



**TO:** GOVERNANCE COMMITTEE  
**FROM:** EXECUTIVE DIRECTOR'S OFFICE  
**SUBJECT:** LAKESIDE SLURRY WALL PROJECT UPDATE  
**DATE:** NOVEMBER 29, 2018

This memo provides an update on the Lakeside Slurry Wall project. A formal update with additional details will be given at the Governance Committee (GC) meeting. The formal update will be brief and used to facilitate GC discussion. The project design team, which consists of JEO Consulting (lead) and Brierley Associates (slurry wall expert) will attend the meeting and will be available for questions during discussion.

#### **Design and Opinion of Probable Cost:**

- The final engineering design of the Lakeside Slurry Wall project is about 70 to 90 percent complete. The design is consistent with what has been presented in the past and is advanced to the point where a near-final opinion of probable cost could be developed. The site layout from the plan set is shown in **Attachment A**.
- The opinion of probable cost (OOPC) is \$9,798,140, including a 10% contingency. This includes all on-property infrastructure and earthwork. The OOPC provided by JEO is presented in **Attachment B**.
- The estimated storage capacity of the facility is approximately 970 acre-feet. The EDO developed a preliminary scoring model using this capacity, as well as inflow and outflow rates of 30 cfs and 50 cfs, respectively. The model yields a preliminary score of 3,098 acre-feet. This estimate was reduced to 2,800 acre-feet to account for remaining uncertainties in the design and operations.

#### **Economics:**

- **Attachment C** provides an updated economic comparison between the Lakeside Slurry Wall project and other selected Program projects. Projects are evaluated over a 50-year period and a 15-year period (2018 – 2032) corresponding to the end date of the proposed First Increment Extension. The analyses include the estimated capital and annual costs of each project. The original memorandum containing the original table is also included in Attachment C.

#### **Next Steps and Timeline:**

In August, the GC authorized JEO to proceed to final design with the understanding that the GC would consider updated cost and yield information prior to deciding whether to proceed to construction. The EDO has developed the following three potential courses of action solely as a starting point for GC discussion at the December meeting.



1. **“Go”**: The project proceeds forward as planned. The design team would complete the final design and the EDO would begin work on local, state and federal permits. We anticipate that permitting will take approximately nine months and construction could begin sometime next fall or early winter. At the time of project completion, the following investments would have been made: \$736,000 for engineering services, \$9,800,000 for construction of the project and approximately \$20,000 to \$40,000 for permitting, mostly related to the Section 404 and DNR permits.
2. **“No Go”**: The project is halted. The design team would spend a small amount of time completing ongoing tasks and develop a final project status memo. To date, the Program has invested approximately \$400,000 to \$450,000 in engineering services (the EDO will have an exact number at the GC).
3. **“Shovel Ready”**: The project proceeds forward until the design is “shovel ready”. This would involve completion of the final design plans and specifications, and near completion of the bid package. The EDO could also secure project permits if so desired. We anticipate that this would require an additional investment of approximately \$25,000, which would bring total investment of approximately \$475,000. and the project could then be put on indefinite hold while the GC evaluates other water supply projects.



