

**NEBRASKA NATURAL RESOURCES COMMISSION**

**Water Sustainability Fund**

Application for Funding

Section A.

**ADMINISTRATIVE**

**PROJECT NAME:** CNPPID E65 Elwood New Water Supply Siphon

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

Sponsor Business Name: Central Nebraska Public Power and Irrigation District (CNPPID)

Sponsor Contact's Name: Scott Dicke

Sponsor Contact's Address: 415 Lincoln St, Holdrege, NE 68949

Sponsor Contact's Phone: (308) 995-8601

Sponsor Contact's Email: [sdicke@cnppid.com](mailto:sdicke@cnppid.com)

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

**Grant** amount requested. \$ 8,982,946

- If requesting less than 60% cost share, what %? Enter if < 60% N/A

**If a loan is requested** amount requested. \$ N/A

- How many years repayment period? N/A
- Supply a complete year-by-year repayment schedule. N/A

2. Neb. Rev. 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. N/A
- What is the population served by your project? N/A
- Provide a demonstration of need. N/A
- 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 <input type="checkbox"/> Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
DNR Surface Water Right	N/A <input checked="" type="checkbox"/> Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
USACE (e.g., 404/other Permit)	N/A <input type="checkbox"/> Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
FEMA (CLOMR)	N/A <input checked="" type="checkbox"/> Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>
Local Zoning/Construction	N/A <input type="checkbox"/> Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Cultural Resources Evaluation	N/A <input type="checkbox"/> Obtained: YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
Other (provide explanation below)	N/A <input checked="" type="checkbox"/> Obtained: YES <input type="checkbox"/>	NO <input type="checkbox"/>

CNPPID has reviewed potential efforts needed associated with items listed above and has extensive experience fulfilling the requirements for the items listed with in-house capabilities with USACE correspondence and 404 permitting.

G&P –T&E consultation: CNPPID does not anticipate impacts to T&E species as a result of construction. However, prior to construction the NGPC and USFWS will be contacted to ensure any necessary compliance is met.

NeDNR Surface Water Right: CNPPID already has a water right for the E65 diversion to Elwood Reservoir and does not anticipate changes to the existing permit. CNPPID will consult with NeDNR to ensure the new siphon alignment is recognized.

USACE 404 Permit: A new siphon will need to be constructed beneath Plum Creek which is likely considered Waters of the United States; however, any impacts would be temporary during construction and thus the project would be categorized as a nationwide permit. During construction, there would be no loss to temporarily impacted wetlands associated with Plum Creek and wetland mitigation is not anticipated. It is possible that construction techniques that employ directional drilling can avoid all Waters of the United States.

Cultural Resources Evaluation: CNPPID has a Cultural Resources Management Plan Programmatic Agreement with the Nebraska State Historical Society (SHPO) and the Advisory Council on Historic Preservation (Council). A Cultural Resource Inventory was conducted as part of the CNPPID plan. Prior to construction, an additional Cultural Resources Review with the History Nebraska will be completed concurrently with any necessary USACE 404 permit.

Gosper County Zoning / Construction Permit: If applicable, a permit authorizing construction within the floodplain will be obtained.

FERC Approval: CNPPID will not require FERC approval for the new canal/siphon project alignment.

4. **Partnerships**

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

CNPPID is the sole project sponsor; however, hydrologic benefits of the Elwood Reservoir and the E65 system are experienced by several supporting agencies and organizations. Letters of support have been provided by the following organizations and are included as Attachment A:

- Tri-Basin NRD
- Nebraska State Irrigation Association (NSIA)
- Nebraska Water Resources Association (NWRA)
- Nebraska Game and Parks Commission (NGPC)
- Platte River Recovery Implementation Program (PRRIP)
- Central District Water Users Association (Water Users)

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

N/A

CNPPID will be responsible for design, permitting, and construction of the new E65 water supply canal/siphon project that delivers water to Elwood Reservoir and the E65 Canal. CNPPID would provide the 40% local match.

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.

The total cost of the project is \$14,971,575. There are no other funding partners contributing to the project. CNPPID intends to provide cash for the local share at 40%, or \$5,988,630. A breakdown of total cost is shown in Table 1 and a cost schedule is shown in Table 2. CNPPID has provided a letter of financial support in Attachment B.

Table 1 - Total Project Cost Summary

	<b>Cost Estimate</b>	<b>WSF Grant Request</b>	<b>CNPPID Cost Share</b>
		60%	40%
<b>Final Design and Construction Services</b>	\$1,282,325	\$769,395	\$512,930
<b>Land Acquisition</b>	\$600,000	\$360,000	\$240,000
<b>Permitting</b>	\$10,000	\$6,000	\$4,000
<b>Bidding and Contracting</b>	\$256,000	\$153,600	\$102,400
<b>Construction of Siphon &amp; Canal</b>	\$12,823,250	\$7,693,950	\$5,129,300
<b>TOTAL</b>	\$14,971,575	\$8,982,946	\$5,988,630

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!

The existing E65 siphons are critical infrastructure components for the CNPPID E65 irrigation canal works. The CNPPID E65 canal works provides water to 150 tenants at 414 separate diversion points, ultimately serving 42,000 irrigated acres. This canal/siphon project is solely responsible for water stored in the Elwood Reservoir, a 1,100-acre irrigation regulating reservoir that is also known for its trophy fishery. The existing siphons have been operational since 1941, and after 80 years of service, they are in a dilapidated condition. A new siphon alignment has been designed to address this essential aging infrastructure.

The “E65 Canal” starts at the Johnson Lake inlet and extends south approximately 6-miles before reaching the Carl T. Curtis Pump Station. The pump station consists of three 350-hp pumps with a combined capacity of 245-cfs which are used to fill Elwood Reservoir. Elwood Reservoir has an operational capacity of 24,715-acre-feet (AF) and total storage capacity of 40,000-AF. Before reaching the pumping station, the canal conveys water beneath three drainage areas and through three separate pipes (siphons) which are separated by open canal sections. Water travels through a total siphoned distance of over 7,000 linear feet through buried 78-inch (5,200 ft), 80-inch (505 ft), and 84-inch (1,558 ft) steel pipe. The maximum flow capacity is 350-cfs. Irrigation demand on the E65 system requires greater than 500-cfs. In order to meet the E65 Canal irrigation demand, water must be pumped into Elwood Reservoir for storage during the non-irrigation season and released for irrigation demands in the summer.

The Elwood Reservoir and E65 canal areas also provide substantial recharge annually, benefitting both the Platte and Republican Basin by enabling the areas to meet state and federal obligations including the Republican River Interstate Compact and efforts related to ESA compliance through PRRIP. The longest section (5,200 ft) of the existing siphon system has needed numerous repairs over the last 80 years. Because the siphon’s cathodic protection failed many years ago, a temporary coating was used to salvage some serviceability from the decaying steel pipe. However, this repair was made several years ago and it is not likely to last long-term.

A new alternative alignment, described within this project has been established that would eliminate the need for costly pumping and is approximately four miles shorter than the existing system. Installation of the new siphon secures the uninterrupted long-term delivery of water to the E65 system and ensures that irrigation, recharge, recreation, and wildlife benefits are maintained into the future. The planned delivery point for the new canal/siphon into Elwood Reservoir is at the north end of the reservoir and removes the need for pumps. Final design flows will be approximately 450 to 500-cfs.

Current irrigation releases would continue uninterrupted through the existing outlet structure during construction of the new canal/siphon project. The total distance of the new siphon is estimated to be approximately 5,400 feet of HDPE pipe with the canal section consisting of open channel with using a combination riprap and a synthetic liner.

Without the new canal/siphon project, a failure of the existing infrastructure would result in the loss of irrigation and the subsequent loss of the economy supported by this irrigation. In addition to the regional economic affect from lost agricultural income due to a failure, multiple ancillary or secondary benefits would be lost too, such as groundwater recharge and recreation. The E65 system is the source of water to Elwood Reservoir and the absence of a working siphon system would ultimately result in a dried-up reservoir. The absence of water in the reservoir would result in the loss of water-based recreation, a trophy fishery, and the important groundwater recharge to both the Platte and Republican Basins. The groundwater recharge provided to the Republican Basin is accounted as Imported Water Supply credit by the interstate Republican River Compact. It could be estimated that the E65 system provides nearly 10,000+ AF annually into Republican Basin which could not otherwise occur without a functioning E65 siphon. Offsets to streamflow depletion because of the absence of this recharge would need to come from other management actions such as pumping water from NCORPE or shutting down or allocating water used for irrigation.

Currently, CNPPID is financing the construction of a \$1-2 million project to repair the Elwood Reservoir dam. Dam leaks and unsafe seepage were discovered after the reservoir was operated at high water levels for longer periods of time to support the NeDNR, TBNRD, and PRRIP’s requests to use any extra available Elwood storage for groundwater recharge. CNPPID remains committed to ensuring the infrastructure is operational to maintain these ancillary benefits.

The Gering - Fort Laramie tunnel collapse is a lesson on aging critical infrastructure that illustrates the criticality of irrigation canal works for the delivery of water to secure irrigated agricultural economies. CNPPID’s E65 siphon is at the end of its useful life, and it is time to install a new canal/siphon. This proactive effort preserves the regional economic vitality supported by 42,000 irrigated acres along with the significant secondary benefits such as water-based recreation and groundwater recharge.

7. **Project Tasks and Timeline**

Identify what activities will be conducted to complete the project, and the anticipated completion date.

- 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 is shovel ready if funding becomes available upon final design. CNPPID is seeking funds from the Water Sustainability Fund for final design, permitting, and construction. However, it is likely that permitting will not be significant. The construction cost includes estimates for engineering oversight. The anticipated schedule summary is:

- January to October 2022 – Final Engineering Designs and Permitting
- November to December 2022 – Finals Bids and Contractor Selection
- January 2023 to July 2024 – Construction.

Table 2 - Total Project Cost by Year

Tasks	Year 1	Year 2	Year 3	Total Amount
	2022	2023	2024	
Final Design	\$641,163			\$641,163
Land Acquisition & Permitting	\$610,000			\$610,000
Bidding and Contracting	\$85,333			\$85,333
Construction and Construction Administration		\$11,029,442	\$2,605,638	\$13,635,079
<b>TOTAL PROJECT COST</b>				<b>\$14,971,575</b>

8. **IMP**

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

YES       NO       Sponsor is not an NRD

The CNPPID system supports both Integrated Management Plans (IMPs) and Basin-wide plans. Basin-wide Plans are jointly developed, adopted, and implemented by multiple NRDs and the NeDNR and IMPs must keep the State in compliance with Interstate Agreements, Compacts, Decrees (Ne Stat. 46-715(4)(b)).

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;

In 2021, CNPPID hired JEO Consulting Group, Inc (JEO) to develop a preliminary engineering design and to determine the feasibility of a new alignment for their existing E65 canal/siphon system, which delivers water for irrigation, from the Supply Canal at Johnson Lake to the Elwood Reservoir and E65 canal system. The new alignment would reduce the length of this critical canal/siphon system, eliminate the need to pump water from the existing canal/siphon into the Elwood Reservoir, and reduce the risk posed by the 80-year-old system to the irrigation water supply and other benefits provided to South Central Nebraska by this system. The new E65 canal/siphon project was evaluated and proved to be feasible. The full Feasibility Report has been attached to this application in Attachment C.

- 1.A.2 Describe the plan of development (004.01 A);

The existing E65 canal/siphon system has been serving the irrigation needs of approximately 42,000 acres in South Central Nebraska for approximately 80 years. The existing siphons have a capacity of 350-cfs. The E65 system's irrigation demand is over 500-cfs during the growing season. Currently the siphon's capacity must be supplemented to meet irrigation demand by releasing Elwood Reservoir water during the irrigation season. Ancillary benefits are also realized from Elwood Reservoir while supplementing the canal/siphon's capacity to provide the 500-cfs needed to supply irrigation needs downstream. These include groundwater recharge, recreation, and a trophy fishery.

This aging system has needed repairs in recent years such as the addition of a temporary coating to the existing steel siphon pipes to address corrosion issues. This coating was added because over time, the cathodic protection on the siphons necessary to prevent

corrosion has failed. Growing repair and efficiency concerns along with the warning that the Fort Laramie Tunnel Collapse of 2019 have led the CNPPID to look for a long-term solution that will secure irrigation within the E65 canal system and the existence of Elwood Reservoir.

The new E65 canal/siphon project will preserve the primary and ancillary benefits into the future. Upon funding of this vital project, CNPPID will contract an engineer to complete the final design of the new E65 canal/siphon. Design is planned to begin by January 2022 and will include gathering of detailed topographic survey, conducting a geotechnical investigation, and completing a wetland delineation along the new alignment. The proposed alignment will then be finalized based on any new discoveries from these field investigations. A final design plan set, and specifications will be completed by approximately August 2022. The new canal/siphon system will include:

- Approximately 2-mile-long canal/siphon system between Johnson Lake inlet and Elwood Reservoir. (Reduced from 4.5-miles in existing system),
- One siphon approximately 1-mile in length (reduced from current three siphons which total to approximately 7,000 feet),
- One diversion gate structure off the existing E65 canal,
- One gate structure at the siphon inlet,
- One siphon outlet structure,
- One gate structure at the new alignment outfall to Elwood Reservoir,
- One drain structure for siphon maintenance, and
- Elimination of need to use pumps to fill the Elwood Reservoir.

Once design is completed it will be used to support permitting and land acquisition. This portion of the project is anticipated to be completed by November 2022. Permitting and compliance needs are anticipated to include:

- USACE Section 404 Permit
- Threatened and Endangered Species Consultation
- Cultural Resources Evaluation
- Gosper County Floodplain Permit
- NPDES Permit

Bidding and award of project are anticipated to be completed by January 2023. Construction is planned to begin Spring 2023 and anticipated to be completed in Summer 2024. Operation of the new E65 canal/siphon would begin by Fall 2024.



1.A.3 Include a description of all field investigations made to substantiate the feasibility report (004.01 B);

Field activities conducted during the feasibility and preliminary design of the proposed new canal/siphon alignment include:

- Initial site visit and
- Survey of proposed diversion and outfall.

These activities were supplemented by:

- Previously conducted geotechnical investigations for nearby projects,
- Correlation of site conditions to existing alignment of the E65 canal which has been in place for approximately 80 years with no complications due to soils,
- Data compiled in the 2014 Groundwater Mounding Study,
- Desktop investigations into topography, soil type, land cover, parcel boundaries, major utility crossings and other potential considerations.

During this process, no roadblocks were found to the feasibility of the proposed new E65 canal/siphon.

The design process will include the following field investigations:

- Detailed Topographic Survey
- Geotechnical Investigation
- Wetland Delineation

1.A.4 Provide maps, drawings, charts, tables, etc., used as a basis for the feasibility report (004.01 C);

The E65 system is shown in Figure 1 below. The system services 42,000 acres of irrigated cropland in Gosper and Phelps County.

