NEBRASKA NATURAL RESOURCES COMMISSION

Water Sustainability Fund

Application for Funding

Section A.

ADMINISTRATIVE

PROJECT NAME: Managing Groundwater at the Next Level: Enhancing Twin Platte NRD's Groundwater Managers' Platform and Water Data Program with Real-time Data

SPONSOR'S *PRIMARY CONTACT INFORMATION* **(Not Consultant's)**

Sponsor Business Name**: Twin Platte Natural Resources District**

Sponsor Contact's Name: **Kent Miller**

Sponsor Contact's Address**: Twin Platte Natural Resources District**

Sponsor Contact's Phone**: (308) 535-8080**

Sponsor Contact's Email: **komiller@tpnrd.org**

1. **Funding** amount requested from the Water Sustainability Fund:

   Grant amount requested**.** $ **2,092,500 .00**

   - If requesting less than 60 Percent cost share, what Percent**? Not Applicable**

   If a loan is requested amount requested**. Not Applicable**

   - How many years repayment period**? Not Applicable**
   - Supply a complete year-by-year repayment schedule**. Not Applicable**

2. **Nebraska Revision Stat. § 2-1507 (2)**

Are you applying for a **combined sewer overflow 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☒
- Attach a copy to your application**. Not Applicable**
- What is the population served by your Project **Not Applicable**
- Provide a demonstration of need**. Not Applicable**
- **Do not complete the remainder of the application.**

3. **Permits Required/Obtained** Attach a copy of each that has been obtained**.** For those needed, but not yet obtained **(**box **"NO"** checked)**,** 1.) State when you will apply for the permit, 2.) When you anticipate receiving the permit, and 3.) Your estimated cost to obtain the permit.

(N/A = Not applicable/not asking for cost share to obtain**)**
(Yes = See attached)
(No = Might need**,** don't have & are asking for 60% cost share to obtain**)**

G&P - T&E consultation (required)	N/A☒	Obtained: YES☐	NO☐
DNR Surface Water Right	N/A☒	Obtained: YES☐	NO☐
USACE (e.g., 404**/**other Permit)	N/A☒	Obtained: YES☐	NO☐
FEMA (CLOMR)	N/A☒	Obtained: YES☐	NO☐
Local Zoning/Construction	N/A☒	Obtained: YES☐	NO☐
Cultural Resources Evaluation	N/A☒	Obtained: YES☐	NO☐
Other (provide explanation below)	N/A☒	Obtained: YES☐	NO☐

Not Applicable

4. Partnerships

List each Partner / Co-sponsor, attach documentation of agreement**:**

Not Applicable

Identify the roles and responsibilities of each Partner / Co-sponsor involved in the proposed Project regardless of whether each is an additional funding source.

Not Applicable

5. 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.

Project costs not covered by a Water Sustainability Fund (WSF) grant will be paid by Twin Platte Natural Resources District (TPNRD) (see Table 1). Funding from TPNRD has been confirmed (see Attachment A).

We note that the full costs (and expenditures to date) of the Water Data Program are far greater than what is reflected in this application in terms of both funds requested and local match; we limit the scope of this application, however, to the deployment of real-time data devices and data platform improvement and maintenance to support delivery of the data gathered.

Table 1: Project Costs and Funding Sources.

WSF Grant	TPNRD Portion	Total Project Cost
$2,092,500.00	$1,398,000.00	$3,490,500.00

6. Overview

In 1,000 words *or less*, provide a brief description of your Project including the nature**/**purpose of the Project and its objectives. Do not exceed one page**!**

This Project's purpose is to optimize irrigation water use and protect the sustainability of water resources within the Twin Platte Natural Resources District (TPNRD). It focuses on two main objectives: enabling real-time, advanced irrigation management to reduce groundwater pumping and its downstream impacts and providing real-time nitrate data to reduce nitrogen fertilizer use, thus preventing nitrate contamination of groundwater. To achieve this, the Project will use WSF funding to deploy field-level moisture monitoring devices that track evapotranspiration, precipitation, and other key data in real time. This data will integrate into TPNRD's existing Water

Data Program, which is widely used by local growers. These devices have already proven effective, saving one grower $5,400 and reducing groundwater usage by 106 acre-feet when they detected a local precipitation event that was not captured by radar. Additionally, TPNRD is currently conducting a comparability study of various moisture monitoring devices to assess their performance, accuracy, and cost-effectiveness (Attachment D). The report from this study will help determine which systems to support local growers, ensuring efficient fund allocation. In terms of water quality, the Project also aims to deploy continuous nitrate probes in monitoring wells, feeding data into TPNRD's Ground Water Managers' Platform (Figure1). This will allow staff, growers, and the public to monitor real-time nitrate levels, helping growers adjust their nitrogen applications to minimize fertilizer use and reduce nitrate contamination in groundwater. TPNRD's Water Data Program was envisioned to significantly change the way growers manage their water. With WSF support beginning in 2019, the Program quite literally took off and became so widely popular among growers that it now enjoys 100 Percent participation: every grower in TPNRD participates in the Water Data Program. More than that, as illustrated by preliminary results of the 2023 Robust Review completed under the TPNRD/NeDNR joint Integrated Management Plan (IMP), implementation of the Program has already provided groundwater pumping reductions significant enough that planning targets for stream depletion offsets as outlined in the 2019 IMP document are expected to be significantly decreased in upcoming updates. Therefore, the Water Data Program is already working to provide reductions in ground water pumping and, therefore, streamflow accretions to the North Platte, South Platte, and Platte Rivers. The missing piece of this puzzle is the field-level data that growers need to make even more effective decisions about their water use – data that will be provided through the placement of tested field-level devices through this Project.

