WASHINGTON STATE
Department of Ecology

OFFICE OF COLUMBIA RIVER

EMERGING TRENDS IN COST OF WATER IN OCR WATER SUPPLY DEVELOPMENT

PAG Meeting

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May 5, 2010

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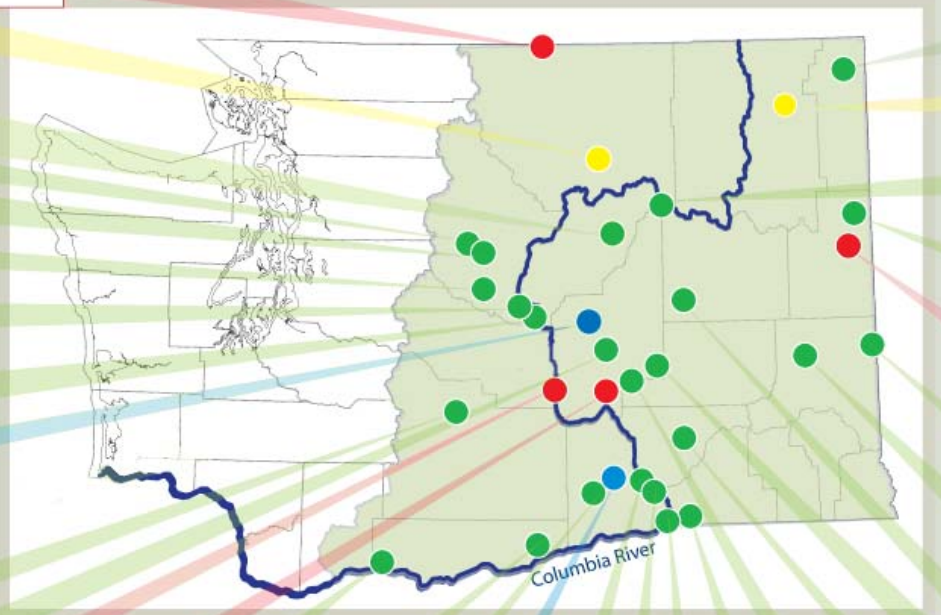
OCR Funded Projects



Goose Lake & 9 Mile Flat Water Storage (Colville Tribe)
Ac-Ft of Water = 4,750,000
Cost = $600,000 (Pre-Appraisal)

Similkameen Storage Project (Shanker's Bend)
Acr-Ft of Water = 50,000 - 1.7M
Cost = $325,000

SRB & Tribal Fisheries Project
Ac-Ft of Water = TBD (Regional)
Cost = $ 1,000,000

Sullivan Lake Reoperation
AC-Ft of Water = 14,000
Cost = $14,000

Peshastin Irrigation District Piping
Ac-Ft of Water = 360
Cost = $ 245,000

Surface Storage (Foster CD) Study
Ac-Ft of Water = 60,000
Cost = $93,750 (Pre-Appraisal)
Cost = $150,000 (Appraisal)

Mill Creek Storage Study
Ac-Ft of Water = 2,000-11,000
Cost = $125,000

Campbell Creek Reservoir Study
Ac-Ft of Water = 500
Cost = $ 232,500

Trout Unlimited, Pioneer Piping
Ac-Ft of Water = 1493
Cost = $ 1,000,000

Lake Roosevelt Incremental Storage Releases
Ac-Ft of Water = 132,500
Cost = $ 4,861,000

Chelan PUD Pump Storage Appraisal
Ac-Ft of Water = TBD
Cost = $ 180,000 (Pre-Appraisal 8 sites)
Cost = $400,000 (Appraisal 2 sites)

Rocky Reach Modifications (Chelan PUD)
Ac-Ft of Water = 28,000
Cost = $ 50,000 (Study)
Cost = $500,000 (EIS)

Spokane-Rathdrum Prairie ASR Study
Ac-Ft of Water = TBD
Cost = $ 250,000

Lands Council (Beaver Study)
AC-Ft of Water = TBD
Cost = $30,000

Columbia Basin Irrigation District Piping
Ac-ft of water = 2,521
Cost = $30,000 (Study)
Cost = $1,000,000 (2009)
Cost = TBD (2010)

