Guidance Document

Opportunities for Participation in the Permitting Process

(Instructions for Responding to the Notice of Application)

This guidance document is advisory in nature but is binding on an agency until amended by such agency. A guidance document does not include internal procedural documents that only affect the internal operations of the agency and does not impose additional requirements or penalties on regulated parties or include confidential information or rules and regulations made in accordance with the Administrative Procedure Act. If you believe that this guidance document imposes additional requirements or penalties on regulated parties, you may request a review of the document.

Notice has been given by the Department of Natural Resources that an application for a permit for a surface water right has been filed with the Department. As a result, the public has two options to respond to the notice of an application having been filed. A person may either submit a comment (Option 1) or if a person has a sufficient interest, a person may submit a formal objection and request a hearing (Option2).

Option 1: Any person, without qualification, may provide the Department written comments on the application. No fee is required, but your written comments must include:

1. The application number to which you are commenting on
2. An indication that your comment is offered under Option 1
3. Your name, address, and contact information
4. Your written comments, which may include facts and/or information showing whether the proposed appropriation would be detrimental to the public welfare and whether denial is demanded by the public interest (See *Neb. Rev. Stat.* §§ 46-234 and 46-235)

Option 2: Only a person with a legal right or interest that may be affected by granting the application should utilize Option 2, which requires an objection and request for a hearing. Option 2 should not be used unless you intend to support your position at a formal hearing. Each person choosing Option 2 must submit their objection and hearing request in accordance to N.A.C. Title 454. A $10 legal filing fee is required for each application to which an objection is made. In addition the following must be submitted for each objection:

1. The application number to which you are objecting
2. An indication that your objection is offered under Option 2
3. Your name, address, and contact information
4. A description of your legal right or interest that may be affected by granting the application
5. A written statement, including whatever facts you currently have, of how your legal right or interest may be affected by granting the application

Your complete response under Option 1 or Option 2 must be received by the date specified in the public notice at the following address:

Department of Natural Resources

PO Box 94676

Lincoln, Nebraska 68509-4676

DNR Form APA-001
August 2008

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
APPLICATION FOR A PERMIT TO APPROPRIATE WATER

Corrected Filed
July 3, 2018

Complete items 1 through 10 by printing in ink or typing the appropriate information and by placing an X in the appropriate box.

For Department Use Only

1. Name and address of owner of land under proposed project. Names must be exactly as described on the deed or document transferring ownership of property. Landowner must sign the application.

Central Nebraska Public Power and Irrigation District, 415 Lincoln St, Holdrege, NE 68949 and the Platte Republican Diversion Interlocal Agreement Partners, 30 S John St, Alma, NE 68920

E-mail address: _____ Telephone No. (___) _____

Filed in the office of the Department of Natural Resources at 4:26 ~~a.m.~~/p.m.

on April 4, 2018

Application No. A-19594

2. Name, address, and telephone number of applicant if different than landowner

Central Nebraska Public Power and Irrigation District, 415 Lincoln St, Holdrege, NE 68949 and the Platte Republican Diversion Interlocal Agreement Partners, 30 S John St, Alma, NE 68920

E-mail address: dkraus@cnppid.com Telephone No. (308) 995-8601

Map No. _____

Water Division 1-A

Receipt No. A-5092 Amount $10.00

Right ID 13325

a. A permit is sought to:
- [x] Use natural flow
- [ ] Use impounded water*

3b. A permit is sought for the purpose of:
- [ ] Irrigation
- [ ] Manufacturing
- [ ] Domestic
- [x] Other Interstate Compact Compliance
- [ ] Temporary** _____

4a. Identify the source of water (name of stream or reservoir).

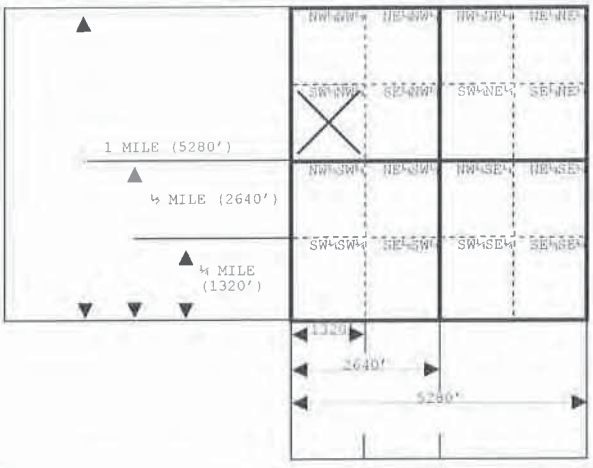
Platte River

4b. If applicable, identify the facility name for transporting water from the source (portable pump, name of canal or pipeline).

CNPPID Supply and E65 Canals, Elwood Reservoir, PRD pipeline

5. Identify the location of the [x] Headgate [ ] Pump

Section 8, Township 13 North, Range 29 E [ ] W [x] County Lincoln



The box at left represents one square mile (section). Place an X within each appropriate 40-acre tract to indicate the location(s) of each headgate or pump.

If applicable, indicate the height, in feet, of any diversion or check dams on the line below.

_____

* A separate permit to impound water must be obtained.

** A temporary permit maybe granted for a maximum of one year.

5. If applicable, identify the location of lands by 40-acre subdivisions that will be irrigated.

LEGAL SUBDIVISIONS	Sec.	Twp.	Rge.	No. of Acres	LEGAL SUBDIVISIONS	Sec.	Twp.	Rge.	No. of Acres
					TOTAL NUMBER OF ACRES TO BE IRRIGATED:			0.0	

☐ Enclosed is an aerial photograph that I have marked to show the approximate location of land to be irrigated as described above.

7. State the approximate quantity of water desired for appropriation: 275 at headgate to divert 100 to Turkey Crk valley

☐ Gallons per minute
☑ Cubic feet per second
☐ Acre-feet (impounded water)

8a. State the estimated time required for completion of all water diversion facilities.
Seven months after the appropriation is granted

8b. State the earliest date when water will have been used for beneficial purposes.
When conditions of the permit are met

9. Will this project be constructed under a federal program, receive federal funding, or have federal planning assistance?
☑ No ☐ Yes If yes, explain: _____

10. I certify that am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate.

4/2/18
Date

Signature of owner or owner's authorized agent (with proper documentation) CNPPID

A final project map may accompany this application or must be filed within six months following departmental approval of this application, drawn in accordance with NAC Title 457 – Rules for Surface Water, Chapter 10, (http://dnr.nebraska.gov/swr/surface-water-rules). At the request of the applicant, the Department will assist with preparation of the project map.

This form must be completed in full. An incomplete or defective application will be returned with 90 days being allowed for resubmission. Failure to resubmit a corrected application within this period shall cause dismissal of the application and consequent loss of priority and fees.

A non-refundable filing fee, payable to the Department of Natural Resources, computed from the table below must accompany this application. Forward this application and applicable fees to:

State of Nebraska
Department of Natural Resources
301 Centennial Mall South / P.O. Box 94676
Lincoln, Nebraska 68509-4676
(402) 471-2363

Nature of Use	Cost
Domestic	$10
Agricultural	
Irrigation from Stream	
0-1,000 acres	$200
Each additional 1,000 acre unit or portion thereof in excess of the first 1,000 acre unit	$100
Irrigation from Storage Reservoir	
0-1,000 acres or portion thereof in excess of the first 1,000 acre unit	$50
Each additional 1,000 acre unit or portion thereof in excess of the first 1,000 acre unit	$25

Nature of Use	Cost
Manufacturing	
General	$10
Power Generation for each theoretical 50 horsepower	$5
Other	$10

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES

Corrected Filed
July 3, 2018

INTERBASIN TRANSFER OF WATER *ADDENDUM* TO APPLICATION FOR A PERMIT TO APPROPRIATE WATER

Pursuant to *Neb. Rev. Stat.* § 46-288, interbasin transfer shall mean the diversion of water in one river basin and the transportation of such water to another river basin for storage or utilization for a beneficial use.

Instructions

This form is an addendum to be filed along with an application for an appropriation of water that proposes water being transferred from one basin to another. Complete items 1 through 10 by printing in ink or typing the appropriate information. In addition to any fee for the application, a non-refundable filing fee of $10.00, payable to the Department of Natural Resources, must accompany this addendum.

The answers to the following questions A-F must be provided on 8½ x 11 inch paper (or folded to such size). An answer is required for each item of A-F. Each answer must be separately identified in the attachment(s).

Department Use Only

Filed in the office of the Department of Natural Resources at 10:45 a.m./p.~~m~~

on July 3, 2018

Appropriation No. A-19594

Map No. _____

Water Division 1-A

Receipt No. _____ Amount _____

A. The economic, environmental, and other benefits of the proposed interbasin transfer and use.
B. Any adverse impact of the proposed interbasin transfer and use.
C. Any current beneficial uses being made of the unappropriated water in the basin of origin.
D. Any reasonably foreseeable future benefits of leaving the water in the basin of origin for current or future beneficial uses.
E. Alternative sources of water supply available to the applicant.
F. Alternative sources of water available to the basin of origin for future beneficial uses.

1. Name, address, telephone number, and email **of owner(s) of land for locations of diversion and for locations of beneficial use** under application:

The benefit for this appropriation is interstate compact compliance which is an obligation of the entire state. Beneficial use will be to the citizens of the entire State of Nebraska.

2. Name, address, telephone, and email of person to contact concerning the application:

Name: Platte Republican Diversion C/O Don Kraus, Central Nebraska Public Power and Irrigation District
Address: 415 Lincoln St, Holdrege, NE 68949
Telephone: 308-995-8601
Email: dkraus@cnppid.com

3. Basin **from** which transfer is proposed: Platte River Basin

4. Basin **to** which transfer is proposed: Republican River Basin

5. State the proposed beneficial use of the water to be transferred: Interstate Compact Compliance

6. Describe the location and method of diversion

Excess flows will be diverted from the Platte River at the Tri-County diversion dam located east of North Platte in Lincoln County Nebraska. The diversion dam will divert water through the headgates of Central Nebraska Public Power and Irrigation District's E65 supply canal into East Branch Turkey Creek. An underground pipeline is proposed to convey the diverted flow for the first approximately 3,000 feet of the East Branch Turkey Creek valley. At the terminus of the pipeline, flow will continue within Turkey Creek to its confluence with the Republican River between Edison and Oxford, NE.

7. Describe the location of beneficial use

The benefit for this appropriation is interstate compact compliance which is an obligation of the entire state. Beneficial use will be to the citizens of the entire State of Nebraska.

8. Identify the quantity of water subject to this transfer
   a. Rate of diversion from source in cubic feet per second or gallons per minute
      275 cfs. This accounts for pumping excess flows into storage in Elwood Reservoir and conveyance loss to achieve up to a maximum of 100 cfs into Turkey Creek valley.
   b. Volume of proposed transfer per year in acre-feet

      The volume will depend on the amount of unappropriated water available from the Platte River each year.

9. Identify the duration/timing of the transfer
   a. Time(s) that diversion is proposed

      The transfers will occur when there is unappropriated water available for diversion from the Platte River.

10. Provide an aerial map clearly marked with the location of diversion, water transport facilities, location of use (if applicable), and any other pertinent information.

I certify that I am familiar with the information contained in this addendum (including attachments), and that to the best of my knowledge and belief, such information is true.

Don Kraus — Landowner (Signature)

6/25/18 — Date

Don Kraus — Print Name

Don Kraus General Manager John Thorburn — Person to Contact Concerning Application (Signature and Title)

6/25/18 — Date

Don Kraus, General Manager — Print Name

If you have any questions regarding this application form, please call the surface water permits section at the Department of Natural Resources (402) 471-2363

Forward this application addendum, supplemental documentation and non-refundable fee of $10.00 to:

State of Nebraska
Department of Natural Resources
301 Centennial Mall South
P.O. Box 94676
Lincoln, Nebraska 68509-4676

Addendum to Application A-19594

In response to Nebraska Revised Statutes § 46-289 (5), the economic, environmental and other benefits of leaving the water in the basin of origin for current or future beneficial uses can be summarized as follows:

Economic Benefits. An economic impact study of the Platte Republican Diversion Project was completed by the University of Nebraska Bureau of Business Research on January 13, 2018. As stated in the Executive Summary, *"No losses are expected in the Platte River basin because the Diversion project would only be utilized in years when there were excess flows of water on the Platte. In other words, absent the Platte Republican Diversion project, this water otherwise would have flowed through the Platte River basin and left the State of Nebraska without any decrease in economic activity in the Platte River basin."* Stated differently there can be no lost economic benefits by simply preventing a non-use of excess water in the Platte Basin.

