is approved by EPA the state then proceeds to implement the identified water quality management measures needed in order for the waterbody to attain the applicable water quality criteria or goal. The Total Maximum Daily Load of e-coli represents the number of coliform bacteria organisms allowed within the Platte River. E-coli bacteria has severe implications for human health as well as other organisms including fisheries. This project will assist with meeting the TMDL on the Lower Platte and therefore assist with furthering the goals of Nebraska's Nonpoint Source Management Plan and the water sustainability fund by creating a tool that will assist local, state and federal resource managers in improving water quality through efficient and effective ag BMP placement.

4. Reduces threats to property damage or protects critical infrastructure that consists of the physical assets, systems, and networks vital to the state or the Untied States such that their incapacitation would have a debilitating effect on public security or public health and safety;

1. Identify the property that the project is intended to reduce threats to.
2. Describe and quantify reductions in threats to critical infrastructure provided by the project and how the infrastructure is vital to Nebraska or the United States.
3. Identify the potential value of cost savings resulting from completion of the project.
4. Describe the benefits for public security, public health and safety.

The project will develop an on-line GIS assessment tool as well as an Ag BMP effectiveness database; there is no direct physical infrastructure intended to be developed at this time. The development of the tool and database will be intended to guide implementation of land treatments that may or may not include physical infrastructure. However, the goal of the project, as outlined previously in this proposal is to better assess the type and placement of ag BMPs to protect critical ground water and surface water resources. The protection of ground water and surface water is critical to the state and the United States. This is particularly of notice in the Lower Platte River Corridor as the Platte River provides critical drinking water to over 50% of the state's population. An additional 15% of the state's population resides within the counties included in the Corridor and depend on individual wells or small systems for their

groundwater. By the development of this tool and implementing more effective types of BMPs as well as more effective locations, there will be long-term cost savings to those implementing the projects as well as reducing costs of treatment or remediation of drinking water supplies.

5. Improves water quality;

1. Describe what quality issue(s) is/are to be improved.
2. Describe and quantify how the project improves water quality, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
3. Describe other possible solutions to remedy this issue.
4. Describe the history of the water quality issue including previous attempts to remedy the problem and the results obtained.

While most ag BMPs address soil and nutrient runoff that protects streams and lakes from degradation these practices can have multiple benefits to the ecosystem. For example buffer strips use permanent vegetation to enhance certain ecological functions by creating stable and productive soils, providing cleaner water, enhancing wildlife populations, protecting crops and livestock, enhancing aesthetics and recreation opportunities, and creating sustainable landscapes (EPA). Additionally, conservation tillage leaves crop residue on the soil surface which reduces runoff and soil erosion, conserves soil moisture, helps keep nutrients and pesticides on the field, and improves soil, water, and air quality (EPA).

The overall goal of this project is to adapt the existing PTMApp Tool to Nebraska watersheds and conservation practice design standards for agriculture producers and conservationists to use to address nonpoint source pollution and water quality. According to EPA agriculture is the leading source of water quality impairments to rivers and lakes. Sediment is the number one cause of water pollution in streams and rivers while nutrients, such as nitrogen and phosphorus, are the main cause of water quality pollution in ponds and reservoirs (EPA). This project will develop a database that summarizes ag BMP effectiveness at reducing pollutant loads of sediment, phosphorus and nitrogen and develop a GIS based tool that will prioritize ag BMP placement on a landscape and provide an associated load reduction with that BMP.

The primary purpose of this tool will be to provide an approximate load reduction for sediment, nitrogen, and phosphorus pollution for a specific ag BMP. These load reductions will tell us how much contamination from soil and nutrient loss we are

preventing by implementing a specific ag BMP. This will be a tool multiple natural resource managers, ag producers, and future generations will be able to utilize to help protect the environment for years to come. Many of the BMPs that will be researched have multiple benefits for surface water, groundwater, and soil health.