WA State University Supply & Demand Report
Demand Forecasted = TBD
Cost = $ 750,000

Yakima River Water Enhancement
Ac-Ft of Water = 350,000
Cost = $ 3,350,000

Potholes Supplemental Feed Route
Conveyance
Cost = $ 10,831,500

Weber Siphon
Conveyance
Cost = $ 800,000

Rock Lake Storage Study
Ac-Ft of Water = 110,000
Cost = $ 126,000

White Salmon ASR
Ac-Ft of Water = 145
Cost = $ 956,950

Passive Rehydration (Lincoln County CD) Feasibility Study
Ac-Ft of Water = 300,000
Cost = $ 925,000

Wanapum Pool Raise
Ac-Ft of Water = TBD
Cost = $500, 000 (Wanapum EIS)
Cost = 225,000 (Rock Island Study)

Crab Creek Storage Project
Ac-Ft of Water = 1-3 Million
Cost = $ 4,112,139

Klickitat County (Horse Heaven Hills) Study
Ac-Ft of Water = TBD
Cost = $170,000 (Pre-Appraisal)
Cost = $300,000 (Appraisal)

Kennewick ASR
Ac-Ft of Water = 318
Cost = $ 1,050,000

Walla Walla Pump Exchange
Ac-Ft of Water = 30,000
Cost = $ 600,000 (EIS)
Cost = $40M (Construction)

Odessa Subarea
Ac-Ft of Water = 140,000
Cost = $ 7,619,785

Kennewick Irrigation District Kiona/Red Mountain
Ac-Ft of Water = 10,000
Cost = $ 95,000 (Study)
Cost = $10,000,000 (Construction)
Cost = $500,000 (Mitigation)

Barker Ranch Canal Piping
Ac-Ft of Water = 6,436
Cost = $ 5,600,000

Franklin CD IWM Study
Ac-Ft of Water = 394,400
Cost = $ 78,000

Boise Cascade ASR
Ac-Ft of Water = 1,657
Cost = $ 4,500,000

Conservation Commission Retiming Pilot
Ac-Ft of Water = TBD
Cost = $ 1,000,000

- Completed, Constructed Projects
- Active, Priority Development Projects
- Pending: Technical, Legal or Funding Issues
- On Hold