Environmental Benefits. The environmental needs of the basin of origin have been quantified through several formal processes. The first was the application for instream flows by the Nebraska Game and Parks Commission (NGPC) for the central and lower Platte River and by the Central Platte Natural Resources District (NDR). These applications were made due to the requirement of § 46-2,109, which states in part:

> *Each natural resources district and the Game and Parks Commission* ***shall*** *conduct studies to identify specific stream segments which the district or commission considers to have a critical need for instream flows. Such studies shall quantify the instream flow needs in the identified stream segments. (Emphasis Added)*

After holding hearings, the Department of Water Resources granted these applications in the early 1990's. "The Central Platte NRD[s] ... instream flow water rights on the Platte River ... protect and enhance wildlife."[1] The NGPC instream flows provide benefits for fish and whooping crane habitat. Collectively, these instream flow water rights provide these environmental benefits from the J-2 return to the confluence with the Missouri River (i.e., the entire river reach that the PRD project could impact). The PRD project will not jeopardize these environmental benefits because these benefits are protected by the senior water rights held by the Central Platte NRD and the NGPC.

If either entity determines environmental benefit(s) to leaving additional water in the basin of origin (not identified when they were originally required to conduct studies pursuant to § 46-2,109), they may protect those benefits from PRD diversions by securing any needed increase in the current instream flow levels. The PRD's permit application includes the requested condition that junior users in the Platte Basin have priority over PRD project diversions, so any changes in the instream flows will be protected from PRD diversions.

The second formal process of determining the environmental needs of the Basin of origin consisted of the definition of the U.S. Fish and Wildlife Services Target Flows (hereinafter "Target Flows") for the critical habitat reach of the Platte River. As part of the Platte River Recovery and Implementation Program (PRRIP), the States of Nebraska, Wyoming, and Colorado, as well as the United States, have agreed not to allow any water uses initiated after 1997 that would result in an increase to any shortages to Target Flows that may exist or occur. Furthermore, they have

[1] Central Platte NRD Master Plan, 2011.

agreed to develop projects and programs that would mitigate post-1997 depletions to Target Flows.

Therefore, there are environmental benefits to leaving additional water in the Platte Basin under two conditions: 1) during times when the Target Flows are not being met, and 2) during times when water is needed for projects or programs that will assist in meeting the PRRIP and New Depletion Plan requirements. However, under the conditions requested with this the permit application, water will be left in the basin of origin under these circumstances. As all currently defined environmental needs for water will not be interfered with under the PRD project, there is no other state recognized environmental benefit to leaving the water diverted under the PRD project in the basin of origin.

Other Benefits. There is currently no other benefit to leaving the water that would be diverted by the PRD project in the basin of origin. While recreation in the Platte Basin is another known benefit of stream flow in the Platte River, the flow protections described above (the instream flow rights and the Target Flows) appear to provide adequate flow to support significant recreational benefits.

Platte Republican Diversion
Interbasin Transfer Permit Application

PREPARED FOR

Platte Republican Diversion
Central Nebraska Public Power and Irrigation District
415 Lincoln St
Holdrege, NE 68949

PREPARED BY

Olsson Associates
601 P Street, Suite 200
Lincoln, NE 68508

April 4, 2018

OLSSON ASSOCIATES

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SECTION 1 - INTRODUCTION

The Platte Republican Diversion (PRD) project will construct a diversion to transfer excess flows from the Platte River Basin into the Turkey Creek valley in the Republican River Basin (Figure 1). The PRD will provide water to the Republican River Basin only during times of excess flow in the Platte River Basin. The primary project objectives are to help the Lower Republican and the Tri-Basin Natural Resources Districts (NRDs) meet the requirements of their Integrated Management Plans (IMPs) and assist the State of Nebraska to meet its obligations under the Republican River Compact (Compact). The purpose of the PRD project is to use the available unappropriated water for the benefit of the citizens of Nebraska.

This application is submitted to provide the necessary documentation for the Nebraska Department of Natural Resources (NDNR) to grant the right to appropriate water to the cooperating partners of the PRD project. The three partners collectively applying for this interbasin transfer permit are the Lower Republican and Tri-Basin NRDs and Central Nebraska Public Power and Irrigation District (CNPPID). Olsson Associates provided engineering, design, and permitting assistance to the PRD and has prepared this application under contract with CNPPID.

There are three forms submitted with this application included as attachments:

Attachment A Application for Variance – DNR Form SW-001 and the Order Granting Leave to File
Attachment B Copy of the Proposed Appropriation Permit – DNR Form APA-001
Attachment C Copy of the Proposed Interbasin Addendum – DNR Form 400

Project Description

The project will divert unappropriated water from the Platte River at the Tri-County diversion dam, through the CNPPID supply canal, through the E65 canal, into a new diversion structure, and discharge into the valley above the East Branch Turkey Creek, a tributary of the Republican River. Although detailed design elements for the PRD project may not be needed for permit approval, it is important to have an overall understanding of the new and existing structures that will accommodate the flow associated with this interbasin transfer permit application. As such, this section summarizes the project design elements as presented in the PRD Project Feasibility Review Report (Olsson, 2017).

For the PRD project, excess flows will be diverted from the Platte River at the Tri-County diversion dam located east of North Platte, Nebraska. The Tri-County diversion dam is an 874-foot-long concrete and steel structure located just east of the confluence of the North and South Platte Rivers. The diversion dam either diverts water through the headgates of CNPPID's supply canal or passes water down river. Water diverted through the 75-mile-long supply canal delivers water to CNPPID's three main irrigation canals, E65, E67 and Phelps (Figure 2).

Water diverted into CNPPID's supply canal for the PRD project will flow into the E65 canal inlet located just upstream of Johnson Lake southwest of Lexington. The water made available to the project would be water diverted into the supply canal that would otherwise be returned the Platte River at the J2 return located southeast of Lexington. When there are excess flows downstream of the J2 return, as measured at a stream gage near Grand Island, NE, some of the water would be retained in the E65 canal and delivered to the PRD project. To ensure the excess flows are available for delivery to the PRD project, some of the excess flows may be regulated in Elwood

Reservoir before delivery to the project. During times of excess flow on the Platte and available space for regulation in Elwood Reservoir, the water would be pumped from the E65 canal into Elwood Reservoir using CNPPID's three existing pumps. The pumps have a total pumping capacity of 275 cubic feet per second (cfs).

As part of the PRD project, CNPPID will construct a diversion structure on the E65 canal between Elwood and Smithfield. Using the new diversion, excess Platte River flows will be diverted from the E65 canal into the valley above the East Branch Turkey Creek (Figure 3). As per the design capacity of the PRD project, the maximum capacity of flow into Turkey Creek valley will be 100 cfs. Any diversion into the E65 Canal above 100 cfs may be regulated in Elwood Reservoir, subject to space limitations.

Turkey Creek is a tributary to the Republican River and generally runs north to south starting approximately 4 miles east of Elwood, Nebraska. It empties into the Republican River between Edison and Oxford, Nebraska. The upper 4 to 5 miles of the Turkey Creek drainage basin is a valley area and many stretches do not have a defined bed and bank or ordinary high-water mark. This upper section does have a defined centerline, but the overall capacity in this section is less than the capacity in the middle and lower sections. There are several farm ponds that currently retain a portion of runoff along the upper section of the Turkey Creek drainage basin. The middle and lower portions of the Turkey Creek drainage basin have fully defined beds and banks that carry base flow. The primary land use within the Turkey Creek drainage basin is pasture and farmland.

To accommodate the temporarily increased flow to Turkey Creek during a diversion, a series of channel and structural improvement recommendations will be made along the creek in Gosper and Furnas County. The recommended improvements are separated into two main categories. The first type of improvement includes maintenance of the existing creek channel so that the channel can support the diverted flows without causing additional erosion. The second type of improvement includes maintenance of existing structures including bridges, culverts, and farm ponds, so that they will not be impacted by the diverted flows.

The following is a summary of these specific design improvements based on the PRD Project Feasibility Review Report (Olsson, 2017):

Drainage Basin Improvements

The improvement for the upper section of Turkey Creek valley includes installation of a new underground polyvinyl chloride (PVC) pipe for an approximately 3,000-foot length (Figure 1). The new pipe will range from 36 to 48-inches in diameter and will protect the steeper slopes of the upper section of Turkey Creek valley from erosion.

Along the middle section of Turkey Creek valley (approximately the next 5 miles) the channel capacity varies. Regrading will be recommended along specific sections of the creek to increase the capacity. The regrading will consist of widening the existing channel in some areas above the high-water mark to allow the diverted flows to stay within the stream banks.

The final section of Turkey Creek currently has sufficient capacity to handle the diverted flows along with the current base flow. No substantial improvements are proposed along this stretch with the exception of minor regrading to repair existing erosion issues caused by historic high flow events. Minor grading will take place above the ordinary high-water mark to minimize impacts to the existing stream.

Maintenance to Existing Structures

The second category of maintenance addresses existing structures and erosion control measures that will be installed at each drainage structure location. Many of the existing drainage structures on Turkey Creek have erosion issues at the upstream face that need to be addressed regardless of whether the diverted flows are introduced into Turkey Creek. If measures are not taken to control erosion in these areas, erosion will continue to expand and may eventually compromise bridge abutments or cause failure along roadway embankments. Specifically, riprap will be installed at the upstream face to provide protection either at bridge abutments or the inlets of culverts. Additionally, new overflow structures and/or additional pipes will be constructed at farm pond locations to allow the diverted flow to travel downstream instead of creating additional ponding areas and erosion along the farm pond embankment.

In summary, the PRD project will include the following new/existing infrastructure and improvements:

- The existing CNPPID supply canal will be used to divert excess flows from the Platte River into E65 canal
- Three existing CNPPID pumps, with a maximum pumping capacity of 275 cfs will be used to regulate excess flows in Elwood Reservoir, as needed
- CNPPID will build a new diversion structure on the E65 canal between Elwood and Smithfield to divert excess flow from the Platte Basin to the Republican Basin at a maximum rate of 100 cfs
- To accommodate the diverted flows in the east branch of Turkey Creek valley, approximately 3,000 linear feet of underground pipe will be installed along the upper section of the valley
- Two small, fourteen medium, and five large erosion protection measures will be built along the middle and lower sections of Turkey Creek valley to protect the streambed and existing infrastructure
- Four new drainage structures, three new culverts, and seven farm pond improvements will be completed to protect the existing infrastructure

SECTION 2 - ANALYSIS OF EXCESS FLOW

One of the first questions that is posed about the PRD project is – is there water available for diversion from the Platte Basin into the Republican River? Additionally, in the petition to the NDNR for leave to file or consider an application for a new surface water appropriation within a moratorium or stay area (often called a variance), it is necessary to provide an analysis of unappropriated water. To answer the question on whether there is water available and to fulfill the permit requirement to provide an analysis of unappropriated flow, three sources of information are presented.

Platte Republican Diversion Feasibility Review Report (Olsson 2017)

The first source of information was summarized in the PRD Feasibility Review Report (Olsson, 2017). In the feasibility report, a summary was presented on the potential water available to divert from the Platte River. The report summarized data from the NDNR on the potential amount of water that may be available in the Platte River. The evaluation involved a comparison of the historic Platte River streamflows against all currently existing demands to this water to compute flows in excess of current demands. Initially, data from the NDNR study from the Overton gage for the years 2000 to 2008 was used to estimate the excess flows that may be available to divert into Turkey Creek valley during a given year and to calculate the actual water the project could provide based on several assumed capacity limitations. These years were chosen because it was a dry period in which Nebraska could have potentially benefited from the diversion of water into the basin by assisting the state with Compact compliance.