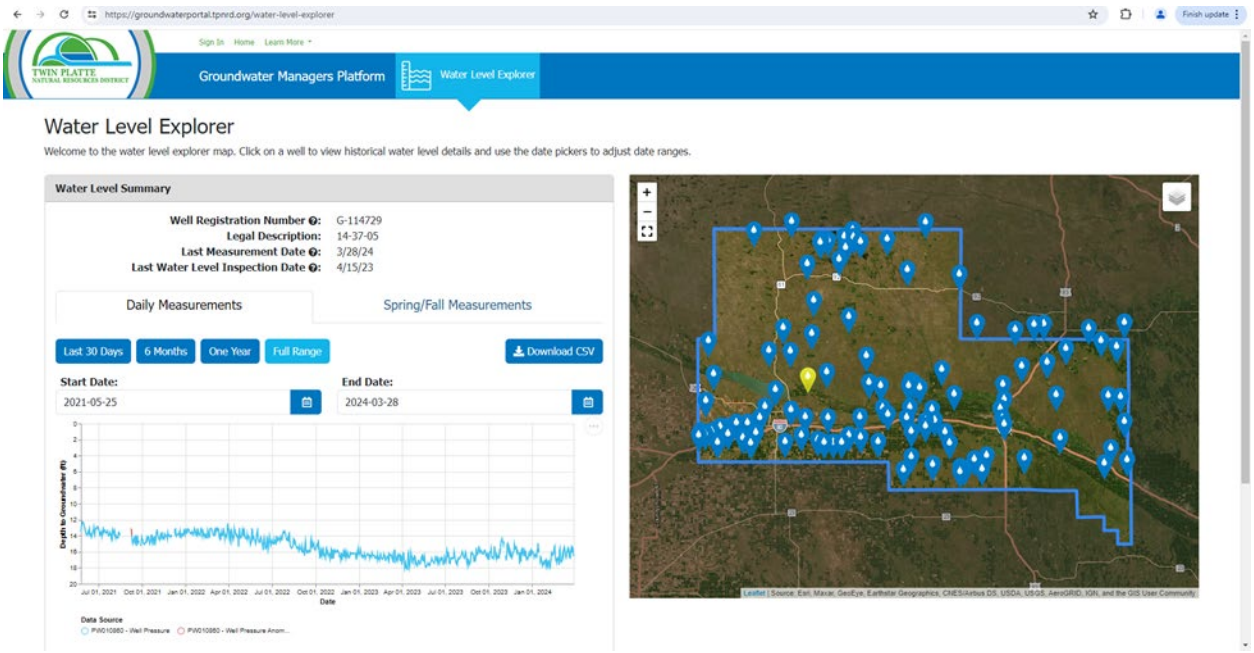

Figure 1: TPNRD's Water Level Explorer page on the Ground Water Managers' Platform.

7. Project Tasks and Timeline

Identify what activities will be conducted to complete the Project, and the anticipated completion date**.**
For multiyear Projects please list (using the following example**):**

Tasks	Year 1$	Year 2$	Year 3$	Remaining	Total $ Amt.
Permits	$18,000				$18,000
Engineering		$96,000			$96,000
Construction		$87,000	$96,000		$183,000
Close-out				$8,000	$8,000
				TOTAL	$305,000

- What activities (Tasks) are to be completed**.**
- An estimate of each Tasks expenditures/cost per year**.**
- Activities in years 4 through Project completion under a single column.

This Project will include the purchase and installation of continuous nitrate probes at each of the 135 existing continuous monitoring wells in TPNRD. It will also include costs for real-time transmittal of the nitrate data via telemetry into the Ground Water Managers' Platform. Upgrades and updates will also be made to the Platform to display nitrate data from across the District in real time.

Additionally, by completion of the TPNRD moisture monitoring study, this Project will cover the costs for up to approximately 450 already tested devices which sense various environmental and plant parameters such as

precipitation, relative humidity, evapotranspiration, crop water balance, heat stress, chlorophyll index, and canopy temperature in real time (Figure 2). The potential devices include Arable (Mark 3), Autonomous Pivot, Water Rite, Crop X, and Nave Analytics.

Upgrades and updates to the Water Data Program have already been initiated to accommodate inclusion of these data; upgrades and updates to the existing LoRaWAN network (provided by Ethos Connected) have already been initiated and will be completed as well.

Figure 2: Modern Moisture Monitoring device sensing capabilities (example from *https://www.arable.com/mark3/*).

The full Project budget is $3,490,500.00, of which TPNRD will cover $1,398,000.00. The remaining $2,092,500.00 of the Project costs will be covered by WSF dollars (see Table 2).

Table 2: Major Project Task Costs and Timeline.

Tasks	Year 1	Year 2	Year 3	Remaining	Total $ Amount
AgHub/GiSC operation and improvements (TPNRD)	$476,000.00	$497,000.00	$425,000.00	$0	$1,398,000.00
Nitrate probe deployment and telemetry (WSF)	$337,500.00	$0	$0	$0	$337,500.00
Tested Moisture Monitoring device leases and deployment (WSF)	$375,000.00	$742,500.00	$637,500.00	$0	$1,755,000.00

8. **IMP**

Do you have an **Integrated Management Plan** in place, or have you initiated one?

YES☒ NO☐ Sponsor is not an NRD☐

Section B.

DNR DIRECTOR'S FINDINGS

Prove Engineering & Technical Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 004)

1. Does your Project include physical construction (defined as moving dirt, directing water, physically constructing something, or installing equipment)?
YES☐ NO☒

If you answered "YES" you must answer all questions in section 1.A.
If you answer "NO" you must answer all questions in section 1.B.

If "YES", it is considered mostly structural, so answer the following:

1.A.1 Insert a feasibility report to comply with Title 261, Chapter 2, including engineering and technical data; **Not Applicable**

1.A.2 Describe the plan of development (004.01 A)**; Not Applicable**

1.A.3 Include a description of all field investigations made to substantiate the feasibility report (004.01 B)**; Not Applicable**

1.A.4 Provide maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C)**; Not Applicable**

1.A.5 Describe any necessary water and/or land rights including pertinent water supply and water quality information (004.01 D)**; Not Applicable**

1.A.6 Discuss each component of the final plan (004.01 E)**; Not Applicable**

1.A.7 When applicable include the geologic investigation required for the Project (004.01 E 1)**; Not Applicable**

1.A.8 When applicable include the hydrologic data investigation required for the Project (004.01 E 2)**; Not Applicable**

1.A.9 When applicable include the criteria for final design including, but not limited to, soil mechanics, hydraulic, hydrologic, structural, embankments and foundation criteria (004.01 E 3)**. Not Applicable**

If "NO", it is considered mostly non-structural, so answer the following:

1.B.1 Insert data necessary to establish technical feasibility (004.02);

TPNRD Ground Water Managers' Platform has undergone significant development and improvements over the past 5 ½ years. Initially developed in 2020 as a minimum viable product (MVP) for TPNRD staff to view water usage data from electric and non-electric irrigation wells, the platform has since evolved through several development surges to become an even more useful tool. (MVP is a commonly used software development term that describes the minimum amount of development needed for a tool to be useful.) The platform now allows staff to view both individual and aggregated water usage data, as well as the locations of Ethos Connected continuity devices deployed on non-electric wells. A Sensor Status page provides a map of all devices with color coding to indicate the length of time since the last data packet was received, helping staff and contractors quickly identify problematic devices and plan field visits for troubleshooting. This page also shows the last voltage reading of each device and allows filtering of the device map according to voltage, enabling efficient planning for battery replacements.

Additionally, the platform houses all TPNRD's chemigation permitting databases and tracks chemigation applications, inspections, approvals, and fees. This enhanced functionality has made the platform an integral part of TPNRD's operations, with at least 75 Percent of the staff use it daily.

The Project team that originally built the Ground Water Managers' Platform including the Water Data Program will continue to add updates and improvements that will allow for integration of data from both the continuous nitrate probes (from Ethos Connected) and the near future tested moisture monitoring devices from the ongoing feasibility study. In fact, stakeholder engagement has already taken place within the last year in the form of user open houses to demonstrate the capabilities of the updated functionality between moisture monitoring devices (such as Arable Mark 3) and the Water Data Program. Lastly, the ongoing comparability study will also inform which devices will work best for each grower location. To be clear, this program is supported in terms of facilitation of TPNRD staff and the technical consultants responsible for design and management of the Ground Water Managers' Platform and its components continue to enjoy close, strong working relationships, and meet on a regular basis.