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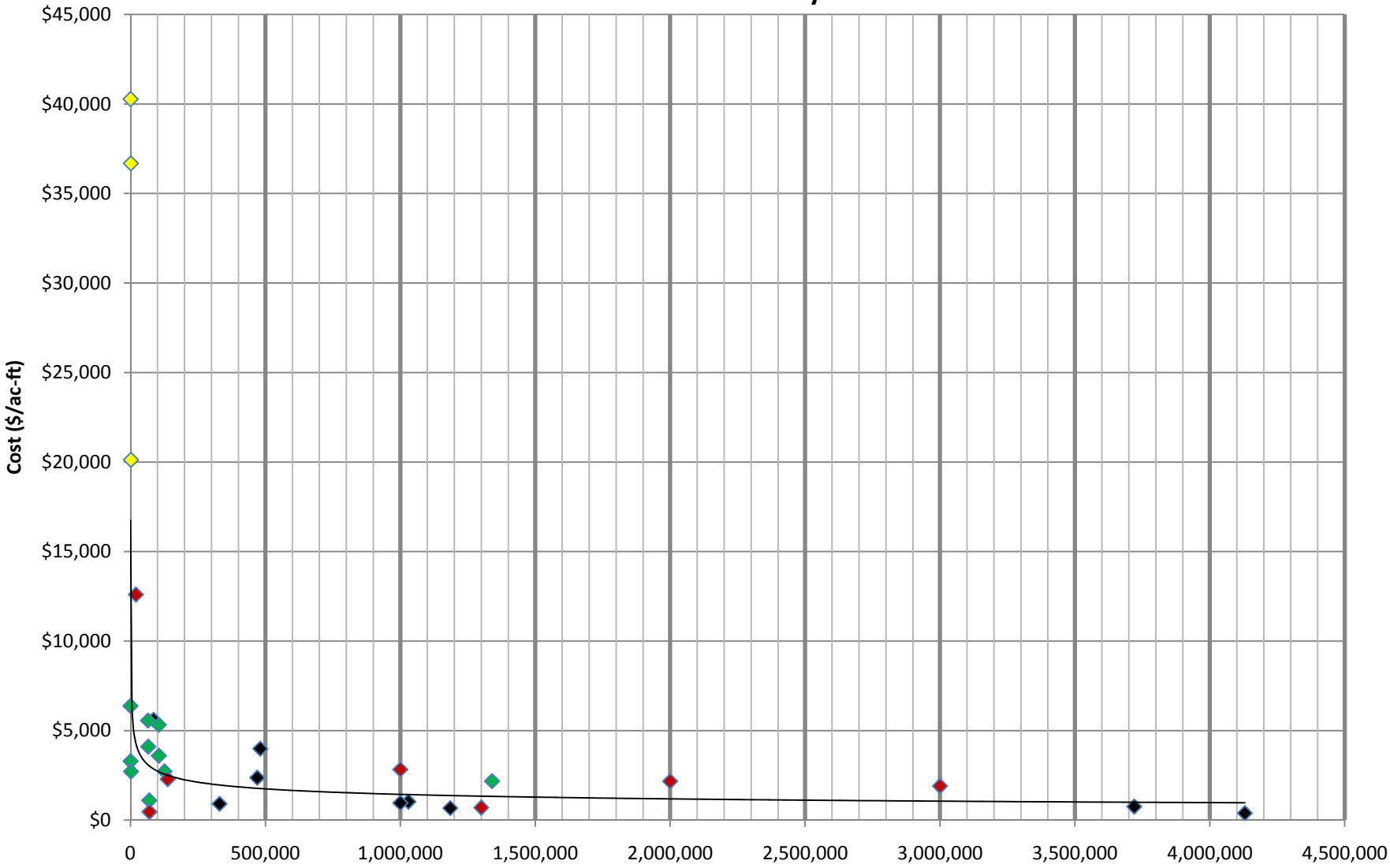
Storage Cost Comparison