In the feasibility report, data was presented listing total monthly excess flows available in the Platte River basin during 2000 to 2007. Originally, the analysis did not take into account future needs for projects in the Platte River Basin designed to meet the Platte River Recovery Implementation Program (PRRIP) goals as well as goals and objectives of the Platte Basin integrated management plans. With assistance from the Executive Directors Office of the PRRIP (J. Farnsworth, personal communication, June 6, 2017), the evaluation was revised and updated through 2016 to take into account future needs in the Platte Basin and additional potential benefits that could have been realized during more recent years. The estimate for future needs in the Platte is up to 1,000 cfs of additional diversions. Table 1 shows the average annual amount of water that would be available to divert from the Platte River basin from 2000 to 2016 with and without an assumed increased use of 1,000 cfs, for a PRD project capacity of 40 cfs and 100 cfs.

Table 1 – Potential Acre-Feet Available to Divert

YEAR	Without additional 1,000 cfs		With additional 1,000 cfs	
	40 cfs	100 cfs	40 cfs	100 cfs
2000	9,340	21,721	3,722	8,989
2001	8,102	19,117	772	1,742
2002	7,419	16,782	0	0
2003	2,408	4,877	0	0
2004	2,752	5,651	0	0
2005	2,994	7,277	0	0
2006	2,487	5,120	79	198
2007	3,665	8,366	79	198
2008	4,346	9,973	713	1,782

YEAR	Without additional 1,000 cfs		With additional 1,000 cfs	
	40 cfs	100 cfs	40 cfs	100 cfs
2009	5,227	12,474	356	752
2010	16,889	41,818	8,217	20,176
2011	25,859	64,469	20,176	49,559
2012	7,827	19,261	2,732	6,712
2013	9,249	21,950	2,119	5,207
2014	8,732	21,115	2,812	6,811
2015	19,206	47,401	12,474	30,730
2016	20,117	49,124	13,266	32,076

One additional factor needs to be taken into account, which is the extent to which water was actually needed in the Republican River Basin during these years. During 2013-2016, the Republican River Basin NRDs pumped approximately 132,000 acre-feet of groundwater into Republican River tributaries from the Rock Creek and Nebraska Cooperative Platte Republican Enhancement Projects in order to ensure that Nebraska complied with the Republican River Compact during those years.

Table 2 presents the total available excess flow that could have been diverted from the Platte Basin into the Republican Basin during 2013-2016. As it is unclear when the Platte Basin will have the infrastructure in place to create an additional 1,000 cfs of diversions in the Platte Basin, the potential benefits of the project when similar years recur in the future is estimated to be between approximately 30,000 and 130,000 acre-feet (139,590 capped at the approximate need for water during 2013-2016) depending on the capacity of the final diversion project.

Table 2 – Potential Acre-Feet Available to Divert during September through April

Design Option	Without Additional 1,000 cfs	With Additional 1,000 cfs
40 cfs	57,303 acre-feet	30,670 acre-feet
100 cfs	139,590 acre-feet	74,824 acre-feet

The results of the analysis summarized in Figure 4 illustrate the daily discharge in the Platte River with and without the proposed diversion. The results are for the last four years of flow recorded at the stream gage in Overton, NE. In blue, is the historic Platte River discharge in cfs. In red is an estimate of the Platte River discharge if the PRD project were in place. The green line represents the diversion of excess flows from the Platte River into the Republican River Basin that would have occurred if the PRD were in place and all current water appropriations were allowed prior to the diversion.

Evaluation of Historic Platte River Streamflow in Excess of State Protected Flows and Target Flows, NDNR 2010

The second source of information was an analysis on the availability of excess flows completed in 2010 entitled, "Evaluation of Historic Platte River Streamflow in Excess of State Protected Flows and Target Flows" (NDNR, 2010). The analysis was prepared by HDR and the Flatwater Group for NDNR and as written in the introduction to the analysis:

> *"This document describes the analysis conducted to evaluate the historic quantity of excess water in the Platte River. The purpose of this project was to develop a planning tool to estimate the rate of flow and the duration and frequency of water in excess of state protected flows by reach; and to determine the quantity of water in excess of target flows based on wet, dry, and normal hydrologic classification. The study included the area from the North Platte River at Lewellen, Nebraska, and the South Platte River at Julesburg, Colorado, to the Platte River near Louisville, Nebraska."*

In the report, the excess natural flow (or excess flow as used in this permit application) was a computed value that represents the difference between the available natural flow and the natural flow demand. The analysis used data from Platte River gages, canal diversions and returns for the period beginning in 1954 through the end of 2008. The analysis identified that at the Overton gage near the PRD project, for the 54-year time period analyzed, the average number of days with excess natural flow ranged from 2.6 days in August to 21.9 days in both February and March. For comparison, at the Louisville gage in the Lower Platte River, for the same 54-year time period, the average number of days with excess natural flow ranged from 12. 2 days in August to 30.2 in March.

NDNR Order Granting Leave to File and Application for a New Surface Water Appropriation within and Area Subject to a Moratorium by Petition VAR-6282 (NDNR 2017)

The final source of information relates to recent surface water appropriations granted within the Platte River basin on the same point of diversion as this application which is at North Platte with the same excess flows on the Platte below the J-2 return. On September 6, 2017, NDNR granted a new temporary surface water appropriation on the Platte River pursuant to petition VAR-6282. As stated in the conclusions of the order, "Petitioner has provided evidence that indicates there is likely to be unappropriated water in the future on the Platte River prior to and after some irrigation seasons because of the flow in excess of appropriated water and Desired Minimum Discharge" as defined in the order. This and other similar permits would not have been granted if unappropriated water was not available on the Platte River.

In summary, the three sources of information indicate that there is sufficient excess flow in the Platte to enable diversion to the PRD project. The PRD is intended to be an additional water management tool that will be used in conjunction with the water management actions currently implemented by the Tri-Basin and Lower Republican NRDs through their IMPs. Specifically, the PRD will be used in conjunction with the groundwater and surface water controls such as moratoria, transfer provisions, and well-metering requirements currently applied across the districts. The PRD will be one of the many tools in the toolbox that will provide flexibility and reliability to the water management actions available for use by the NRDs to meet the requirements of their IMPs and the Compact.

SECTION 3 - INTERBASIN TRANSFER ADDENDUM QUESTIONS A-F

NDNR surface water (SW) Form 400 titled "Interbasin Transfer of Water *Addendum* to Application for a Permit to Appropriate Water" is to be filled out along with an appropriation that proposes transferring water from one basin to another. Since the PRD application involves diverting water from the Platte River to the Republican River, items 1-10 have been filled out in the attached application (Attachment C Interbasin Addendum – DNR Form 400) and responses to questions A-F are submitted in the following subsections.

A. The economic, environmental, and other benefits of the proposed interbasin transfer and use.

Primary Economic Benefits

The PRD project provides a beneficial impact to the state's residents by helping meet the obligations that the State of Nebraska has under the Interstate Compact between Kansas, Nebraska and Colorado, known as the Compact. The Compact and the more recent Final Settlement Stipulation (FSS), which resolved interstate litigation concerning the Compact in 2002, lay out specific limitations on Nebraska use of the water supply of the Republican River Basin. The current level of irrigation development in the Republican River Basin results in a violation of these limitations under certain climate and water use conditions in the absence of management actions such as development of projects like the PRD. For example, NDNR forecasted that, in lieu of additional actions, it was expected that Nebraska would overuse its water supply allotment for the years 2013-2017 (NDNR, 2013, 2014, 2015, 2016 and 2017). The PRD project will provide additional water supply to the Republican River Basin when excess flows are available in the Platte River and when these potential violations might otherwise occur.

To comprehend the dangers associated with Nebraska overusing its allotment of Republican River Basin water supplies, it is important to understand what non-compliance has cost the State of Nebraska in the past, and the cost the State of Nebraska would likely incur given a future violation. The facts of the Kansas v. Nebraska lawsuit were reported on the Legal Information Institute website as follows:

> *"On May 3, 2010, Kansas filed a Motion with the Supreme Court of the United States that revived previous litigation between Kansas and Nebraska concerning a water rights dispute. The dispute reflects ongoing tensions between Kansas and Nebraska concerning a water rights agreement signed in 1943. The 1943 Republican River Compact agreement ("Compact") allocates 49 percent of the river's water to Nebraska, 40 percent to Kansas, and 11 percent to Colorado. Notably, the "Compact Clause" of the United States Constitution dictates that Congress must approve any compact—an agreement—between two states.*
>
> *Starting in 1999 and continuing through the action at hand, Kansas accuses Nebraska of violating the Compact by allowing farmers to divert more water than they should for private use. The Compact, however, does not contain clauses for dispute resolution, actual administration of the Compact, or for damages. Colorado, not accused of wrongdoing itself, is involved as one of the members of the Compact and as a party interested in the outcome of the case.*

> *In the previous dispute, Kansas alleged that Nebraska's use of hydraulic wells to drain the Republican River and its tributaries constituted consumption that counted against Nebraska's allocated share of the water. The Court decided to exercise original jurisdiction on January 19, 1999. The Court appointed a Special Master ("Master") to handle proceedings and give findings and suggestions to the Court. Thereafter the parties entered into settlement discussions on how to properly account for water consumption in accordance with the Compact. In 2003, the parties adopted a groundwater agreement known as the Final Settlement Stipulation ("FSS").*
>
> *In 2010, Kansas claimed Nebraska violated the FSS by over-consuming water from the Republican River and that Nebraska's violation harmed Kansas. Kansas thus requested the Court for various remedies. In April 2011, the Court again appointed a Master to direct the proceedings of the litigation, take evidence, and report to the Court with recommendations.*
>
> *After taking evidence and hearing the parties' claims, the Master issued a Special Master's Report and gave suggestions to the Supreme Court regarding how to settle the dispute. The Master concluded that Nebraska used more water than it should, and that the Court should use its equitable powers to craft a remedy to suit the situation. The Master suggested that the parties abide by a new accounting procedure to determine water use. The Master further concluded that the Court deny Kansas' request that Nebraska be held in contempt. The Master also recommended that the Court enter judgment in the amount of $5.5 million against Nebraska and in favor of Kansas for Nebraska's failure to meet the standards set forth in the compact in 2006. Finally, the Master suggested that the Court deny Kansas' other requests for relief, including requests for injunctive relief, sanctions, and appointment of a river master."*
> (https://www.law.cornell.edu/supct/cert/126orig)

Additionally, the Supreme Court indicated that the penalty for a future violation would likely be significantly greater in the future (U.S. Supreme Court, 2014). The total of $5.5 million includes disgorgement of a portion of Nebraska's gains as a result of the violation (i.e., the award was for more than Kansas' losses alone). In the words of the Special Master, "Nebraska's incentive to extend its recent record of strong compliance should be increased by its knowledge that, in the event of a relapse after this date, Nebraska will have a difficult time parrying a request for disgorgement even in the absence of a deliberate breach."

The possibility of future litigation is not an idle threat. The State of Kansas recently filed a friend-of-the-court brief on water litigation in the State of New Mexico. In the brief, it was clear that Kansas will continue to pursue litigation should Nebraska fail to meet its obligations under the Compact and FSS. Given that Nebraska no longer has any financial incentive to overuse its allotment of the Republican River Basin's water supply, and that demand for water exceeds the supply in some years, one of two things must happen: 1) Nebraska must reduce its demand on the water supply or 2) increase the supply. As will be shown below, the economic implications of reducing these demands are dramatic. By moving water that is not needed in the Platte Basin to the Republican River, the PRD project would provide an enormous economic benefit to the water users and other residents of the Republican River Basin.

From the time the states adopted the FSS through conclusion of the litigation described above, the Nebraska Legislature appropriated many tens of millions of dollars from the general fund

through NDNR toward Compact compliance and legal support. In other words, the State of Nebraska has invested heavily in the economic well-being of the residents of the Republican River Basin. As will now be shown below, this investment, and additional future investments through projects such as the PRD, are small relative to the economic benefits of sustaining the current level of irrigation development in the basin.

