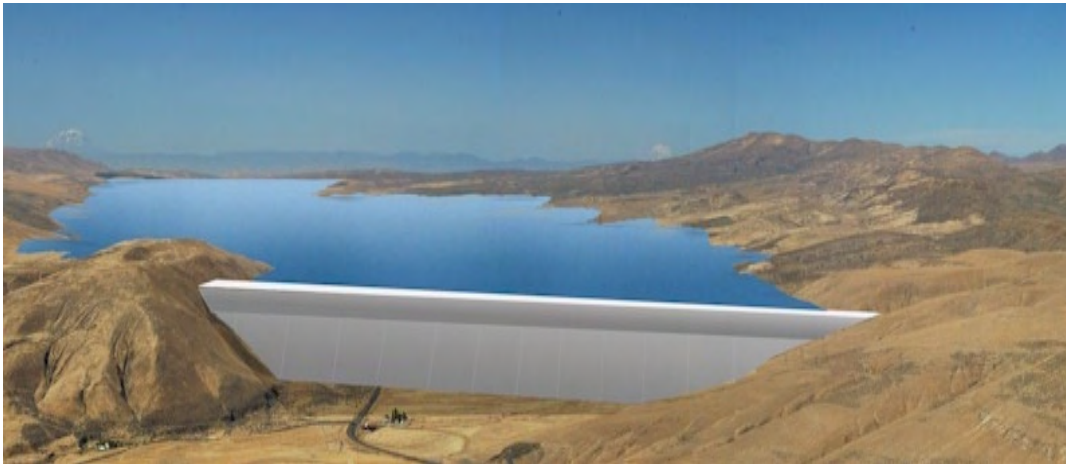


Yakima Basin Storage Alliance

Critique of the Bureau of Reclamation Benefits Analysis

January 2007



Black Rock Benefits

The Yakima Basin Storage Alliance (YBSA) believes the benefits of Black Rock Reservoir developed by the Bureau of Reclamation (BOR) in the Yakima River Basin Water Storage Feasibility Study (Storage Study) grossly underestimated the value that a new storage facility (Black Rock) can generate. With 600-800 thousand acre/feet of new water available in the Yakima River, a large lake for recreation and development, and a power generating capacity to assist the new wind power generation projects, the value of Black Rock will exceed the cost of constructing the reservoir.

Recreation

New recreation associated with Black Rock Reservoir would represent a twenty year spending potential of \$1.28 billion. Land values are estimated over \$1.273 billion. The twenty year net present value (NPV) of all cash flows for land and housing units is roughly \$1.977 billion with commercial development of \$.147 billion.¹ Based on cash flow analysis to NPV, the twenty year revenues can bring a total current value of:

Travel and Recreation	\$1.280 billion
Residential and resort development	\$1.977 billion
Commercial development	\$.147 billion
Total NPV of Revenue Stream	\$3.247 billion



¹As reported by Mitchell Nelson Group, LLC in Recreation and Economic Development Analysis of Lands around the proposed Black Rock Reservoir. Recreation cash flows pg 41 & 42; land values pg 43; commercial development pg 44.



Power Generation

The power market in the Northwest has changed. Pumping at the times of the day when power costs are relatively inexpensive and releasing water when prices skyrocket will make the operation more cost effective. This plan has the potential to significantly reduce or eliminate the projected cost of pumping.



The demand for wind power is planned to dramatically increase and with it the need for “wind integration”. Wind integration would place a premium on the “storage battery” value of controllable generation from Black Rock to offset the fact that the wind only blows around 30% of the time.

The Black Rock Reservoir project includes a power plant at Roza and Sunnyside Canal. Also, water can be returned to the Columbia River through a plant at Priest Rapids Dam to generate electricity and add to the flow of the Columbia River when needed. Power plants at the western facility at Roza Canal and Sunnyside Canal and the eastern facility at the Columbia River can produce a cash flow to help defray the operating cost of pumping from the Columbia River.

Energy sales based on cash flow analysis and reduce to NPV, the 40 year revenues can bring a total value of \$412 million¹ at the western power plants and the P/G power benefits from the eastern power plant is estimated to be \$25.7 million/year.²

¹The Recreation and Economic Development Analysis of Land around the Proposed Black Rock Reservoir study by Mitchell Nelson Group, LLC.

²As reported in the Power Generation Study by Larry Felton of Energy Northwest.

Construction/Jobs

The BOR Storage Study Report estimates construction contract cost of \$2.21 billion and adding ($\pm 25\%$) contingencies and non-contract costs ($\pm 35\%$) bring the project total cost to \$3.749 billion.¹ It is estimated the project will take ten years to compete.

The Washington State Public Works

Board estimates that PWTF dollar yields additional economic activity and that each million spent on new construction generates \$2.34 million in economic activity and creates additional jobs.

With an estimated construction cost of \$2.21 billion to be expended over a 10 year period the annual expenditure will average approximately \$200 million per year. Based upon the PWTF Board figures an estimated \$468 million in additional economic activity and approximately 6000 construction and auxiliary jobs will be created.²

¹The Yakima River Basin Water Storage Feasibility Study, Washington, November 2006 pg 16.

²Washington State Public Works Board Investing in Washington, Feb. 2003 pgs 18 & 21.