Reservoir Cost Only

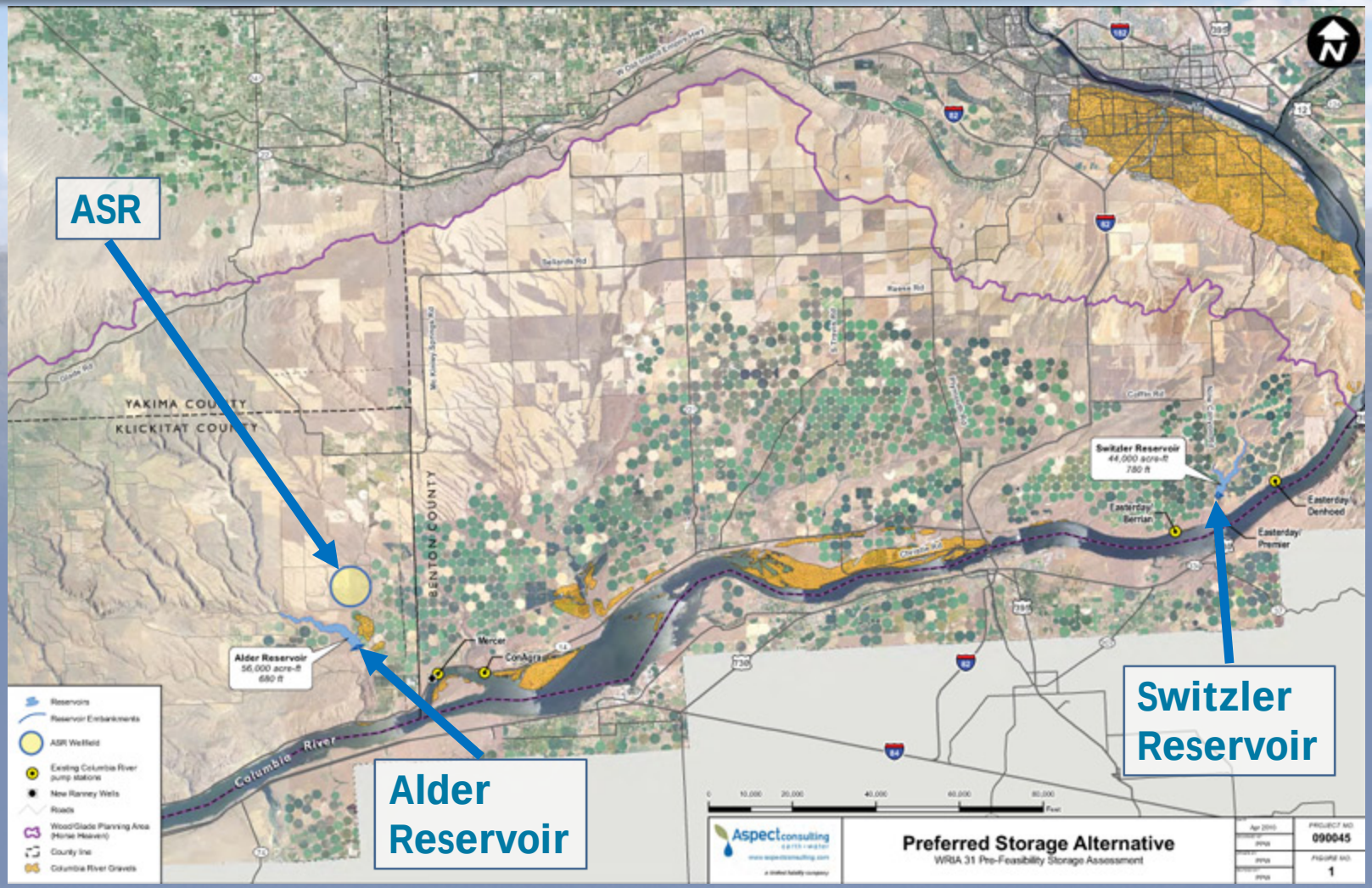


Includes multiple configurations of single projects.

Example 1: Columbia Basin Irrigation Districts Piping

- $1M OCR funding plus local match.
- 2,521 ac-ft of water savings.
- Approximately $400 per ac-ft.
- Savings to be used in the Odessa Subarea in 2011.