Economic Impact of the PRD Project

To estimate the specific economic impacts of the PRD project, Dr. Eric Thompson from the University of Nebraska-Lincoln Bureau of Business Research (UNL-BBR) prepared an economic impact study of the PRD project (Thompson, 2018). The full report is included as Attachment D and the following is a summary of the methodology and findings presented in the report.

The methodology of the analysis is described as follows. The study assessed the economic impact that the proposed PRD project would have on both the Platte and the Republican River basins. Specifically, the study assessed: 1) any loss of economic activity in the Platte River basin, if present, which results from the diversion of water from the Platte River during years when the project is utilized; 2) any loss in economic activity due to an occupation tax revenue from lands which must be raised to support construction or operation of the PRD; and 3) any gain in economic activity in the Republican River basin due to avoiding irrigation shutdowns or reduced allocations in the Lower Republican NRD.

The analysis considered that the PRD project would only be utilized in select years when there is sufficient excess flow in upper portions of the Platte River basin which are not allocated or appropriated for current or expected future downstream use. The water allocated to the Republican River basin would aid the Lower Republican NRD to support compliance with the Compact without shutting down groundwater irrigated acres. The continued operation of irrigated acres would be the direct economic impact of the project.

The Lower Republican NRD has approximately 78,000 rapid response groundwater irrigated acres which would be shutdown, if necessary, to keep the district in compliance with their IMP and the State of Nebraska in compliance with the Compact. There would be lost agricultural activity and lost income if those 78,000 acres engaged in dryland rather than irrigated production. As was discussed in the 2007 UNL-BBR report "The Economic Impact of Reduced Irrigation in the Republic River Basin", the resulting decline in agricultural production is a direct economic impact on the basin economy (Thompson, 2007).

The PRD project may also impact the economy by generating recreation opportunities. Water diverted through the PRD project in many cases would be stored in Harlan County Lake until such time that it is needed for compliance with the Compact. Such storage would result in a higher water level and enhanced recreation opportunities at Harlan County Lake. A report from the U.S. Department of Interior Bureau of Reclamation provides estimates of the economic benefits of enhanced recreation opportunities at Harlan County Lake (U.S. Bureau of Reclamation, 2017). The report generated estimates of the recreation benefits at Harlan County Lake under alternative climate and infrastructure investment scenarios. Under one estimate, the net present value of annual recreation benefits from a combination of higher lake levels and warmer temperatures was nearly $50 million. However, information in the report did not break out the share of benefit which could be attributed to higher lake levels versus warmer temperatures. As result, it is not feasible to use estimates from the Republican River Basin Study to estimate specific recreation benefits from the PRD project, as this would only influence water levels but not temperatures. The results of the Republican River Basin Study, however, do indicate that there are additional economic

benefits for individuals utilizing Harlan County Lake for recreation, as well as additional economic impacts in the Republican River basin.

In addition to this direct impact, there also is a multiplier impact on the economy. The multiplier impact occurs for two reasons: changes in business spending on supplies and services, and changes in household spending as employees spend their paychecks. In the report, such multiplier impacts are estimated using the IMPLAN model. The sum of the direct economic impact and the multiplier impact is the total economic impact.

These economic impacts in the Republican River basin would be the only economic impacts expected to result from the project. This is because no economic impacts are expected for the Platte River basin. The PRD project only would be utilized in years when there are excess flows of water on the Platte River. In other words, absent the PRD project, this water otherwise would flow through the Platte River basin and leave the State of Nebraska without decreasing economic activity.

There would also be a construction period impact from the project. The direct economic impact during the construction period was estimated based on construction cost estimates. The multiplier impact during the construction period, due to spending on materials and as workers spend their paychecks, was also estimated using the IMPLAN model. The direct impact would be added to the multiplier impact to yield the total economic impact during the construction period.

The findings of the analysis are described as follows. Impact estimates were developed for the Republican River basin during two periods. First, impact estimates were developed for the construction period when the PRD project infrastructure is put in place. Second, impact estimates were developed for compact "call years" when the PRD project would help avoid the "shut down" of groundwater irrigated production in the Republican River basin.

As stated in the report, the potential economic impact of the PRD is substantial. The estimated economic impact during the construction period would be $0.91 million in output, including $0.53 million in labor income paid out over 14 jobs-years. During call years, the economic impact in the Republican River basin would range from $14.17 million to $33.05 million, depending on how much of the water needed to meet interstate agreements and obligations comes from the PRD project versus other sources. This total impact would include a labor income impact ranging between $2.41 million to $5.63 million over the course of a year which would be paid out in 28 to 65 jobs. Even larger impacts are possible under an alternative regulatory scenario where more of the Lower Republican NRD acres would potentially lose irrigation. Impacts also would grow if irrigation needed to be shut down in other areas of the Republican River basin. Additionally, given these large impacts during each call year, the project would have a substantial cumulative impact over its lifetime. If there are two call years out of each ten years, as anticipated, over a 50-year project lifetime the impacts would occur ten times over that period or $141.7 million to $330.5 million.

The PRD project also would at times lead to higher water levels at Harlan County Lake. Higher lake levels are associated with greater recreation amenities according to the U.S. Department of Interior Republican River Basin Study. Greater recreation amenities would result in economic benefits for individuals engaged in recreation and economic impacts for local businesses who provide goods and services to visitors. Higher levels of recreation amenities result because Harlan County Lake would have a larger surface area, which is more attractive for potential visitors.

Environmental and Other Benefits:
The PRD project will provide the following secondary benefits:

- **Municipal and industrial use** – by providing additional streamflow to Turkey Creek and the Republican River basin, the project will provide additional groundwater recharge that could be used for more sustainable municipal and industrial groundwater supplies.
- **Wildlife habitat** – by providing additional streamflow to Turkey Creek and the Republican River, wildlife habitat along the rivers and within Harlan Reservoir will be enhanced. The Nebraska Game and Parks Commission noted that currently due to low flow conditions to Turkey Creek, aquatic habitat conditions associated with high water levels have been reduced and lower production of shoreline species has occurred. Further they indicate that some fisheries species are not sampled anymore due to the absence of coves which results in a low fish counts.
- **Conservation and preservation of water resources** – The past few years have seen significant flows in the Platte River at a time when water supplies have been relatively low in the Republican River Basin. For example, in the summer of 2010, the peak discharge on the Platte River at Maxwell, Nebraska was over 7,600 cfs, and again in the summer of 2011, the peak discharge nearly exceeded 7,900 cfs. These flows occurred at times when flows in the Republican River at McCook, south of Maxwell, were about 190 to 200 cfs. The PRD project will conserve and preserve some of the excess Platte River flows that would otherwise be lost to the Missouri River.
- **Aquifer recharge** – The PRD project will increase recharge along Turkey Creek during times of diversion.
- **Flood reduction** - The PRD project will provide a small increment of flood magnitude reduction in the Platte River valley downstream of the J-2 River Return.

B. Any adverse impact of the proposed interbasin transfer and use.

None.

This can be definitely stated due to the application's specific request for the condition to be included in any final order that the appropriation granted to the PRD project will never be able to exercise a call over any future junior appropriations granted for water uses of the Platte River within the Platte River Basin. This will mean that the owners of the PRD project will not be able to request administration of junior appropriators in the Platte Basin, and junior appropriators in the Platte Basin will always be able request administration of the PRD project to protect their rights.

C. Any current beneficial uses being made of the unappropriated water in the basin of origin.

The only known uses of unappropriated water in the Platte River are for meeting the Target Flows of the PRRIP. The applicants recognize the requirements placed on the State of Nebraska by the Nebraska New Depletions Plan, which is incorporated into the Water Action Plan of the PRRIP. It is also understood that the target flows are subject to future modifications. Therefore, any final order granting this application should also be conditioned in a manner similar to Permit A-18922 to appropriate water for the purpose of groundwater recharge through the Cozad Canal System, which includes the following condition: "Only those flow's in excess of the Desired Minimum Discharge shall be considered to be available to be diverted." The term "Desired Minimum Discharge" (DMD) is quantitatively defined and incorporated into the permit and is based on the

current target flows and would change per the conditions of the permit if the target flows change in the future. Therefore, the current beneficial uses of the unappropriated water in the basin of origin will be protected from any impacts of the PRD project.

D. Any reasonably foreseeable future benefits of leaving the water in the basin of origin for current or future beneficial uses.

None.

Through conditions of the permit described in response to Questions B and C (above), current and future beneficial uses provided through appropriations and agreements will continue to occur by leaving the water in the basin of origin when needed for those appropriations and agreements.

E. Alternative sources of water supply available to the applicant.

Three alternative sources of water supply were evaluated for this permit application. Of the three, the first was deemed too expensive, the second is currently being implemented through the IMPs, and the third alternative is currently in progress through this application.

Surface Water Purchase and Augmentation Projects

As part of the PRD feasibility study two alternative sources of water supply were compared to the PRD project (Olsson, 2017). The two alternatives implemented in the Republican River Basin to increase streamflow were: 1) Surface water leases from irrigation districts and 2) the Nebraska Cooperative Republican Platte Enhancement (N-CORPE) Project. The following describes these two alternatives and the cost of water for each alternative. Development of another large-scale augmentation project or future surface water purchases are considered to be the next best alternatives to developing the PRD project.

Surface Water Purchase: From 2006 to 2008, surface water was leased from irrigation districts in the basin to assist with compliance with the Compact. The state and the local NRDs paid $18,722,500, which resulted in a reduction of consumptive use of 51,614 acre-feet, which equates to $362 per acre-foot of water.

Nebraska Cooperative Republican Platte Enhancement (N-CORPE) Project: The N-CORPE project is a large-scale streamflow augmentation project located in southern Lincoln County. This project provided construction costs and delivery costs for water to accomplish the goal of increasing streamflow. Based on project costs and an assumed average annual delivery of 3,750 acre-feet, the annual delivery cost for water from N-CORPE is $272.59 per acre-foot.

As described in the feasibility study, the unit cost for water from the PRD project is substantially less than the cost of these two alternatives. The cost of water for the PRD is projected to be $60 per acre foot.

IMP Implementation of Controls and Management Activities

The Tri-Basin and Lower Republican NRDs developed IMPs in collaboration with NDNR that include basic controls for Compact and FSS compliance. Tri-Basin NRD's IMP is dated September 2012, and the IMP jointly developed by the NDNR and the Lower Republican NRD is dated January 15, 2016. The basic controls for compliance included moratoria, transfer provisions, and well-metering requirements. Additionally, controls included in the IMPs for implementation during compact call years were: 1) curtailment of groundwater pumping within the Rapid Response Region in each NRD; and 2) a one-year pumping allocation that would apply to

the entire district and would limit groundwater use from each well regardless of any carry-over allocation from previous years. Both of these alternatives were evaluated in the economic analysis by Dr. Eric Thompson and the conclusions indicated that there would be a significant negative impact on the economy of the Republican River Basin as described in Section A, above.

Republican River Basin-wide Planning

In 2014, LB1098 added the requirement for basin-wide planning in fully-appropriated river basins with two or more NRDs. For the past three years, a dedicated group of stakeholders has been working on development of a basin-wide plan for the Republican River Basin that mandates sustainable water management. The group has been working to identify alternative water sources along with identifying ways to minimize consumptive use of water across the basin. The current Goals and Objectives section of the DRAFT Republican River Basin-Wide Plan has the following as its first objective:

> *"Objective 4.1: Increase water supply through interbasin transfers during periods of high flows. This objective relates to increasing water supply through interbasin transfers. This idea of diverting available water to the Republican Basin from other basins during periods of high flows has garnered much support from stakeholders throughout the plan development process. The most likely basin to serve as a suitable basin or origin for an interbasin transfer project would be the Upper Platte Basin in Nebraska, but other basins within and outside the state have also been suggested at times during Stakeholder Advisory Committee meetings. Interbasin transfers would benefit the Republican Basin by bringing additional water into the Basin and may also benefit the basin of origin (such as the Upper Platte Basin) by potentially reducing the impacts of flooding downstream of the diversion site."*

With that said, the basin-wide planning is ongoing. The PRD is the only project currently identified for implementation in order to assist in meeting the goals and objectives of the plan.