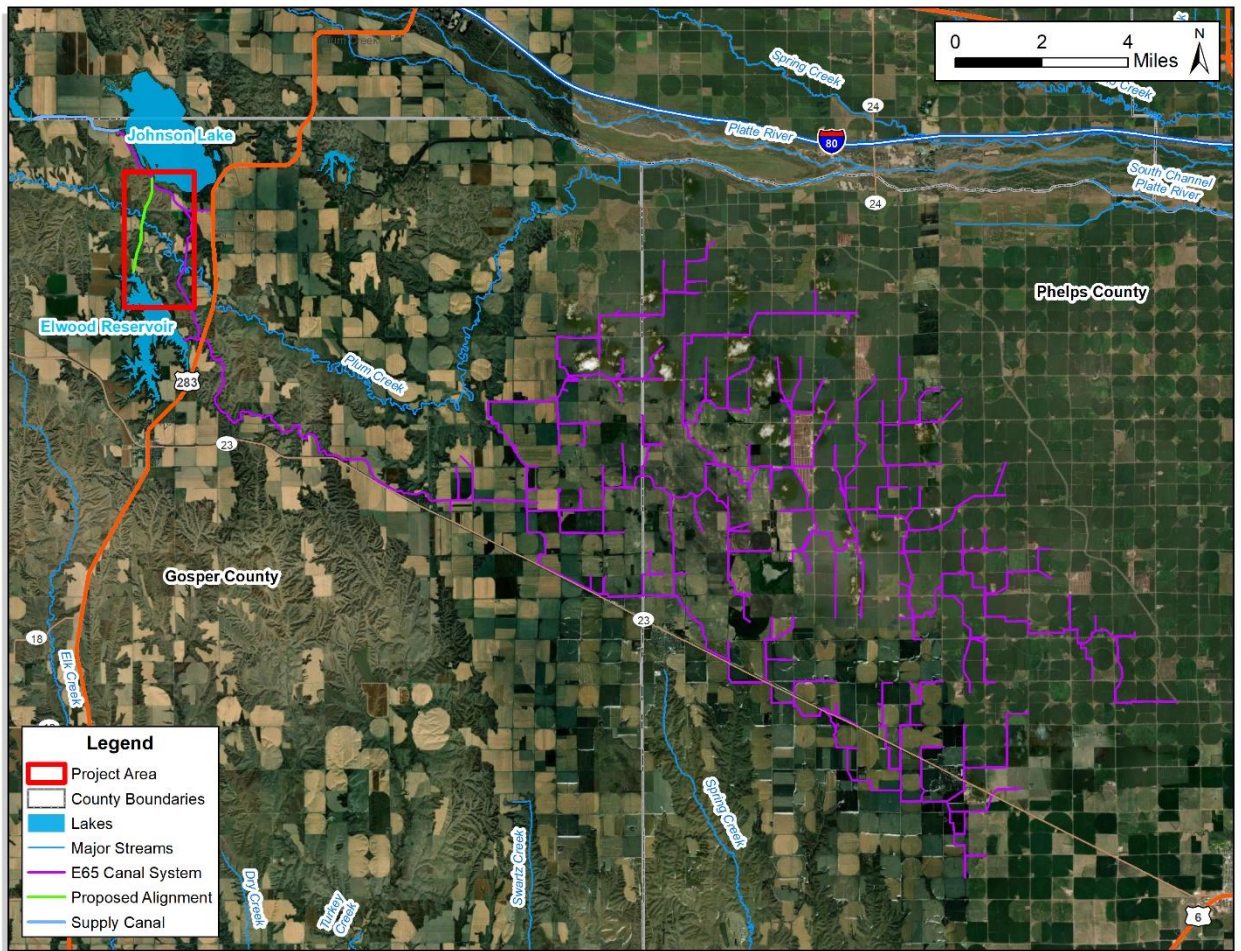


Figure 1 - E65 Service Area

The proposed new E65 canal/siphon system alignment totals approximately 2 miles long. The siphon section is approximately 1 mile long and the sections of lined canal at its upstream and downstream ends are approximately 1 mile in total. This new alignment utilizes approximately 1.5 miles of existing open canal south of the Johnson Lake diversion. The proposed alignment is significantly shorter than the existing 4.5-mile-long alignment beyond the proposed diversion. This new alignment also eliminates the need for the pumping station at the Elwood Dam. Figure 2 shows the new alignment in comparison to the existing alignment.

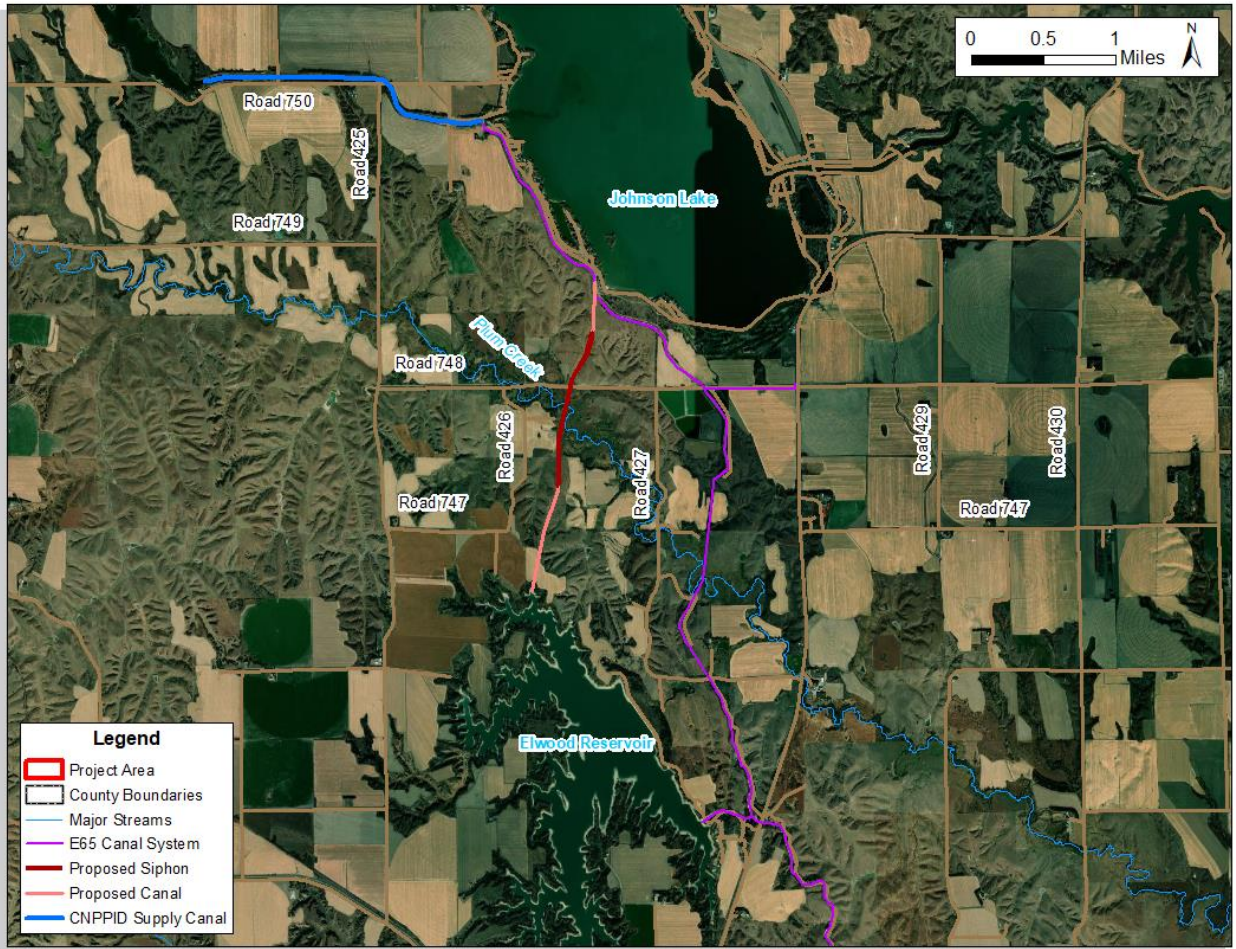


Figure 2 - Proposed New E65 Alignment

The main technical evaluative criteria to the feasibility of the proposed E65 alignment is the total available head along the alignment and the potential head losses within the system. The total head within the proposed alignment is based on the water surface elevation at the new diversion and the outfall at Elwood Reservoir. Based on survey information gathered for the 2021 feasibility study, at the high water elevation, when 500-cfs is available, the total potential head is 14.8 ft. Table 3 outlines likely head loss scenarios based on siphon length, material, and structures. All scenarios are feasible as the head loss does not exceed the total head available in the system.

Table 3 - Head Loss Calculations

Head Loss within Siphon			
	Scenario 1	Scenario 2	Scenario 3
Material	Concrete	Concrete	HDPE
Number of Pipes	1	2	1
Length of Pipe (ft)	6000	6000	6000
Pipe Flow (cfs)	500	250	475
Pipe Hydraulic Diameter (in)	108	84	98.4
<b>Head Loss in Pipe (ft)</b>	<b>8</b>	<b>8</b>	<b>9</b>
Pipe Velocity (ft/sec)	7.9	6.5	9.0
North Canal Velocity (ft/sec)	5	5	5
South Canal Velocity (ft/sec)	4.6	4.6	4.6
<b>Entrance Loss (ft)</b>	<b>1.1</b>	<b>0.6</b>	<b>1.6</b>
<b>Exit Loss (ft)</b>	<b>2.3</b>	<b>1.3</b>	<b>3.1</b>
<b>Total Head Loss in Siphon (ft)</b>	<b>11</b>	<b>9</b>	<b>13</b>

Further maps can be found in the feasibility report included in Attachment C. Also attached to the Feasibility Report is a preliminary design plan set which details the elevations used in the head loss calculations. The proposed diversion and siphon inlet can be seen in Figure 3 and the remaining sheets are included in Attachment C.

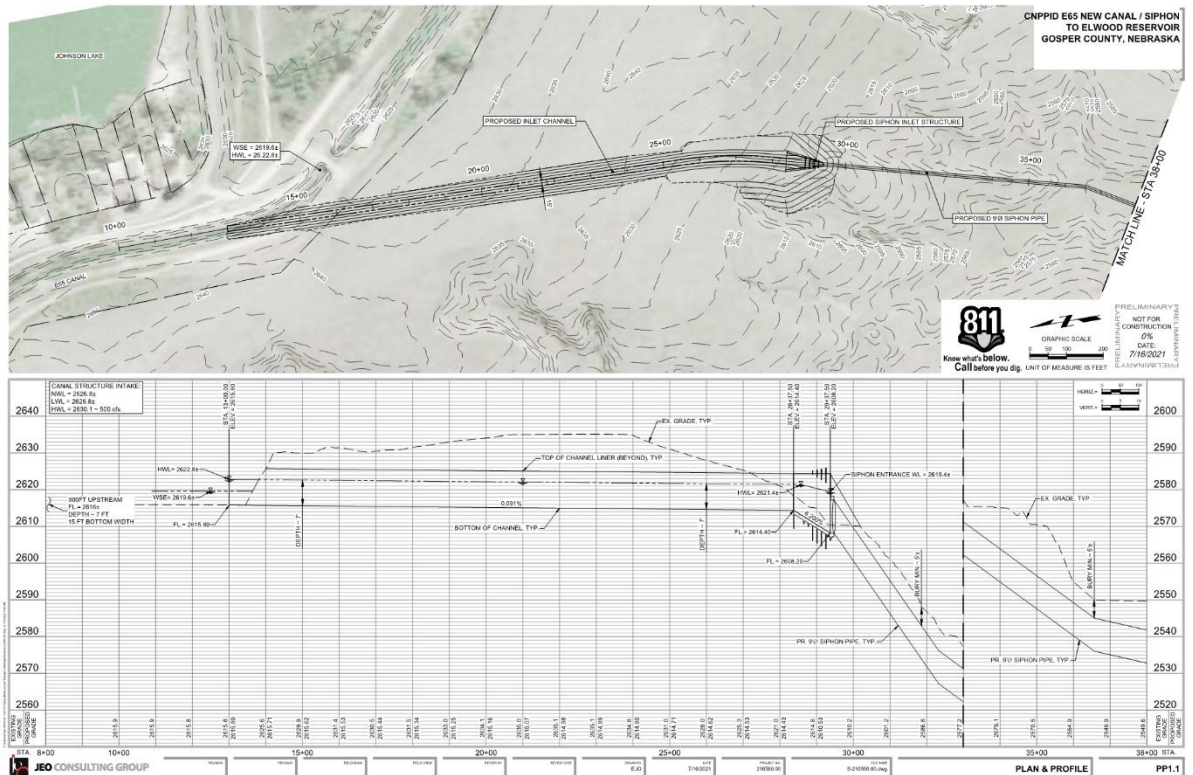


Figure 3 - Preliminary Design Plan and Profile Sheet 1.1

1.A.5 Describe any necessary water and/or land rights including pertinent water supply and water quality information (004.01 D);

No additional water rights will be needed for the implementation of this project. CNPPID has an existing surface water right and will work with the NeDNR to ensure that they continue to work within their existing right.

Additional land rights will be needed for the construction of this canal/siphon project. The alignment stretches across portions of 6 parcels currently owned by three separate owners: CNPPID and two private landowners. Both private landowners have been contacted about the potential of CNPPID project and grant submittal. These landowners have been shown the alignment and they have given a verbal go ahead to continue with the grant submittal. Final negotiations with these landowners will begin during final design. Current quantities for land acquisition are based on a 50-foot buffer from either the edge of the canal embankment or from the centerline of the siphon pipe. These quantities also consider access and soil spoil site needs. Final land acquisitions will be determined based on current landowner preferences, final design, soil spoil sites, and site access routes. See Figure 4 for a map detailing parcel location.

Table 4 - Land Acquisitions

<b>Parcel ID</b>	<b>Owner</b>	<b>Total Acres</b>	<b>Acres to Acquire</b>
370016696	Owner #1	362.09	25
370017374	Owner #2	431.41	35
370017390	CNPPID	126.29	5
370017331	Owner #2	306.08	5
370016718	CNPPID	191.24	5
370017366	Owner #2	132.75	35
<b>Total Owned</b>			<b>10</b>
<b>Total to Acquire</b>			<b>100</b>

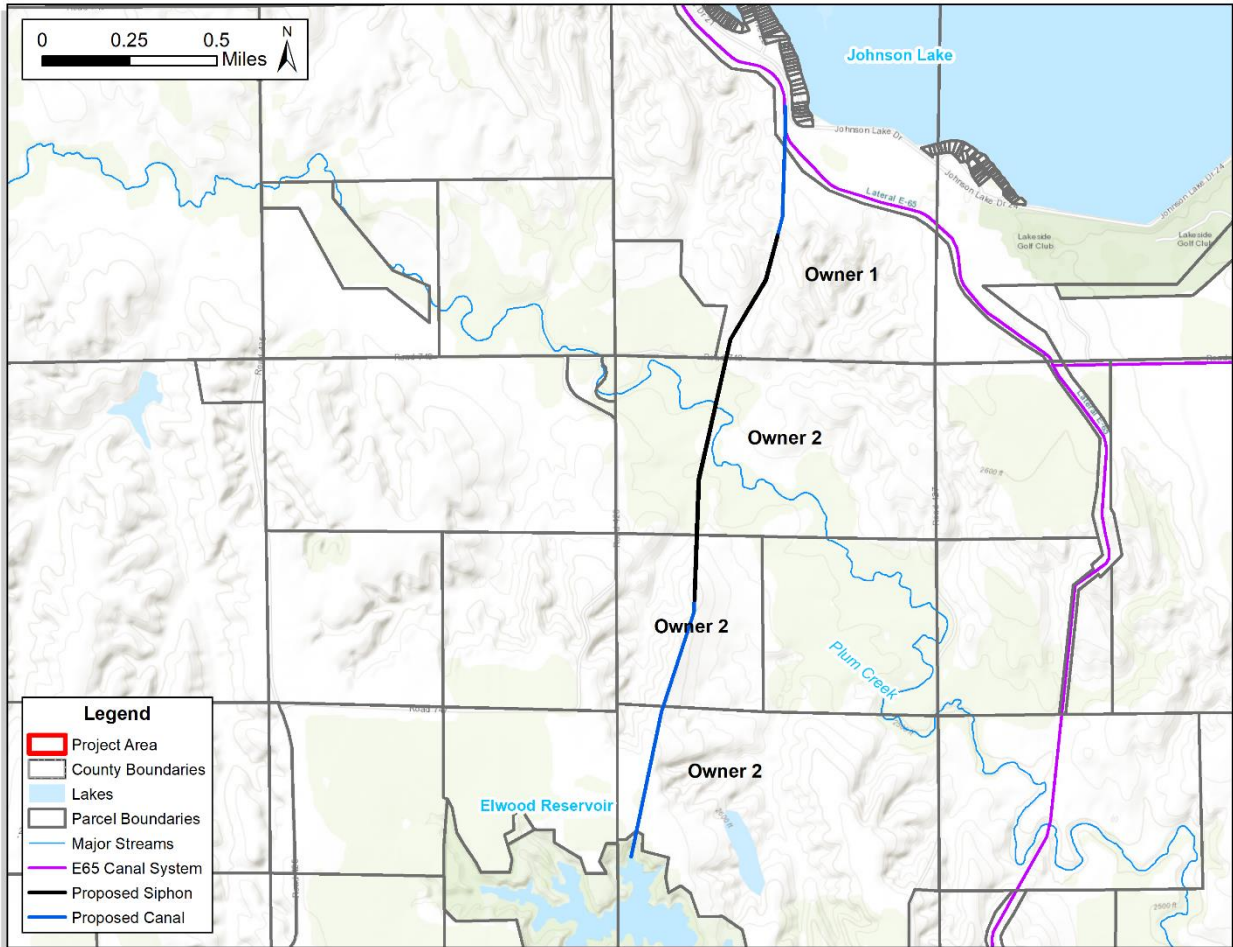


Figure 4 - Proposed New Alignment Parcel Boundaries

1.A.6 Discuss each component of the final plan (004.01 E);

There are two main components of the final plan: 1) an open canal and 2) an inverted siphon. These components and their respective structures as described below and shown in Figure 5. Additionally, access roads for regular maintenance of the system are part of this project.