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**Attachment A:**

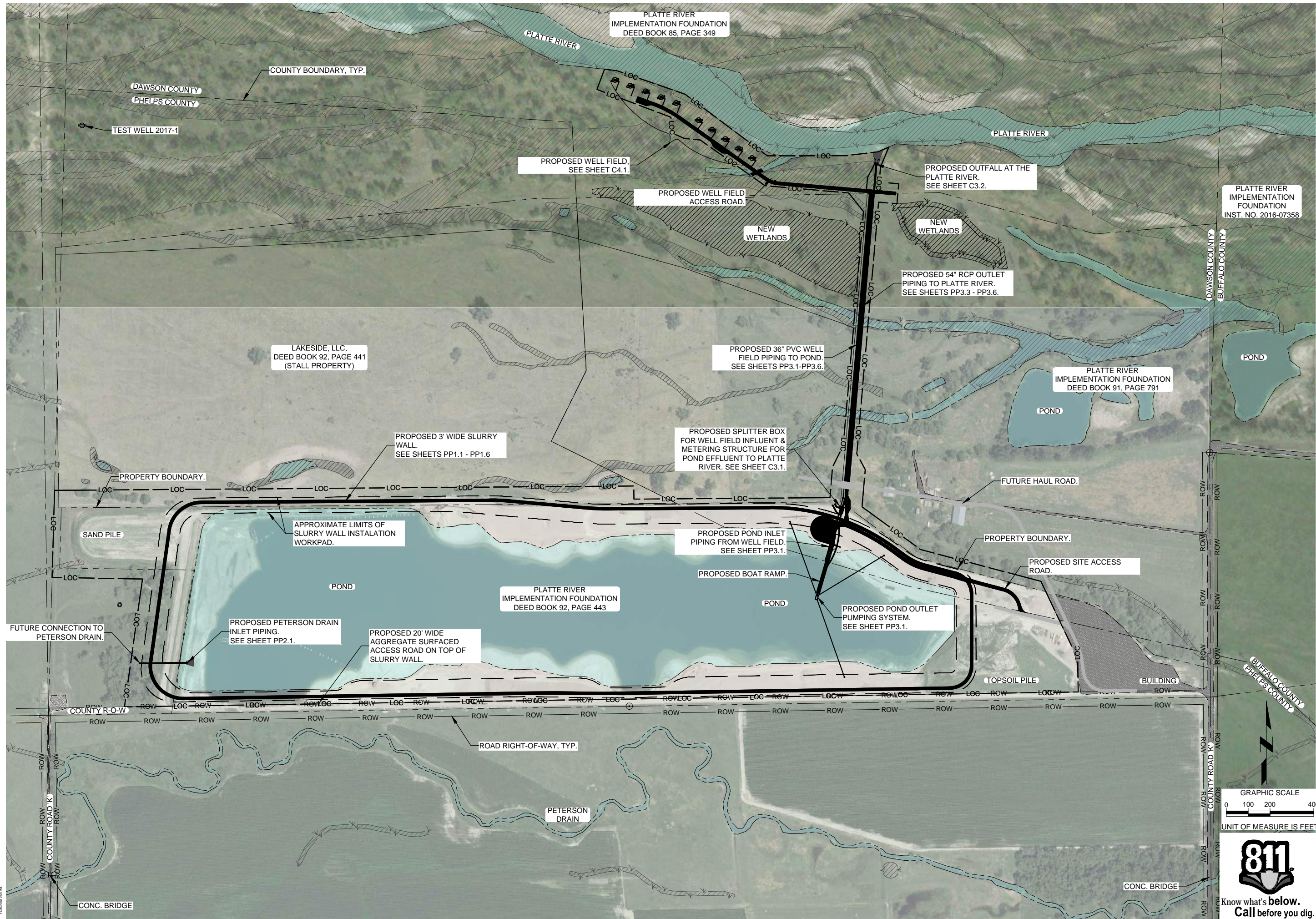
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**Site Layout**

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11/26/2018 2:55 PM  
Platte River Recovery Implementation Program Survey Data Construction Design Change Sheet 170609.00.dwg  
11/26/2018 2:55 PM



PLATTE RIVER RECOVERY AND  
IMPLEMENTATION PROGRAM  
SLURRY WALL FACILITY

OVERALL VICINITY MAP

PRELIMINARY  
NOT FOR  
CONSTRUCTION  
70%  
DATE:  
11/26/2018  
PRELIMINARY

PROJECT NO. 170609.00  
DATE 11/26/2018  
DRAWN BY E.J.O.  
FILE NAME S-170609.00.dwg  
FIELD BOOK GI Buffalo Co. #1  
FIELD CREW A.G., W.J.  
SURVEY FILE NO. SV-170609  
PLAN IN HAND  
DATE  
70 PERCENT REVIEW  
DATE  
95 PERCENT REVIEW  
DATE  
REVISIONS

