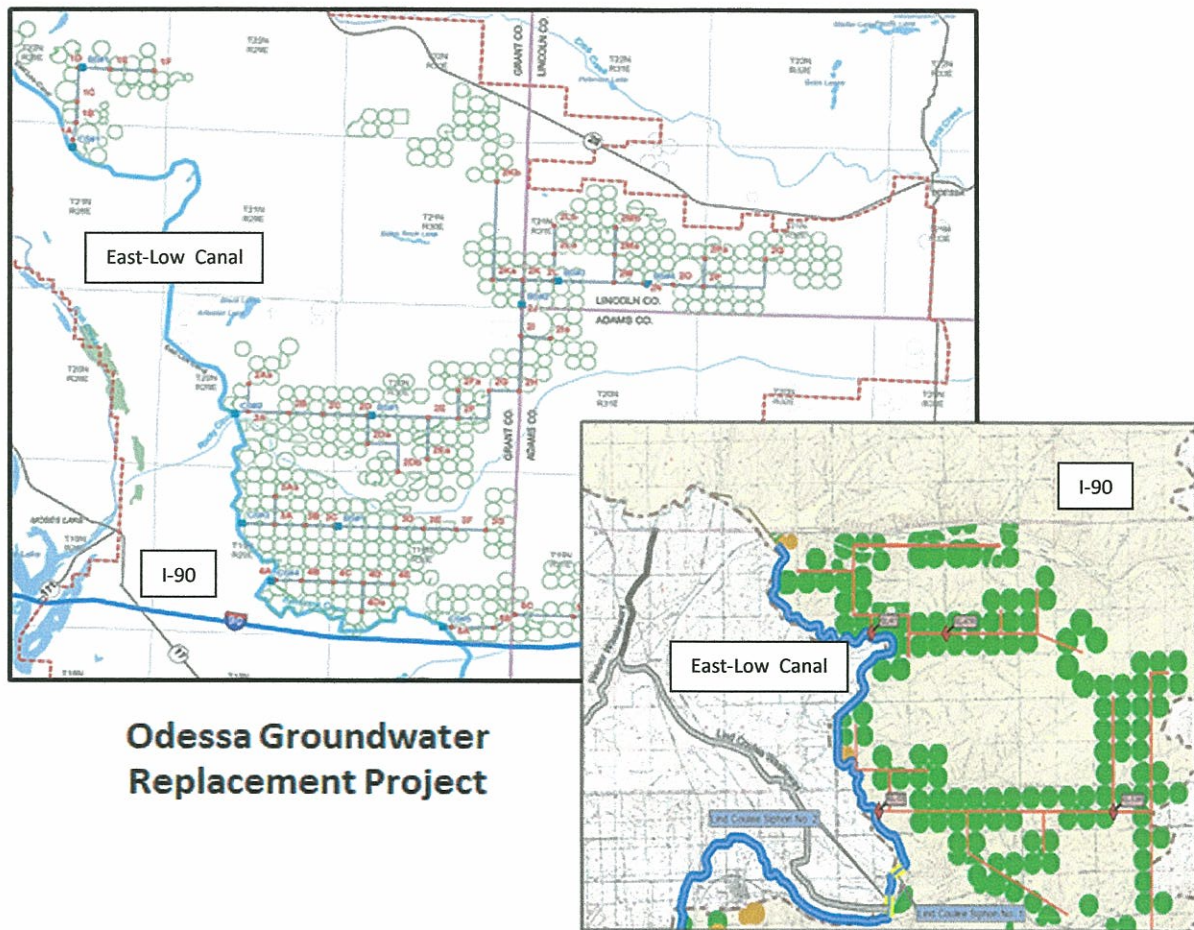


# Odessa Subarea Surface Water Supply Alternatives

## Economic and Technical Review



**Odessa Groundwater Replacement Project**

**PREPARED FOR THE ADAMS COUNTY COMMISSION  
WITH SUPPORT FROM THE COLUMBIA RIVER OFFICE, ECOLOGY**

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## I. Executive Summary

### a. Executive Summary

The CSRIA Review is provided to the Adams County Commission and Columbia River Office (Department of Ecology, WA), and it covers economic and technical analyses of surface water supply alternatives for irrigated lands, for the Odessa Subarea in Eastern Washington. This review provides some additional perspective toward the extensive environmental and technical issues assessed within the Ecology-USBR Draft EIS (2010), including a state approach to determining direct benefits and costs for project development.