In conclusion, three alternative sources of water supply were evaluated for this permit application. Of the three, the first was deemed too expensive, the second is currently being implemented through the IMPs, and the third alternative is currently in progress through this application.

F. Alternative sources of water available to the basin of origin for future beneficial uses.

Through conditions of the permit described in response to Question B and C (above), alternative future sources of water available to the basin of origin are any and all currently unappropriated water of the Platte River. Future uses will be met, to the extent allowed by actual Platte River flows, by leaving the water in the basin of origin when needed for those uses.

SECTION 4 - SUMMARY

As demonstrated above, the PRD project is in the public interest because the overall benefits to the state and applicant's basin (which are significant) are greater than or equal to any adverse impacts to the state and the basin of origin, because there will be none. The interbasin transfer permit for up to 275 cfs from the Platte Basin for deliveries to the Republican Basin via the CNPPID E65 canal, temporary regulation in Elwood Reservoir, and to Turkey Creek should be granted with the conditions described above, and any other deemed necessary to protect the public interest.

SECTION 5 - REFERENCES

Olsson Associates, 2017. Platte Republican Diversion Feasibility Review Report. Prepared for PRD, July 2017, 442 pgs.

NDNR, 2010. Evaluation of Historic Platte River Streamflow in Excess of State Protected Flows and Target Flows. Prepared for NDNR by HDR and the Flatwater Group. December 2010. 202 pgs.

NDNR, 2013. Forecast of Allowable Depletions in the Republican Basin During 2014 and 2024.

NDNR, 2014. Forecast of Allowable Depletions in the Republican Basin During 2015 and 2025.

NDNR, 2015. Forecast of Allowable Depletions in the Republican Basin During 2016 and 2026.

NDNR, 2016. Forecast of Allowable Depletions in the Republican Basin During 2017 and 2026.

NDNR, 2017. Forecast of Allowable Depletions in the Republican Basin During 2018 and 2026.

Thompson, Eric. 2007. The Economic Impact of Reduced Irrigation in the Republic River Basin, Bureau of Business Research Report.

Thompson, Eric, 2018. Economic Impact Study of the Platte River Diversion Project, Prepared for the Central Nebraska Public Power and Irrigation District, Final Report.

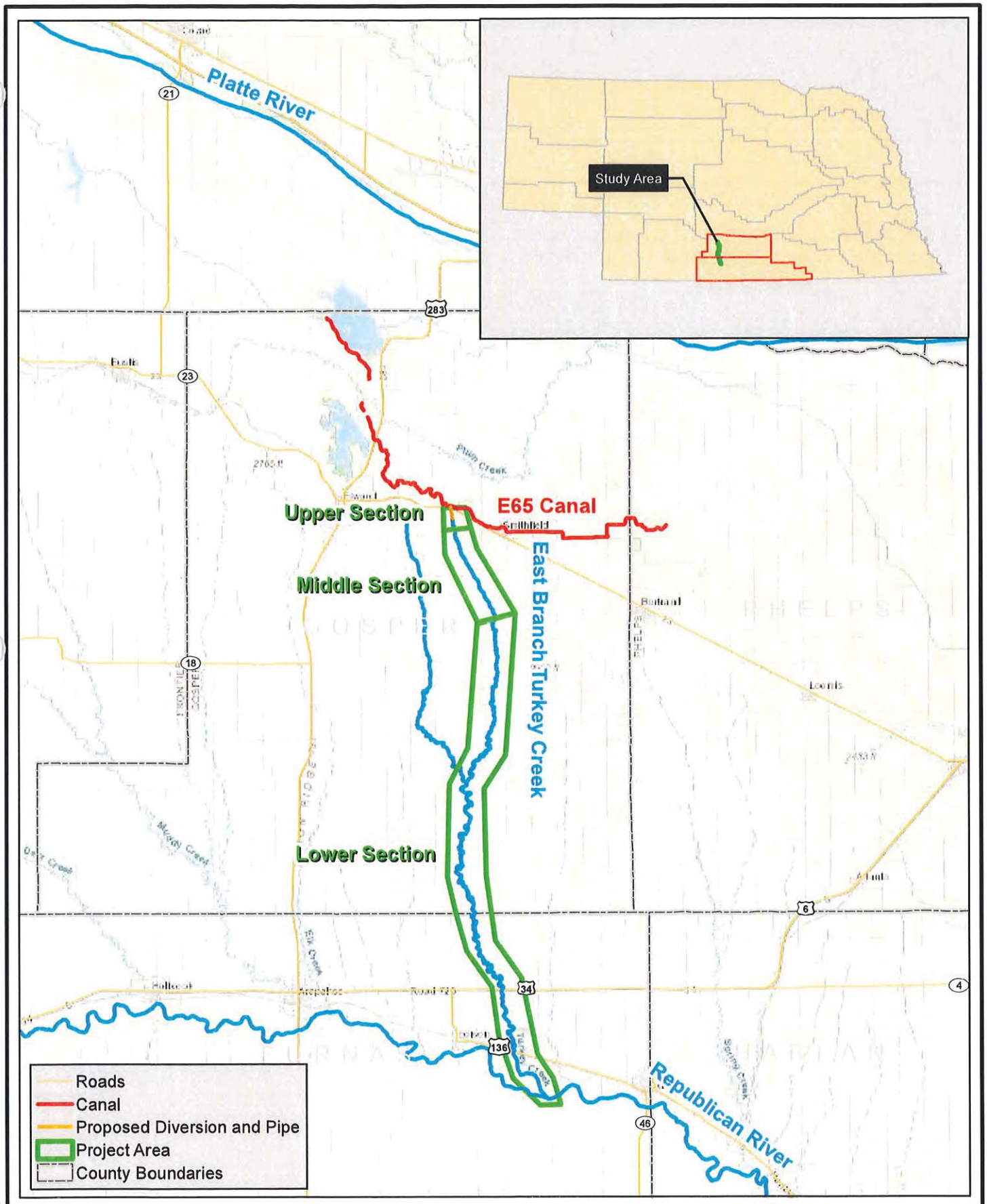
U.S. Department of Interior, Bureau of Reclamation, 2016. Reclamation: Managing Water in the West, Republican River Basin Study, December 19, 2017.

U.S. Supreme Court, 2014. Syllabus Kansas v. Nebraska et al., On Exceptions to Report of Special Master. October Term, 2014.

SECTION 6 - RELIANCE

This document was prepared solely for the PRD under contract with CNPPID in accordance with professional standards at the time the services were performed. This document is governed by the specific scope of work authorized by CNPPID and is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. All data, drawings, documents, or information contained this report have been prepared exclusively for the person or entity to whom it was addressed and may not be relied upon by any other person or entity without the prior written consent of CNPPID and PRD.

FIGURES



OLSSON ASSOCIATES

Platte Republican Diversion Project
Location Map

FIGURE
1

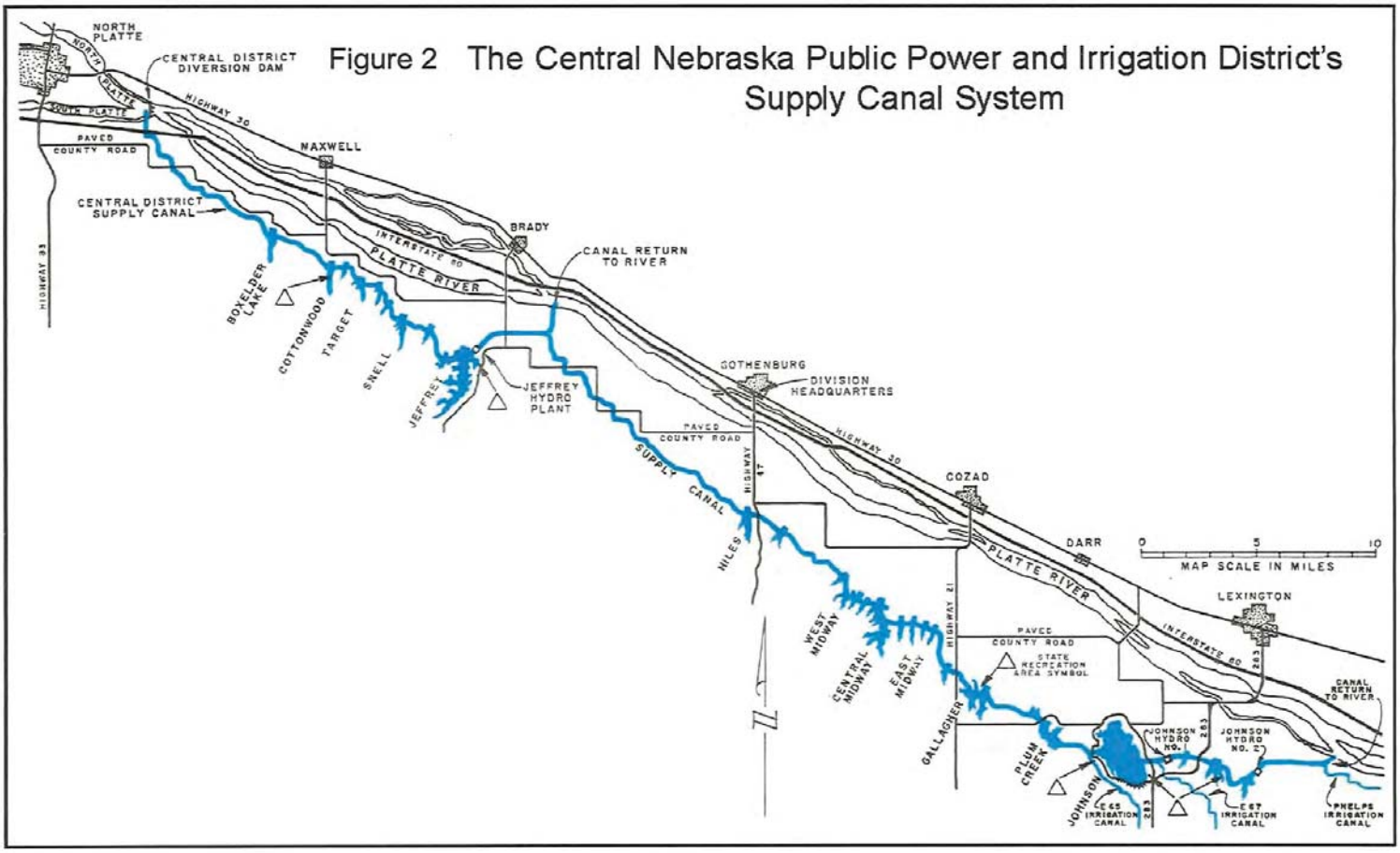
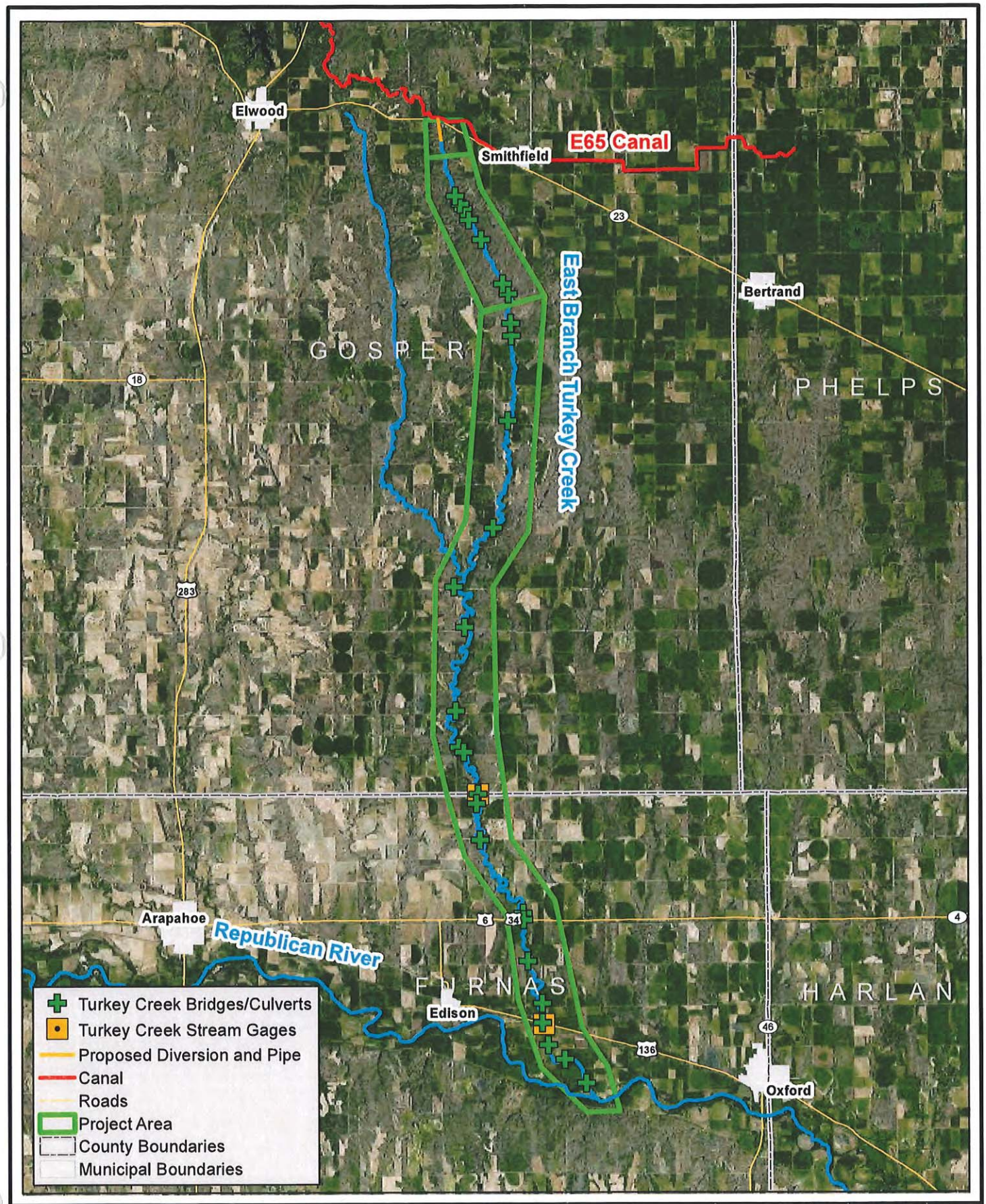