C0.5





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**Attachment B:**

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**Opinion of Probable Cost**

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**ENGINEER'S OPINION OF PROBABLE COST - 90% DESIGN****Lakeside Slurry Wall Storage Facility - Base Design****Platte River Recovery Implementation Program****JEO Project No. 170609.00**Date Prepared:  
November 21, 2018**ESTIMATE OF QUANTITIES**

Item #	Description	Unit	Quantity	Unit Price	Total
<b>Lakeside Slurry Wall Storage Facility</b>					
1.	Mobilization	LS	1	\$608,000.00	\$608,000.00
2.	Bonding and Insurance	LS	1	\$203,000.00	\$203,000.00
3.	Clearing and Grubbing	LS	1	\$40,000.00	\$40,000.00
4.	Temporary Dewatering	LS	1	\$150,000.00	\$150,000.00
5.	Remove Fence	LF	5,500	\$4.00	\$22,000.00
6.	Remove Pavement	SY	437	\$15.00	\$6,555.00
7.	Remove CMP Storm Sewer Pipe	LF	26	\$15.00	\$390.00
8.	General Embankment, On-Site	CY	130,100	\$4.00	\$520,400.00
9.	General Embankment, Imported	CY	4,000	\$16.00	\$64,000.00
10.	Slurry Wall, Imported	LS	1	\$2,848,965.00	\$2,848,965.00
11.	Drill Bore Hole, Caisson Method	VF	380	\$250.00	\$95,000.00
12.	24" Steel Casing (0.5" Thickness)	VF	280	\$400.00	\$112,000.00
13.	24" SS Screen (200 Slot)	VF	100	\$450.00	\$45,000.00
14.	Bentonite, Grout, Gravel Pack	EA	10	\$15,000.00	\$150,000.00
15.	Develop Well & Pump Testing	EA	10	\$10,000.00	\$100,000.00
16.	Submersible Pump, Motor, Drop Pipe, Check Valve, etc., Complete	EA	10	\$50,000.00	\$500,000.00
17.	Pitless Adapter Unit, Complete	EA	10	\$30,000.00	\$300,000.00
18.	72" Well Security Manhole	EA	10	\$10,000.00	\$100,000.00
19.	72" Meter Vault	EA	10	\$16,000.00	\$160,000.00
20.	48" Valve Vault	EA	10	\$10,000.00	\$100,000.00
21.	Winterization Drain	EA	1	\$3,000.00	\$3,000.00
22.	10" DIP Water Main, Class 350	LF	600	\$50.00	\$30,000.00
23.	10" 90° Bend, MJ	EA	10	\$350.00	\$3,500.00
24.	6" PVC Water Main, DR 18	LF	140	\$30.00	\$4,200.00
25.	6" 22.5° Bend, MJ	EA	1	\$300.00	\$300.00
26.	6" Gate Valve and Box, MJ	EA	1	\$1,000.00	\$1,000.00
27.	30" x 6" Saddle	EA	1	\$7,000.00	\$7,000.00
28.	30" 90° Bend, MJ	EA	1	\$4,000.00	\$4,000.00
29.	30" 45° Bend, MJ	EA	3	\$4,000.00	\$12,000.00
30.	30" 11.25° Bend, MJ	EA	1	\$4,000.00	\$4,000.00
31.	30"x10"x30" Tee, MJ	EA	10	\$5,000.00	\$50,000.00
32.	30" PVC Water Main, DR41	LF	3,108	\$150.00	\$466,200.00
33.	30" DIP Water Main, Class 350	LF	95	\$250.00	\$23,750.00
34.	30" Plug, MJ	EA	3	\$1,000.00	\$3,000.00
35.	30" HDPE Pipe, Dual Wall	LF	400	\$150.00	\$60,000.00
36.	30" HDPE Flexible Joint	EA	1	\$500.00	\$500.00
37.	30" RCP, Class III	LF	84	\$90.00	\$7,560.00
38.	30" RCP Flared End Section	EA	4	\$1,000.00	\$4,000.00
39.	36" RCP, Class III	LF	220	\$110.00	\$24,200.00
40.	36" Concrete Pipe Plug	EA	1	\$400.00	\$400.00
41.	54" RCP, Class III	LF	1,593	\$175.00	\$278,775.00
42.	54" RCP Flared End Section	EA	1	\$2,500.00	\$2,500.00
43.	Concrete Headwall	LS	1	\$5,000.00	\$5,000.00
44.	Concrete Influent Headwall	LS	1	\$5,000.00	\$5,000.00
45.	Concrete Collar	EA	1	\$1,500.00	\$1,500.00
46.	Lakeside Measurement/Diversion Structure	LS	1	\$83,600.00	\$83,600.00
47.	Floating Pump System	LS	1	\$400,000.00	\$400,000.00
48.	30" Pipe Float	EA	4	\$4,000.00	\$16,000.00
49.	De-Icer, 1/2 HP	EA	2	\$2,000.00	\$4,000.00
50.	Cable Span Support	EA	3	\$1,200.00	\$3,600.00
51.	Winch	LS	1	\$5,000.00	\$5,000.00
52.	Electrical Service to Site	LS	1	\$215,000.00	\$215,000.00
53.	Discharge Pump Electrical	LS	1	\$243,000.00	\$243,000.00
54.	Well Field Electrical	LS	1	\$447,000.00	\$447,000.00
55.	Rock Riprap, NDOR Type C	TONS	400	\$85.00	\$34,000.00
56.	Crushed Rock Surface Course	TONS	1,360	\$50.00	\$68,000.00
57.	Gravel Surface Course (On-Site)	TONS	680	\$10.00	\$6,800.00
58.	7" Concrete Pavement	SY	360	\$70.00	\$25,200.00