#### Two Project Alternatives Are Examined:

- A Modified Partial Replacement Alternative (State-USBR Project), with 45,000 acres located South of I-90, and 25,000 acres located North of I-90 (see Figure 1, general Project location map).
- A Private-State Project, with 75,000 acres (including existing water service contract ground) located North of I-90 (see Figure 2).

#### Project(s) Benefit/Cost (B/C) Analyses:

Estimates for the B/C analyses convey that:

- The State-USBR Project direct net benefits amount to about \$1.235 billion, and the Project costs amount to about \$1.172 billion (2010\$, present value, rounded). The B/C ratio is about 1.05. Overall, the Project is displaying greater benefits than costs given the complex set of economic variables under consideration; Project operations would commence in 2017. It is anticipated that most of the Project costs would be paid by federal and state sources—local improvement districts (LIDs) also could be involved for repayment options.
- The Private-State Project net benefits amount to about \$1.457 billion and costs to about \$0.727 billion (2010\$, present value, rounded). The B/C ratio is about 2.0 per the analysis assumptions employed. The Project benefits are expected to significantly exceed costs; Project operations would commence in 2013. It is anticipated that most of the Project costs would be repaid by private irrigators, relying initially on state capital resources for construction funds.
- For both project alternatives, additional value estimates are currently being revised for the municipal/industrial and power sectors. These changes will further reduce costs and increase benefits, with resulting higher B/C ratios.

#### Project(s) Regional Economic Development (RED) Impacts:

Economic impact estimates (RED) are derived for the project(s):

- Measured in terms of statewide, annual household income (value added impacts), the combined Project(s) impact (120,000 acres) would be about \$438

million; the State-USBR Project (70,000 acres) annual household income impact would be about \$244 million.

#### Project(s) Construction Impacts:

Project construction impacts are expressed in terms of total state direct and indirect employment, labor income, and the value of all goods and services used during construction (net output changes of all economic sectors):

- Within the Ecology-USBR Draft 2010 EIS, total direct and indirect economic impacts, from construction of the initial version of the partial replacement alternative (57,000 acres below I-90), are estimated to be about 2,196 jobs, \$114 million of labor income, and \$321 million of output for the regional area (totals during the construction period).
- The Private-State Project construction is estimated to produce about 860 direct jobs (annual FTEs during the construction period), and about 1,650 to 1,820 jobs taking into account direct and indirect employment throughout the region/state. Construction labor income impacts are estimated to be about \$106 million; and the total value of goods and services affected throughout the state is potentially about \$250 to \$489 million.