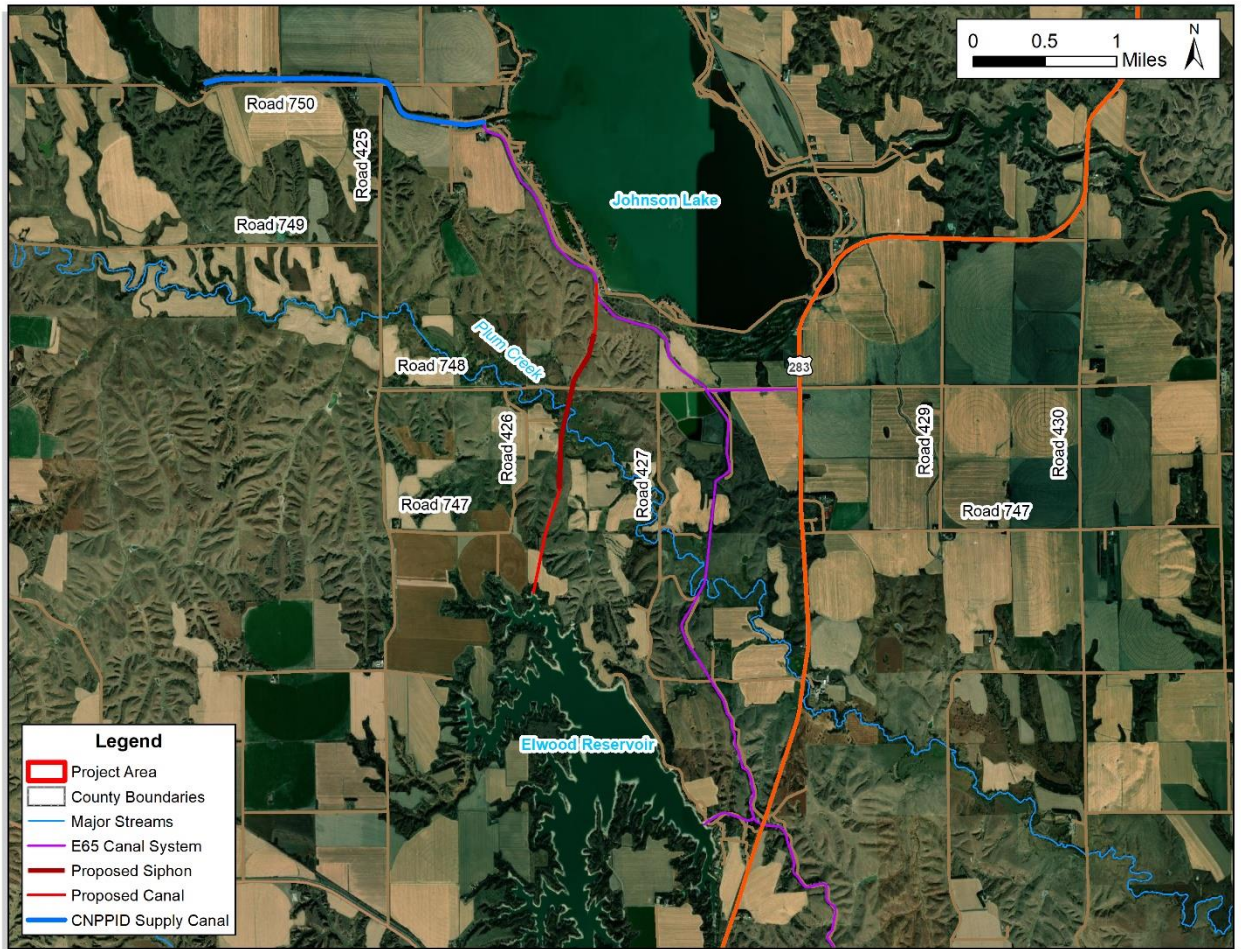


Figure 5 - Proposed Canal Siphon and Project Area

Open Canal – This will consist of two sections of lined canal at the upstream and downstream ends of the siphon. The open canal sections will be lined to reduce energy losses and infiltration losses within the canal. The upstream section of canal will be controlled by a diversion gate from the existing E65 canal. This diversion gate would control both the existing and proposed canals. The downstream canal would be controlled by a gate structure as well, which would be used to control the water surface elevation within the canal and Elwood Reservoir.

Inverted Siphon - This will consist of one or two large diameter pipes. Currently, the preferred material for these pipes is HDPE as this will minimize energy losses within the siphon, reduce maintenance needs, and increase the expected life of the project. The HDPE has a design life expectancy of 100 years. The siphon will have an inlet structure that reduces energy losses and have a gate structure to control flows within the siphon. There will also be an outlet structure to reduce energy losses along with at least one structure within the lower section of the siphon to allow it to be drained for maintenance.

1.A.7 When applicable include the geologic investigation required for the project (004.01 E 1);

A desktop geotechnical (geologic) investigation was completed for this project using USDA’s Natural Resource Center Web Soil Survey. This investigation showed that the soils within the project area show no signs of complication for the construction of the proposed canal/siphon project. Additionally, the soils along the proposed alignment are similar to those along the existing canal and siphon which have experienced no problems because of soils throughout its 80 years of service.

CNPPID has completed multiple studies near the project area which were reviewed to understand the conditions within the project area. The 2014 EA Groundwater Mounding Study provided an idea of groundwater levels along the alignment as seen in Figure 6 and Figure 7. Additionally, geotechnical findings from the construction of the Elwood Reservoir were examined to access the soil properties within the project area.

Detailed geotechnical evaluation will be a part of the final design. The geotechnical investigation will include soil borings, lab testing, slope stability analyses, and settlement analyses.

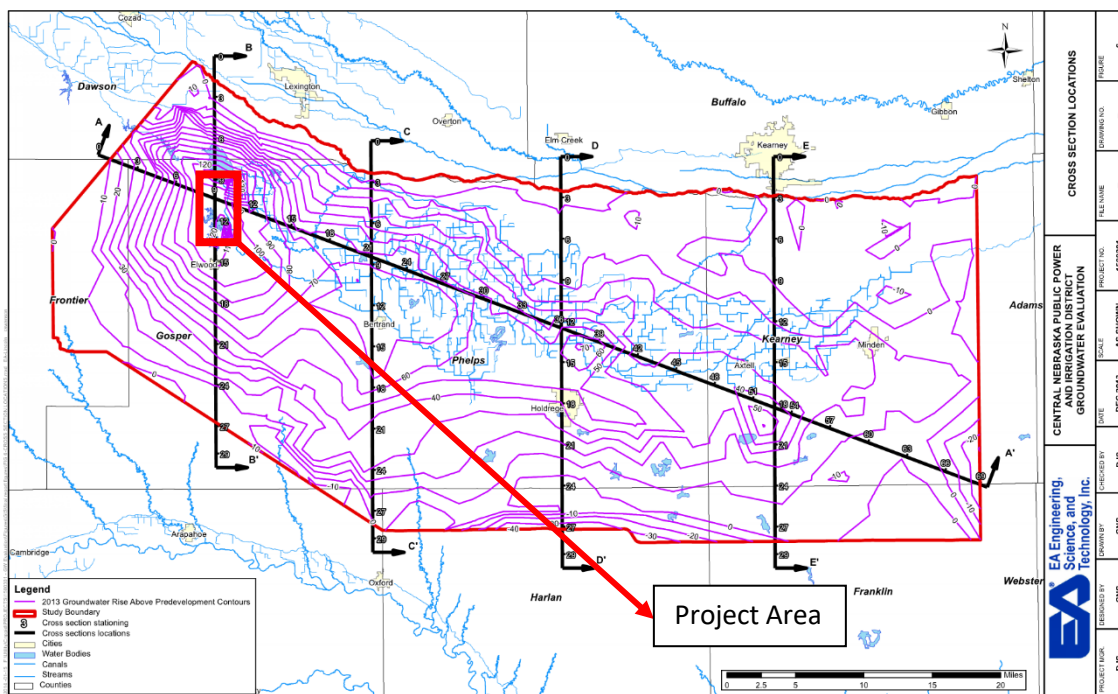


Figure 6 - Groundwater Mound Cross Sections





- Surface Hydrology – Existing drainage pathways should be maintained as close to existing as possible. No permanent impacts within floodplain or wetlands.
- Hydraulic Criteria – Head loss within siphon and associated structures will not exceed total potential head within the system.
- Velocity Criteria – Velocities within the siphon will not exceed 10-ft/s.
- Embankments - Slopes above the lined open canal sections will not exceed slopes recommended by geotechnical recommendations.
- Trailblazer Gas Pipeline – Separation of at least 2-ft will be maintained at the crossing and siphon will pass under the gas line.
- Road 748 – Will be replaced to match existing condition.
- Operations – Ability to run the canal/siphon during various water levels will be considered.
- Maintenance – Maintenance practices for various materials will be considered during the final design. Longevity of material along with frequency and ease of maintenance will be considered when selecting siphon materials and determining the placement of maintenance structure.

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

- 1.B.1 Insert data necessary to establish technical feasibility (004.02); [Click here to enter text.](#)
- 1.B.2 Discuss the plan of development (004.02 A); [Click here to enter text.](#)
- 1.B.3 Describe field or research investigations utilized to substantiate the project conception (004.02 B); [Click here to enter text.](#)
- 1.B.4 Describe any necessary water and/or land rights (004.02 C); [Click here to enter text.](#)
- 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). [Click here to enter text.](#)

### **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.

Three alternatives were initially considered to address the aging infrastructure within the E65 canal and siphon system. The alternative considered were:

1. Proposed New Alignment

2. Repair Existing Alignment
3. No Action

Of these three alternatives, the proposed new alignment was selected as it will meet the project purpose of ensuring a long-term, sustainable supply of irrigation water to the region served by the E65 system. Repair and no action would not meet the project goals of maintaining irrigation service to the E65 system, eliminating the need for pumping and increasing capacity. Both repair and no action are also likely to be far more costly. The next best alternative was repair of the existing system. Repair was eliminated because it does not meet the purposes of the project. Repairs on the existing system result in:

- Longer length of canal which increases cost
- Interruption of canal operations to perform repairs, and,
- Pumping would still be required to fill Elwood Reservoir.

To gain the additional capacity, both the canal and siphon sections of the existing system would need to be upsized, along with the replacement of multiple grade control structures throughout the 6-mile system. Construction of this alternative would likely interrupt two to three years of normal canal operation and thus directly impact the local economy. Other benefits such as water-based recreation and groundwater recharge would also be impaired for this duration.

No Action was eliminated as an alternative because the No Action alternative would eventually lead to either infeasibility of canal irrigation within this area along with the end to water for Elwood Reservoir, or a situation like the Ft. Laramie tunnel collapse which was declared a State Emergency. Ending irrigation along E65 would impact the local economy by reducing yields and increasing well pumping costs for the 42,000 acres supported by E65. The increased well irrigation and the loss of the recharge from the system would lead to groundwater declines. The effects of a no action alternative would be realized across South Central Nebraska. Impacts would likely include:

- Acute economic losses,
- Long-term losses of community well capacity,
- Reduction in Nebraska's imported water supply credit accounting for compliance with the RRC,
- Loss of a management action tool being utilized through Platte Basin Basin-wide and individual IMP's that support Nebraska's New Depletion Plan in accordance with PRRIP.
- Loss of a trophy fisheries and associated water-based recreation.

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, up to fifty (50) years; *or*, with prior approval of the Director up to one hundred (100) years, (Title 261, CH 2 - 005).

Economic feasibility was reviewed as a portion of the Technical Feasibility Report which is included in Attachment C (pg. 13 to 17). The period of analysis used for the feasibility of this project was 50-years. The proposed new E65 canal/siphon project preliminary design uses 2021 unit cost values from potential product vendors. Additionally, CNPPID records were used to determine costs presented in 3A. An economic analysis, using long term average crop yields and commodity prices along with an IMPLAN economic input-output model, were performed to determine the potential impact of a E65 failure. This economic analysis and CNPPID Elwood pumping station records were used to determine the direct irrigation benefits presented in 3B.

- 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 following conceptual opinion of cost was developed during the feasibility study for this project. This opinion of cost includes the total construction cost, land acquisition cost, and engineering design cost based on the preliminary design plan set.

Table 5 - Conceptual Opinion of Project Cost

ESTIMATE OF QUANTITIES					
Item #	Description	Unit	Quantity	Unit Price	Total
<b>CONSTRUCTION</b>					
1.	Mobilization	LS	1	\$575,000.00	\$575,000.00
2.	Bonding and Insurance	LS	1	\$200,000.00	\$200,000.00
3.	Temporary Traffic Control Measures	LS	1	\$1,000.00	\$1,000.00
4.	Clearing and Grubbing	ACRE	10	\$10,000.00	\$100,000.00
5.	Construction Entrance	EA	10	\$3,500.00	\$35,000.00
6.	Miscellaneous Site Grading	LS	1	\$50,000.00	\$50,000.00
7.	Canal Excavation, Spoil On-Site	CY	363,000	\$5.00	\$1,815,000.00
8.	Geosynthetic (Liner)	SY	48,000	\$18.00	\$864,000.00
9.	Canal Diversion Structure w/ Gates	LS	1	\$275,000.00	\$275,000.00
10.	Siphon Intake Structure w/ Gates	LS	1	\$425,000.00	\$425,000.00
11.	98.4" HDPE Pipe	LF	5,400	\$950.00	\$5,130,000.00
12.	Siphon Outlet Structure	LS	1	\$200,000.00	\$200,000.00
13.	Canal Outlet Structure w/ Gate	LS	1	\$250,000.00	\$250,000.00
14.	Intermediate Access and Winter Drawdown	LS	1	\$100,000.00	\$100,000.00
15.	Rip Rap	TONS	2,500	\$75.00	\$187,500.00
16.	Seeding, Fertilizer and Mulch	ACRE	80.0	\$1,000.00	\$80,000.00
17.	Erosion Control (Wattles/Silt Fence)	LF	20,000	\$6.00	\$120,000.00
18.	Miscellaneous Items (dewatering, valves, manholes....)	LS	1,250,000	\$1.00	\$1,250,000.00
Construction Subtotal					\$11,657,500.00
Contingency				10%	\$1,165,750.00
<b>Total Opinion of Construction Cost</b>					<b>\$12,823,250.00</b>
<b>PROFESSIONAL SERVICES &amp; OTHER ASSOCIATED COSTS</b>					
1.	Land Acquisition (Acres)	100	\$6,000.00	\$600,000	
2.	Design Services (Engineering, Survey)		5.0%	\$641,163	
3.	Permitting		LS	\$10,000	
3.	Construction Administration Services (Engineering, Survey)		5%	\$641,163	
4.	Overhead (Legal, Fiscal)		2%	\$256,000	
Subtotal					\$2,148,325
<b>Total Opinion of Project Cost</b>					<b>\$14,971,575</b>

It is assumed that the annual operations and maintenance of the proposed canal and siphon will be approximately \$50,000. The life of the project for the purpose of economic analysis will be 50 years, though it is likely that the materials for this design, specifically

the HDPE pipe, will have a lifespan of 100 years. The construction timeline is estimated to be approximately 18 months. These costs are summarized in Table 6 below:

Table 6 - 50-Year Project Cost

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4-50	Total Amount
	2021	2022	2023	2024	2024-2070	
Preliminary Design	\$29,950					\$29,950
Final Design and Permitting		\$1,507,163				\$1,507,163
Construction and Construction Administration			\$8,976,275	\$4,488,138		\$13,464,413
Operation and Maintenance (Est. \$50,000/year)					\$2,350,000	\$2,350,000
<b>TOTAL 50-YEAR PROJECT COST</b>						<b>\$17,351,525</b>

- 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 benefit of this project is the avoidance of the economic losses due to a failure of the existing system and the reliable long-term delivery of irrigation water. This project also eliminates the need for pumping water to fill the Elwood Reservoir. The existing system’s pumping station currently incurs costs of \$95,000 annually to fill the Elwood Reservoir. Based on the economic analysis provided by the CNPPID the total economic losses caused by the E65’s eventual failure would be \$33.36 million and 99 jobs across the State of Nebraska. Table 7 below summarizes the total benefit of this project.

Table 7 - 50-Year Project Benefit

Benefit Items	Year 0	Year 1	Year 2	Year 3	Year 4 - 50	Total Amount
	2019	2020	2021	2022	2023-2069	
Elimination of Pumping (Est. \$95,000 per year)					\$4,465,000	\$4,465,000
Irrigation Related Benefits (Est. one time cost)					\$33,360,000	\$33,360,000
<b>TOTAL 50-YEAR PROJECT BENEFIT</b>						<b>\$37,825,000</b>

The secondary benefits of the proposed new E65 canal/siphon project are numerous. For example, groundwater recharge from the E65 system and Elwood Reservoir are important to the surrounding area. This recharged water supports two Basin wide plans (Platte and Republican) along with direct impacts to the Tri-Basin NRD and the PRRIP. Recharged water also benefits communities within the groundwater mound by safeguarding the quantity and quality of their water supply. Recreation benefits are also supported through the continued operation of the Elwood Reservoir along with continuation of the trophy fishery found here as well. Other secondary benefits include the upkeep of three Waterfowl Production Areas (WPA), namely Cottonwood, Victor Lakes, and Linder, which are located along the E65 canal/siphon system.