There are two objectives of this project: 1) identify pollutant removal effectiveness research on ag BMPs that has been completed in Nebraska or surrounding states with similar ecoregions; 2) adapt an existing tool to Nebraska watersheds and conservation practice design standards to aid in surface water quality implementation plans and evaluation. To research every possible ag BMP is too cost prohibitive. Instead the top 20 ag BMPs used in Nebraska that address sediment, nitrogen, and phosphorus pollution will be researched. This list will be developed based off of numbers from the NRCS EQIP program. The database will contain information related to the top 20 ag BMPs used in Nebraska and their application toward cleaner water.

Objective one will identify ag BMP effectiveness research that has been completed in Nebraska or surrounding states with similar landscapes. The outcome of this task will be a database that will house general information on each Ag BMP including: the associated NRCS Practice Code, expected life span of a BMP, limitations and potential hindrances to applying the practice. Additionally, the database will contain comprehensive information that: quantifies ag BMP effectiveness at reducing surface water load and focus on performance of single BMPs, not BMP suites. For example, if you wanted information about terraces you select that BMP type and the database will provide you with the following information: study site, date data was collected, the pollutant of concern, data gap summary-number of articles addressing each pollutant, and a summary report. The summary report would graph the effectiveness data for each BMP with box and whisker plots and include the number of samples the data is based off of. This database could then be used to identify research gaps in the State, guide funding and inform different stakeholders on BMP effectiveness to set priorities for future research. The outcome of this task will also be used in goal two for adapting the Prioritization, Targeting and Measuring Application (PTMApp) tool to Nebraska watersheds and as an educational tool. This objective will help fulfill the requirements of identifying Best Management Practices under Initiative 1 of the LPRCA Management Plan Implementation.

Objective two will adapt an existing tool (PTMApp) to Nebraska watersheds and conservation practice design standards to aid in surface water quality implementation plans and evaluation. The PTMApp uses water quality related products derived from high resolution topographic data collected using LiDAR technology to model and identify sources of sediment, total phosphorus, and total nitrogen and the loads associated with runoff. The tool will identify the subwatersheds which have the highest loading of each pollutant. Then the subwatershed with the highest pollutant load can be targeted and be modeled to estimate field scale (~ 40 acres) nutrient and sediment mass delivered

downstream to a subwatershed pour point. The results of this model will identify potential locations for BMP prioritization. Additionally this tool will “measure” the effectiveness of BMPs and CPs by cost and expected load reduction benefits at the resource of concern within the watershed. For example, if there is $150,000 to spend, what is the best annual sediment load reduction at the resource of concern (lake or river)? PTMApp will be able to look at the benefits of existing practices and determine how well the practices are protecting the resource of concern. The tool will also be able to determine the feasibility of achieving a water quality goal. An additional outcome will be a graphic illustration used to engage landowners in opportunities for additional practices. This objective helps fulfill the requirements of inventorying current land treatment practices and identification of best management practices under Initiative 1 of the LPRCA Management Plan Implementation. The next step in implementing the Management Plan is determine the existing loads of the pollutants of concern within the study area in order to determine the appropriate load reductions and determine the best BMPS to meet the desired goals and objectives set forth in the Plan and this objective will do just that.

The web based tool will be implemented on a pilot watershed (Buffalo Creek) with LiDAR data available. The Buffalo Creek watershed is one of six priority watersheds identified in the LPRCA Basin Management Plan. The outcome of this project will be a web based tool for the Buffalo Creek watershed to help determine reasonable effectiveness ranges based on BMP type and landscape. Additionally, this project would demonstrate how the LiDAR data can be used to prioritize the landscape for water quality improvement implementations.

Following the completion of this project the effectiveness of the tool will be evaluated. Upon completion the three Natural Resources Districts (NRDs) that make up the Lower Platte River Corridor Alliance will be asked to utilize the tool and recommend any changes they feel would be beneficial. After the tool has been evaluated it could be expanded to be utilized where LiDAR data is available. This would require GIS data products be created and adequate support to host and maintain the web application tool.

5. Has utilized all available funding resources of the local jurisdiction to support the program, project, or activity;

1. Identify the local jurisdiction that supports the project.
2. List current property tax levy, valuations, or other sources of revenue for the sponsoring entity.
3. List other funding sources for the project.