Figure 2 The Central Nebraska Public Power and Irrigation District's Supply Canal System



OLSSON ASSOCIATES

N

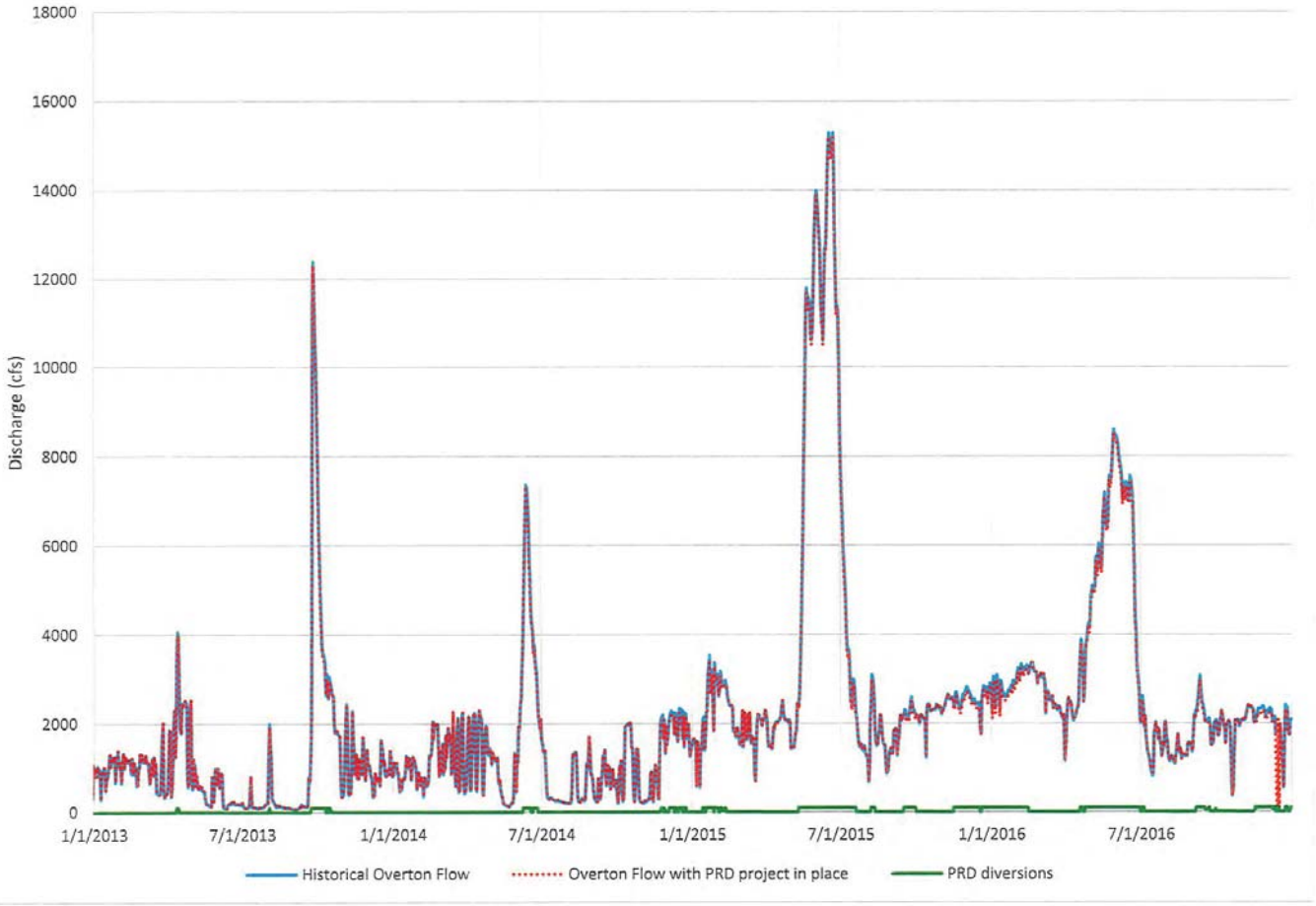
0 1 2 4 Miles

Sources: NDNR, USGS, US Census Bureau, ESRI

Platte Republican Diversion Project Components Map

FIGURE 3

Figure 4 Daily Discharge in the Platte River at Overton



ATTACHMENT A

APPLICATION FOR VARIANCE – DNR FORM SW-001
AND THE
ORDER GRANTING LEAVE TO FILE

DNR Form SW-001
January 2009

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES

PETITION TO THE NEBRASKA DEPARTMENT OF NATURAL RESOURCES

FOR LEAVE TO FILE OR CONSIDER AN APPLICATION FOR A NEW SURFACE WATER APPROPRIATION WITHIN A MORATORIUM OR STAY AREA UNDER TITLE 457 N.A.C. CHAPTER 23

Complete items 1 through 5 by printing in ink or typing the appropriate information and by placing an X in the appropriate box. Attach supporting documentation and a $10 non-refundable filing fee.

For Department Use Only

Modification No.: _____
Date Filed: _____
Time Filed: _____
SW Appropriation No.: _____ (if applicable)
Right ID No.: _____ (if applicable)
Water Division: _____
Receipt No.: _____
Amount: _____

1. Name and address of petitioner:

Central Nebraska Public Power and Irrigation District, 415 Lincoln St, Holdrege, NE 68949
and the Platte Republican Diversion Interlocal Agreement Partners, 30 S John St, Alma, NE 68920

E-mail address: dkraus@cnppid.com Telephone No. (308) 995-8601

2. Check the situation that applies:

- ☐ Application Already Filed — Application Number: _____
- ☑ Application Not Filed (Enclose copy of proposed application)

3. Description of proposed project:

The Platte Republican Diversion project will divert unappropriated flows from the Platte River to the Republican River. The proposed project is located in Gosper and Furnas Counties and will divert water from the Platte River through the E65 canal between Elwood and Smithfield, NE into the east branch of Turkey Creek. The diverted flows will enter the Republican River between Edison and Oxford, NE.

4. The Proposed Project — (Check all that apply):

- ☐ 001.01 — Is a non-consumptive use
- ☐ 001.02 — Will replace (offset) any consumptive use (Attach Offset Plan)
- ☑ 001.03 — Is for possible unappropriated water (Attach Analysis)
- ☐ 001.04 — Existed before the stay or moratorium (Attach Proof)
- ☐ 001.05 — Addresses a public safety issue (Attach Explanation)
- ☐ 001.06 — Is a temporary use for public construction (<10 AF)

5. Other reason why a variance should be granted:

Nebraska Rev. Statutes §46-715 (4)(b) requires that Integrated Management Plans ensure that the state remain in compliance with interstate water compacts or formal state agreements pertaining to water supplies. This variance will assist the Natural Resources Districts in meeting the requirements of their Integrated Management Plans and assist the State of Nebraska meet its obligations under the Republican River Compact and the Final Settlement Stipulation by diverting excess flows from the Platte to the Republican .

3/1/18
Date

Signature of Applicant (or authorized agent)

CNPPID

Send to the following address (along with $10 non-refundable filing fee):

State of Nebraska
Department of Natural Resources
301 Centennial Mall South / PO Box 94676
Lincoln, Nebraska 68509-4676
(402) 471-2363

STATE OF NEBRASKA

DEPARTMENT OF NATURAL RESOURCES

ORDER GRANTING LEAVE TO FILE AN APPLICATION FOR

A NEW SURFACE WATER APPROPRIATION WITHIN AN AREA SUBJECT TO A

MORATORIUM BY PETITION VAR-6600

WATER DIVISION 1-A

BACKGROUND

1. On July 14, 2004, the Department of Natural Resources (Department) issued a formal moratorium on all new surface water appropriations in the Platte River Basin upstream of the confluence with the Loup River near Columbus, Nebraska. The moratorium included all tributary streams above the Loup River confluence including the North and South Platte Rivers and tributaries. Subsequently, integrated water management plans have continued the moratorium on issuing new surface water appropriations.

2. Provisions of *Neb. Rev. Stat.* § 46-714(3)(n) allow for new surface water appropriations and increases in irrigated acres if the Department grants a variance and subsequently approves a permit for such new use.

3. On March 2, 2018, John Thorburn, on behalf of the Platte Republican Diversion Interlocal Agreement Partners, and Don Kraus, P.E., General Manager of The Central Nebraska Public Power and Irrigation District (CNPPID) (Petitioners) filed petition VAR-6600 for Leave to File or Consider an Application for a Permit to Appropriate Water within a Moratorium Area or Stay Area. The petition requests leave to file an application for an interbasin transfer for the purpose of meeting the requirements of Integrated Management Plans, the Republican River Compact and the December 15, 2002, Final Settlement Stipulation in the Kansas v. Nebraska and Colorado, No. 126 Original. Platte River water would be diverted via the Tri-County diversion dam, through the CNPPID supply canal, E-65 Canal, and Elwood Reservoir before being released into the East Branch of Turkey Creek, a tributary to the Republican River.

4. When filing a variance request, a project proponent must offer a clearly stated basis for such request and must offer sufficient good cause shown. *Department of Natural Resources Rules for Surface Water, Title 457 Neb. Admin. Code* Chapter 23 lists six circumstances that may be put forward as justification for granting a variance to apply for a new water use, in conjunction with an examination of good cause shown.

FINDINGS

1. The formal moratorium issued by the Department in 2004 has been continued in the surface water controls included in the integrated management plans (IMPs) adopted by the Platte River Basin Natural Resources Districts and the Department.