59.	Seeding, Fertilizer and Mulch	ACRE	45.0	\$4,000.00	\$180,000.00
60.	Straw Wattle	LF	9,500	\$3.00	\$28,500.00
61.	Silt Fence, High Porosity	LF	4,200	\$5.00	\$21,000.00
Construction Subtotal					\$8,907,400.00
Contingency 10%					\$890,740.00
Total Opinion of Construction Cost					\$9,798,140.00
PROFESSIONAL SERVICES					
1.	Engineering Services				\$736,000.00
2.	Land Acquisition				
3.	Legal and Fiscal Fees				
Subtotal Professional Services					\$736,000.00
Total Opinion of Project Cost					\$10,534,140.00

JEO Consulting Group Inc.'s (JEO) Opinions of Probable Cost provided for herein are to be made on the basis of JEO's experience and qualifications and represent JEO's best judgment. However, since JEO has no control over the cost of labor, materials, equipment, or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, JEO cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from Opinions of Probable Cost prepared by JEO.



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**Attachment C:**

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**Updated Cost Comparison and Memo with Original Cost Comparison**







**TO:** JASON FARNSWORTH, EXECUTIVE DIRECTOR  
**FROM:** GEORGE OAMEK, EXECUTIVE DIRECTOR'S OFFICE  
**SUBJECT:** COST SUMMARY OF WATER SELECTED WATER ACTION PLAN PROJECTS  
**DATE:** JULY 13, 2018

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This memorandum summarizes an economic comparison of selected PRRIP water projects based on their total costs as well as cost per acre-foot of Program score. The latter metric is critical because it reflects both the cost of the water and the efficiency of water in offsetting deficits to USFWS target flows (score).

Projects are evaluated over a 50-year period of analysis typical of water supply projects and also over the 15-year period 2018 to 2032 corresponding to the end date of the proposed First Increment Extension.

The Water Resource Council's "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" (1983) provides the methodology for the evaluation. This source is the basis for Bureau of Reclamation and other federal resource agencies economic evaluations. Briefly, the evaluation involves (1) estimating the present value of current and future project expenditures, (2) amortizing this total cost over the period of analysis, resulting in an annual equivalent value, and (3) dividing this annual equivalent cost by the Program score.