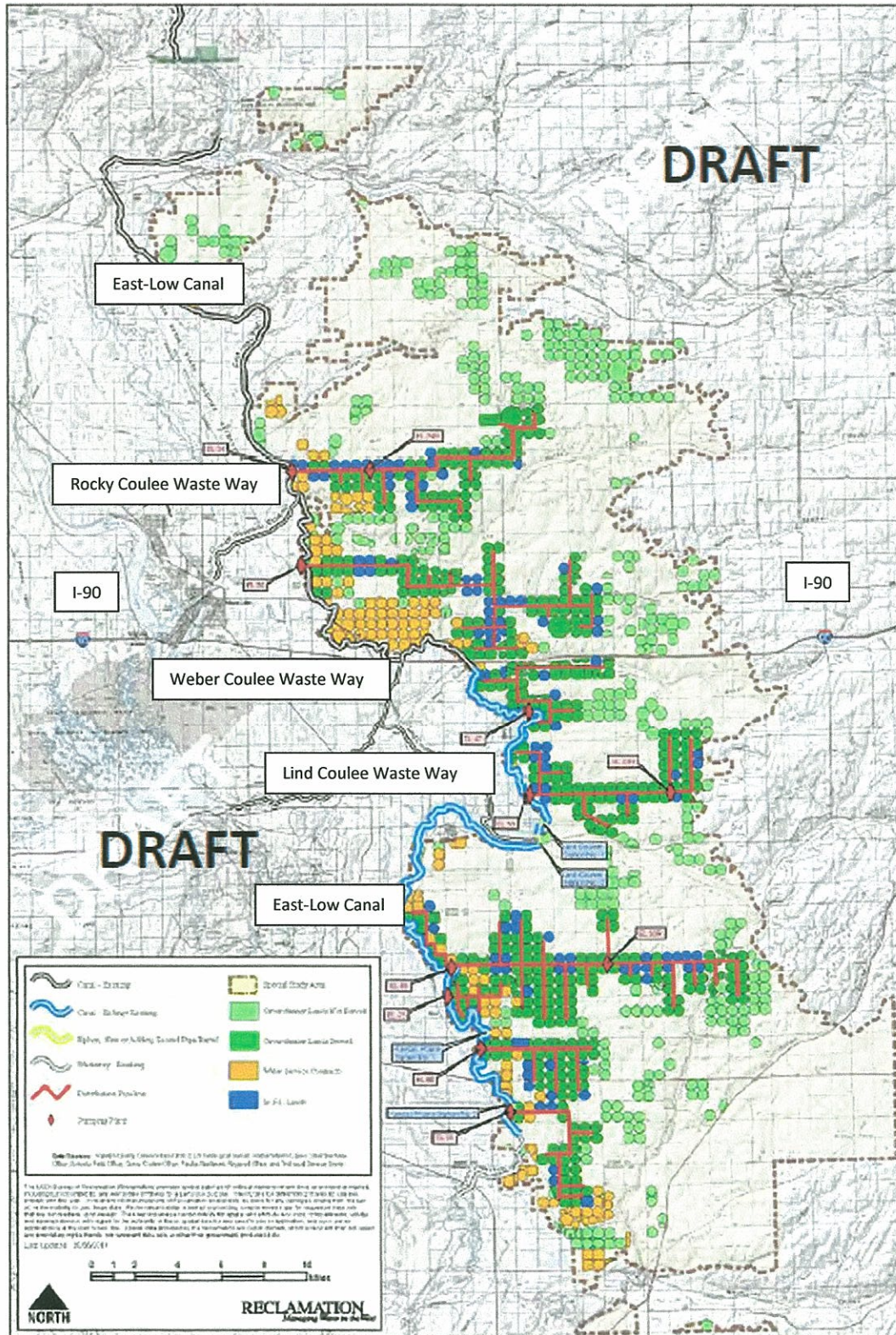
#### Project(s) Development Factors and Considerations:

For Review analysis purposes, water supply sources for the Project(s) would be from Lake Roosevelt and Banks Lake operations; Conservation Operation & Maintenance (O&M) programs within the Columbia Basin Project; and perhaps from new legislative proposals (RCW 90.90 amendments) to allow for new water permits to produce biofuels and organics crops, from mainstem Columbia-Snake River pools.

Project(s) development involves cost levels and timing driven by the magnitude of infrastructure changes needed to deliver new surface water supplies:

- One USBR estimate suggests that the State-USBR Project could be in initial operation by 2017, with full operations commencing by about 2024 (phased development). The capital costs for the Project include major East-Low Canal modifications and some limited waste way improvements. Direct construction costs are estimated to exceed \$10,500 per acre (preliminary estimate).
- A pre-construction engineering estimate for the Private-State Project suggests that initial operations could be in place by 2013, with full development completed by 2015. The capital costs for the Project would be primarily directed toward Canal pumping stations and water system delivery mainlines, with some modifications to the waste ways. Direct construction costs are estimated to be about \$4,500 per acre (not including limited costs to waste way modifications depending on further Canal modeling assessments).