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).

Table 8 - Project Annual Cash Flow

Project Year(s)	Calendar Year(s)	Cash Flow Categories	Costs	Benefits
0	2021			
		Preliminary Design	\$29,950	
		Final Design and Permitting		
		Construction and Construction Administration		
		Operation and Maintenance		
		<b>Total Costs:</b>	<b>\$29,950</b>	
	<b>Total Benefits:</b>		<b>\$0</b>	
1	2022			
		Preliminary Design		
		Final Design and Permitting	\$1,507,163	
		Construction and Construction Administration		
		Operation and Maintenance		
		<b>Total Costs:</b>	<b>\$1,507,163</b>	
	<b>Total Benefits:</b>		<b>\$0</b>	
2	2023			
		Preliminary Design		
		Final Design and Permitting		
		Construction and Construction Administration	\$8,976,275	
		Operation and Maintenance		
		<b>Total Costs:</b>	<b>\$8,976,275</b>	
	<b>Total Benefits:</b>		<b>\$0</b>	
3	2024			
		Preliminary Design		

		Final Design and Permitting		
		Construction and Construction Administration	\$4,488,138	
		Operation and Maintenance		
		<b>Total Costs:</b>	<b>\$4,488,138</b>	
		<b>Total Benefits:</b>		<b>\$0</b>
4 — 50	2023 — 2069	Operation and Maintenance (Est. \$50,000/year)	<b>\$2,350,000</b>	
		<b>Total Costs:</b>	<b>\$2,350,000</b>	
		Elimination of Pumping (Est. \$350,000 per year)		\$4,465,000
		Irrigation Related Benefits (Est. one time cost)		\$33,360,000
		<b>Total Benefits:</b>		<b>\$37,825,000</b>
		<b>GRAND TOTAL COSTS</b>	<b>\$17,351,525</b>	
		<b>GRAND TOTAL BENEFITS</b>		<b>\$37,825,000</b>
		<b>BENEFIT:COST</b>	<b>2.18</b>	

- 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.)

A Benefit Cost Ratio has been calculated and is described above.

**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.

CNPPID has sufficient funds to pay for its 40% of costs. CNPPID is a public corporation and political subdivision of the state of Nebraska with ten-year average (2011-2020) operating revenues of approximately \$19,688,533 annually.

CNPPID has the authority under Nebraska Statutes Chapter 70 to develop rates for its customers to recover its share of the project costs. CNPPID operating revenue primarily consists of hydroelectric power generation, irrigation water sales, and lake lot leases. The CNPPID charter territory includes facilities in six counties extending east from Lake McConaughy in Keith County to irrigation deliveries near Minden, Nebraska in Kearney County.



Neb. Rev. Stat. 70-655 states in part: (1) Except as otherwise provided in this section, the board of directors of any district organized under or subject to Chapter 70, Article 6, shall have the power and be required to fix, establish, and collect adequate rates, tolls, rents, and other charges for electrical energy, water service, water storage, and for any and all other commodities, including ethanol and hydrogen, services, or facilities sold, furnished, or supplied by the district, which rates, tolls, rents, and charges shall be fair, reasonable, nondiscriminatory, and so adjusted as in a fair and equitable manner to confer upon and distribute among the users and consumers of commodities and services furnished or sold by the district the benefits of a successful and profitable operation and conduct of the business of the district.

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

CNPPID has sufficient funds to pay for its 40% of costs. CNPPID is a public corporation and political subdivision of the state of Nebraska with ten-year average (2011-2020) operating revenues of approximately \$19,688,533 annually. A letter of financial support can be found in Attachment B.

CNPPID currently covers the cost of operations and maintenance of the existing E65 canal/siphon alignment (which is two times larger than the proposed alignment and in its aged state has increased maintenance needs) The proposed new E65 alignment would enable all the maintenance costs for the existing alignment to be transferred to the proposed alignment.

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

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

The new E65 canal/siphon project will minimize impacts to the natural environment as the proposed project timeline is a proactive approach that will eliminate disruption to secondary benefits like fisheries, groundwater recharge, and WPAs supported by the E65 Canal system. Construction timing will be coordinated to avoid impacts to migratory birds during nesting seasons.

A U.S. Army Corps of Engineers (USACE) Clean Water Act (CWA) Section 404 nationwide permit will likely be required for regulated wetlands or other Waters of the United States (WOTUS) temporarily impacted during construction. A preliminary wetland review has been conducted. The proposed alignment has been modified to minimize impacts to WOTUS. Additionally, erosion control measures and proposed grading were designed to avoid affecting the existing wetlands.

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

As described above, CNPPID has the authority under Nebraska Statutes Chapter 70 to develop rates for its customers to recover its share of the project costs. CNPPID operating revenue primarily consists of hydroelectric power generation, irrigation water sales, and lake lot leases. A letter of support expressing financial assurance and authority to complete the project is found in Attachment B.

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

This project will contribute directly to meeting the goals and objectives documented in the TBNRD's IMP, PRRIP's Water Action Plan and indirectly to goals or actions of members participating in the Upper Platte Basin Plan, and Republican River Basin Plan. The E65 system contributes directly to the TBNRD and PRRIP goals for flows in the Platte River to support threatened and endangered species. Indirectly, the E65 Canal system meets a critical goal of maintaining compliance with the Republican River Compact through groundwater recharge. These actions help maintain a balance of groundwater and surface water uses, thus maintaining the ability to irrigate and support the local and state economies. Highlights of each plan or program known to be benefited include:

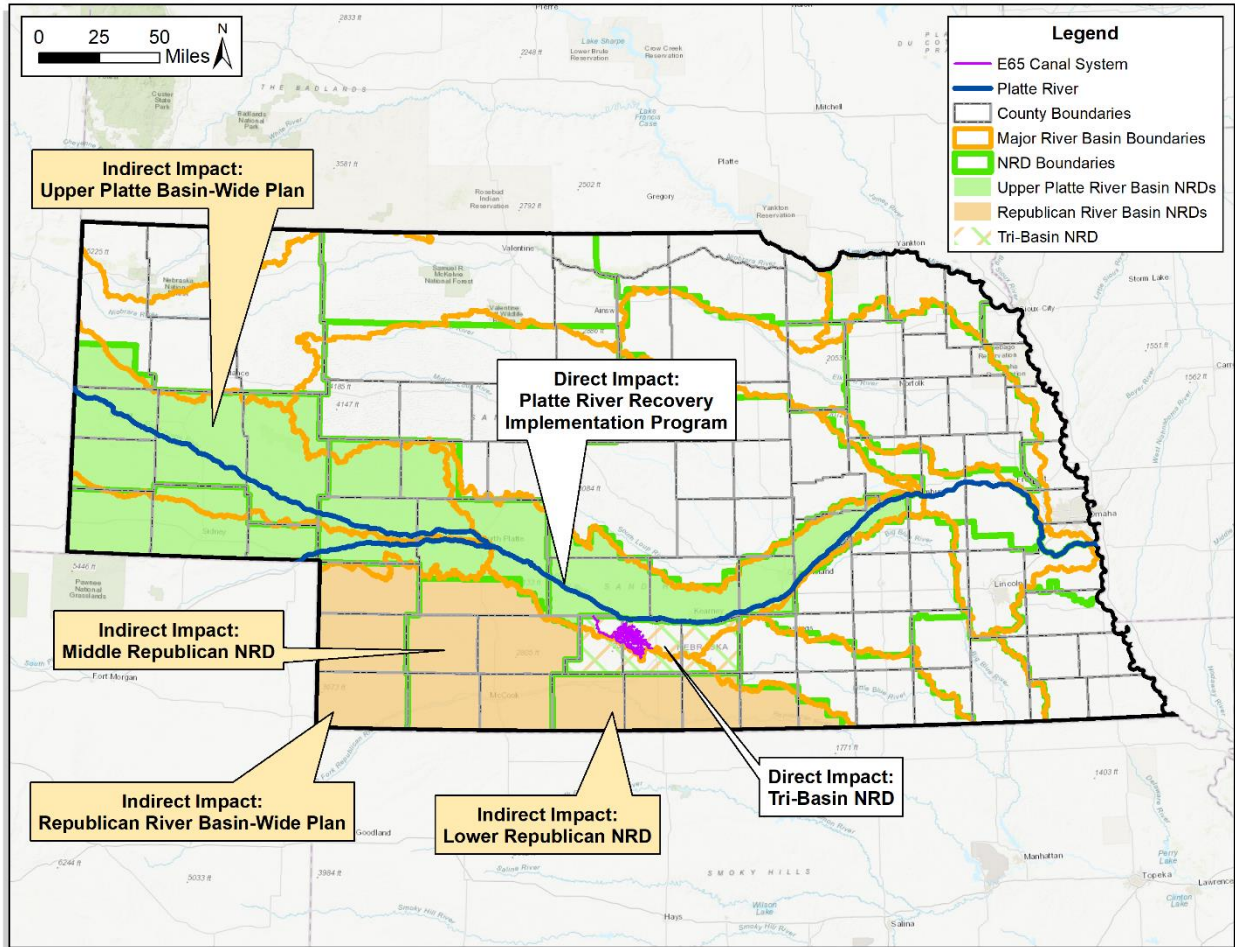


Figure 8 - Summary of NRD IMP and Basin Plan Benefits from CNPPID Operations

CNPPID works with TBNRD to divert excess flows from the Platte River to E65 and Elwood Reservoir. These diverted flows provide groundwater recharge and offset depletions to streamflow that result from pumping groundwater. More than 100,000 acres of cropland within the Upper Platte River Basin portion of TBNRD are irrigated with water diverted from the Platte River and distributed through the canals of CNPPID.

This project will help meet two interstate compacts or decrees on the Platte and Republican Rivers and help TBNRD to meet IMP goals.

Platte River Recovery Implementation Program (PRRIP)

The PRRIP utilizes federal, and state provided financial resources, water monitoring, and scientific monitoring and research to support T&E species that inhabit areas of the Central and Lower Platte rivers while allowing for continued agricultural water use and hydropower. The PRRIP is a partner of CNPPID’s specifically for recharge projects such as groundwater recharge projects on the Phelps County Canal and the Elwood Reservoir. CNPPID works with PRRIP on excess flow measurements and delivery for the program’s

goals. Recharge benefits of PRRIP projects benefit water management goals for the Platte River and Republican River.

Republican River Compact

Many of the Republican River’s tributaries originate in or pass through CNPPID’s district. Some of these tributaries, including Muddy Creek, Elk Creek, Turkey Creek and Spring Creek have base flow volumes that have increased through time. This increase is likely due to a rise in the groundwater table resulting from decades of irrigation and seepage from canals and reservoirs. Specifically, within the CNPPID’s district, this rise primarily came from the delivery and irrigation of surface water from the Platte River by CNPPID and its customers in the Platte Basin in Gosper, Phelps, and Kearney Counties. In fact, the increase in baseflows in these tributaries has been so significant that it has created annual credits in excess of 10,000 acre-feet annually in Republican Basin Compact Accounting for the State of Nebraska (TBNRD IMP within Republican River, 2012).

TBNRD IMP – Republican River Area

Goal A, Objective 2, of TBNRD’s IMP for the portion of the district in the Republican Basin states the following, “Develop and implement plans, in collaboration with CNPPID, its customers and other affected water users, that continue and, to the extent possible, increase groundwater recharge and stream baseflow enhancement from Platte Basin surface water supplies in amounts sufficient to sustain existing groundwater uses and to maintain imported water contributions to the Republican River Basin.” Elwood Reservoir contributes approximately 20,000 to 25,000 AF annually to the groundwater mound which contributes to stream baseflow and benefits to the Republican River Basin.

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.

There are a total of six parcels within the project area, two owned by CNPPID and four others owned by two separate owners along the new alignment as show in Table 9 . A map of the property boundaries is shown in Figure 9.

Table 9 - Land Acquisition

Parcel ID	Owner	Total Acres	Acres to Acquire
370016696	Owner #1	362.09	25
370017374	Owner #2	431.41	35
370017390	CNPPID	126.29	5
370017331	Owner #2	306.08	5
370016718	CNPPID	191.24	5
370017366	Owner #2	132.75	35
<b>Total Owned</b>			<b>10</b>
<b>Total to Acquire</b>			<b>100</b>

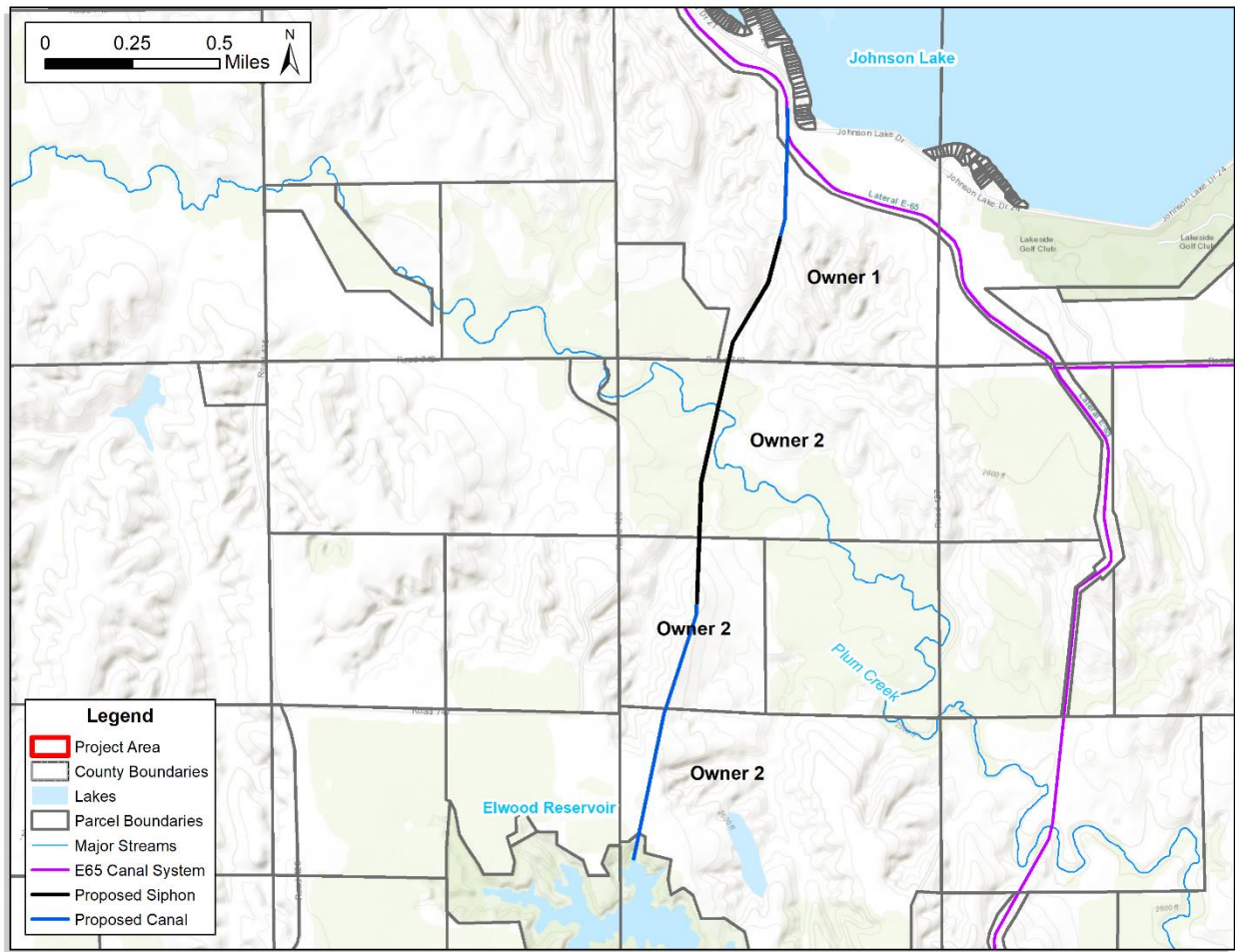


Figure 9 - Proposed New Alignment Parcel Boundaries

10.B Attach proof of ownership for each easement, rights-of-way and fee title currently held.

CNPPID’s deed for the property currented owned within the project area can be found in Attachment D – Supplemental Information.

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

CNPPID is currently working with two willing landowners to acquire either an easement or purchase of the necessary lands. Should negotiations fail with either landowner, CNPPID has the capability to utilize eminent domain.