2. Petitioners provided information that indicates at times there may be unappropriated water in the Platte River Basin upstream of the confluence of the Loup and Platte Rivers.

3. The proposed application is for diverting unappropriated water to assist the Natural Resources Districts in meeting the requirements of their IMPS and to meet compliance with the Republican River Compact and the Final Settlement Stipulation.

CONCLUSIONS

1. The Petitioner has provided evidence that indicates at times there may be unappropriated water in the future on the Platte River prior to and after some irrigation seasons, thereby meeting the requirements of *Department of Natural Resources Rules for Surface Water* 457 *Neb. Admin. Code* Chapter 23, § 001.03.

2. The potential benefits of helping the Lower Republican and Tri-Basin Natural Resources Districts meet requirements of their IMPs and assist the State of Nebraska to meet its obligations under the Republican River Compact that the Petitioners expect to result from the proposed project show sufficient good cause for the Department to allow the application to be filed.

ORDER

IT IS HEREBY ORDERED:

1. Petition VAR-6600 for Leave to File an Application for a Permit to Appropriate Water is GRANTED.

2. This Order granting leave to file or consider an application for a new surface water appropriation within a moratorium or stay area pursuant to petition VAR-6600 shall be in effect for one year from the date this order is signed.

3. This decision shall not bind the Director to approve any application to which it relates, or in any way be used as evidence of prejudice for the Director's future decisions concerning the specific approval requirements of such an application.

DEPARTMENT OF NATURAL RESOURCES

March 23, 2018

Gordon W. Fassett

Gordon W. Fassett, P.E., Director

A copy of this Order was posted on the Department's website. A copy of this Order was provided to the Department's field office in Bridgeport, Nebraska. A copy of this Order was mailed on March 23, 2018, to the following:

Don Kraus, P.E., General Manager
The Central Nebraska Public Power and Irrigation District
415 Lincoln Street, P.O. Box 740
Holdrege, Nebraska 68949-0740

John Thorburn
Platte Republican Diversion Interlocal Agreement Partners
30 South John Street
Alma, Nebraska 68920

ATTACHMENT B

APPROPRIATION PERMIT – DNR FORM APA-001

ATTACHMENT C

INTERBASIN ADDENDUM – DNR FORM 400

ATTACHMENT D

FINAL ECONOMIC IMPACT STUDY OF THE PLATTE RIVER DIVERSION PROJECT

A Bureau of Business Research Report
From the University of Nebraska—Lincoln

Final Report

Economic Impact Study

of the Platte River Diversion Project

Prepared for the Central Nebraska Public Power and Irrigation District

January 13, 2018

Bureau of Business Research
Department of Economics
College of Business
University of Nebraska—Lincoln
Dr. Eric Thompson, Director

University of Nebraska Lincoln

Executive Summary

The proposed Platte Republican Diversion project (or Diversion project) would support compliance with Nebraska's interstate agreements and obligations as well as water management plans developed cooperatively by the Lower Republican and Tri-Basin Natural Resources Districts and the State of Nebraska. This study from the University of Nebraska-Lincoln Bureau of Business Research (UNL-BBR) estimates gains in economic activity in the Republican River Basin due to the project. No losses are expected in the Platte River basin because the Diversion project would only be utilized in years when there were excess flows of water on the Platte. In other words, absent the Platte Republican Diversion project, this water otherwise would have flowed through the Platte River basin and left the State of Nebraska without any decrease in economic activity in the Platte River basin.

Impact estimates are developed for the Republican River basin during two periods. First, impact estimates are developed for the construction period when the Platte Republican Diversion project infrastructure is put in place. Second, impact estimates are developed for compact "call years" when the Diversion project would help avoid the "shut down" of groundwater irrigated production in the Republican River basin. This report focuses on the avoided shut down of groundwater irrigated production in the Lower Republican Natural Resources District. The estimated economic impact during the construction period would be $0.91 million in output, including $0.53 million in labor income paid out over 14 jobs-years. During call years, the economic impact in the Republican River basin would range from $14.17 million to $33.05 million, depending on how much of the water needed to meet interstate agreements and obligations comes from the Platte Republican Diversion project versus other sources. This total impact would include a labor income impact ranging between $2.41 million to $5.63 million over the course of a year which would be paid out in 28 to 65 jobs. Even larger impacts are possible under an alternative regulatory scenario where more Lower Republican NRD acres would potentially lose irrigation. Impacts also would grow if irrigation needed to be shut down in other areas of the Republican River basin.

The Platte Republican Diversion project also would at times lead to higher water levels at Harlan County Lake. Higher lake levels are associated with greater recreation amenities according to the U.S. Department of Interior *Republican River Basin Study*. Greater recreation amenities would result in economic benefits for individuals engaged in recreation and economic impacts for local businesses who provide goods and services to visitors. Higher levels of recreation amenities result because Harlan County Lake would have a larger surface area, which is more attractive for potential visitors.

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I. Introduction

The proposed Platte Republican Diversion project would support compliance with Nebraska's interstate agreements and obligations as well as Integrated Management Plans (IMPs) developed cooperatively by the Lower Republican and Tri-Basin NRDs and the State of Nebraska. This study from the University of Nebraska-Lincoln Bureau of Business Research (UNL-BBR) provides a localized economic impact analysis for the project. In particular, the analysis compares lost economic activity due to the diversion of water from the Platte River basin with gains in economic activity in the Republican River basin. Those gains would be due to avoiding periodic groundwater irrigation shutdowns or reduced irrigation allocations which could become necessary in the absence of the Diversion project.

II. Methodology

This study assesses the economic impact that the proposed Platte Republican Diversion project would have on each river basin. Specifically, the study will assess: 1) any loss of economic activity in the Platte River basin, if present, which results from the diversion of water from the Platte River during years when the project is utilized (Olsson, 2017)[1], 2) any loss in economic activity due to an occupation tax revenue from lands which must be raised to support construction or operation of the Diversion Project, and 3) any gain in economic activity in the Republican River basin due to avoiding irrigation shutdowns or reduced allocations in the Lower Republican Natural Resources District.

Analysis will consider that the Platte Republican Diversion project only would be utilized in select years when there is sufficient excess flow in upper portions of the Platte River basin which are not allocated or appropriated for current or expected future downstream use. The water allocated to the Republican River basin would aid the Lower Republican to support compliance with the Republican River compact without shutting down groundwater irrigated acres. The continued operation of irrigated acres would be the direct economic impact of the project.

The potential economic impact is substantial. The Lower Republican Natural Resources District has approximately 78,000 rapid response groundwater irrigated acres which would be shutdown, if necessary, to keep the district in compliance with their IMP and the State in compliance with the Compact. There would be lost agricultural activity and lost income if those 78,000 acres engaged in dryland rather than irrigated production. [2] As was discussed in the 2007 UNL Bureau of Business Research report *The Economic Impact of Reduced Irrigation in the Republic River Basin*, the resulting decline in agricultural production is a direct economic impact on the basin economy.

The Platte Republican Diversion project also may impact the economy by generating recreation opportunities. Water diverted through the Platte Republic Diversion project in many cases would be stored in Harlan County Lake until such time that it is needed for compliance with the

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[1] Olsson Associates, 2017. *Platte Republican Diversion Project Feasibility Review*. No. 016-1500 (July).

[2] The report does not consider any potential impacts of the Platte Republican Diversion project on surface water irrigated acres.

Republican River Compact. Such storage would result in a higher water level and enhanced recreation opportunities at Harlan County Lake. A report from the U.S. Department of Interior Bureau of Reclamation provides estimates of the economic benefits of enhanced recreation opportunities at Harlan County Lake.[3]

In addition to this direct impact, there also is a multiplier impact on the economy. The multiplier impact occurs for two reasons: changes in business spending on supplies and services, and changes in household spending as employees spend their paychecks. Such multiplier impacts are estimated using the IMPLAN model.[4] The sum of the direct economic impact and the multiplier impact is the total economic impact.

These economic impacts in the Republican River basin would be the only economic impacts expected to result from the project. This is because no economic impacts are expected for the Platte River basin. The Platte Republican Diversion project only would be utilized in years when there are excess flows of water on the Platte River. In other words, absent the Platte Republican Diversion project, this water otherwise would flow through the Platte River basin and leave the State of Nebraska without decreasing economic activity.[5]

The last point is that there also would be a construction period impact from the project. The direct economic impact during the construction period would be estimated based on construction cost estimates from the report *Platte Republican Diversion Project Feasibility Review* (see footnote 1). The multiplier impact during the construction period, due to spending on materials and as workers spend their paychecks, also would be estimated using the IMPLAN model. The direct impact would be added to the multiplier impact to yield the total economic impact during the construction period.

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[3] U.S. Department of Interior, Bureau of Reclamation, 2016. Reclamation: Managing Water in the West, Republican River Basin Study. Available at: https://www.usbr.gov/watersmart/bsp/docs/finalreport/republican/republican-river-basin-study-final-report.pdf. Access on December 19, 2017.

[4] The IMPLAN model is the leading model for calculating multiplier impacts for specific projects and economic regions based on the input-output structure of the economy. In particular, the IMPLAN model calculates the multiplier impact based on the unique industrial structure of the region.

[5] Analysis conducted by Olsson Associates (see footnote 1) of water availability even assumed a significant future increase in use in the Platte River basin, after consultation with relevant natural resource experts.

III. Findings

This section presents estimates for the construction period impact of the Platte Republican Diversion Project and the potential impact during call years. The construction period impact is presented first.

A. Construction Period Impact

The construction period impact is based on project costs estimates from the Olsson Associates report *Platte Republican Diversion Project Feasibility Review* (see footnote 1). That report contained four possible construction scenarios based on the capacity of the construction project (diverting 40 cubic feet per second [cfs] versus 100 cfs) and the engineering method for the upper portion of the project (grading versus pipe installation). Construction impact estimates in this report are based on the 100 cfs capacity project utilizing pipe installation. The estimated construction cost for that project is $1.59 million.

The direct construction impact is based on that $1.59 million project cost. However, not all construction costs represent a direct economic impact on the basin economy. In particular, specialized equipment installed at the site is not necessarily manufactured within the basin, so the full purchase cost does not represent a direct economic impact. After making this adjustment, the direct economic impact from construction is $1.33 million.

There are also economic costs associated with the project. In particular, local sources would be required to pay part of the cost of construction. A grant of $0.9 million has been obtained to defray part of the cost of the project but another $0.69 million is still required. The ultimate source for this additional funding is unknown, but a local source may be required, and funds utilized to pay for this project would not be available for other projects, creating a negative economic impact. Given the amount of money involved, it is not expected that payments would occur via a long-term bond. Instead, a short-term payment plan is anticipated; in particular, it is assumed that the required amount would be paid during the construction period using funds being raised annually. For example, taxes raised through property taxing authorities of the Lower Republican Natural Resources District and the Tri-Basin Natural Resources District could provide the required funds. The ultimate source of tax payments is the household income of land owners. The economic impact estimate, therefore, should reflect this lost household income as well as the economic impact of construction activity. Impact estimates in Table 1 reflect both. The direct impact is the $0.64 million, which is the direct construction impact of $1.33 million less the $0.69 million of project costs paid locally.

Table 1 also shows the local multiplier impact estimated utilizing the IMPLAN model. This multiplier shows an additional impact on the basin economy of $0.27 million during the construction period. The multiplier impact results as supplies are purchased locally to support construction and as construction workers spend a portion of their paycheck within the region. The total economic impact during the construction period is $0.91 million.

Table 1 also shows the economic impact in terms of other key measures of the economy. These represent alternative measures of impact and should not be added to the economic impact as measured by output. In fact, the other measures are simply components of output. Value-added is a component of output referring to payments to the factors of production including labor, land,

certain taxes, and the consumption of capital (i.e., the depreciation of construction equipment as it is used). Labor income, which is the salaries, wages and benefits paid to employees plus any proprietor's income, is the principal component of value-added. There are also jobs associated with this labor income. Table 1 shows the full-year equivalent jobs associated with the given level of labor income. The term job-years reflects the varying length of a construction period; for example, two job-years could mean a single job lasting two years, or two jobs lasting one year.