**Figure 1. State-USBR Project North/South of I-90, East-Low Canal Modified Partial Replacement Alternative (70,000 Acres)**





## **II. Study Area Alternatives and Operations Under Review**

This Review examines key economic and technical features surrounding two potential surface water alternatives for the Odessa Subarea: 1) a Modified Partial Replacement Alternative, referred to here as the State-USBR Project; and 2) a Private-State Project Alternative (see Figures 3 and 4 below). Both project alternatives involve receiving surface water from the Columbia River via existing U.S. Bureau of Reclamation (USBR) pumping plant and headwork facilities, located on Lake Roosevelt and Banks Lake. Both alternatives would deliver new water supplies from the East-Low Canal. And both alternatives would provide surface water to a portion of the Odessa Subarea currently operating under groundwater right permits issued by the Washington State Department of Ecology.

### **a. State-USBR Project (Modified Partial Replacement Alternative)**

The State-USBR-Project is so named, because this alternative would be principally funded by the U.S. Bureau of Reclamation (USBR) and the state of Washington, to pay for heavy construction improvements to the East-Low Canal. The State and USBR funding could come from Columbia River Program (RCW 90.90) funds (or other state resources) and conventional federal budget sources. And it can involve participation by local improvement districts (LIDs) to pay for portions of the water distribution system separate from construction modifications to the East-Low Canal. This Project would likely be under East Columbia Basin District operations. Water delivery would be for firm annual water supplies.

The Project would deliver new surface water to portions of the Odessa Subarea located North of I-90, East of Moses Lake, with about 25,000 acres not including land already receiving water service contracts; and portions of the Subarea located South of I-90, with about 45,000 acres not including land already receiving water service contracts.

### **b. Private-State Project Alternative**

The Private-State Project is so named, because this alternative would be principally funded by the private sector (irrigators) and state of Washington, to cover the costs of new irrigation pumping and distribution systems, connected to the East-Low Canal. Depending on future considerations, some modifications to existing East-Low Canal waste way facilities may be funded by the state, as well. State funding would likely be allocated from the Columbia River Program funds (RCW 90.90) and possibly through revenue bonds—state funding resources require further considerations. Private sector funding would be through annual payments to either state or local entities, as well as annual O&M payments to USBR for water service delivery. It would likely involve formation of local improvement districts (LIDs). This Project would likely be under East Columbia Basin District operations.

The Project would deliver new surface water to portions of the Odessa Subarea located North of I-90, East of Moses Lake, about 75,000 acres including land already receiving water service contracts.

In Appendix A and Review Summary Table 1, estimates are provided for the added irrigated acres to be served by the project(s), and for the required capacity needs for East-Low Canal. These estimates take into account water supply deliveries to both North and South of I-90, as depicted under both a State-USBR Project and the Private State Project set of operations. The extent of the Private-State Project lying North of I-90 is limited to available canal capacity (North of I-90) for future service to South of I-90 lands—this includes existing water service contracts and the new project lands per the State-USBR estimate (about 45,000 acres).

**Table1. Review Summary-East-Low Canal Capacity  
for New Water Allocations and Distribution**

**Odessa East-Low Canal--Peak Daily Flow Water Allocations**

	<b>USBR Pref. Alt.</b>	<b>Existing WSC</b>	<b>TOTAL</b>	<b>Priv.-State-Alt. Above-I-90*</b>	<b>Priv.-State-Alt. Below-I-90*</b>	<b>TOTAL</b>
Irrigated Acres	70,000	19,000	89,000	75,000	54,500	129,500
Total Acre-ft.**	216,300	47,500	275,010	187,500	136,250	323,750
Flow Rate/gpm/acre	6.5	6.5	6.5	6.5	6.5	6.5
Daily G/Day	655,200,000	177,840,000	833,040,000	702,000,000	510,120,000	1,212,120,000
Daily Acre-ft.	2,011	546	2,557	2,154	1,566	3,720
Daily cfs (Peak)	1,012	275	1,287	1,085	788	1,873
Daily cfs (Peak) @75% On-Field Cap.Factor	NA	NA	NA	814	591	1,405
Daily cfs (Peak) @70% On-Field Cap.Factor	NA	NA	NA	759	552	1,311

\*Includes water service contracts. On-farm water delivery at 2.5 acre-ft./acre/year, and 70-75% on-farm capacity factor.

