



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

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)