1.B.2 Discuss the plan of development (004.02 A)**;**

TPNRD contracts with GiSC for ongoing improvements and maintenance of the Water Data Program, including the incorporation of data transmitted through the Ethos Connected network from Arable Mark 3 devices, and has already begun hosting open houses (in February 2024) to demonstrate the use of the Mark 3 device. A few growers already use these devices and have offered testimony of their experiences to others. In addition, Arable has been working with a grower to test the device's function when mounted on a

center pivot (rather than at ground level, as generally used thus far) to allow for ease of device placement and avoidance of damage through the growing season. These trial runs have been successful and have demonstrated that the device remains accurate and reliable when placed on the center pivot.

TPNRD contracts with Olsson for ground water modeling services; Olsson will continue to coordinate with GiSC and NeDNR to incorporate data from the Water Data Program into refined watershed and ground water models and will also use the evapotranspiration data from the moisture monitoring devices in comparison to data received from OpenET to determine whether this new data may be appropriate for incorporation into models in the future.

In the first year of the Project, TPNRD will purchase continuous nitrate probes from Ethos Connected for installation in the District's 135 dedicated monitoring wells. Data from these probes will be transmitted via telemetry directly into the Ground Water Managers' Platform and will be viewable as a map similar to the Water Level Explorer (see Figure 1). Additionally, TPNRD will cover grower leases on up to 100 moisture monitoring devices, and work with GiSC to incorporate data from these devices into the Water Data Program. In Years 2 and 3 of the Project, TPNRD will cover grower leases up to approximately 450 on the results of the current comparability study (Attachment D). We note that – while, under the leasing agreements from companies such as Arable or others, it maintains responsibility for the ongoing functionality of the device for the term of the lease – TPNRD and its growers maintain ownership of the data collected by the devices. This is like other WSF Projects that have funded the collection of airborne electromagnetic survey data to better understand aquifer locations and characteristics.

1.B.3 Describe field or research investigations utilized to substantiate the Project conception (004.02 B)**;**

The Water Data Program, including the LoRaWAN network through which data are transmitted from continuity devices on non-electric wells, was established beginning in 2019 and has been continually refined and improved in the 5½ years since. In preparation for deployment of field-level devices for sensing precipitation, ET, and other parameters in real time, TPNRD has been working with Water Data Program partner GiSC and Arable – maker of the Mark 3 device – to deploy Mark 3 sensors mounted on center pivots to determine feasibility of using this approach, rather than the typical approach of placing the devices at ground level. It has been determined that this approach is feasible and does not compromise data accuracy. In addition, TPNRD began demonstrating the capabilities of these devices through open houses starting in February 2024, and discussion of these devices was very well received by growers in attendance.

Further, the 100 Percent participation in the Water Data Program in its 5½ years of operation strongly supports the feasibility of deploying up to approximately 450 devices in a three-year period. Lastly, the results from the current comparability study will also help tailor these additional devices to each of the growers' needs in the district.

Over the past three years, TPNRD has been working to update their Ground Water Management Plan (GMP) (Attachments J & K), which serves as a guidance document for implementing ground water quantity and quality triggers and controls. Stakeholders identified the need for accessible nitrate data, both for irrigation and domestic water use implications. Deploying continuous nitrate probes and creating a repository to view this data along with historical sample results will help meet this need.

1.B.4 Describe any necessary water and/or land rights (004.02 C)**; Not Applicable**

1.B.5 Discuss 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)**.**

Not applicable; there are no currently known structural measures that may be directly affected by the Project.

Prove Economic Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 005)

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

In investigating similar alternatives, we found the costs for hardware (e.g., field-level weather stations) to be similar. In addition, also to highlight the cost effectiveness and efficiency of this Project, as of January 2025, the TPNRD has been involved in a comparability study of other various water monitoring devices (Attachment D). The potential devices include Arable (Mark 3), Autonomous Pivot, Water Rite, Crop X, and Nave Analytics. In the end it is important that this Project will cover the costs for up to approximately 450 already tested devices which sense various environmental and plant parameters such as precipitation, relative humidity, evapotranspiration, crop water balance, heat stress, chlorophyll index, and canopy temperature in real time (Figure 2) for the District's growers.

The objective of this study is to compare the performance of different moisture monitoring systems to determine which system(s) offer the best value and accuracy for the growers within the TPNRD. This includes evaluating each system's accuracy, reliability, ease of use, and impact on water conservation practices. The data gathered will help TPNRD determine which system(s) to cost-share with local growers, ensuring effective allocation of funds.

At the end of the growing season, Twin Platte NRD will have a detailed report that includes: A comparison of the water applied versus recommended water usage (if recommendations were provided by the systems). Benchmarks for each grower in relation to the average water use within the Twin Platte NRD. An analysis of the performance, strengths, and weaknesses of each system, based on data collected and grower feedback.

Before the comparability study, Arable and Ethos Connected already determined that the Mark 3 data can be transmitted through the Ethos Connected LoRaWAN network. This helps by not adding additional costs of setting up a new network or even new online dashboard.

Leveraging the existing – and widely popular – Water Data Program/Ground Water Managers' Dashboard clearly represents the least-cost option for delivery of extremely robust data to growers and TPNRD staff.

The next best alternative to deployment of the continuous nitrate probes at existing monitoring wells would require an extreme level of staff participation to collect *daily* nitrate grab samples, send these samples for

analysis, and enter and assimilate the data once available. Further, the cost of daily nitrate analysis for 135 monitoring wells for three years (the life of the proposed WSF Project) would be $1,219,556.25.00 – this represents only laboratory analysis fees and far exceeds the cost of purchasing continuous nitrate probes and transmitting the data into the Ground Water Managers' Platform for these same wells.

The proposed Project is not only significantly more cost effective than any other alternative, but it will also provide TPNRD staff and growers the necessary information to manage both water quantity and quality more proactively. Further, building on the great success of the Water Data Program to date stands to launch TPNRD growers into truly the next era of agricultural water management in the digital age, and serve as examples for growers across Nebraska.

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 is the Project life**.** (Title 261, CH 2 - 005)**.**

Project costs are calculated based on ongoing AgHub/GiSC operations and improvements to the Water Data Program within the Ground Water Managers' Platform. These costs will be paid by TPNRD, as documented in Attachment A. The remaining Project costs include the purchase and telemetry costs for 135 continuous nitrate probes at $2,500 each, and five-year leases for up to approximately 450 moisture monitoring devices at $3,750 each.

Benefits are, currently, difficult to quantify. However, a clear benefit would be the outcomes of the current compatibility study and choosing moisture monitoring devices that work well for each grower at the best cost option as well.

Lastly, we note that one grower – as discussed above – was able to save a conservatively estimated $5,400.00 during a single precipitation event that his Mark 3 devices sensed, allowing him to shut off his center pivots. Savings on fertilizer expenses - by accounting for nitrogen in irrigation water – are also expected to be significant. Finally, through helping to ensure State compliance with the Platte River Recovery Implementation Program by reducing ground water pumping impacts on streamflow, this Project stands to produce millions of dollars' worth of avoided noncompliance costs.

3.A 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 total Project cost is $3,490,500.00, of which TPNRD will cover 40 Percent and the WSF would cover 60 Percent.

Ongoing costs include annual fees paid to GiSC for improvements and maintenance of the Ground Water Managers' Platform/Water Data Program; TPNRD is committed to paying these costs throughout the life of this Project and beyond, as the Platform is an integral part of TPNRD's operations and has proven a vital resource to growers in the District. We note that, as with all technology, the rapid evolution of computing power and software development is difficult to predict.