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

CNPPID has the authority under Nebraska Statutes Chapter 70 to develop rates for its customers to recover its share of the project costs. CNPPID operating revenue primarily consists of hydroelectric power generation, irrigation water sales, and lake lot leases. A letter of support expressing financial assurance and authority to complete the project is found in Attachment B.

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

If the E65 canal/siphon new alignment project is not completed, multiple environmental and ecological consequences can be expected. Currently the existing E65 canal/siphon supports the Elwood Reservoir, three Waterfowl Production Areas (WPA), and is the main contributor to the groundwater mound in South Central Nebraska. If this project is not completed, the aging infrastructure will fail at some point. Failure of the E65 system will stop the flow of irrigation and recharge water resulting in the following consequences:

Elwood Reservoir – The Elwood Reservoir has no natural surface flows to it, thus within a few years, the reservoir would be dry. This would eliminate the productive fishery within the reservoir, eliminate wildlife habitat along the shore, and stop the recharge to the aquifer.

WPAs – The three WPAs supported by the E65 system are Victor Lakes, Linder and Cottonwood. These WPAs support the local and migratory waterfowl population through the creation of a cumulative 445 wetland acres. Not only do these areas support waterfowl, but also water quality through the maintenance of wetlands.

Groundwater – Per the 2014 EA Groundwater Mounding Study for South Central Nebraska, Elwood Reservoir and E65 have contributed approximately 60% of the existing groundwater mound. If this project is not completed, groundwater would likely begin to decline due to increased well pumping with no recharge to replace pumped water. Lower groundwater levels would likely cause the degradation of local wetlands and streams, which would reduce wildlife habitat.

## 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:

- 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 69 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.

A prominent area of groundwater rise is located and well documented in the vicinity of the lands irrigated by CNPPID facilities. This area is generally referred to as the CNPPID “groundwater mound” and covers most of Gosper, Phelps, and Kearney Counties. The groundwater mound has seen rises of up to 70-feet in Elwood, Bertrand, Holdrege, Axtell and 20 to 30-feet rises near Minden. Much of the rise is attributed to the E65 system. The

recharge provided by this CNPPID system is used by thousands of private wells and five municipalities including Elwood, Bertrand, Holdrege, Axtell, and Minden.

This groundwater recharge mitigates the threat to drinking water by diluting nitrate concentrations within the aquifer, providing a major benefit to municipal and private water supplies within an intensive agriculture area. Additionally, without this regular recharge from water from the Platte River, this area could be subject to severe declines in groundwater as seen in other heavily irrigated areas of Nebraska. The E65 recharge mitigates the threat to both drinking water quality and quantity.

The CNPPID system and resulting groundwater mound has increased baseflow to the Platte River which several downstream municipal supplies rely on for drinking water source. It is difficult to quantify the downstream municipal water supplies along the Platte River, however the numbers are substantial to Nebraska.

Accretion into the Republican River basin from the E65 system provides an excess of nearly 10,000 acre-feet annually of accounting credit for Nebraska for the Republican Basin Compact. Not only does this water support interstate compact compliance but it also provides a hydrologic source to alluvial systems that need drinking water. Many of the Republican Basin communities have public water supplies within or near the Republican River alluvium.



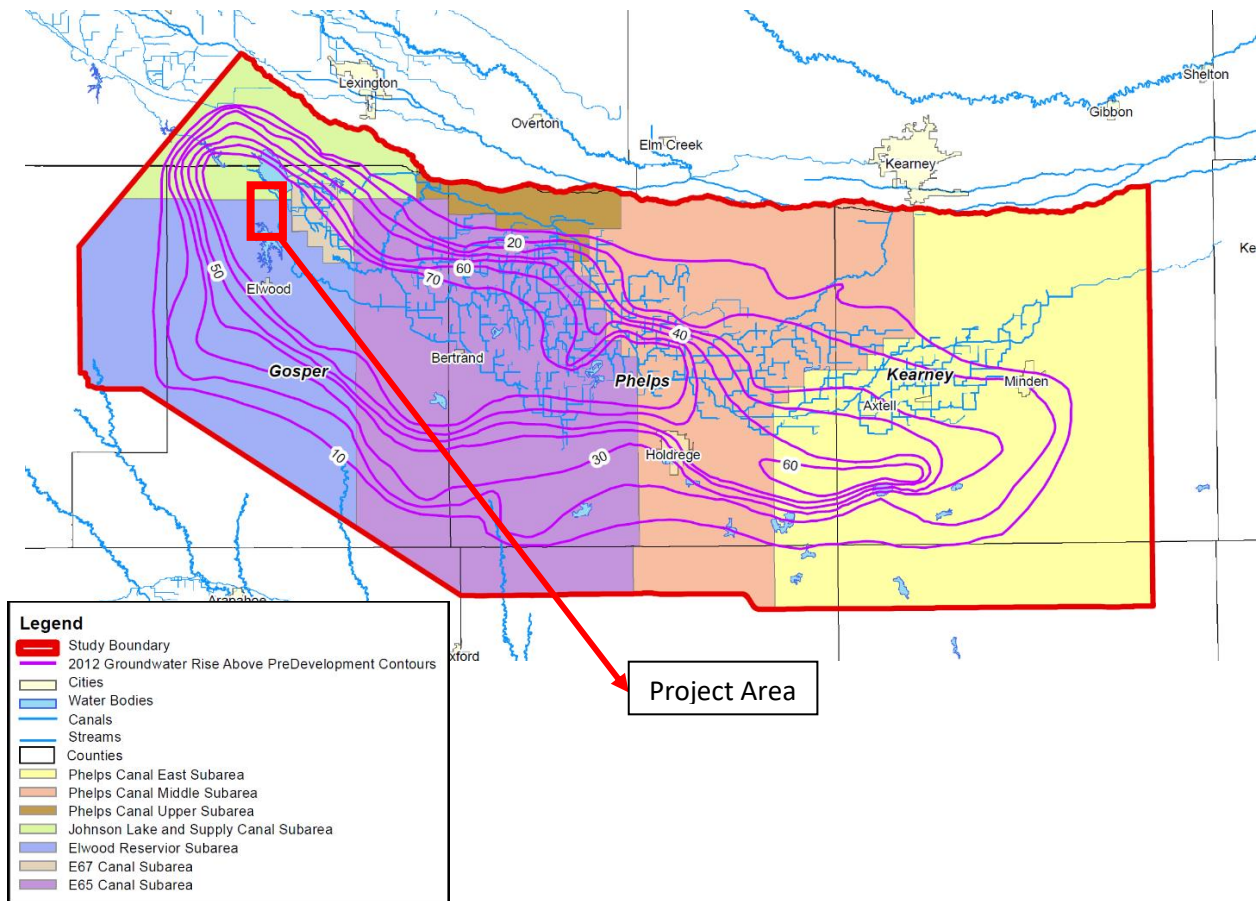


Figure 10 - CNPPID's Groundwater Mound

The long-range impacts from a failed or abandoned E65 siphon would result in lower groundwater levels and higher nitrate contamination. This threat to the quantity and quality of drinking water extends directly to Gosper, Phelps, and Kearney Counties and indirectly to all municipal well fields above the Missouri River Confluence.

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.

The CNPPID system is heavily involved to support Integrated Management Plans (IMPs). Additionally, the CNPPID system supports Basin-wide Plans that are jointly developed, adopted, and implemented by multiple NRDs and the NeDNR. IMPs must keep

the State in compliance with Interstate Agreements, Compacts, and Decrees (Ne Stat. 46-715(4)(b)). The CNPPID system supports both individual IMPs and Basin-wide plans.

The CNPPID system includes water storage facilities and canal systems that became operational nearly 80 years ago. The CNPPID system has provided significant groundwater recharge across Central Nebraska from operations. The area beneath CNPPID's irrigation system where long-term groundwater recharge has occurred is often referred to as the "Groundwater Mound." The CNPPID mound water provides benefits to both the Platte and Republican Basin's.

The Basin-Wide Plan for Joint Integrated Water Resources Management of Overappropriated Portions of the Platte River Basin, Nebraska (Upper Platte River Basin-Wide Plan (UPRBP)) second increment was effective in September of 2019. The adopted UPRBP included the Nebraska Department of Natural Resources (NeNDR) along with Natural Resources Districts (NRD) comprised of the Central Platte NRD, North Platte NRD, South Platte NRD, TriBasin NRD, and the Twin Platte NRD. The UPRBP details the important efforts related to all the benefits supported by CNPPID's system such as interstate compacts or decrees, recreation, water supply retiming, groundwater recharge and the important economic viability related to irrigated agriculture (Goal 1). The UPRBP quantifies efforts accomplished throughout the plan with CNPPID's system under goals and objectives action items that includes addressing aging canal works as part of the plans action items. All these benefits currently supported by the existing E65 siphons could be not be fully realized or would be lost with a siphon failure.

The Republican River Basin-Wide Plan (RRBP) was adopted in 2019 by the NeDNR and the Upper Republican, Middle Republican, Lower Republican, and Tri-Basin Natural Resources Districts (NRDs). The RRBP identifies the groundwater mound and the water accretions from the Platte River Basin into the Republican River Basin. This accretion, known as the Imported Water Supply, is an accounting credit to Nebraska that supports compliance with the Interstate Republican River Compact. Nebraska was able to receive the credit as counterclaim against Kansas at the United States Supreme Court in 2015. One of the key goals of the RRBP was to stay in compliance with the Republican River Compact. The E65 Canal System with Elwood Reservoir provides a substantial amount of water to the Republican Basin that supports the State of Nebraska and the Republican NRDs compliance with the RRC.

The Tri-Basin NRD overlays' three watersheds and has individual IMPs with the NeNDR for each of these watersheds. The approved Tri-Basin IMP for the Republican River basin, states that:

*"The Republican River originates in eastern Colorado and traces a course through southern Nebraska on the way to its confluence with the Kansas River. The Republican River does not pass through the Tri-Basin NRD, but approximately 40% of the district lies within the Republican watershed. Several tributaries of the Republican originate in or pass through the district. Base flows in some of these tributaries (Muddy Creek, Elk Creek, Turkey Creek and Spring Creek) have increased through time, likely due to a rise in the groundwater table. This rise resulted*

*primarily from delivery and irrigation with surface water from the Platte River by Central Nebraska Public Power and Irrigation District (CNPPID) and its customers in the Platte Basin in Gosper, Phelps and Kearney Counties. The increase in baseflows in these tributaries has been so significant that it has created annual credits in excess of 10,000 acre-feet annually in Republican Basin Compact Accounting for the State of Nebraska”*

Additionally, the Tri-Basin NRD Republican River IMP identifies Goal # 2 as:  
*“Develop and implement plans, in collaboration with CNPPID, its customers and other affected water users, that continue and, to the extent possible, increase groundwater recharge and stream baseflow enhancement from Platte Basin surface water supplies in amounts sufficient to sustain existing groundwater uses and to maintain imported water contributions to the Republican River Basin.”*

The Tri-Basin IMP for the Platte River Basin discusses management actions that used CNPPID’s system. These efforts include the diversion of excess flows from the Platte River into CNPPID’s Elwood Reservoir, canal systems, and the designation of federally owned Rainwater Basin wetlands to provide groundwater recharge that offset depletions to streamflow resulting from groundwater pumping. More than 100,000 acres of cropland within the Upper Platte River Basin portion of TBNRD are irrigated with water diverted from the Platte River and distributed through the canals of CNPPID. Action items in the Tri-Basin Platte River IMP have conjunctive management efforts working with surface water that can provide groundwater recharge and the retiming of water through excess flow diversions.

Between 2006 and 2021, the E65 siphons have conveyed the diversion of over 175,000 acre-feet of excess flows, to be retimed for increased streamflow. A portion of the water conveyed has been through the support of the Platte River Recovery Program (PRRIP). The Tri-Basin (Platte Basin) IMP and the Upper Platte Basinwide Plan work together to ensure compliance with interstate compacts and decrees such as Nebraska New Depletion Plan, in accordance with PRRIP.

CNPPID’s system support the efforts of both individual IMPs and Basin-wide IMPs. The E65 siphons specifically convey water to support both direct and indirect management efforts outlined in these plans. These efforts include groundwater recharge, excess flow diversions, compliance with interstate compacts and decrees, recreation, and the economic viability of irrigation. An E65 siphon failure would not allow CNPPID the capability to support these IMP’s and Basinwide planning efforts.

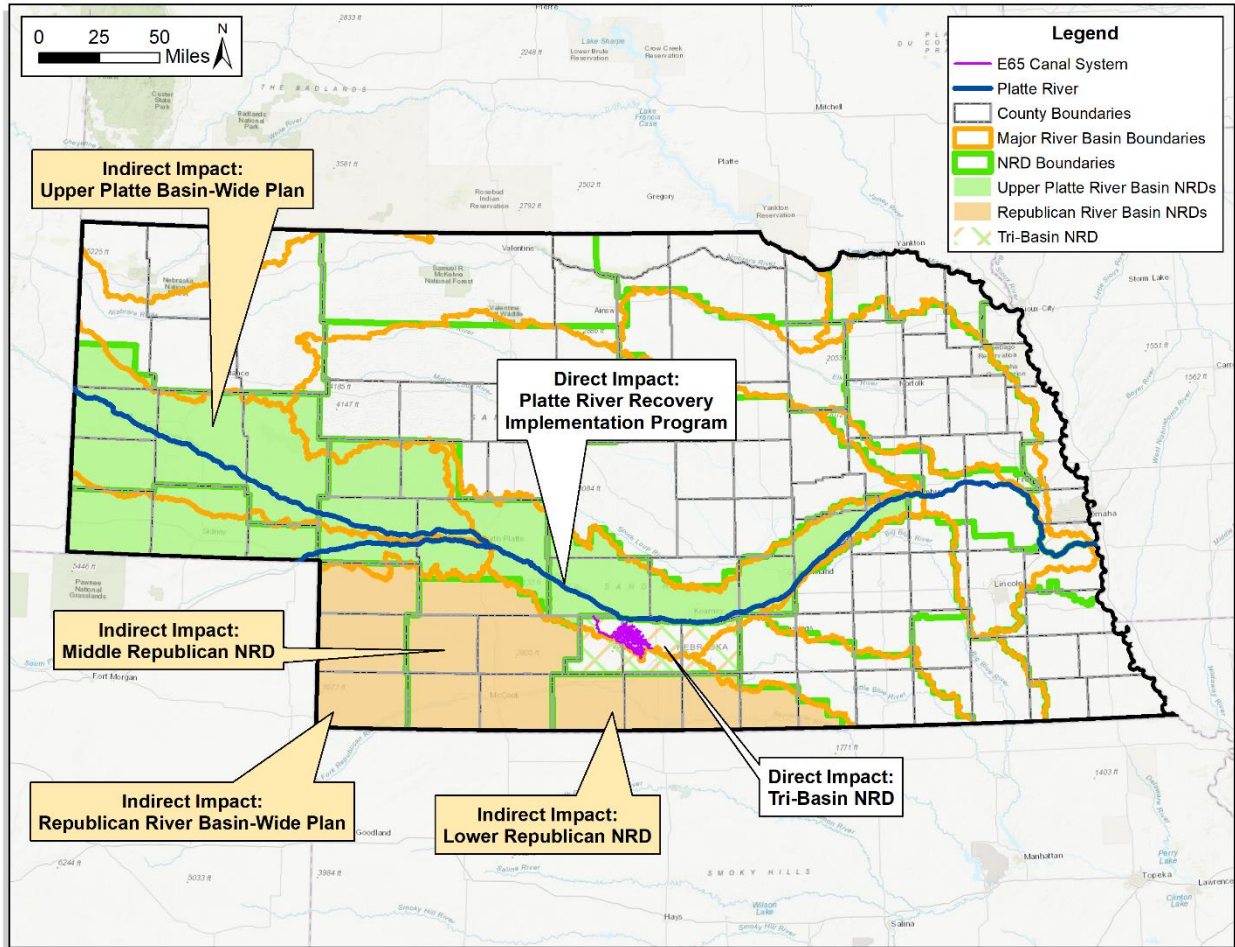


Figure 11 - Summary of NRD IMP and Basin Plan Benefits from CNPPID Operations

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.

The existing E65 Canal system has provided significant contributions to sustain Nebraska water resources over the past 80 years. If the E65 system were to fail or be abandoned, continued and future capabilities to sustain these water resources would not be fully realized or be completely lost.

A prominent area of groundwater rise is located and well documented in the vicinity of the lands irrigated by CNPPID facilities. This area is generally referred to as the CNPPID “groundwater mound” and in 2014 was subject to a detailed study completed by EA Engineering, Science & Technology (EA) to delineate the approximate boundary and volume.