Lower Platte South NRD is the legal parent of the LPRCA and is therefore the lead sponsoring entity. LPSNRD's FY2016 tax levy is $0.034472/$100 actual valuation. The total valuations of the 6 counties within LPSNRD for FY2016 were $26,854,617,912. The LPSNRD share $9,257,353. The LPRCA provides annual funding for real-time water quality monitoring used in the development of the watershed management plan. The annual LPRCA contribution for the WQMN is approximately $140,000. Additionally, the LPRCA is providing funds for supplemental planning and implementation work of $40,000. The development of the Watershed Management Plan was done through a $102,000 grant from the Nebraska Department of Environmental Quality Non-point source pollution program.

4. Has a local jurisdiction with plans in place that support sustainable water use;

1. List the local jurisdiction and identify specific plans being referenced that are in place to support sustainable water use.
2. Provide the history of work completed to achieve the goals of these plans.
3. List which goals and objectives this project will provide benefits for and how this project supports or contributes to those plans.
4. Describe and quantify how the project supports sustainable water use, what is the target area, what is the population or acreage receiving benefits, what is the usage of the water: residential, industrial, agriculture or recreational.
5. List all stakeholders involved in project.
6. Identify who benefits from this project.

The LPRCA is currently finalizing a 9 Element Watershed Management Plan for 34 HUC 12 Watersheds within the Lower Platte River Corridor. The Plan will be approved by the EPA prior to this project's initiation. This project would be some of the first work towards implementation of that plan efficiently and effectively. Additionally, Lower Platte South NRD and Papio-Missouri River NRD have DNR approved Integrated Management Plans. Both Lower Platte South NRD and Papio-Missouri River NRD have or are in process of creating groundwater management plans and District-wide watershed management plans. Lower Platte North NRD has a groundwater management plan and are in the final stages of their Integrated Management approval process. Lower Platte South NRD and Papio-Missouri River NRD have initiated early steps such as increased monitoring of groundwater and surface water monitoring. LPSNRD has also conducted a broader drought planning exercise with stakeholders across the District.

This project specifically addresses Goal 1 of the Watershed Management plan for the Lower Platte River Corridor focused on the implementation of practices to reduce loadings of e-coli, nitrogen, phosphorous and other nutrients. Additionally the project also speaks to Management Initiative 3 of the plan: coordination with contributing watersheds for expansion of water quality practices outside of the specific area of the plan. The target area for this proposed project would be one HUC-12 watershed classified as a priority 1 watershed which at this time is anticipated to be Buffalo Creek. Buffalo Creek is 12,476 acres and total acreage within the plan is 626,106 acres. The primary focus of the plan will be on agricultural use and BMP implementation. However the entire Lower Platte River is utilized for domestic/municipal water, industrial uses, and recreational uses in addition to agricultural uses.

7. Addresses a statewide problem or issue;

1. List the issues or problems addressed by the project and why they should be considered statewide.
2. Describe how the project will address each issue and/or problem.
3. Describe the total number of people and/or total number of acres that would receive benefits.
4. Identify the benefit, to the state, this project would provide.

Farmland makes up 93% of Nebraska's land. The National Water Quality Assessment shows that agricultural nonpoint source (NPS) pollution is the leading source of water quality impacts on rivers and streams, the third largest source for lakes, the second largest source of impairments to wetlands, and a major contributor to contamination of estuaries and ground water (EPA, 2016). Agricultural activities that cause NPS pollution most generally occur in the absence of a conservation plan. Impacts can be caused from activities such as poorly located or managed animal feeding operations and manure, overgrazing, plowing too often or at the wrong time and improper application of fertilizer (EPA, 2016). The effects of non-point source pollutants on specific waters vary and have harmful effects on drinking water supplies, recreation, fisheries and wildlife.