3.B 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 intangible or secondary benefits (if any) 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, in a way that justifies economic feasibility of the Project such that the finding can be approved by the Director and the Commission (005.02)**.**

The primary benefits of this Project include improved management of TPNRD's ground water resources in terms of both quantity and quality; specifically, further significant progress toward achieving and maintaining goals and objectives of the second-increment IMP (2019-2029) and a fully appropriated status. A new understanding of nitrate-level fluctuation with time is an additional benefit, alongside placing this information into an already-used and trusted water management platform that will allow growers to quickly assess fertilizer needs while taking nitrogen application with irrigation water into account and thus reducing over-application of fertilizer and the resulting leaching of nitrate into ground water. While these benefits are difficult to quantify monetarily, they are significant for this District and may serve as models for others throughout the state (and beyond) grappling with similar ground water management concerns.

3.C Present all cost and benefit data in a table to indicate the annual cash flow for the life of the Project (005.03)**.**

See Attachment C.

3.D 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, demonstrate the economic feasibility of such proposal by such method as the Director and the Commission deem appropriate (005.04). (For example, show costs of and describe the next best alternative.)

In investigating similar alternatives, we found the costs for hardware (e.g., field-level weather stations) to be similar.

In addition, also to highlight the cost effectiveness and efficiency of this Project, as of January 2025, the TPNRD has been involved in a comparability study of other various water monitoring devices (Attachment D). The potential devices include Arable Mark 3, Autonomous Pivot, Water Rite, Crop X, and Nave Analytics. In the end it is important that this Project will cover the costs for up to approximately 450 already tested devices which sense various environmental and plant parameters such as precipitation, relative humidity, evapotranspiration, crop water balance, heat stress, chlorophyll index, and canopy temperature in real time (Figure 2) for the District's growers.

The objective of this study is to compare the performance of different moisture monitoring systems to determine which system(s) offer the best value and accuracy for the growers within the TPNRD. This includes evaluating each system's accuracy, reliability, ease of use, and impact on water conservation practices. The data gathered will help TPNRD determine which system(s) to cost-share with local growers, ensuring effective allocation of funds.

At the end of the growing season, Twin Platte NRD will have a detailed report that includes: A comparison of the water applied versus recommended water usage (if recommendations were provided by the systems). Benchmarks for each grower in relation to the average water use within the Twin Platte NRD. An analysis of the performance, strengths, and weaknesses of each system, based on data collected and grower feedback.

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Leveraging the existing – and widely popular – Water Data Program/Ground Water Managers' Dashboard clearly represents the least-cost option for delivery of extremely robust data to growers and TPNRD staff.

The next best alternative to deployment of the continuous nitrate probes at existing monitoring wells would require an extreme level of staff participation to collect *daily* nitrate grab samples, send these samples for analysis, and enter and assimilate the data once available. Further, the cost of daily nitrate analysis for 135 monitoring wells for three years (the life of the proposed WSF Project) would be $1,219,556.25 – this represents only laboratory analysis fees and far exceeds the cost of purchasing continuous

nitrate probes and transmitting the data into the Ground Water Managers' Platform for these same wells.

The proposed Project is not only significantly more cost effective than any other alternative, but it will also provide TPNRD staff and growers with the necessary information to manage both water quantity and quality more proactively. Further, building on the great success of the Water Data Program to date, it stands to launch TPNRD growers into truly the next era of agricultural water management in the digital age, and serve as examples for growers across Nebraska.

Prove Financial Feasibility

(Applicant must demonstrate compliance with Title 261, CH 2 - 006)

4. Provide evidence that sufficient funds are available to complete the proposal.

   See Attachment A, from TPNRD's General Manager, documenting the District's FY2025 budget, and past and ongoing commitment to the Ground Water Managers' Platform and Water Data Program.

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

   See Attachment A, from TPNRD's General Manager, documenting the District's FY2025 budget, and past and ongoing commitment to the Ground Water Managers' Platform and Water Data Program. TPNRD, like all other NRDs in the state, has taxing authority (Neb. Rev. Stat. §2-3225) and is funded by a tax levy that has been in place for many decades.

6. If a loan is involved, provide sufficient documentation to prove that the loan can be repaid during the repayment life of the proposal. **Not Applicable**

7. Describe how the plan of development minimizes impacts on the natural environment (i.e. timing vs nesting/migration, etc.).

   There is no impact to the natural environment because of this Project; tested devices will be placed in existing agricultural fields, and continuous nitrate probes will be placed in existing monitoring wells.

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

   TPNRD has a wide range of statutory responsibilities and authorities, including but not limited to Nebraska Revised Statutes §2-3,201 through 2-3,243 and the Ground Water Management and Protection Act (Neb. Rev. Stat. §46-701 through 46-756). As the state of Nebraska's preferred regulator of groundwater, TPNRD is clearly both qualified and responsible for carrying out the proposed Project.

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

   The implementation of the Ground Water Managers' Platform – including the Water Data Program – has been and continues to be done to assist TPNRD in fulfilling the goals, objectives, and requirements of its joint IMP with NeDNR, which was written in accordance with the Basin-Wide Plan for Joint

Integrated Water Resources Management of Over appropriated Portions of the Platte River Basin, Nebraska (Second Increment [2019-2029]). The Ground Water Management and Protection Act requires both the basin-wide plan (§46-755(1)) and the IMP (§46-715(1)(a)) consistent with the basin-wide plan (§46-755(2)). Further, the State of Nebraska is a signatory to an interstate agreement, the Platte River Recovery Implementation Program; and TPNRD has/is updating its Ground Water Management Plan pursuant to the Ground Water Management and Protection Act. The proposed Project is to further enhance the Ground Water Managers' Platform and Water Data Program and ensure that TPNRD (and, therefore, the State) meets the requirements of all these plans and agreements.

10. Are land rights necessary to complete your Project? YES☐ NO☒

If yes:

10.A Provide a complete listing of all lands involved in the Project. **Not Applicable**

10.B Attach proof of ownership for each easements, rights-of-way and fee title currently held. **Not Applicable**

10.C Provide assurance that you can hold or can acquire title to all lands not currently held. **Not Applicable**

11. Identify how you possess all necessary authority to undertake or participate in the Project.

TPNRD has a wide range of statutory responsibilities and authorities, including but not limited to Nebraska Revised Statutes §2-3,201 through 2-3,243 and the Ground Water Management and Protection Act (Neb. Rev. Stat. §46-701 through 46-756). As the state of Nebraska's preferred regulator of groundwater, TPNRD is clearly both qualified and responsible for carrying out the proposed Project.

12. Identify the probable consequences (environmental and ecological) that may result if the Project is or is not completed.

As a result of this Project, TPNRD expects to meet the second-increment accretions targets for the North Platte, South Platte, and Platte Rivers within its boundaries, as outlined in its IMP. The IMP and the basin-wide plan from which its goals, objectives, action items, and controls are derived are ultimately the product of Nebraska's plan for compliance with the Platte River Recovery Implementation Program (PRRIP). PRRIP's primary focus is to enhance, restore, and protect habitat for threatened and endangered species, including the piping plover, least tern, whooping crane, and pallid

sturgeon. Thus, completion of this Project will directly contribute to ecological benefits for these species. It will also assist in working towards viable solutions in addressing nitrate concentrations through better monitoring as discussed in the 2025 NDEE Nitrate Study Report.