- The groundwater mound study area, defined by studying historic groundwater rises, is approximately 1,620-square miles, or 1,036,800 acres.
- The area is generally from the Village of Elwood near the Frontier / Gosper County boundary to the southeast to Minden.
- Seven subareas were identified to represent areas of interest or key features. The subareas are as follows: Johnson Lake, Elwood Reservoir, E76 Canal, E65 Canal, Phelps Canal Upper, Phelps Canal Middle, and Phelps Canal East.
- The Elwood Reservoir subarea contains approximately 1,012,747 acre-feet (AF), or 26 % of the total.
- Elwood Reservoir itself provides recharge of up to 20,000 to 25,000-AF per year.
- The greater E65 subarea contributes 1,444,703-AF, or 37% of the total.
- Combined, the areas that will receive water from the new E65 to Elwood canal siphon contribute 63% of the water within the groundwater mound.

In 2021, CNPPID was preparing for the construction of a \$1M to \$2M project to fix leaks found in the main dam after the reservoir was being operated at higher water levels to support TBNRD and PRRIP’s recharge efforts. CNPPID remains committed to ensuring the infrastructure is operational allowing for continued benefits.

Table 10 - Estimated Contributions to the CNPPID Groundwater Mound

<b>Subarea</b>	<b>Area (sq. mi)</b>	<b>Area (acres)</b>	<b>GW Mound Volume (AF)</b>	<b>GW Mound Volume per Unit Area %</b>
E67	16	10,240	127,240	3%
Elwood Reservoir	250	160,000	1,012,747	26%
E65 Canal	387	247,680	1,444,703	37%
Johnson Lake	93	59,520	344,489	9%
Phelps Canal Middle	329	210,560	502,860	13%
Phelps Canal East	513	328,320	479,332	12%
Phelps Canal Upper	32	20,480	1,4543	0%
<b>Totals</b>	<b>1,620</b>	<b>1,036,800</b>	<b>3,925,914</b>	<b>100%</b>

Source: EA Engineering, Science & Technology, 2014

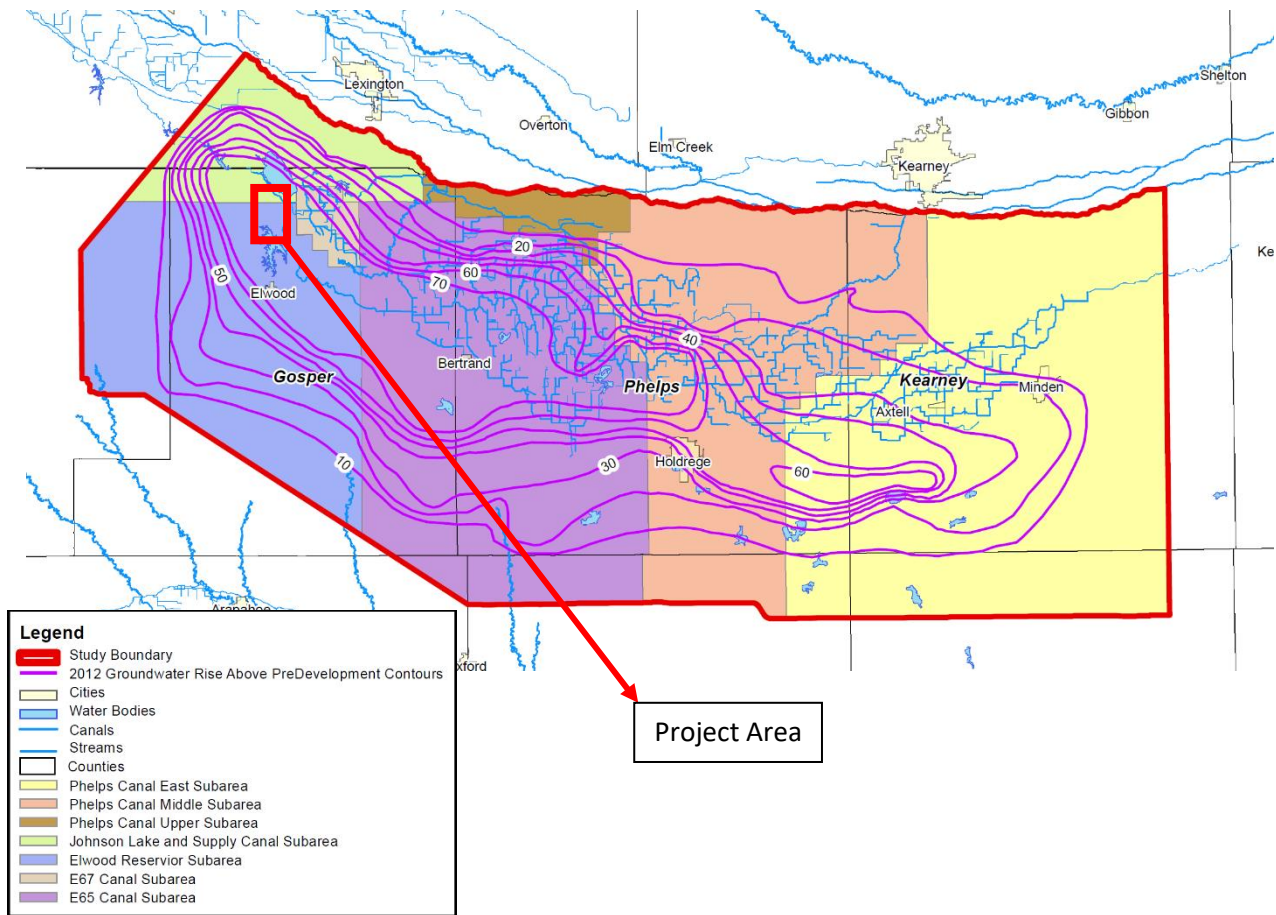


Figure 12 - CNPPID Groundwater Mound

According to the TBNRD, “The recharge has also contributed to documented increases in baseflow of several tributaries to the Republican River. Base flows in some of these tributaries (Muddy Creek, Elk Creek, Turkey Creek and Spring Creek) have increased through time, likely due to the groundwater mound. This rise resulted primarily from delivery and irrigation with surface water from the Platte River by CNPPID and its customers in the Platte Basin in Gosper, Phelps and Kearney Counties. The increase in baseflows in these tributaries has been so significant that it has created annual cross basin credits in excess of 10,000 acre-feet annually in Republican Basin Compact Accounting for the State of Nebraska,” (TBNRD IMP within Republican River, 2012). This cross-basin benefit is so important that the State of Nebraska filed a counterclaim against Kansas for credit and won in the United States’ Supreme Court in 2015. All three Republican NRD and TriBasin benefit from the Imported Water Supply Credit.

Platte River Recovery Implementation Program (PRRIP) Elwood Reservoir Recharge Project

In addition to serving as an irrigation water regulating reservoir, Elwood Reservoir also provides a mechanism to increase baseflows by recharging excess flows from the Platte River managed by the PRRIP. Elwood Reservoir is an unlined reservoir that acts as a

holding basin to allow excess flows to seep and recharge the alluvial aquifer. The PRRIP provides excess flows that are delivered through the E65 Canal to the Carl T. Curtis Pump Station, which pumps the water into Elwood Reservoir. The 2019 PRRIP work plan sites that the Executive Directors Office (EDO) estimates that 12,000-AF of excess flow is routed annually into Elwood for water budgeting purposes.

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.

Assuming the proposed E65 canal/siphon is installed it will provide the same benefits that have been realized by the existing canal/siphon system.

#### Flood Control

The E65 system has provided flood mitigation by diverting flows when the Platte River floods. This flood mitigation effort was realized on the most recent events along the Platte (2013 and 2019) Furthermore, the 450 to 500 cfs capacity provided by the proposed E65 canal/siphon will increase the potential for mitigating damages due to future flood events along the Platte River.

#### Agricultural Use

The existing E65 Siphon is critical infrastructure for the CNPPID irrigation canal works. The E65 siphon is solely responsible for water delivery to over 42,000 irrigated acres and for the existence of water placed into Elwood Reservoir.

The Fort Laramie tunnel collapse is a lesson on aging critical infrastructure to irrigation canal works and the delivery of water to secure irrigated agricultural economies. CNPPID's E65 water supply canal/siphon has exceeded its operational design life and it is time to install a new canal/siphon. This proactive effort preserves the regional economic viability along with the significant secondary benefits such as water-based recreation and groundwater recharge.

#### Municipal and Industrial Use

Water diverted from the Platte River by CNPPID, or its water management partners including TBNRD and PRRIP, provide retiming of excess Platte River flows through recharge at Elwood Reservoir, throughout the canal systems, and under fields benefiting from the available water. The new canal/siphon system providing water to Elwood Reservoir is critical to keep the existing system working in a sustainable manner.

The recharge provided by the CNPPID system is used by thousands of private wells and at least five municipalities for drinking water within the groundwater mound area. Without this regular recharge from Platte River water, this area could be subject to severe declines in groundwater as seen in other heavily irrigated areas of Nebraska.

In 2021, CNPPID was preparing for construction of a \$1 to 2 Million project to fix leaks found in the main dam after the reservoir was being operated at higher water levels to support TBNRD and PRRIP's recharge projects. CNPPID remains committed to ensuring the infrastructure is operational to maintain its many benefits.

#### Recreational Benefits and Wildlife Habitat

Elwood Reservoir inundates approximately 960-acres and provides a productive and diverse fishing spot for largemouth bass, smallmouth bass, spotted bass, channel catfish, blue catfish, black crappie, walleye, bluegill, rock bass, white bass, yellow perch, hybrid striped bass, and muskie. Located only 15-miles from Interstate 80, the area is a hot-spot for fisherman and includes a Wildlife Management Area maintained by the NGPC. The only hydrologic supply of water to the reservoir is from the E65 canal through a pumping station. The waterbody does not receive natural surface water runoff. The failure of the existing siphon and canal water supply would be detrimental to the recreation benefits currently provided.

Elwood Reservoir includes an approximate 800 acres of Wildlife Management Area (WMA) maintained as public hunting by the NGPC. Waterfowl blinds are allowed and the primary upland species include deer, pheasant, quail, and turkey.

CNPPID's also provides water through the E65 system to Cottonwood, Victor Lakes, and Linder Waterfowl Production Areas (WPA) in Phelps and Gosper Counties, a total of 819-acres of wetland areas, for waterfowl and groundwater recharge benefits (see Figure 13). Thus far, 1,764-AF of water has been placed into Victor Lakes over the last two years. In the near future, all three WPAs will receive water from E65, if excess flows are available.



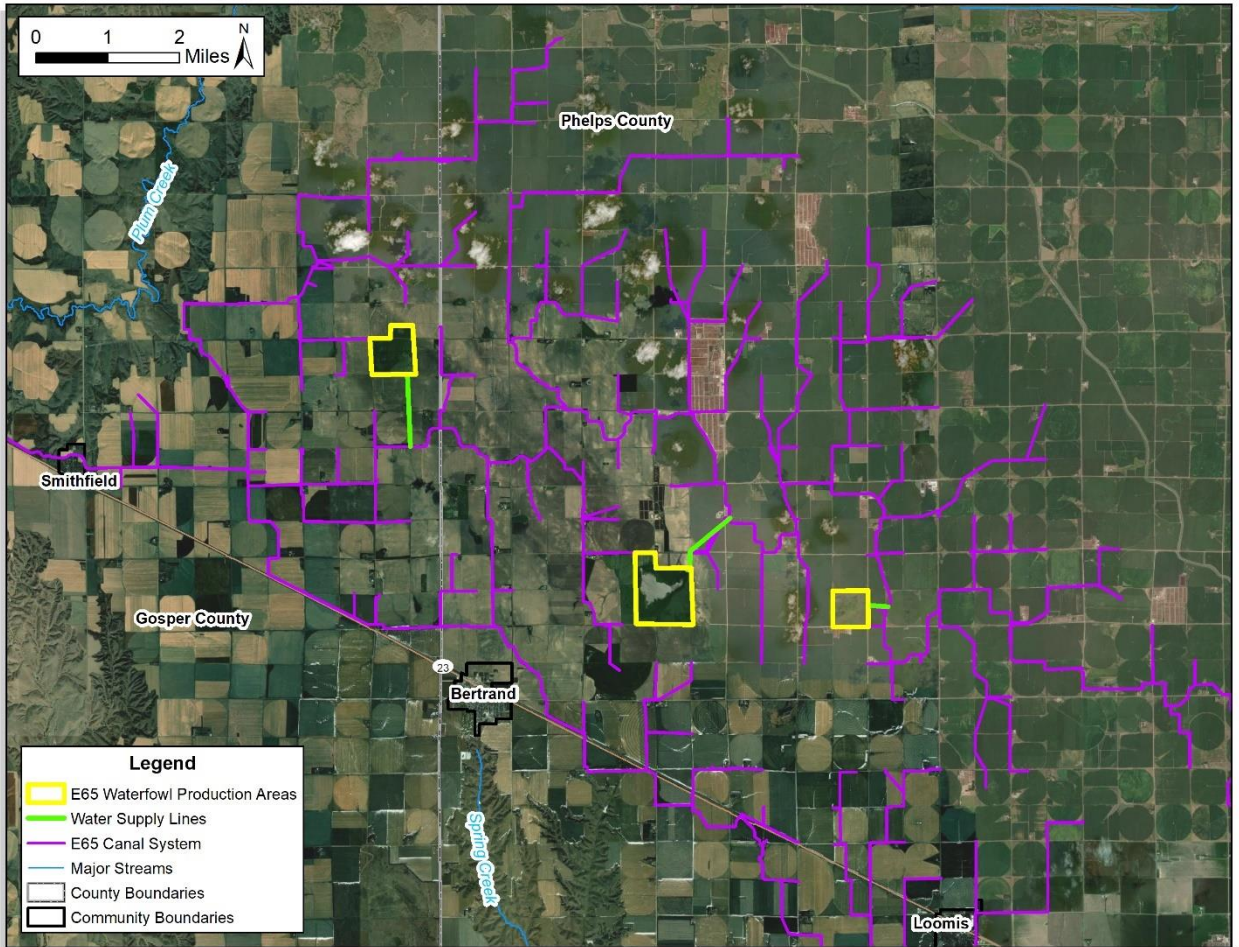


Figure 13 - E65 Water Supply to WPA

Conservation and Preservation of Water Resources

The preservation of the E65 system with a new siphon is water sustainability for Nebraska, given the multitude of primary and secondary benefits. Water managers throughout Nebraska have focused on innovative solutions to maximize the benefits of the water made available to users. The Platte and Republican Rivers are two of the most vital water resources in the state and both benefit from CNPPID’s aquifer recharge as a result of the E65 irrigation canal system. The E65 system is the definition of conjunctive management—managing surface water and groundwater in a collaborative method to create a balance between water uses and water supplies so that the economic viability, social and environmental health, safety, and welfare of the river basin can be achieved and maintained for both the near term and the long term. The new E65 canal/siphon water supply to Elwood Reservoir would allow for a continued conjunctive management approach and help CNPPID, producers, TBNRD, and PRRIP reach water management goals. Water sustainability is achieved by a new siphon alignment.

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.

This project will enhance and support or protect beneficial uses provided by the reservoir that include: recreation, aquatic life, agriculture, aesthetics, irrigation, and downstream drinking water supplies. The Nebraska Department of Environmental and Energy (NDEE) Water Quality Standards recognize recreation, aquatic life, agriculture, and aesthetics as listed beneficial uses to the State of Nebraska.

Agriculture is the heart and soul of Nebraska’s economy. Managing water sustainably is the most important aspect to ensure our economy. Securing reliable water delivery to Elwood Reservoir through a new E65 canal/siphon provides the following major state benefits, without reducing or jeopardizing any of the existing beneficial uses:

#### Agricultural Economy

The existing E65 Siphon is critical infrastructure for the CNPPID irrigation canal works. The E65 siphon is solely responsible for water delivery to over 42,000 irrigated acres and for the existence of water placed into Elwood Reservoir. CNPPID is working proactively based upon the lessons learned from the Fort Laramie tunnel collapse in July of 2019. The Ft. Laramie disaster illustrated the criticality of maintaining infrastructure such as irrigation canal works for the delivery of water to secure irrigated agricultural economies. CNPPID’s E65 siphon is at the end of its life, and it is time to install a new canal/siphon project. This proactive effort preserves the regional economic viability along with the significant secondary and ancillary benefits such as water-based recreation and groundwater recharge that are already present.

#### State Compact and IMP Compliance

Nebraska’s New Depletion Plan (NNDP), supported through PRRIP, helps to meet obligations under the Endangered Species Act through an agreement with the United States Fish and Wildlife Service. Many management actions supporting the NNDP are implemented by NRDs that have IMPs and by PRRIP’s Water Action Plan. The existing E65 siphons have conveyed over 175,000 acre-feet of water since 2006. Failure of the siphons would require other efforts, such as reducing the number of irrigated acres. The E65 siphons currently convey excess flows that would otherwise leave the Platte and Nebraska and sustain the water through diversion for enhanced streamflow for many years to come. The benefactors are irrigators, endangered species, recreationalist, and the resource itself —water.