This project addresses how we can manage nonpoint source pollution in a way that maximizes the dollars spent and load reduction to address a pollutant of concern. The overall goal of this projects is to adapt the existing PTMApp Tool to Nebraska watersheds and conservation practice design standards for agrilcuture producers and conservationists to use to address nonpoint source pollution and water quality. This project will utilize the LPRCA water quality management plan, LiDAR data, and other water quality information to develop a database that summarizes ag BMP effectiveness

at reducing pollutant loads of sediment, phosphorus and nitrogen and develop a GIS-based best management practice tool that will prioritize ag BMP placement on a landscape and provide an associated load reduction with that BMP. This project is to be implemented on a pilot watershed (Buffalo Creek). The Buffalo Creek watershed, 12,476 acres, is one of six priority watersheds identified in the LPRCA Water Quality Management Plan.

The primary purpose of this tool will be to provide an approximate load reduction for sediment, nitrogen, and phosphorus pollution for a specific ag BMP. These load reductions will tell us how much contamination from soil and nutrient loss we are preventing by implementing a specific ag BMP. Additionally, this project would demonstrate how the LiDAR data can be used to prioritize the landscape for water quality improvement implementations.

Once this project is completed and evaluated it could be used as a template to expand the tool across the state to address NPS pollution. As conservationists we need to assist and educate agriculture producers how to best protect our natural resources while considering yields and profits. As stated previously, Nebraska's farm and ranches account for 93% of the land in the state. This will be a tool that NRDs, NRCS, NDEQ and others will be able to utilize to help protect the environment for years to come.

Many of the BMPS that will be researched have multiple benefits for surface water, groundwater, and soil health. For example, conservation tillage leaves crop residue on the soil surface which reduces runoff and soil erosion, conserves soil moisture, helps keep nutrients and pesticides on the field, and improves soil, water, and air quality (EPA).

Cash receipts from farm marketings contributed over $23 billion to Nebraska's economy in 2013 and 5.9% of the U.S. total (USDA, 2015). Nebraska's economy is dependent on the long term viability of agriculture production and agriculture production is dependent on conservation practices that reduce soil and nutrient losses. These conservation practices that preserve soil health and reduce nutrient losses also protect groundwater and surface water quality. Creating a tool that provides comprehensive, easily accessible data will allow agriculture producers and conservationists to work together implementing practices that benefit both parties and maximize profits.

5. Contributes to the state's ability to leverage state dollars with local or federal government partners or other partners to maximize the use of its resources;

1. List other funding sources or other partners, and the amount each will contribute, in a funding matrix.
2. Describe how each source of funding is made available if the project is funded.

3. Provide a copy or evidence of each commitment, for each separate source, of match dollars and funding partners.

4. Describe how you will proceed if other funding sources do not come through.

Below is a matrix showing the NARD staff time contribution. All other match funding will be provided by the LPRCA. If the funding is not received additional grant sources may be attempted but there is not an immediate set of funding identified for the development of the project beyond this proposal.

Source	Amount
Nebraska Association of Resources District	$2,216

5. Contributes to watershed health and function;

1. Describe how the project will contribute to watershed health and function in detail and list all of the watersheds affected.

The top 20 ag BMPs utilized in Nebraska will be researched and will identify how they contribute to watershed health and function. While most ag BMPs address soil and nutrient runoff that protects streams and lakes from degradation these practices can have multiple benefits to the ecosystem. For example, conservation crop rotation have many benefits to the producer including reducing fertilizer inputs and the risk of nitrate leaching, reduced erosion and improved water quality of runoff, improved soil quality, and improved wildlife habitat. Additionally, conservation tillage leaves crop residue on the soil surface which reduces runoff and soil erosion, conserves soil moisture, helps keep nutrients and pesticides on the field, and improves soil, water, and air quality (EPA). These are just two ag BMP examples that have multiple benefits and contribute to watershed health and function. This project will be developed in a pilot watershed (Buffalo Creek) to start and after it is completed and evaluated can be expanded across the state.

2. Uses objectives described in the annual report and plan of work for the state water planning and review process issued by the department.