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 to 6 for items (1) - (9); and 0 to 3 for items (10) - (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:

- 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.

- There is a total of 72 possible points, plus two bonus points. The potential number of points awarded for each criteria are noted above**.** Once points are assigned, they will be added to determine a final score. The scores will determine ranking.

- 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:

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

    Note to Reviewer(s): Attachment B is a list of Acronyms to help with understanding of the proposal

Nitrate has been an ongoing threat to drinking water resources throughout the state for several decades. In 2025, the Nebraska Department of Environment and Energy (NDEE), has released some graphics related to this existing decadal threat and other informational graphics/maps are located in Attachment E. Locally, in the southwest portion of TPNRD (Keith Co.), nitrate levels have risen and remained high which is also based on the scientific evidence that once Nitrate enters into the groundwater system, it will linger for decades). Therefore, this has prompted the District to continue revisions to its Ground Water Management Plan, including currently considering establishment of a Ground Water Quality Management Area for nitrate levels in excess of 10 ppm in this portion of the District that would cover over 28,000 acres and includes 12 registered domestic wells (we note that the actual number of domestic wells is unknown but likely far greater, as registration of domestic wells constructed before 1993 is not required in Nebraska). The installation of continuous nitrate probes in the District's monitoring wells will allow for ongoing monitoring of nitrate levels in real time as well as potentially identifying other areas where nitrate concentrations are problematic. This information will then allow TPNRD to appropriately plan for and conduct outreach and mitigation/remediation activities to help prevent further nitrate contamination from occurring and to minimize health impacts of drinking water contamination. These health impacts have become more widely publicized in recent years: they include methemoglobinemia (blue baby syndrome) colorectal cancer, thyroid disease, and neural tube defects (Attachment F). Additionally, elevated nitrate and atrazine concentrations have been correlated with pediatric brain and central nervous system cancers, leukemia, and lymphoma such that they may pose a risk for development of these cancers (Attachment G). The outcomes of this study will also assist in working towards viable solutions (such as lowering the instances of the mentioned potential health issues) in addressing nitrate concentrations through better monitoring as discussed in the 2025 NDEE Nitrate Study Report.
(https://dee.nebraska.gov/water/nitrate-drinking-water-study)

2. Meets the goals and objectives of an approved integrated management plan or ground water management plan:

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

   This Project will assist the TPNRD in meeting the goals and objectives of its Integrated Management Plan (IMP). The TPNRD's IMP was jointly adopted by the TPNRD and the Nebraska Department of Natural Resources on August 13, 2009 and updated on February 14, 2013. The first ten years (first increment) of the IMP concluded September 2019. The second increment IMP has been developed and became effective September 11, 2019, and will end in 2029.

   The TPNRD's IMP has the vision of "jointly managing and balancing water use and water supply while optimizing economic, social and environmental benefits for the near and long term", and the following goals:

   - **To incrementally achieve and sustain a fully appropriated condition while maintaining economic viability, social and environmental health, safety, and welfare of the basin.**
   - **To ensure that no act or omission of the TPNRD or the NeDNR would cause noncompliance by Nebraska with any interstate decree, compact, or other formal state contract or agreement.**
   - **Keep the IMP current, maintain consistency with the Basin-Wide Plan, and keep water users informed.**

   In the over appropriated area of the TPNRD, the goal of the IMP is to return the area to a fully appropriated designation and sustain it. It was determined that progress toward this designation would be benchmarked in ten (10)-year increments. Within the first increment of the IMP (September 2009- August 2019), a major goal of the TPNRD was to "address impacts of streamflow depletions to surface water appropriations and water wells constructed in aquifers dependent upon recharge from streamflow to the extent those depletions are due to water use initiated after July 1, 1997". The TPNRD is required by the IMP to provide annual accretions to the river equal to or exceeding the post-1997 depletion amount.

   This Project will assist the TPNRD in achieving all current goals by continuing to provide the data and tools required to assess progress toward the 1997 condition, thus ensuring that TPNRD does not act (or fail to act) in such a way as to cause noncompliance with any interstate decree, compact, or other formal agreement (most specifically, the Platte River Recovery

Implementation Program). Further, the continuation and improvement of the Ground Water Managers' Platform and Water Data Program (WDP) directly address the IMP's third goal, to keep water users informed.

The TPNRD has expended significant resources to meet the goals and objectives of the IMP since its adoption in 2009 and update in 2019. These efforts have included the issuance of a moratorium on new or expanded water well construction, requiring water users to certify their irrigated acres, the development of provisions for ground water transfers, and the establishment of an accounting system for municipal, industrial, and commercial water users. In addition, the TPNRD has attended basin-wide meetings and implemented several studies and data collection efforts to monitor progress toward meeting IMP goals. The TPNRD has also developed several Projects utilizing state and local funding to assist in meeting the IMP goals – including three WSF Projects supporting the original establishment and ongoing improvements to the Water Data Program. This Project will take the Water Data Program to truly the next level of informing precise and sustainable ground water use in the District's (and state's) largest use sector: crop irrigation. Providing growers with not only their daily use information but also, now, the crop's water needs in real time will allow for precise water application and further conservation of ground water – leading to additional accretions to the North Platte, South Platte, and Platte Rivers.

The TPNRD is currently updating the Groundwater Management Plan (GMP) which was last updated in 1995. This updated GMP outlines the creation of groundwater quality management areas where groundwater contamination exceeds 75 Percent of contaminants maximum contaminant load (MCL) set by the Environmental Protection Agency. (Attachment K) The updated GMP will use an expansive testing approach to delineate areas of groundwater contamination. (Attachment J) Under this expansive testing approach, the TPNRD will sample a particular set of wells identified as groundwater quality monitoring each spring. If a well exceeds 75 Percent of a contaminant's MCL (7.5 mg/L for nitrate), multiple nearby wells will be tested for the same contaminant. If those wells do not exceed the 75 Percent MCL threshold, there will be no additional testing in the area, but if a well exceeds the 75 Percent MCL threshold, the process will repeat until a GWQMA can be delineated. Furthermore, real-time nitrate probes would reduce the sampling demands of the TPNRD staff by providing the groundwater nitrate concentrations at the regulatory wells and could allow for a more efficient sampling operation each spring. Pairing the existing data presented in the Water Data Program with real-time nitrate probes will allow for the TPNRD to examine temporal trends in the groundwater nitrate concentration at a well. These temporal trends can be paired with the water use data collected daily at over 2,000 locations and could be coupled with farming operation plans and nitrogen use reports that will be required for areas of known groundwater contamination under the updated GMP. This pairing of

information will lead to a more granular approach to nutrient management and improving groundwater quality, as is a primary objective of the updated GMP.

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

   List the following information that is applicable:

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

   This Project adds to the overall water sustainability goals by increasing aquifer recharge, reducing aquifer depletion, or increasing streamflow. As shown by the preliminary 2023 Robust Review results, the Water Data Program has already led to reductions in ground water pumping sufficient to increase streamflow to such a degree that short-term planning targets (for stream accretions) are expected to be significantly lowered upon updates to the IMP. This has been a direct result of providing growers with their water use information daily. With the additional information provided by the final selected devices – in real time and at the field level – growers will now have the missing pieces of data they need to fully tailor their irrigation to their crops' needs and further reduce ground water pumping, producing even greater streamflow accretions.