Additionally, for the Republican Basin it is noted that: *“Several tributaries of the Republican originate in or pass through the district. Base flows in some of these tributaries (Muddy Creek, Elk Creek, Turkey Creek and Spring Creek) have increased through time, likely due to a rise in the groundwater table. This rise resulted primarily from delivery and irrigation with surface water from the Platte River by CNPPID and its customers in the Platte Basin in*

*Gosper, Phelps and Kearney Counties. The increase in baseflows in these tributaries has been so significant that it has created annual credits in excess of 10,000 acre-feet annually in Republican Basin Compact Accounting for the State of Nebraska.*” (TBNRD IMP within Republican River, 2012).

Goal A, Objective 2, of TBNRD’s IMP for the portion of the district in the Republican Basin states the following, *“Develop and implement plans, in collaboration with CNPPID, its customers and other affected water users, that continue and, to the extent possible, increase groundwater recharge and stream baseflow enhancement from Platte Basin surface water supplies in amounts sufficient to sustain existing groundwater uses and to maintain imported water contributions to the Republican River Basin.”* Elwood Reservoir contributes approximately 20,000 to 25,000-AF annually to the groundwater mound which contributes to stream baseflow and benefits to the Republican River Basin.

#### Wildlife and Recreation

Elwood Reservoir inundates approximately 960-acres and provides a productive and diverse fishing spot for 13 popular gamefish. Located only 15-miles from Interstate 80, the area is a hot-spot for fisherman and includes a WMA maintained by the NGPC. The only hydrologic supply of water to the reservoir is from the E65 canal and pumping station. The waterbody does not receive natural surface water runoff. The failure of the existing siphon and canal water supply would be detrimental to the recreation benefits provided currently.

#### 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.

The majority of the project cost requested will provide resources for construction. Final design, permitting, and land acquisition are also included in this requested project cost. A breakdown of project cost is shown below in Table 11.

Table 11 - Project Cost Share

	<b>Cost Estimate</b>	<b>WSF Grant Request</b>	<b>CNPPID Cost Share</b>
		60%	40%
<b>Final Design and Construction Services</b>	\$1,282,325	\$769,395	\$512,930
<b>Land Acquisition</b>	\$600,000	\$360,000	\$240,000
<b>Permitting</b>	\$10,000	\$6,000	\$4,000
<b>Bidding and Contracting</b>	\$256,000	\$153,600	\$102,400
<b>Construction of Siphon &amp; Canal</b>	\$12,823,250	\$7,693,950	\$5,129,300
<b>TOTAL</b>	\$14,971,575	\$8,982,946	\$5,988,630

Operation and Maintenance (O&M) will be the responsibility of CNPPID. The estimated annual cost for O&M is assumed to be approximately \$50,000.

The 2.18 cost benefit ratio (See Attachment C, pg. 17) indicates that this project will pay for itself upon completion because it will advert the result of a failure. The cost of the project is approximately \$14.9 million and the conservative economic loss from a failure in year one is \$33 million. An economic review of the project is detailed below:

The E65 siphon failure analysis evaluates the economic impact of a potential failure of the siphons providing deliveries to the CNPPID E65 Canal, resulting in shutting-off irrigation supplies to about 42,000 acres of agricultural land, primarily corn and soybeans, irrigated under this system. The analysis assumes that the failure occurs during a time of high crop demand, when the delivery system is under the most stress. Although it is possible that a siphon failure could impact surface water deliveries in multiple crop years, only a single year is considered here on the basis that repairs would likely be expedited in a similar fashion as the response for the Gering-Fort Laramie Irrigation District tunnel collapse. If the repairs stretch over multiple years, the results below can be multiplied by the number of years operations are restricted.

It is acknowledged that some producers may have the opportunity to pump groundwater and forego their surface water allocation, mitigating adverse impacts for these individuals. However, it is also recognized that the additional pumping due to the failure will have an impact on the nearby “groundwater mound” and resulting flows in the adjacent Republican River system, significantly increasing the risk of Republican NRD’s having to utilize the NCORPE project to meet Compact compliance terms. As a result, for purposes of this analysis, it is assumed that mitigation provided by substituting groundwater is offset by additional Compact compliance costs incurred by Republican NRD’s through their IMP obligations.

The majority of the economic impact falls upon irrigators and is based upon anticipated impacts to crop yields resulting from abruptly stopping irrigation. These impacts are

quantified below and represent the focus of the analysis. However, there will also be adverse impacts to the fishery value and other recreation at Elwood Reservoir due to a probable lengthy drawdown.

This initial, or direct, impact of a possible siphon failure is felt by the irrigator who experiences obvious financial hardship in response. But there are also secondary, or “third party” impacts to those providing goods and services to raise the crop and the damage to those depending on using the crops for feeding livestock and producing energy. These third-party impacts consist of both indirect impacts to input suppliers and induced impacts to the households of the suppliers’ employees. These impacts are estimated as multipliers of the direct impact, using multipliers derived in the IMPLAN economic input-output model. These multipliers represent Nebraska state-wide impacts.

### **Direct Impacts**

In an average moisture year, irrigators growing corn can expect yield reductions of 50 percent, from about 250 to 125 bushels per acre. In a dry year, dryland yield could be as low as 80 bushels per acre. Valued at a long-term moving average price of \$4.45 per bushel, the impact to the corn component of a typical crop rotation could range from \$556 dollars per acre in an average year to \$757 per acre in a dry year.

The soybean portion of the local crop rotation suffers qualitatively similar impacts. Irrigated yields are reduced from about 70 bushels per acre to 35 bushels per acre under average year conditions. In a dry year, yields may be reduced to 25 bushels per acre. At a moving average soybean price of \$11.50 per bushel, this translates to an impact ranging from \$400 to \$515 per acre for an average and dry year, respectively.

From the irrigator’s perspective, there are also additional impacts to consider. Although costs will be incrementally reduced by not having to pump and apply irrigation water, the capital portion of the irrigation unit still depreciates. Plus, in hindsight, the irrigator will have over-applied seed and fertilizer to achieve these reduced yields. As a result, any savings in irrigation cost are more than offset by over-investment in these expensive inputs.

Based on a regional irrigated cropping pattern of about 2/3rd corn and 1/3rd soybeans, the total direct impact to an irrigator, weighted by cropping pattern, is estimated to be \$500 to \$675 per acre, depending on whether it is an average or dry year. Over 42,000 acres, this direct impact may range from \$21 million to \$28 million for each year affected by a siphon failure.

### **Third Party Impacts**

The \$21 million to \$28 million direct impact of a siphon failure causes negative indirect and induced impacts of \$8.1 million and \$4.0 million, respectively, to suppliers of goods and services supporting the crops. These impacts combine to lower the total value of output across the State of Nebraska by over \$33 million (Table 12)

This also translates to proportionate employment losses across a wide range of economic sectors. The direct, indirect, and induced impacts to employment are estimated to cost the State 99 full-time equivalent (FTE) jobs during the year of the failure (Table 13).

Table 12 - Estimated Economic Output Impact to the State of Nebraska Resulting from a Siphon Failure (Average Moisture Year)

Crop	Direct impact	Multipliers			Estimated impacts			
		Direct impact multiplier	Indirect impact multiplier	Induced impact multiplier	Direct impacts (million)	Indirect impacts (million)	Induced impacts (million)	Total (million)
Corn (2/3 of acreage)	(\$15.65)	1.000	0.4673	0.1669	(\$15.65)	(\$7.31)	(\$2.61)	(\$25.58)
Soybeans (1/3 of acreage)	(\$5.58)	1.000	0.1441	0.2505	(\$5.58)	(\$0.80)	(\$1.40)	(\$7.78)
<b>Totals</b>	<b>(\$21.23)</b>				<b>(\$21.23)</b>	<b>(\$8.12)</b>	<b>(\$4.01)</b>	<b>(\$33.36)</b>

Table 13 - Estimated Employment Impact to the State of Nebraska Resulting from a Siphon Failure (FTE's) (Average Moisture Year)

Crop	Direct impact	Multipliers (impact for every million dollar of direct impact)			Estimated impacts			
		Direct impact multiplier	Indirect impact multiplier	Induced impact multiplier	Direct impacts (FTE)	Indirect impacts (FTE)	Induced impacts (FTE)	Total (FTE)
Corn (2/3 of acreage)	(\$15.65)	1.07	2.65	1.335	(17)	(41)	(21)	(79)
Soybeans (1/3 of acreage)	(\$5.58)	0.46	0.83	2.02	(3)	(5)	(11)	(20)
<b>Totals</b>	<b>(\$21.23)</b>				<b>(20)</b>	<b>(46)</b>	<b>(32)</b>	<b>(99)</b>

In addition to the economic linkages related to support industries estimated above, there are linkages to industries that use the corn and soybeans produced. Specifically, local cattle feeders will have to reach further to acquire sufficient corn and corn byproducts for feed blends, incrementally, but temporarily, increasing feed costs in the affected region. As much as 3.5 million to 4.8 million bushels of corn could be needed to make-up for lost local production, depending on whether it is an average or dry year. If the effective price of corn temporarily increases by \$0.10 per bushel to maintain a steady supply of corn, the total adverse output impact shown in

Table 12 will incrementally increase by about \$0.64 million and the adverse employment impact will increase by about 2 jobs (Table 13).

- 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 new E65 canal/siphon will directly support NeDNR's efforts to maintain a balance of groundwater and surface water uses by maintaining the ability to irrigate and support the local and state economics, This project will help meet two interstate compacts on the Platte and Republican Rivers and help TBNRD to meet IMP goals.

#### Republican River Compact

*“Several tributaries of the Republican originate in or pass through CNPPID’s district. Base flows in some of these tributaries (Muddy Creek, Elk Creek, Turkey Creek and Spring Creek) have increased through time, likely due to a rise in the groundwater table resulting from decades of irrigation and seepage from canals and reservoirs. This rise resulted primarily from delivery and irrigation with surface water from the Platte River by CNPPID and its customers in the Platte Basin in Gosper, Phelps and Kearney Counties. The increase in baseflows in these tributaries has been so significant that it has created annual credits in excess of 10,000 acre-feet annually in Republican Basin Compact Accounting for the State of Nebraska” (TBNRD IMP within Republican River, 2012).*

#### Platte River Recovery Implementation Program

The PRRIP utilizes federal, and state provided financial resources, water monitoring, and scientific monitoring and research to support the recovery of T&E species that inhabit areas of the Central and Lower Platte rivers while allowing for continued agricultural water use and hydropower. The PRRIP uses CNPPID’s canal works, specifically for recharge projects such as the groundwater recharge projects on the Phelps County Canal and Elwood Reservoir. CNPPID works together with the PRRIP to manage excess flow measurements and to deliver the program’s goals. Recharge benefits of PRRIP projects also benefit water management goals for the Platte River and provides indirect benefits to the Republican River.

#### TBNRD IMP – Republican River Area

Goal A, Objective 2, of TBNRD’s IMP for the portion of the district in the Republican Basin states the following, *“Develop and implement plans, in collaboration with CNPPID, its customers and other affected water users, that continue and, to the extent possible, increase groundwater recharge and stream baseflow enhancement from Platte Basin surface water supplies in amounts sufficient to sustain existing groundwater uses and to maintain imported water contributions to the Republican River Basin.”* Elwood Reservoir contributes approximately 10,000-AF to the groundwater mound which contributes to stream baseflow and benefits to the Republican River Basin. This project has no deficiencies to adversely effect State obligations or decrees. This project helps the State meet those obligations.

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.

The new E65 canal siphon water supply to Elwood Reservoir greatly reduces the risk of a catastrophic failure of the existing water supply which began operations in 1941. The cathodic protection for the siphon pipe has deteriorated and no longer functions. A coating has been applied to the interior of the siphon to gain a few more years of service until funding can be secured for the necessary replacement. The project benefits include:

- The proposed new two-mile E65 canal/siphon project would replace 4.5-miles of aging canal/siphon and eliminate the need to pump water into the Elwood Reservoir from its current outlet configuration, therefore reducing dependence on energy and lowering carbon emissions.
- The new water supply protects critical infrastructure that is responsible for irrigating over 42,000 acres.
- Ensuring a sustainable water supply to the E65 system provides benefits to the State's efforts to balance water supply and demand with the State of Kansas to comply with the republican River Compact, ratified by the United States Congress.
- The project benefits public security by ensuring 99 jobs and \$21 Million to \$28 Million in annual economic income which is all maintained through the water supplied to producers through E65 canal.
- The project will lower the dependence on projects such as NCORPE (approximately \$275/AF cost).
- The project will continue to benefit Nebraska's Republican River Compliance efforts.

The Gering - Fort Laramie tunnel collapse illustrates the importance of repairing and replacing aging critical canal works infrastructure to maintain the delivery of water to secure irrigated agricultural economies. CNPPID's E65 siphon is at the end of its useful life, and it is time to install a new canal/siphon system to sustain the current benefits 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.

Elwood Reservoir's only water supply is the E65 canal, and the water quality of the lake is good, thus it supports a healthy fishery. A failure of the existing system would result in the waterbody drying up completely and devastating the currently established fishery. This location is a popular destination for outdoor recreation in south-central Nebraska. Protecting high water quality is key to maintaining this resource for the benefit of the local economy.

The recharge provided by the CNPPID system is used by thousands of private wells and five municipalities and is known to dilute nitrate concentrations within the aquifer. Nitrate dilution is considered a major benefit for at least five municipalities including Elwood, Holdrege, Minden, Bertrand, and Axtell and private water supplies within an intensive agriculture area. The downstream municipalities also receive recharge benefits all the way to the Missouri River Confluence. Without functioning siphons, there is no way to secure the water quality benefits provided by the E65 system.

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.

CNPPID is the local jurisdiction that is supporting the project. Additional support for the project has been provided by TBNRD, NGPC, PRRIP, Nebraska Water Resources Association (NWRA), and Nebraska State Irrigation Association (NSIA). Letters of support are found in Attachment A.

CNPPID is a non-taxing public entity and does not collect property taxes. CNPPID funding sources derive from the delivery of irrigation water, electricity, and leases on CNPPID property. As a quasi-public entity, the funding for project does not create a burden on local property taxes. The state funding through the NRC will be leveraged with revenue generated by CNPPID, not tax collections. Should the funding not come through, CNPPID would either resubmit the following year or look to other alternative funding sources.

There are no other funding sources for the project currently planned to be used in 2021.

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 CNPPID system is heavily involved with supporting IMPs. Additionally, the CNPPID system supports Basin-wide plans that are jointly developed, adopted, and implemented by multiple NRDs and the NeDNR. IMPs must keep the State in compliance with Interstate Agreements, Compacts, Decrees (Ne Stat. 46-715(4)(b)). The CNPPID system supports both individual IMPs and Basin-wide plans.

The CNPPID system includes water storage facilities and canal systems that became operational nearly 80 years ago. Since then, operation of the CNPPID system has provided significant groundwater recharge across Central Nebraska. The area beneath CNPPID's irrigation system where long-term groundwater recharge has occurred is often referred to as the "Groundwater Mound." The CNPPID mounded water provides benefits to both the Platte and Republican Basins.

The Basin-Wide Plan for Joint Integrated Water Resources Management of Overappropriated Portions of the Platte River Basin, Nebraska (Upper Platte River Basin-Wide Plan (UPRBP) second increment was effective in September of 2019. The adopted UPRBP included the NeNDR along with NRD comprised of the Central Platte NRD, North Platte NRD, South Platte NRD, Tri Basin NRD and the Twin Platte NRD. The UPRBP details the important efforts related to all the benefits supported by CNPPID's system such as interstate compacts or decrees, recreation, water supply retiming, groundwater recharge and the important economic viability related to irrigated agriculture. The UPRBP quantifies efforts accomplished throughout the plan with CNPPID's system and includes addressing aging canal works as part of the plans action items. All these benefits, which are currently supported by the existing E65 siphons, could not be fully realized or would be lost with a siphon failure.

The Republican River Basin-Wide Plan (RRBP) was adopted in 2019 by the NeDNR and the Upper Republican, Middle Republican, Lower Republican, and TBNRDs. The RRBP identifies the groundwater mound and the water accretions from the Platte River Basin into the Republican River Basin. This accretion, known as Imported Water Supply, is an accounting credit to Nebraska that supports compliance with the interstate Republican

River Compact. Nebraska was able to receive the credit as a counterclaim against Kansas at the United States Supreme Court in 2015. One of the key goals of the RRBP was to stay in compliance with the Republican River Compact. The E65 Canal System with Elwood Reservoir provides a substantial amount of water to the Republican Basin that supports the State of Nebraska and the Republican NRDs compliance with the RRC.