Projects are categorized as whether (1) they depend on excess flows in the Platte River or acquire water through irrigator leases or other means and (2) the supply can be controlled and released as desired, primarily through storage in the Lake McConaughy Environmental Account and newly developed storage facilities. Intuitively, willingness to pay for controllable water would be higher than for non-controllable supplies and the reliability of supply provided by leases would tend to have a higher value than supply reliant on excess flows. However, there may be exceptions to these generalizations.

- Projects using excess flows with controllable releases include the slurry wall project currently being considered by the PRRIP and GC for construction.
- Projects using excess flows but without controllable releases include proposed Cottonwood Ranch broad-scale recharge and the existing Phelps County Canal recharge and Elwood Reservoir recharge projects.
- Current water leases all involve controllable supplies and include the CNPPID irrigator lease and the Pathfinder Reservoir Municipal Account lease. A potential additional lease in the North Platte basin is shown but is currently in an exploratory phase.



Table 1 summarizes the economic comparison of these projects.

- There is significant uncertainty around the score of the slurry wall project. In response, a range of scores have considered. Since there is a substantial up-front cost associated with this project, it is interesting to note that slurry wall storage may be quite economical over a 50-year period, but somewhat less so when the period of analysis is truncated to 15 years. However, at the higher end of the score range, it may still be economical even with this shortened time frame compared to other projects.
- The economics of CWR broad scale recharge share some characteristics with slurry walls because its useful life is greater than 15 years. However, even at 15 years, it does not appear excessively expensive.
- In general, generalizations about controllable water being more expensive appear to ring true, with exception of the Pathfinder water. Pathfinder water is priced on a cost of service basis as opposed to a market-based negotiation.

**Table 1. Summary of Selected Platte River Recovery Implementation Program Water Projects (2018 dollars)**

				Project evaluated over 50 years				Project evaluated over extended First Increment					
		Up-front capital costs (Million)	Annual O&M (Million)		Net present value of total cost (Million)	Annual equivalent cost (Million)	Score (acre-feet)	Annual cost, \$/acre-foot		Net present value of total cost (Million)	Annual equivalent cost (Million)	Score (acre-feet)	Annual cost, \$/acre-foot
Excess flows, controllable													
	Slurry walls	\$ 8.55	\$ 0.19		\$ 12.62	\$ 0.49	2,500 - 3,200	\$147 - \$196		\$ 9.95	\$ 0.83	2,500 - 3,200	\$255 - \$334
Excess flows, non-controllable													
	CWR broad scale recharge	\$ 5.09	\$ 0.37		\$ 13.26	\$ 0.52	4,000	\$ 129		\$ 8.16	\$ 0.68	4,000	\$ 171
	Phelps County recharge		\$ 0.19		\$ 5.01	\$ 0.19	2,700	\$ 72		\$ 2.32	\$ 0.19	2,700	\$ 72
	Elwood Reservoir recharge		\$ 0.55		\$ 14.07	\$ 0.55	3,000	\$ 182		\$ 6.52	\$ 0.55	3,000	\$ 182
Water leases, controllable													
	CNPPID irrigator lease		\$ 0.66		\$ 16.96	\$ 0.66	2,250	\$ 293		\$ 7.87	\$ 0.66	2,250	\$ 293
	Potential North Platte lease												
	Pathfinder Municipal Account		\$ 0.55		\$ 14.05	\$ 0.55	6,760	\$ 81		\$ 6.52	\$ 0.55	6,760	\$ 81

Note: The net present value and annual equivalent value of project cost are calculated as per guidance provided by the Water Resource Council's "ECONOMIC AND ENVIRONMENTAL PRINCIPLES AND GUIDELINES FOR WATER AND RELATED LAND RESOURCES IMPLEMENTATION STUDIES" (1983)