Example 2: Horse Heaven Hills Pre-Appraisal Study

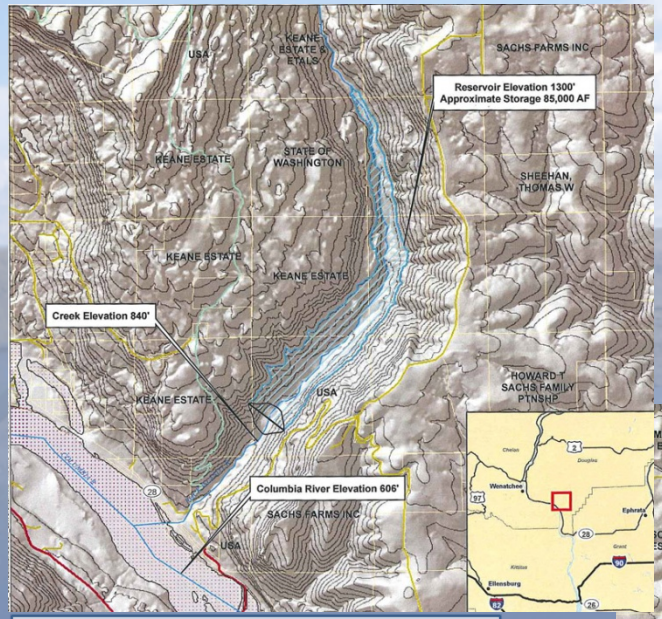


Example 2: Horse Heaven Hills Pre-Appraisal Study

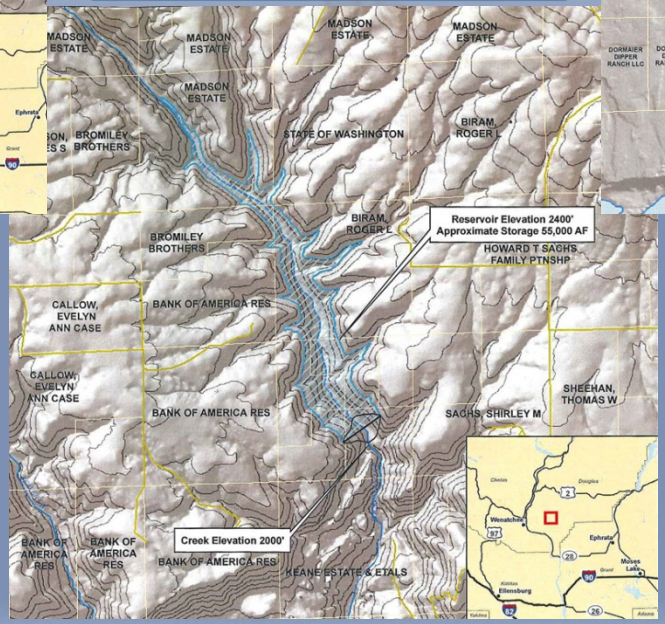
	With Existing Conveyance				With New Conveyance			
	Alder	ASR	Switzler	All	Alder	ASR	Switzler	All
Ac-ft	55.8K	5K	44.4K	105.2K	55.8K	5K	44.4K	105.2K
Cost	$167.3M	$23.2M	$187.7M	$378.2M	$256.9M	$30M	$273M	$560M
$/ac-ft	$2,999	$4,636	$4,228	$3,595	$4,604	$6,006	$6,150	$5,323
ALTC*	$12.9M	$2.7M	$14M	$29.6M	$18.8M	$3.2M	$19.7M	$41.7M
ALTC/ac-ft	$232	$538	$316	$282	$632	$443	$396	$396

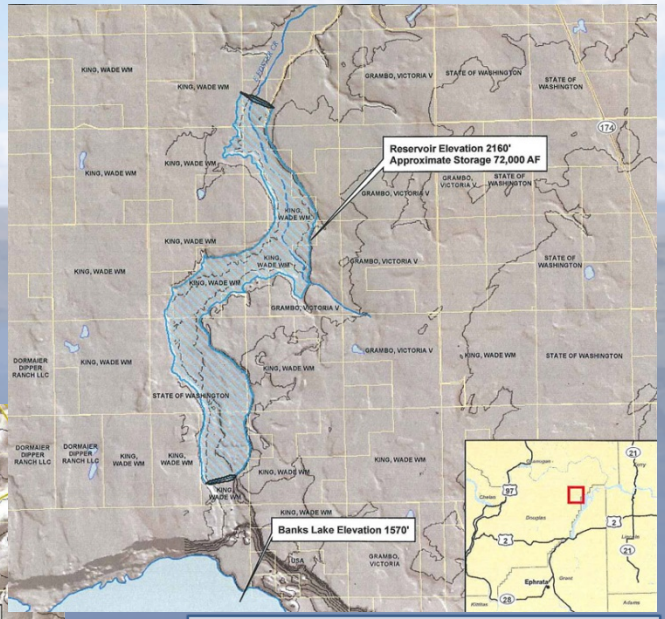
*Annual Long Term Costs = O&M + pumping power costs + amortized annual cost