3. Identify the date of the Annual Report utilized.

4. List any and all objectives of the Annual Report intended to be met by the project

5. Explain how the project meets each objective.

This project will utilize research, data, and modeling to assist in meeting the goals of the Water Sustainability Fund to: remediate or mitigate threats to drinking water; contribute to multiple water supply management goals; and provide increased water productivity and enhance water quality. Additionally, this project supports the mission of the Nebraska Nonpoint Source Management Program to protect the quality of Nebraska's water resources from nonpoint source pollution and to improve waters that have been degraded by nonpoint source pollution wherever possible. Nebraska will be recognized as a leader among states in addressing nonpoint source pollution through efficient and effective implementation of water quality management actions. This vision will be realized by effectively collaborating with partner organizations to support well-defined, highly focused watershed-based projects that measurably reduce the degradation of surface and ground water resources by nonpoint source pollution. Projects will be designed to integrate all available tools to restore and protect the human and ecological health of targeted waters.

6. Federal Mandate Bonus. If you believe that your project is designed to meet the requirements of a federal mandate which furthers the goals of the WSF, then:

1. Describe the federal mandate.
2. Provide documentary evidence of the federal mandate.
3. Describe how the project meets the requirements of the federal mandate.
4. Describe the relationship between the federal mandate and how the project furthers the goals of water sustainability.

This project's implementation will result in the reductions towards meeting the TMDL for e-coli loads within the lower Platte River. The TMDL was issued and approved by EPA in 2007. The Total Maximum Daily Load of e-coli represents the number of coliform bacteria organisms allowed within the Platte River. E-coli bacteria has severe implications for human health as well as other organisms including fisheries. This project will assist with meeting the TMDL on the Lower Platte and therefore assist with furthering the goals of water sustainability by creating a tool that will assist local,

state and federal resource managers in improving water quality through efficient and effective ag BMP placement.

Section D.

PROJECT DESCRIPTION

1. Overview

In 1,000 characters *or less*, provide a brief description of your project including the nature and purpose of the project and objectives of the project.

The goal of this project, supports the LPRCA mission, by adapting an existing tool to Nebraska with information on ag BMPs for agriculture producers and conservationists to use to address local nonpoint source pollution and water quality issues. Objective 1 under this goal will identify pollutant removal effectiveness research on ag BMPs that has been completed in Nebraska or surrounding states with similar ecoregions. The outcome will be a database which houses information on ag BMPs including: the associated NRCS Practice Code, expected life span, limitations and potential hindrances to applying the practice. Additionally, the database will contain comprehensive information that quantifies ag BMP effectiveness at reducing surface water loading. The information in the database would be used to identify research gaps in Nebraska, guide funding and inform different stakeholders on BMP effectiveness to set priorities for future research. Objective 2 will adapt an existing tool to Nebraska watersheds and conservation practice design standards that can be used to aid in surface water quality implementation plans and evaluation. The Prioritization, Targeting and Measuring Application (PTMApp) uses water quality related products derived from high resolution topographic data collected to inform the prioritization of resource concerns and target specific fields for the implementation of nonpoint source best management practices (BMPs) and conservation practices (CPs). The PTMApp will also “measure” the effectiveness of BMPs and CPs by cost and expected load reduction benefits at the resource of concern within the watershed. This project helps fulfill the next steps of the LPRCA Management Plan Implementation by inventorying existing BMPs, identify future BMPs, determine the existing loads of the parameters of concern, and measure the reduction in loading of the parameter of concern that would result from implementing a BMP at the resource being protected in order to make sound management decision.

2. Project Tasks and Timeline

Identify what activities will be conducted by the project. For multiyear projects please list what activities are to be completed each year.

There are two objectives of this project: 1) identify pollutant removal effectiveness research on ag BMPs that has been completed in Nebraska or surrounding states with similar ecoregions; 2) adapt an existing tool to Nebraska watersheds and conservation practice design standards to aid in surface water quality implementation plans and evaluation. To research every possible ag BMP is too cost prohibitive. Instead the top 20 ag BMPs used in Nebraska that address sediment, nitrogen, and phosphorus pollution will be researched. This list will be developed based off of numbers from the NRCS EQIP program. The database will contain information related to the top 20 ag BMPs used in Nebraska and their application toward cleaner water.