4. 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;

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

   This Project will contribute to multiple water supply goals, including sustainable agricultural use, wildlife habitat, and conservation of water resources.

   Sustainable agricultural use and conservation of water resources are the cornerstone goals and products of the Water Data Program; the Program's entire purpose is to provide the actionable information to growers that they need to conserve ground water while optimizing its use for the benefit of

their crops. To date, this has been initiated – and now widely adopted – by providing growers simply with their water use data. The addition of data on the crops' water needs will provide the missing information that will allow growers to further tailor their usage to their crops' environmental conditions and water needs, leading to additional reductions in ground water pumping throughout the District.

These reductions in ground water pumping – which have already occurred in the four irrigation seasons since the Program first began delivering data to growers – also translate to reduced impact on streamflow. With the Platte River Recovery Implementation Program (PRRIP) in place, this also directly translates to both local and downstream improvements in the Associated Habitats Reach of the Platte River, providing improved habitat for the PRRIP target species – the interior least tern, piping plover, whooping crane, and pallid sturgeon.

5. Maximizes the beneficial use of Nebraska's water resources for the benefit of the state's residents:

   - Describe how the Project will maximize the increased beneficial use of Nebraska's water resources.
   - Describe the beneficial uses that will be reduced, if any.
   - Describe how the Project provides a beneficial impact to the state's residents.

   The TPNRD/NeDNR joint Integrated Management Plan (IMP) is focused in large part on achieving and maintaining a fully appropriated condition, rather than the current over appropriated condition of portions of the upper Platte River basin. Central to this is the concept of addressing impacts of streamflow depletions to the extent that those depletions are attributed to water use initiated after July 1, 1997; in other words, TPNRD must provide annual accretion (increased flow) to the North Platte, South Platte, and Platte Rivers equal to or greater than the depletions that have occurred relative to the 1997 level of development.

   To deliver these accretions to the Platte River system while maximizing the beneficial use of water resources requires TPNRD to strike a delicate balance. This was the purpose of the Water Data Program at its inception: to provide growers with the information they need, at their fingertips, to optimally exercise their right to use water for beneficial purposes but not to *over*-utilize that water to the extent that other beneficial purposes are damaged. This Project will now allow for the missing pieces of that information to be delivered at growers' fingertips, in real time, to fully bolster the achievement of that balance and push even more significant progress forward in achieving and maintaining a fully appropriated condition.

6. Is cost-effective:

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

In investigating similar alternatives, we found the costs for hardware (e.g., field-level weather stations) to be similar.

In addition, also to highlight the cost effectiveness and efficiency of this Project, as of January 2025, the TPNRD has been involved in a comparability study of other various water monitoring devices. The potential devices include Arable (Mark 3), Autonomous Pivot, Water Rite, Crop X, and Nave Analytics. In the end it is important that this Project will cover the costs for up to approximately 450 already tested devices which sense various environmental and plant parameters such as precipitation, relative humidity, evapotranspiration, crop water balance, heat stress, chlorophyll index, and canopy temperature in real time (Figure 2) for the District's growers.

The objective of this study is to compare the performance of different moisture monitoring systems to determine which system(s) offer the best value and accuracy for the growers within the TPNRD. This includes evaluating each system's accuracy, reliability, ease of use, and impact on water conservation practices. The data gathered will help TPNRD determine which system(s) to cost-share with local growers, ensuring effective allocation of funds.

At the end of the growing season, Twin Platte NRD will have a detailed report that includes:

- **A comparison of the water applied versus recommended water usage (if recommendations were provided by the systems).**
- **Benchmarks for each grower in relation to the average water use within the Twin Platte NRD.**
- **An analysis of the performance, strengths, and weaknesses of each system, based on data collected and grower feedback.**

Before the comparability study, Arable and Ethos Connected already determined that the Mark 3 data can be transmitted through the Ethos Connected LoRaWAN network. This helps by not adding additional costs of setting up a new network or even new online dashboard.

Leveraging the existing – and widely popular – Water Data Program/Ground Water Managers' Dashboard clearly represents the least-cost option for delivery of extremely robust data to growers and TPNRD staff.

The next best alternative to deployment of the continuous nitrate probes at existing monitoring wells would require an extreme level of staff participation to collect *daily* nitrate grab samples, send these samples for analysis, and enter and assimilate the data once available. Further, the cost of daily nitrate analysis for 135 monitoring wells for three years (the life of the proposed WSF Project) would be $1,219,556.25 – this represents only laboratory analysis fees and far exceeds the cost of purchasing continuous nitrate probes and transmitting the data into the Ground Water Managers' Platform for these same wells.

The proposed Project is not only significantly more cost effective than any other alternative, but it will also provide TPNRD staff and growers the necessary information to manage both water quantity and quality more proactively. Further, building on the great success of the Water Data Program to date stands to launch TPNRD growers into truly the next era of agricultural water management in the digital age, and serve as examples for growers across Nebraska.

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

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

   The proposed Project will assist the State of Nebraska in meeting its obligations under the Platte River Recovery Implementation Program (PRRIP), an interstate agreement between Nebraska, Colorado, and Wyoming. The TPNRD lies upstream of the critical habitat areas of the Platte River (known as the Associated Habitats Reach); impacts to flows must be quantified and limited within or above the reach. Both the Nebraska New Depletions Plan (NNDP; Attachment H), a component of the PRRIP Water Plan, and TPNRD's IMP require TPNRD to offset any new depletions to Platte River streamflow that have occurred since July 1, 1997.

   TPNRD's WDP has already provided significant progress toward the current-increment IMP targets for streamflow accretions by providing growers with their daily water use information. This Project will provide further progress toward those accretions targets by filling in the data gap: the crops' water

needs and field-level climate conditions in real time. Serving this information up to growers within the WDP – which all growers in the District are already using – will enable truly advanced on-farm management of irrigation water and, therefore, ensure the State meets its obligations under PRRIP.

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

   - Identify the property that the Project is intended to reduce threats to.
   - 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.
   - Identify the potential value of cost savings resulting from completion of the Project.
   - Describe the benefits for public security, public health and safety.

   With TPNRD being home to roughly 300,000 irrigated acres, the groundwater supply in the District is critically important to the State of Nebraska and to the United States. Without this supply, effects to public security, public health, and safety would be debilitating. The Water Data Program (WDP) has already demonstrated it is essential in promoting the sustainability of the ground water supply in the upper Platte River basin. Enhancing the TPNRD's ability to make informed decisions shifts the reactive management of the past to a proactive approach for the future.

   This proactive approach will be especially critical as Projected declines in ground water supplies contribute to uncertainties in future food security. A report released by the United States Department of Homeland Security's Office of Cyber and Infrastructure Analysis titled Analysis of High Plains Resource Risk and Economic Impacts (see Attachment I) outlines the importance of the High Plains Aquifer to the country. The report analyzed how continued depletions of the High Plains aquifer in Kansas and Nebraska might impact critical infrastructure and the economy at local, regional, and national levels. According to the report, ground water supplies in some areas of the TPNRD are Projected to face exhaustion in 100-200 years. How the TPNRD manages their supply in the present will dictate whether ground water is available in the future. The proposed Project is clearly beneficial to public security, public health, and safety by not only continuing to supply TPNRD with information on the current state of ground water availability in the District and how that might change over time, but also further encouraging the most significant users of ground water in the District to optimize their management of this vital resource and ensure its sustainability now and well into the future.