Example 3: Foster CD Pre-Appraisal Study



Upper Rock Island
$1.3B
65,900 ac-ft
$20,200/ac-ft

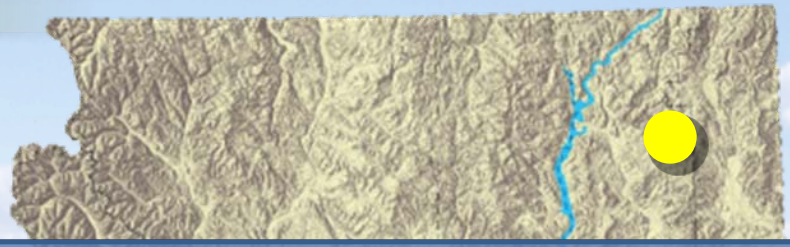




Lower Rock Island
$864M
85,300 ac-ft
$10,130/ac-ft

Foster Coulee
$692M
69,700 ac-ft
$9,900/ac-ft

Example 4: Mill Creek Storage



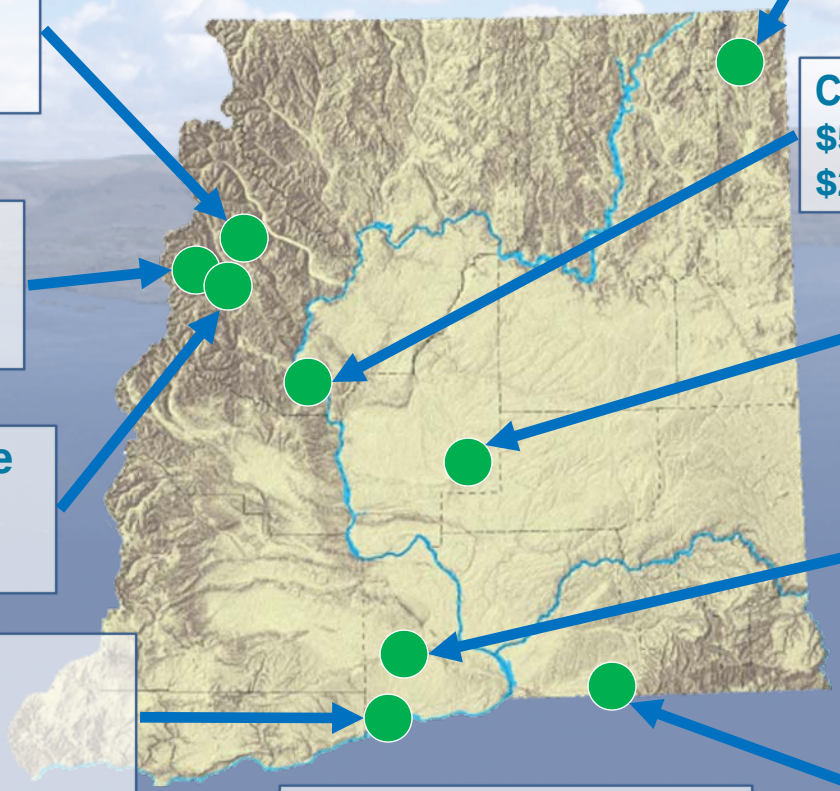
Alt.	Type	Height	ac/ft	Cost	$/ac-ft	Hydropower (annual) Production*	Revenue**
Alt. #1	Earthen	118’	1,400	$62.5M	$44,700	1.2M kWh	$61,200
Alt. #2	Earthen	68’	200	$37.7M	$188,600	--	--
Alt. #3	Concrete	118’	1,900	$36.2M	$19,100	--	--
Alt. #4	Concrete	68’	400	$15.3M	$38,300	686,400 kWh	$34,300

*Mean
**Wholesale price: $0.05/kWh

Policy Issues: How does the cost of water supply development affect funding choices?

- Funding amongst types of projects (surface vs. ASR storage, mainstem vs. tributary investments).
- Coordination with 2011 WSU demand study, areas of high or low demand.
- At what price do we put projects "on hold" and investigate other options?

2010-2011 Projects



Sullivan Lake Reoperation
$7.5 M to $14M

Foster Creek Storage Study
$93,750

Chelan PUD
$500,000 (Rocky Reach EIS)
$200,000 (Pump Storage Study)

Peshastin Pipeline Construction
$325,000

Col. Basin ID Piping Construction
$1M-$3M

TU, Pioneer Pipeline Construction
$1,100,000

KID Kiona/Red Mountain Studies, Construction
$10.5M

Horse Heaven Hills Study
$300,000

Walla² Pump Exchange Construction
$2M-$3M ($40M Total)

SRB/Tribal Fisheries
$1M (region-wide)