\*\* Water supplies for Private-State-Alternative from Banks Lake operations/Lake Roosevelt, and CBP CBP Conservation O&M, and new allocations from biofuel-organic permits under amendments to RCW 90.90.

NOTE: USBR staff indicate that existing Canal model runs include interim Lake Roosevelt water (10,000 acres), in addition to the Modified Preferred Alternative. Consequently, marginal available canal capacity exceeds the daily peak cfs indicated above (>1,287 cfs).

Under the operational regime reviewed for the Private-State Project alternative, new irrigated acre water duties, for field delivery, would be set at about 2.5 acre-ft./acre; and on farm water application factors (capacity factors) would be set at 70%. This would allow for: 1) the maximum development of acreage North of I-90; and 2) adequate canal capacities to ensure water deliveries North and South of I-90.

To safely operate the East-Low Canal while serving large pump stations, waste ways must be available to waste excess water that may be in the canal system if all pumps failed owing to mechanical or electrical failures—catastrophic failure conditions. The waste ways that can be utilized to waste water associated with pumping off the East-Low Canal, North of I-90, are the Rocky Coulee Waste Way, the Weber Coulee Waste Way, and the Lind Coulee Waste Way. The operational use of the waste ways has been discussed with USBR staff, as well as received initial review by IRZ Consulting irrigation engineers.

The Rocky Coulee Waste Way has significant capacity, and would likely be utilized under any pump failure (for canal-serviced mainlines above the waste way). It could be utilized to waste excess waters from the bifurcation works to the waste way. No significant additional works would be needed to make the waste way operational.

The Weber Coulee Waste Way could be utilized. This waste way wastes water from the canal into Weber Coulee. Water would then flow down Weber Coulee a few miles to its intersection with Lind Coulee. Any wasting of water down Weber Coulee Waste Way would result in significant erosion in Weber Coulee, depositing significant materials in Lind Coulee and Potholes reservoir. The erosion channel would be significant, and the USBR considers it a “one-time” option for this reason.

To deal with the Weber Waste Way erosion issue, the USBR considered in their 2007-08 review acquiring/expanding the USBR right-of-way and perhaps making some structural reinforcement changes at the head gate. The land acquisition approach would be a low-cost approach to making the waste way more functional—a factor that contributes to both project(s) operation. Also, this waste way would operate in conjunction with Lind Coulee Waste Way operations, for North of I-90 operations.

The Lind Coulee Waste Way has significant capacity to take excess water. There appears to be some capacity to transport excess water down the existing channel of the East-Low Canal located South of I-90 to this Waste Way, but additional enlargement of the Canal is proposed under the State-USBR Project, in part to deliver additional water to project lands South of Lind Coulee. Some additional modeling needs to be conducted to determine the amount of water that the Canal could safely transport to the waste way now that the second Weber Siphon is in place. At the Lind Waste Way, a second gate would be installed, as well. But until the additional irrigated acreage South of the Lind Coulee Waste Way is served, some additional Canal capacity should be in place without the need for direct Canal expansion.

Further modeling of the new operations for canal system should be conducted, but it would appear that with some work on the waste way gates, and the intertie of pumps and waste way operations, there is significant capacity to waste water in case of dramatic pump failures. By utilizing conjunctively all three waste ways, the operational integrity of the East-Low Canal should be maintained.

**Figure 3. State-USBR Project North/South of I-90, East-Low Canal Modified Partial Replacement Alternative (70,000 Acres)**