9. Improves water quality:

- Describe what quality issue(s) is/are to be improved.
- 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.
- Describe other possible solutions to remedy this issue.
- Describe the history of the water quality issue including previous attempts to remedy the problem and the results obtained.

Several areas in TPNRD – most notably the southwestern portion of the District – have experienced high levels of nitrate in ground water, just as many areas across the state have experienced the same. In the southwestern portion of TPNRD, these levels are sufficiently high, at 10 ppm or above, to prompt current consideration of designation of a Ground Water Quality Management Area covering more than 28,000 acres.

This Project will deploy continuous nitrate probes in 135 dedicated monitoring wells across the District, allowing for nitrate data to be delivered into the Ground Water Managers' Platform in real time. This will provide both TPNRD staff and growers nitrate concentrations across the District in such a way that the information is actionable: growers will know - at precisely the time they intend to fertilize - how much nitrogen has been or will be applied with their irrigation water and will therefore be able to adjust fertilizer application accordingly, reducing unnecessary fertilizer application and leaching of nitrate into ground water *and* saving themselves money.

Nitrate contamination in ground water has been an issue plaguing Nebraskans – in communities and on farms alike – for decades. As a contaminant, nitrate is ubiquitous in areas across the U.S. where corn is grown under irrigation in high quantities because fertilizer has remained a relatively inexpensive input, and preventing or remediating such a widespread nonpoint source of contamination is simply an issue that regulations have, to date, been unable to address. In this respect, TPNRD again proposes to use a proactive approach and rely again on the power of actionable information at growers' fingertips to induce the changes in behavior necessary to affect real change in the status of our ground water resources. The Water Data Program (WDP) has already produced real change in ground water quantity – we propose now to leverage that system to produce change in ground water quality.

Another effort currently taking place at the local level is the update of the TPNRD Groundwater Management Plan (GMP) which was last updated in 1995. This updated GMP outlines the creation of groundwater quality management areas where groundwater contamination exceeds 75 Percent of contaminants maximum contaminant load (MCL) set by the Environmental

Protection Agency. (Attachment K) The updated GMP will use an expansive testing approach to delineate areas of groundwater contamination (Attachment J). Under this expansive testing approach, the TPNRD will sample a particular set of wells identified as groundwater quality monitoring each spring. If a well exceeds 75 Percent of a contaminant's MCL (7.5 mg/L for nitrate), multiple nearby wells will be tested for the same contaminant. If those wells do not exceed the 75 Percent MCL threshold, there will be no additional testing in the area, but if a well exceeds the 75 Percent MCL threshold, the process will repeat until a GWQMA can be delineated. Furthermore, real-time nitrate probes would reduce the sampling demands of the TPNRD staff by providing the groundwater nitrate concentrations at the regulatory wells and could allow for a more efficient sampling operation each spring. Pairing the existing data presented in the Water Data Program with real-time nitrate probes will allow for the TPNRD to examine temporal trends in the groundwater nitrate concentration at a well. These temporal trends can be paired with the water use data collected daily at over 2,000 locations and could be coupled with farming operation plans and nitrogen use reports that will be required for areas of known groundwater contamination under the updated GMP. This pairing of information will lead to a more granular approach to nutrient management and improving groundwater quality, as is a primary objective of the updated GMP.

Also, as of 2025, the Nebraska Department of Environment and Energy (NDEE) released a statewide report covering the Nitrate in Drinking Water Study. This study originated from the passage of LB 814 during the 2023 legislative session, at the request of Governor Jim Pillen. The goal of this study was to provide an analysis and recommend viable solutions for nitrate-affected drinking water. This proposed Project will help add to the solutions.

10. Has utilized all available funding resources of the local jurisdiction to support the program, Project, or activity:

- Identify the local jurisdiction that supports the Project.
- List current property tax levy, valuations, or other sources of revenue for the sponsoring entity.
- List other funding sources for the Project.

The local jurisdiction that supports this Project is TPNRD; TPNRD could support the proposed Project as evidenced by the budget provided for fiscal year 2025 and projections through fiscal year 2029 (see Attachment A). Attachment A also shows TPNRD's expenditures on the Water Data Program to date, clearly demonstrating the District's strong commitment. There are also ongoing funded programs such as the GiSC and Open ET. The TPNRD also has received in the past Bureau of Reclamation grants to help with various water devices. TPNRD also supports this Project through tax levy authority. The current tax levy for the TPNRD is 1.7533 ¢ per $100.00 valuation.

11. Has a local jurisdiction with plans in place that support sustainable water use:

- List the local jurisdiction and identify specific plans being referenced that are in place to support sustainable water use.
- Provide the history of work completed to achieve the goals of these plans.
- List which goals and objectives this Project will provide benefits for and how this Project supports or contributes to those plans.
- 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.
- List all stakeholders involved in Project.
- Identify who benefits from this Project.

The local jurisdiction, TPNRD, has multiple plans in place that support sustainable water use, including an Integrated Management Plan (IMP) and a Ground Water Management Plan. The current increment of the TPNRD/NeDNR joint IMP became effective September 11, 2019. TPNRD's Ground Water Management Plan – currently in revision – was adopted on December 14, 1995 (see Attachment K).

TPNRD's IMP has the vision of "jointly managing and balancing water use and water supply while optimizing economic, social and environmental benefits for the near and long term, and the following goals:

- **To incrementally achieve and sustain a fully appropriated condition while maintaining economic viability, social and environmental health, safety, and welfare of the basin.**

- **To ensure that no act or omission of the TPNRD or the NeDNR would cause noncompliance by Nebraska with any interstate decree, compact, or other formal state contract or agreement.**
- **Keep the IMP current, maintain consistency with the Basin-Wide Plan, and keep water users informed.**

In the over appropriated area of the TPNRD, the goal of the IMP is to return the area to a fully appropriated designation and sustain it. It was determined that progress toward this designation would be benchmarked in ten-year increments. Within the first increment of the IMP (September 2009- August 2019), a major goal of the TPNRD was to "address impacts of streamflow depletions to surface water appropriations and water wells constructed in aquifers dependent upon recharge from streamflow to the extent those depletions are due to water use initiated after July 1, 1997." The TPNRD is required by the IMP to provide annual accretions to the river equal to or exceeding the post-1997 depletion amount.

This Project will assist the TPNRD in achieving all current goals by continuing to provide the data and tools required to assess progress toward the 1997 condition, thus ensuring that TPNRD does not act (or fail to act) in such a way as to cause noncompliance with any interstate decree, compact, or other formal agreement (most specifically, the Platte River Recovery Implementation Program). Further, the continuation and improvement of the Ground Water Managers' Platform and Water Data Program directly address the IMP's third goal, to keep water users informed.