Objective one will identify ag BMP effectiveness research that has been completed in Nebraska or surrounding states with similar landscapes. The outcome of this task will be a database that will house general information on each Ag BMP including: the associated NRCS Practice Code, expected life span of a BMP, limitations and potential hindrances to applying the practice. Additionally, the database will contain comprehensive information that: quantifies ag BMP effectiveness at reducing surface water load and focus on performance of single BMPs, not BMP suites. For example, if you wanted information about terraces you select that BMP type and the database will provide you with the following information: study site, date data was collected, the pollutant of concern, data gap summary-number of articles addressing each pollutant, and a summary report. The summary report would graph the effectiveness data for each BMP with box and whisker plots and include the number of samples the data is based off of. This database could then be used to identify research gaps in the State, guide funding and inform different stakeholders on BMP effectiveness to set priorities for future research. The outcome of this task will also be used in goal two for adapting the Prioritization, Targeting and Measuring Application (PTMApp) tool to Nebraska watersheds and as an educational tool. This objective will help fulfill the requirements of identifying Best Management Practices under Initiative 1 of the LPRCA Management Plan Implementation.

Objective two will adapt an existing tool (PTMApp) to Nebraska watersheds and conservation practice design standards to aid in surface water quality implementation plans and evaluation. The PTMApp uses water quality related products derived from high resolution topographic data collected using LiDAR technology to model and identify sources of sediment, total phosphorus, and total nitrogen and the loads associated with runoff. The tool will identify the subwatersheds which have the highest loading of each pollutant. Then the subwatershed with the highest pollutant load can be targeted and be

modeled to estimate field scale (~ 40 acres) nutrient and sediment mass delivered downstream to a subwatershed pour point. The results of this model will identify potential locations for BMP prioritization. Additionally this tool will “measure” the effectiveness of BMPs and CPs by cost and expected load reduction benefits at the resource of concern within the watershed. For example, if there is $150,000 to spend, what is the best annual sediment load reduction at the resource of concern (lake or river)? PTMApp will be able to look at the benefits of existing practices and determine how well the practices are protecting the resource of concern. The tool will also be able to determine the feasibility of achieving a water quality goal. An additional outcome will be a graphic illustration used to engage landowners in opportunities for additional practices. This objective helps fulfill the requirements of inventorying current land treatment practices and identification of best management practices under Initiative 1 of the LPRCA Management Plan Implementation. The next step in implementing the Management Plan is determine the existing loads of the pollutants of concern within the study area in order to determine the appropriate load reductions and determine the best BMPS to meet the desired goals and objectives set forth in the Plan and this objective will do just that.

Timeline for this project is as follows:
Year 1
Objective I: Literature research on ag BMPs, database with literature review complete, final report and presentation of Objective I database complete.

Objective II: GIS data products complete

Year 2
Objective I: Hosting obligations for BMP database completed

Objective II: BMP scenario and GIS desktop analysis completed, web based GIS tool completed, final report completed.

3. Partnerships

Identify the roles and responsibilities of agencies and groups involved in the proposed project regardless of whether each is an additional funding source. List any other sources of funding that have been approached for project support and that have officially turned you down. Attach the rejection letter.

The LPRCA is a consortium of three Natural Resources Districts (NRDs) and six state agencies dedicated to working with people to protect the long-term vitality of the

Lower Platte River Corridor. Additionally, the LPRCA is involved with eleven other organizations or programs. While not all agencies or groups are directly involved in this project their collaboration in previous or current projects have helped pave the way for this project. Also, the outcome of this project will be used for future projects where these organizations may be in involved.

4. Other Sources of Funding

Identify the costs of the entire project, what costs each other source of funding will be applied to, and whether each of these other sources of funding is confirmed. If not, please identify those entities and list the date when confirmation is expected. Explain how you will implement the project if these sources are not obtained.

The total cost for Objectives I & II is estimated to be $311,266 with $241,500 being requested from the Water Sustainability Fund. The LPRCA will contribute $67,550 and Nebraska Association of Resources Districts will contribute approximately $2,216 in-kind match. Funds listed have been confirmed with all parties.

5. Support/Opposition

Discuss both support and opposition to the project, including the group or interest each represents.

Generally speaking this project has had a lot of positive support and feedback. There is no known opposition to this proposed project.