Fishery use/Fishery Nonuse

Benefits developed in the Storage Study indicate that Black Rock Reservoir creates a surplus of approximately 600 thousand acre/feet of water in the Yakima River for fish and instream flow, but it only projects an increase of 69,000¹ fish coming



back to the river and its tributaries to spawn based on modeling for Black Rock. Historically salmon and steelhead runs have declined from an estimated 800,000 fish to less than 5% of this number. With Roza and Sunnyside Irrigation Projects served with water from the Columbia River, the reaches of the Yakima River that have been de-watered can be partially restored and passage over the existing reservoirs can be created.²

With the excess water available in the Yakima River managed by the Yakama Nation, the State and Federal Departments of Fisheries and the Bureau of Reclamation, habitat along the river can be rewatered opening miles of new habitat. Operations that exist now such as the flip flop and the less than normal flow in the upper Yakima and Cle Elum Rivers can be eliminated.

With the additional water remaining in the five existing reservoirs, fish ladders could become a reality, opening many miles of habitat in the upper Cle Elum, Wapatus, Cooper and other rivers and streams that have been inaccessible for years.

The Yakama Nation, using the Cle Elum Supplementation and Research Facility, can restore the Sockeye and Coho runs in the Yakima Basin, Sockeye Salmon can be reestablished in Lake Cle Elum. The historical level of Sockeye Salmon production in the original Lake Cle Elum is estimated to be about 31,125 fish (Yakama Nation et al. 1990). Based upon the current lake which is larger with a much greater surface area the estimate can be expanded to 58,783 adults.³

The present worth calculations developed by the BOR in the Yakima River Basin Water Storage Feasibility Study: Plan Formulation Phase estimates an additional 69,000 coming back to the Yakima Basin. With the additional habitat, water managed to create a more normal flow in the Yakima River (no more gimmicks), passage into and above the

existing reservoirs, and the elimination of water short years, YBSA through their research believes a minimum of 200,000 fish will return.

Using the value per fish⁴ used in the BOR study for fishery use and nonuse the additional fish returning will have values of at least \$100 million for fishery use and approximately \$2.6 billion fishery nonuse.



¹Yakima River Basin Water Storage Feasibility Study, Washington, November 2006; pg 59.

²As reported in the Reaches Project by Jack A. Stanford et al. October 4, 2002; the

³Draft 36 for core team review 30 Nov. 2006, summary of smolt production in the Cle Elum Lake.

⁴Valuing multiple programs to improve fish population for the Washington State Department of Ecology by Gardner M. Brown Jr. et al., April 1999.

Note: Modeling is only as accurate as the design of the model and the accuracy of the input by the operator.

Irrigated Agriculture

The BOR used the Principle and Guidelines (P & G) analysis of National Economic Development (NED) agricultural benefits which identifies the change in net farm income associated with the irrigation water supply available related to a change in crop acreage while maintaining the same cropping patterns. Irrigation benefits are accounted for in drought years when proration is less than seventy percent. BOR chose to use a 23 year period 1981 through 2003 to determine benefits and used the years 1993, 1994, & 2001 to determine irrigation benefits.¹

The BOR did not include that from 1977 to 2002 there have been 7 years with prorated water less than seventy percent.² In addition to those years, in 2005 prorated water was again reduced to below the 70% threshold. Climate change in the Yakima River Basin, a snow meltdown basin, could cause peak stream flows to arrive earlier and reduce summer stream flows. One study³ projects global warming would decrease the amount of water available for irrigation in the Yakima River Basin by an average of 20% to 40% in a typical year by 2050.



The calculations presented in the Yakima River Basin Water Storage Study show the annual equivalent and present worth of irrigation benefits over the 100 year period of analysis is \$86,600,000.

The economic impact of the 2001 drought to the Yakima Basin irrigated agriculture for all three counties was estimated to be \$130,434,500. The agriculture revenue was entered into the IMPLAN models shows that the \$130 million reduction in agriculture revenues contributed to a loss of \$196 million in total economic output within the Yakima River Basin region. The loss of \$130 million in agriculture revenue within

the Yakima Basin resulted in a total loss of nearly \$226 million in total output within Washington State and a temporary loss of 4,900 jobs in 2001.⁴

Using an average loss of \$200 million each year over 7 out of the 25 year period when proration was less than 70% the loss would be approximately \$1.4 billion dollars to our region and the state, or an average of \$56 million/year. The NPV of which for 100 years is \$930,000,000 at a 6% discount rate.

¹The Yakima River Basin Water Storage Feasibility Study, Washington Nov. 2006 pg 58.

²The Economic Impacts of Improved Water Supply Reliability in the Yakima River Basin by Northwest/Economic Associates, March 23, 2004, pg 44.

³Climate Change and Adaptation in Irrigated Agriculture – A Case Study of the Yakima River. Prepared by Joe Casola, Amy Stover and the Climate Impacts Group (CIG) at the University of Washington, October 2005.

⁴The Economic Impacts of Improved Water Supply Reliability in the Yakima River Basin by Northwest/Economic Associates, March 23, 2004, pg 82 & 83.

“Questions and Answers Concerning Economic Impacts of Droughts in Washington State” found at www.washingtondrought.org/



Economic Analysis Results

Benefits	BOR –Feasibility Study	YBSA – Black Rock Projections
Irrigated Agriculture	\$ 86,600,000	\$ 930,000,000
Fisheries Use	\$ 33,800,000	\$ 100,000,000
Recreation & Resort	\$ 558,100,000	\$3,404,000,000
Hydropower	\$ 171,200,000	\$ 412,000,000
Municipal & Construction Jobs	\$ 46,500,000	\$ 468,000,000
Fisheries Nonuse	\$ 881,600,000	\$2,600,000,000
Total	\$1,777,200,000	\$7,914,000,000

YBSA used figures based on the highest and best use.

BOR, in the Storage Study, chose benefits so they can run a comparison with the Wymer and the Pumpback project does not maximize the beneficial value of the Black Rock Reservoir project to the Yakima Basin and the Northwest.