The TPNRD has expended significant resources to meet the goals and objectives of the IMP since its adoption in 2009 and update in 2019. These efforts have included the issuance of a moratorium on new or expanded water well construction, requiring water users to certify their irrigated acres, the development of provisions for ground water transfers, and the establishment of an accounting system for municipal, industrial, and commercial water users. In addition, the TPNRD has attended basin-wide meetings and implemented several studies and data collection efforts to monitor progress toward meeting IMP goals. The TPNRD has also developed several Projects utilizing state and local funding to assist in meeting the IMP goals – including three WSF Projects supporting the original establishment and ongoing improvements to the Water Data Program. This Project will take the Water Data Program to truly the next level of informing precise and sustainable groundwater use in the District's (and state's) largest use sector: crop irrigation. Providing growers with not only their daily use information but also, now, the crop's water needs in real time will allow for precise water application and further conservation of groundwater – leading to additional accretions to the North Platte, South Platte, and Platte Rivers.

This Project will benefit all residents of the District – especially growers who receive moisture monitoring devices for deployment in their fields – as well as innumerable downstream residents and visitors as a result of the streamflow accretions attributed to reduced ground water pumping in TPNRD. The primary usage of water directly impacted by this Project is agricultural, although all water use types stand to benefit. Stakeholders include all residents of the District – again, especially growers – and downstream residents and visitors.

12. Addresses a statewide problem or issue:

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

This Project helps the state meet its obligations under the Platte River Recovery Implementation Program (PRRIP), which is clearly a statewide issue. This interstate agreement and its extensions have been signed by Governors, and the Legislature has provided a significant amount of general fund appropriations through NeDNR to implement PRRIP.

Nebraska's obligations are contained within the Nebraska New Depletions Plan (NNDP), a component of the PRRIP Water Plan. Generally speaking, the NNDP requires Nebraska to offset any depletions to Platte River streamflow that result from new or expanded uses that occurred subsequent to July 1, 1997. Successful implementation of PRRIP and the NNDP provides benefits to the approximately 500,000 irrigated acres in the Platte River basin that were developed after 1997. By successfully offsetting the impact of these irrigated acres, Nebraska's economy will benefit significantly by allowing those acres to remain in irrigated agriculture.

TPNRD has undertaken various management actions pursuant to their IMP in order to provide compliance with the NNDP, including the establishment of the Water Data Program. The Program has already proven successful in reducing ground water pumping and, therefore, providing streamflow accretions in accordance with meeting the NNDP and complying with PRRIP. With this Project, irrigators in TPNRD will be given a complete picture of their crops' water needs as well as their water usage, further helping them optimize their irrigation practices for water sustainability. This will provide direct benefits to the roughly 300,000 ground water-irrigated acres in TPNRD, as well as to residents across the state by ensuring adequate ground water and surface water supplies will be available into the future and the State will remain in compliance with PRRIP.

This project also helps with the viable solutions portion the current 2025 NDEE Nitrate in Drinking Water study report. As an example, by monitoring the direct levels of Nitrates, growers can limit their future levels of fertilizer during planting season.

13. 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:

    - List other funding sources or other partners, and the amount each will contribute, in a funding matrix.
    - Describe how each source of funding is made available if the Project is funded.
    - Provide a copy or evidence of each commitment, for each separate source, of match dollars and funding partners.
    - Describe how you will proceed if other funding sources do not come through.

    Attachment A provides the funding for the Water Data Program to date. Additionally. TPNRD is also aware of and prepared to submit a proposal to NRCS's Conservation Innovation Grant (CIG) program and is aware that these awards typically total $1-2 million. (Table 2)

Table 2. Funding Sources Other than WSF.

Funder	Amount
USDA NRCS – Conservation Innovation Grant Program	$1-2 million (planned)

14. Contributes to watershed health and function:

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

This Project will contribute to watershed health and function in the South Platte River, North Platte River, Birdwood Creek, and Platte River watersheds. Benefits to water quality and quantity will be realized across the entire TPNRD. This Project will provide the TPNRD staff and growers the information needed to make appropriate management decisions regarding water consumption, and actions to reduce aquifer depletions and increase streamflow as well as to reduce nitrate leaching to groundwater. Addressing the largest water quantity and quality concerns within District go directly to the heart of improving watershed health and function, not only for the area within TPNRD's boundaries but also for the upper Platte River basin and particularly the Associated Habitats Reach of the Platte River, downstream of TPNRD.

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

- Identify the date of the Annual Report utilized.
- List any and all objectives of the Annual Report intended to be met by the Project.
- Explain how the Project meets each objective.

Table 3. below, summarizes how this Project will meet the objectives of the Annual Report (dated 2022-2023).

Table 3. 2022-2023 Annual Report Objectives and How This Project Will Meet Them.

Objective	How Objective is Met by this Project
Objective 1B: Work collaboratively with other partner agencies to develop and improve the "best available science" to support policy decisions	The Water Data Program represents the innovative state-of-the-science solution to providing growers with actionable information that allows them to best manage water resources; enhancing this Program with **real time and tested** field-level crop water needs represents even stronger innovation
Objective 1C: Develop methods to distribute data	The Water Data Program is, at its core, an innovative data distribution method. **Also, the data works with 100% participation from stakeholders.**
Objective 3C: Support the continued compliance with all interstate water compacts, decrees, and agreements	By further encouraging reduced ground water pumping and resulting streamflow accretions, this Project will help ensure compliance with the Platte River Recovery Implementation Program (PRRIP)
Objective 4B: Work to streamline communication of key materials for consumption by diverse stakeholder groups	The Water Data Program is, and will continue to be, designed to deliver actionable information to growers in the most streamlined and user-friendly format **especially from cutting edge tested moisture monitoring devices.**
Objective 6A: Enhance the public dissemination of water-related data to support transparent and effective planning and mitigation of future risks	The Ground Water Managers' Platform, including the Water Data Program, does and will continue to provide information to all TPNRD residents on the status of ground water resources in the District – in terms of both quantity and quality – which is even more important since the **2025 NDEE Nitrate in Drinking Water Study Report.**

16. 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:

- Describe the federal mandate.
- Provide documentary evidence of the federal mandate.
- Describe how the Project meets the requirements of the federal mandate.
- Describe the relationship between the federal mandate and how the Project furthers the goals of water sustainability.

This Project will aid in meeting the requirements of a federal mandate called the Platte River Recovery Implementation Program (PRRIP). PRRIP is how the states of Colorado, Wyoming, and Nebraska are providing regulatory certainty with regard to the U.S. Endangered Species Act. The federally listed threatened or endangered least tern, piping plover, and whooping crane must be addressed under the Endangered Species Act. If PRRIP did not exist, other water management actions would be required of the states or individual water users on the Platte River. Nebraska's obligations are contained within the Nebraska New Depletion Plan (NNDP), a component of the PRRIP Water Plan. The NNDP requires Nebraska to offset any depletions to the Platte River streamflow that result from new or expanded uses that have occurred after July 1, 1997. TPNRD has undertaken various management actions pursuant to the IMP to provide compliance with the NNDP, with the Water Data Program being perhaps the most successful of these to date in terms of widespread reductions in ground water pumping that have led to greater streamflow accretions. This Project will further those accretions even more by providing additional data enabling growers to truly optimize their water use and ensure that over-pumping is not occurring, because they have the most current – real-time – data on their water usage and also the crops' water needs.