The Tri-Basin NRD overlays three watersheds and has individual IMPs with the NeNDR for each of these watersheds. The approved *Tri-Basin IMP for the Republican River* basin, states that: *“The Republican River originates in eastern Colorado and traces a course through southern Nebraska on the way to its confluence with the Kansas River. The Republican River does not pass-through Tri-Basin NRD, but approximately 40% of the district lies within the Republican watershed (see Map #1 in Appendix A). Several tributaries of the Republican originate in or pass through the district. Base flows in some of these tributaries (Muddy Creek, Elk Creek, Turkey Creek and Spring Creek) have increased through time, likely due to a rise in the groundwater table. This rise resulted primarily from delivery and irrigation with surface water from the Platte River by Central Nebraska Public Power and Irrigation District (CNPPID) and its customers in the Platte Basin in Gosper, Phelps and Kearney Counties. The increase in baseflows in these tributaries has been so significant that it has created annual credits in excess of **10,000 acre-feet annually** in Republican Basin Compact Accounting for the State of Nebraska”*

Additionally, the Tri-Basin NRD Republican River IMP identifies Goal # 2 as: *“Develop and implement plans, in collaboration with CNPPID, its customers and other affected water users, that continue and, to the extent possible, increase groundwater recharge and stream baseflow enhancement from Platte Basin surface water supplies in amounts sufficient to sustain existing groundwater uses and to maintain imported water contributions to the Republican River Basin.”*

The *Tri-Basin IMP for the Platte River Basin* discusses management actions that utilized CNPPID’s system. These efforts include the diversion of excess flows from the Platte River into CNPPID’s Elwood Reservoir, canal systems, and federally owned Rainwater Basin wetlands to provide groundwater recharge and offset depletions to streamflow resulting from groundwater pumping. More than 100,000 acres of cropland within the Upper Platte River Basin portion of TBNRD are irrigated with water diverted from the Platte River and distributed through the canals of CNPPID. Action items in the Tri-Basin Platte River IMP have conjunctive management efforts working with surface water that can provide groundwater recharge and retime water delivery through excess flow diversions.

Between 2006 and 2021, the E65 siphons have conveyed the diversion for over 175,000 acre-feet (AF) of excess flows to be retimed to increase streamflow. A portion of the water conveyed has been through the support of the PRRIP. The Tri-Basin Platte Basin IMP and the Upper Platte Basin wide plan work to ensure compliance with interstate compacts and decrees such as Nebraska New Depletion Plan, in accordance with PRRIP. CNPPID’s system thus supports the efforts of both individual IMPs and Basin-wide IMPs. The E65 siphons specifically provide conveyance of water to support management effort of these plans both directly and indirectly. These include groundwater recharge,

excess flow diversions, compliance with interstate compacts and decrees, recreation, and the economic viability of irrigation.

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.

The project addresses the State of Nebraska's priority of maintaining compliance with Kansas on the Republican River Compact. The Republican River Basin-Wide Plan (RRBP) was adopted in 2019 by the NeDNR and the Upper Republican, Middle Republican, Lower Republican, and TBNRDs. The RRBP identifies the groundwater mound and the water accretions from the Platte River Basin into the Republican River Basin. This accretion, known as Imported Water Supply, is an accounting credit to Nebraska that supports compliance with the interstate Republican River Compact. Nebraska was able to receive the credit as counterclaim against Kansas at the United States Supreme Court in 2015. One of the key goals of the RRBP was to stay in compliance with the Republican River Compact (RRC). The E65 Canal System with Elwood Reservoir provides a substantial amount of water to the Republican Basin that supports the State of Nebraska and the Republican NRDs compliance with the RRC.

In 2019, the Goshen/Gering Fort Laramie Canal tunnel collapse put 107,000-acres of crops, 55,000-acres in Nebraska, out of water for irrigation during the peak of the growing season. Wyoming and Nebraska declared state emergencies. CNPPID is working proactively to mitigate a similar repeat of that emergency with the E65 canal/siphon. Working proactively will mitigate the need for disaster funding from federal and state resources, alleviate the need for producers to utilize federal crop insurance, and does not unexpectedly create a burden through the levy of bonds or increased taxes. Matching project funds for this application do not come from levied taxes.

This existing E65 canal and siphon has outlived its design life by several decades. The cathodic protection for the siphon pipe has deteriorated and no longer functions. A coating has been applied to the interior of the siphon to gain a few more years of service until funding can be secured for the necessary replacement. The existing supply canal would be used while the new supply is being constructed so that there are no schedule interruptions to service.

The new E65 canal/siphon will alleviate this statewide concern and ensure a steady supply of irrigation water is provided for the foreseeable future. In addition to the 150 producers utilizing flows for irrigation on 42,000 acres, the NeDNR, TBNRD, CPNRD, and PRRIP utilize the conveyance infrastructure for multiple recharge projects to meet

goals designed to increase stream baseflows. This is a benefit to Nebraska and its citizens.

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.

CNPPID is a political subdivision of the State of Nebraska governed by a 12-member Board of Directors from Gosper, Phelps, Kearney, Keith, Lincoln, and Dawson Counties. The E65 canal/siphon project is a great example of quasi-state and state resources collaborating on a project with statewide importance. The CNPPID voted unanimously to approve this grant application on July 6, 2021.

- The CNPPID is the sole partner and will be responsible for funding the local share of 40%.
- CNPPID does not collect property taxes.
- Funding sources derive from the delivery of irrigation water, electricity, and leases on land.
- As a public entity, the funding for projects does not create a burden on local property taxes.
- The state funding through the NRC will be leveraged with revenue generated by CNPPID, not tax collections.
- Should the funding not come through, CNPPID would either resubmit the following year or look to other alternative funding sources.

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.

The groundwater mound has increased baseflow in several tributaries of the Platte and Republican River. Base flows in some of these tributaries are significant enough to contribute to flow credit to the Republican River for the compact. Streams from where these flows come include Muddy Creek, Elk Creek, Turkey Creek and Spring Creek. The increase in baseflows improves the health of those watersheds by providing a steady water for streams. Without the E65 and other CNPPID projects, groundwater declines would be likely, thus reducing baseflows and causing perennial streams to become intermittent or ephemeral flowing waterbodies.

CNPPID’s E65 system provides water to the Cottonwood, Victor Lakes, and Linder Waterfowl Production Areas (WPA). These WPAs are located in Phelps and Gosper Counties, contain a total of 819-acres of wetland areas, and provide waterfowl and groundwater recharge benefits because they are crucial natural areas (see Figure 14). Thus far, 1,764 AF of water has been placed into Victor Lakes over the last two years. In the near future, all three WPAs will receive water from E65, when excess flows are available.

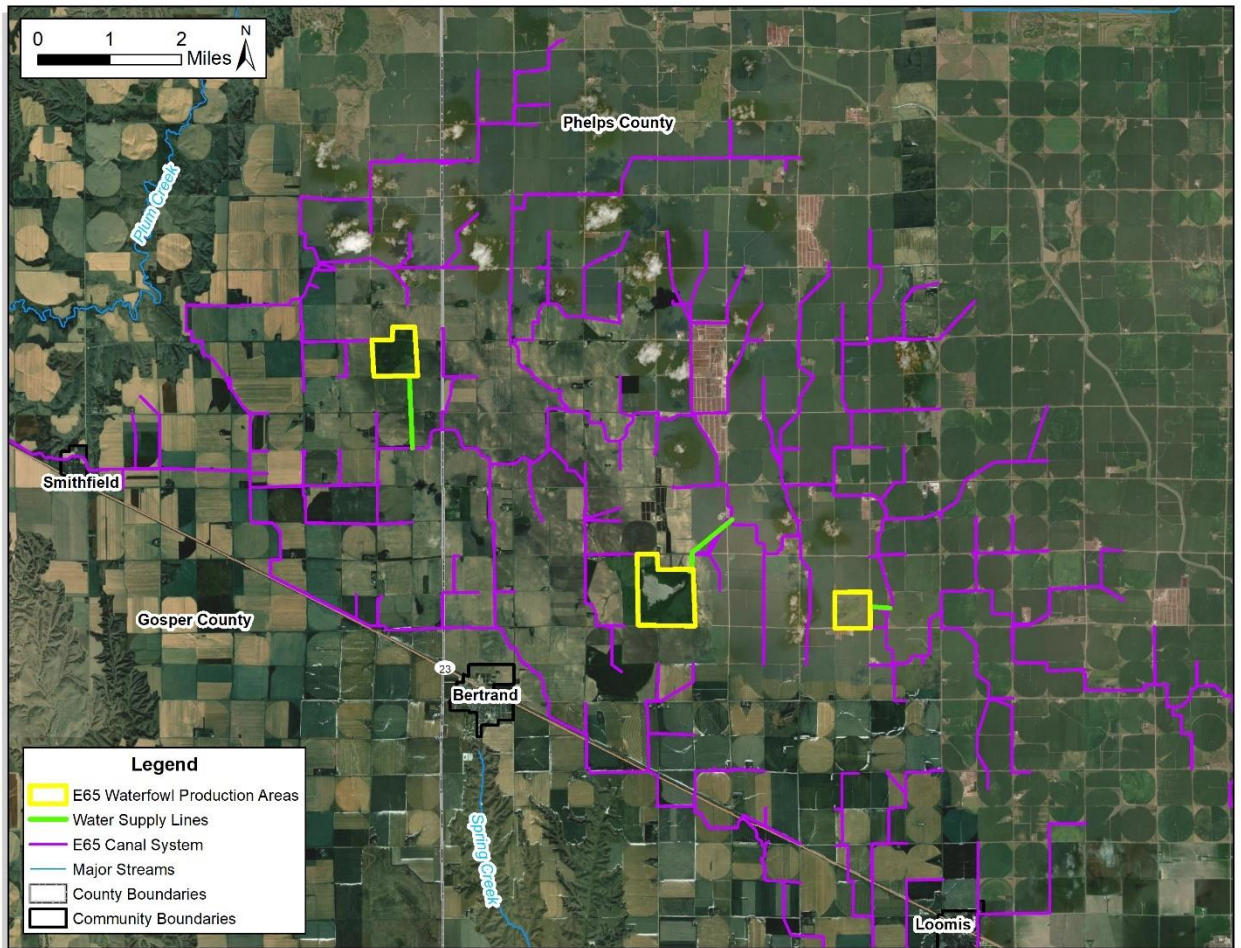


Figure 14 - E65 Water Supply to WPA

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.

The NeDNR's Annual Report and Plan of Work for the State Water Planning and Review Process (NeDNR Annual Report) dated September 2020 identifies six objectives for implementing the state water planning and review process. This project meets six of the objectives identified, including:

*Objective #1 - Maintain data, information, and analysis capabilities for water planning, including specific programs for collecting, maintaining, and distributing information on streamflow's, as well as analyzing water uses and water supplies across the state;*

CNPPID's website and staff provide real time readings for lake and reservoirs, rivers, and canal flows. This includes Lake McConaughy, critical to Platte River water management, environmental accounts, and flood control. CNPPID utilizes NeDNR and USGS gage data regularly. CNPPID has full time staff dedicated to 24 hours a day for water operations.

*Objective #2 - Provide staff and resources to support planning and implementation of water resources projects;*

The NeDNR staff worked with CNPPID staff as stakeholders in the development of IMPs for TBNRD (three total including the Little Blue, Republican, and Platte areas of the district), Central Platte NRD, and the Upper Platte Basin-Wide Plan. The NeDNR and CNPPID staff are also directly involved with PRRIP water management planning and implementation, of which CNPPID is also an active partner. CNPPID was also part Platte and Republican Basin-wide Plans.

*Objective #3 - Support locally developed water management plans for conjunctively managing hydrologically connected groundwater and surface water supplies;*

As described in Objective #2, CNPPID and NeDNR staff are actively and regularly working together to assist NRDs, PRRIP, and the State of Nebraska to maintain a balance of groundwater and surface water uses, thus maintaining the ability to irrigate and support the local and state economics. CNPPID utilizes its infrastructure to not only provide irrigation but to provide an opportunity for recharge from excess flows to the Platte River for conjunctive management of Nebraska's water resources.

*Objective #5 - Participate in interagency collaboration with federal agencies, state agencies, local natural resources districts (NRD's), and other water interest entities on various water resources programs and projects;*

CNPPID and NeDNR resources overlap regularly in interagency collaboration, including work with the U.S. Fish and Wildlife Service on instream flow targets for the Platte River and collaboration with TBNRD, CPNRD, and PRRIP on a variety of irrigation management and recharge projects. CNPPID also has staff that serve on the PRRIP water advisory team and Platte River Cooperative Hydrology Study (COHYST) technical review team.

*Objective #6 - Consolidate and present information in a form that is understandable and useful to the public and interagency collaborators.*

CNPPID has a Government and Public Relations Manager that oversees regular press releases on water, property, and infrastructure projects that affect irrigators, recreationists, or the public at large. Information is shared with NeDNR staff and CNPPID will also post signage at the Johnson Lake inlet that explains what the E65 canal/siphon project is about and recognizes the contribution from the Natural Resources Commission's WSF.

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.

The E65 canal/siphon project will support two federal mandates. CNPPID supports efforts by PRRIP through the use of the E65 canal/siphon to divert excess flows into Elwood Reservoir. The diverted water is retimed through groundwater recharge to increase streamflow, that aids in the recovery of threatened and endangered species under the Endangered Species Act. Additionally, CNPPID provides the same opportunity to use E65 system for the TriBasin NRD for efforts to comply with their IMP. The NeDNR and TriBasin collectively maintain efforts through the IMP to address streamflow depletions. The IMP and PRRIP aid NeDNR in the implementation of the Nebraska New Depletion Plan (NNDP) (<https://www.fws.gov/platteriver/Documents/NE-Depletion%20Plan.pdf>). The plan details actions Nebraska will take to prevent or mitigate for new depletions to United States Fish and Wildlife Service (USFWS) target flows that are important to recovery plans for species under the ESA.

The Republican River Compact (RRC) between Nebraska, Kansas and Colorado was created in 1943 as an act of Congress ([http://republicanriver.org/wp-content/uploads/2018/05/Compact\\_US-version.pdf](http://republicanriver.org/wp-content/uploads/2018/05/Compact_US-version.pdf)). The States employ and have agreed upon accounting methodology to divide each States portion of the water. In 2015, the United States Supreme Court determined that Nebraska should get a change to accounting methodology. The accounting procedure change is known as Imported Water Supply Credit. The credit provides an increase to Nebraska's Republican River supply under RRC.

In the 2015 Supreme Court case Kansas was seeking remedy from Nebraska's overuse of the basin's water supply in 2005-2006. Kansas was awarded over \$5,000,000 by the ruling. Nebraska made a counterclaim against Kansas to change accounting methodology. The court agreed with



Nebraska that the methodology should be changed. In acknowledgement by the court, the ruling states that:

*“In 2006, for example, the Procedures charged Nebraska with using 7,797 acre feet of Platte River water, over 4% of the State’s allotment. By our estimate, just that single year’s miscalculation cost Nebraska over \$1 million. See id., at 37, 176”* ([https://www.supremecourt.gov/opinions/14pdf/126orig\\_olq2.pdf](https://www.supremecourt.gov/opinions/14pdf/126orig_olq2.pdf))

The Imported Water Supply Credit is supported by the E65 system. According to the TriBasin NRD IMP,

*“The Republican River does not pass through Tri-Basin NRD, but approximately 40% of the district lies within the Republican watershed (see Map #1 in Appendix A). Several tributaries of the Republican originate in or pass through the district. Base flows in some of these tributaries (Muddy Creek, Elk Creek, Turkey Creek and Spring Creek) have increased through time, likely due to a rise in the groundwater table. This rise resulted primarily from delivery and irrigation with surface water from the Platte River by Central Nebraska Public Power and Irrigation District (CNPPID) and its customers in the Platte Basin in Gosper, Phelps and Kearney Counties. The increase in baseflows in these tributaries has been so significant that it has created annual credits in excess of 10,000 acre-feet annually in Republican Basin Compact Accounting for the State of Nebraska.”* (<https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/republican/tri-basin-NRD/TBNRDIMP642012.pdf>).

Without the E65 siphons, neither of these federal mandates could be supported by the CNPPID system to provide recharge. If a failure were to occur or if the siphon system was abandoned, other efforts would be needed to support offsets to stream flow depletions, such as the retirement of groundwater irrigated acres. This project, to install a new E65 canal/siphon, will help to sustain irrigated agriculture in both the Platte and Republican Basins for years to come and supporting these basins in fulfilling two federal mandates.