Direct impacts in terms of value-added, labor income and job-years are estimated using the IMPLAN model. Average ratios between output and value-added, output and labor income, and output and employment from the infrastructure construction sector are applied to total spending estimates to yield the direct impacts. IMPLAN also is used to estimate economic multipliers in terms of value-added, labor income and job-years. The impact in terms of value-added is $0.64 million. Most of the value-added is due to labor income of $0.53 million. This labor income is spread over an estimated 14 job-years.

Table 1
Economic Impact in the Republican River Basin during Construction Period

Impact Measure	Direct Impact	Multiplier Impact	Total Impact
Output (Millions $)	0.64	0.27	0.91
Value-Added (Millions $)	0.50	0.15	0.64
Income (Millions $)	0.43	0.09	0.53
Job-Years	12	2	14

Source: BBR calculations using IMPLAN

B. Annual Impact From Maintaining Activity in the Republican River Basin

Table 2 shows the potential annual economic impact during call years from economic activity maintained in the Republican River basin due to the Platte Republican Diversion project. Water used during these years would help the Lower Republican Natural Resources District avoid shutting down "rapid response" acres. This section estimates that economic impact from avoiding such a shut-down; that is, the additional economic activity which occurs in a year if rapid response acres are engaged in irrigated rather than dryland production. Analysis addresses 78,000 such rapid response acres in the Lower Republican Natural Resources District. The direct impact occurs because there are more input purchases with irrigated production, along with higher labor and proprietor income. There is also a cost for the purchase of water.[6]

The economic impact from maintaining economic activity for one year is $47.22 million in economic output. This annual output impact includes $14.01 million in value-added. Once again, a majority of value-added is realized as labor income. Specifically, the annual impact in terms of labor income is $8.04 million. This income would be earned in 92 full-year equivalent jobs.

[6] The estimated rate for diverting of water from Turkey Creek would be $38/AF (acre-foot) in 2018, according to rate information provided by the Lower Republican Natural Resources District. Given that the Lower Republican Natural Resources District may need to provide up to 10,000 acre-feet during a call year, the cost of water could be as much as $380,000, although the amount would be less if the Platte Republican Diversion project only needs to provide a portion of the call year requirement.

Table 2
Annual Gain in Economic Activity from Maintaining 78,000 Acres in Irrigated Production in the Republican River Basin

Impact Measure	Direct Impact	Multiplier Impact	Total Impact
Output (Millions $)	37.09	10.13	47.22
Value-Added (Millions $)	9.20	4.82	14.01
Income (Millions $)	5.35	2.69	8.04
Employment (Job-Years)	28	64	92

Source: BBR calculations using IMPLAN

The Platte Republican Diversion project would be one source of water available to avoid shutting down irrigated acres during a particular call year. For example, the Lower Republican Natural Resources District also can utilize the NCORPE project to draw water required to meet obligations to Kansas during a call year. The Platte Republican Diversion project, as a result, may not be solely responsible for avoiding the shut down of rapid response acres in any particular year. The economic impact of the Diversion project would be impacted as a result. Table 3 shows the annual gain in economic activity from maintaining 78,000 acres in irrigated production if the Diversion project is assigned 30%, 50% or 70% of the "credit" for avoiding the shut down of irrigation in any particular year. The impact ranges from $14.17 million to $33.05 million. The labor income impacts ranges between $2.41 million to $5.63 million over the course of a year which would be paid out in 28 to 65 jobs.

Table 3
Annual Gain in Economic Activity Depending on Share Attributed to the Platte Republican Diversion Project

	Type of Impact			
Percentage	Output (Millions $)	Value-Added (Millions $)	Labor Income (Millions $)	Employment (Job-Years)
30%	14.17	4.20	2.41	28
50%	23.61	7.01	4.02	46
70%	33.05	9.81	5.63	65

Source: BBR calculations using IMPLAN

Given these large impacts during each call year, the project would have a substantial cumulative impact over its lifetime. If there are 2 call years out of 10, as anticipated, over a 50-year project lifetime the impacts shown in Table 3 would occur 10 times over that period.

C. Note on the Average Net Annual Impact

The potential annual economic impact referenced in Table 3 pertains to the contribution of the Platte Republican Diversion project during call years. These are years when Republican River Compact agreements might require the "shut down" of groundwater irrigated acres in the Lower Republican Natural Resources District. The frequency of call years is uncertain and a function of climate conditions in Nebraska and neighboring states such as Colorado and Wyoming. In call years, available water generated through projects such as the Platte Republican Diversion project or alternative sources such as the NCORPE project can be used to supplement streamflow and avoid the shut down of irrigated acres.

The economic impact of the Platte Republican Diversion project therefore varies from year-to-year. During call years, a range of potential impacts is presented in Table 3. In other years, the only potential economic benefit would result from the higher water levels at Harlan County Lake. This implies that the magnitude of the average annual impact would depend on the frequency of call years.

D. Recreation Benefits

The Platte Republican Diversion project also would at times lead to higher water levels at Harlan County Lake. Higher levels are associated with greater recreation amenities (see footnote 3), and associated economic benefits for individuals engaged in recreation. There also would be direct economic impacts on local businesses which provide goods and services to visitors. Higher levels of recreation amenities result because Harlan County Lake would have a larger surface area, which is more attractive for potential visitors.

The *Republican River Basin Study* (see footnote 3) generated estimates of the recreation benefits at Harlan County Lake under alternative climate and infrastructure investment scenarios. Under one estimate, the net present value of annual recreation benefits from a combination of higher lake levels and warmer temperatures was nearly $50 million. However, information in the report did not break out the share of benefit which could be attributed to higher lake levels versus warmer temperatures. As results, it is not feasible to use estimates from the *Republican River Basin Study* to estimate specific recreation benefits from the Platte Republican Diversion project, as this would only influence water levels but not temperatures. The results of the *Republican River Basin Study*, however, do indicate that there are additional economic benefits for individuals utilizing Harlan County Lake for recreation, as well as additional economic impacts in the Republican River basin, beyond the impacts reported in Tables 2 and 3.

IV. Findings under an Alternative Impact Scenario

Economic impacts presented in the previous section were based on regulations described in the Integrated Management Plans of Natural Resource Districts located in the Republican River basin. Those plans typically refer to options to "shut down" rapid response acres within Natural Resources Districts in response to a call year. This section considers the economic impact from an alternative regulatory approach which calls for a 60% reduction in total groundwater irrigation activity in the Upper, Middle and Lower Republican Natural Resources Districts.[7] Such reductions could be implemented in a variety of ways including reducing the allocation on all irrigated acres, shutting down a significant share (up to 60%) of all irrigated acres in a NRD, or a combination of both. The key point is that all irrigated acres in a District would be impacted, not just the rapid response acres.

The implementation and reduction of allocations are one way to reduce irrigation within a Natural Resources District. Marginal reductions in allocations may even be a less economically impactful way to reduce irrigation compared to "shutting down" irrigated acres (Thompson, 2007).[8] Irrigated producers may find ways to marginally reduce irrigation through investing in and using "precisions agriculture" equipment which econonizes on the use of water, fertilizer and other inputs. However, such mitigating activities would not be as effective in the case of a drastic reduction in allocations such as a 60% reduction. We therefore assume that it would be equivalent to model a 60% reduction in the irrigated acres of production in the Lower Republican Natural Resources District.

Table 4 shows the potential annual economic impact resulting from a 60% reduction in groundwater irrigated acres in the Lower Republican Natural Resources District. There are 282,000 groundwater only irrigated acres in the Lower Republican Natural Resources District.[9] At a 60% reduction, this implies a total of 169,500 impacted acres included in the estimates in Table 4.

The economic impact from maintaining irrigated production on these 169,500 acres for one year is $102.05 million in output. This annual output impact includes $30.11 million in value-added. Once again, a majority of value-added is realized as labor income. Specifically, the annual impact in terms of labor income is $17.40 million. This income would be earned in 199 full-year equivalent jobs.

Table 5 shows the annual gain in economic activity from maintaining 169,500 acres in irrigated production if the Diversion project is assigned 30%, 50% or 70% of the credit. The impact ranges from $30.62 million to $71.44 million. The labor income impacts ranges between $5.22 million to $12.18 million which would be paid out in 60 to 139 full-year equivalent jobs.

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[7] Nebraska Department of Natural Resources, 2009. Integrated Management Planning in the Republican River Natural Resources Districts. (October).

[8] Thompson, Eric. 2007. *The Economic Impact of Reduced Irrigation in the Republic River Basin*, Bureau of Business Research Report.

[9] Nebraska Department of Natural Resources, 2016. Irrigated Acres by HC Area Handout, Republican River Basin Wide Plan-Stakeholder Meeting #8, Nov. 1, 2016

Table 4
Annual Gain in Economic Activity from Maintaining Acres in Irrigated Production in the Republican River Basin under the Alternative Scenario

Impact Measure	Direct Impact	Multiplier Impact	Total Impact
Output (Millions $)	80.14	21.91	102.05
Value-Added (Millions $)	19.68	10.42	30.11
Income (Millions $)	11.58	5.82	17.40
Employment (Job-Years)	60	138	199

Source: BBR calculations using IMPLAN

Table 5
Annual Gain in Economic Activity Depending on Share Attributed to the Platte Republican Diversion Project under the Alternative Scenario

	Type of Impact			
Percentage	Output (Millions $)	Value-Added (Millions $)	Labor Income (Millions $)	Employment (Job-Years)
30%	30.62	9.03	5.22	60
50%	51.03	15.05	8.70	99
70%	71.44	21.08	12.18	139

Source: BBR calculations using IMPLAN

Appendix 1. About the UNL Bureau of Business Research and Key Personnel

A. The Bureau of Business Research

The Bureau of Business Research is a leading source for analysis and information on the Nebraska economy. The Bureau conducts both contract and sponsored research on the economy of the United States as well as Nebraska and its communities including: 1) economic and fiscal impact analysis; 2) models of the structure and comparative advantage of the current economy; 3) economic, fiscal, and demographic outlooks, and 4) assessments of how economic policy affects industry, labor markets, infrastructure, and the standard of living. The Bureau also competes for research funding from federal government agencies and private foundations from around the nation and contributes to the academic mission of the University of Nebraska-Lincoln through scholarly publication and the education of students.

B. Key Personnel

Dr. Eric Thompson – Principal Investigator

Dr. Eric Thompson will be the principal investigator on this project. Dr. Thompson is the Director of the Bureau of Business Research and an Associate Professor of Economics at the University of Nebraska-Lincoln. Dr. Thompson has conducted a broad group of economic impact studies including impact studies of Nebraska agriculture, irrigation and regulation of irrigation, Sandhill Cranes migration, the Nebraska child care industry, the Omaha Zoo, the Nebraska horseracing industry, Husker Harvest Days, and the UNL Athletic Department. Dr. Thompson also works on demographic projections, and analyses of economic development programs for Nebraska and cities in Nebraska. He also has conducted numerous economic impact studies for the Lincoln Department of Economic Development, the Omaha Chamber of Commerce, the Nebraska Department of Economic Development, various Nebraska industries and Nebraska tourism attractions. Dr. Thompson's research has received support from the United States Department of Labor, the United States Department of Agriculture, the Robert Wood Johnson Foundation, the Nebraska Health and Human Services System, as well as Lincoln, Omaha, and Nebraska organizations and agencies. In his previous employment, Dr. Thompson served as the Director of the Center for Business and Economic Research and a Research Associate Professor of Economics at the University of Kentucky. Dr. Thompson received his Ph.D. in agricultural economics from the University of Wisconsin-Madison in 1992. His research fields include regional economics, economic forecasting, and state and local economic development. His research has been published in Regional Science and Urban Economics, the Journal of Regional Science, the American Journal of Agricultural Economics, the Journal of Cultural Economics, and the Economic Review of the Federal Reserve Bank of Cleveland.