Odessa Subarea Special Study
Appraisal Investigation
Columbia Basin Project

Public Information Meeting
October 23, 2007
Moses Lake, WA
Meeting Objectives

- Provide update on appraisal investigation analyses
- Provide overview of study process and schedule
- Obtain feedback on appraisal investigation results
Study Purpose

• Continue phased development of the Columbia Basin Project as authorized

• Replace groundwater pumping in the Study area with a surface water supply from the Columbia Basin Project
Study Process Overview

- Organize and Develop Plan of Study
- Pre-appraisal Investigation
- Appraisal Investigation (Pre-plan formulation)
- Feasibility Investigation (Plan formulation)
- Environmental Regulatory Requirements
- Alternative Selected
- Repayment Contract Discussions Begin
- Construction Authority w/Federal Appropriations
- Final Engineering Design and Specifications
- Award Construction Contract
PASS Recommendations

• Four Water Delivery Alternatives
  Infrastructure to convey surface water to groundwater irrigated lands in Study area

• Water Supply Options
  Replacement surface water supply for current groundwater irrigation in Study area
## Water Delivery Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Groundwater Acreage Supplied</th>
<th>Estimated Water Supply Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>acres</td>
<td>percent of total</td>
</tr>
<tr>
<td>Alternative A: Construct East High Canal</td>
<td>140,000</td>
<td>100</td>
</tr>
<tr>
<td>Alternative B: North portion of EHC.</td>
<td>127,300</td>
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<tr>
<td>Enlarge &amp; extend ELC.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative C: Enlarge East Low Canal</td>
<td>70,100</td>
<td>50</td>
</tr>
<tr>
<td>Alternative D: Use existing East Low Canal</td>
<td>40,700</td>
<td>29</td>
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</table>
Water Storage Options

- Lake Roosevelt Re-Operation
- Banks Lake Drawdown
- Banks Lake Raise
- Potholes Reservoir Re-operation
- Dry Coulee Reservoir
- Rocky Coulee Reservoir
- Lind Coulee Reservoir
- Lower Crab Creek Reservoir
- Black Rock Coulee Reservoir
- Canal System Efficiency Improvement
## Estimated Groundwater Acreage By Water Supply Option

<table>
<thead>
<tr>
<th>Water Supply Option</th>
<th>Groundwater Acreage Served</th>
<th>acres</th>
<th>percent</th>
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<tbody>
<tr>
<td>Banks Lake</td>
<td>Draw down to 1563’</td>
<td>Up to 19,000</td>
<td>14</td>
</tr>
<tr>
<td>Draw down below 1563’</td>
<td></td>
<td>Up to 140,000</td>
<td>100</td>
</tr>
<tr>
<td>Operational raise of 2’</td>
<td></td>
<td>Up to 19,000</td>
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<td>Up to 140,000</td>
<td>100</td>
</tr>
<tr>
<td>Rocky Coulee Reservoir</td>
<td></td>
<td>Up to 46,900</td>
<td>34</td>
</tr>
<tr>
<td>Lower Crab Creek Reservoir</td>
<td></td>
<td>Up to 140,000</td>
<td>100</td>
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Groundwater Conditions
Engineering Studies
Engineering Scope and Limitations

- Investigated four water delivery alternatives and six water storage options

- Designs and cost estimates based on previous studies and limited design data

- Maximum 140,000 groundwater irrigated acres

- Columbia River water availability limited
  - ESA Fish flow objectives must be met
  - Water only available for diversion in September, October, December, and January in driest years

- Delivery of 3.0 acre-feet per acre annually
Water Delivery Alternatives

Four water delivery alternatives investigated involving one or both of the following components:

- Construction of new East High Canal system (previous feasibility investigation between 1960s and 1980s)
- Using existing East Low Canal system.
Alternative A – Construct new East High Canal system.
Alternative B –

Construct north portion of new East High Canal system.

Expand (south of I-90) and extend (near Connell) existing East Low Canal.
Alternative C – Expand existing East Low Canal south of Interstate 90.
Alternative D –

Use existing East Low Canal capacity north of Interstate 90.
## Water Delivery Alternatives

### Estimated Water Supply Needs

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Water Supply Options

Options investigated included:

• Operational modifications to existing storage facilities
  • Banks Lake (Dry Falls and North Dams)
  • Potholes Reservoir (O’Sullivan Dam)

• New reservoirs
  • Dry Coulee Dam and Reservoir
  • Rocky Coulee Dam and Reservoir
  • Lower Crab Creek Dam and Reservoir (two size options)
Columbia River: Available Supply

Odessa Subarea Special Study - Appraisal Level Analysis

Columbia River 90% Exceedance Monthly Available Flow Volumes
Based on BPA Hyd-Sim Results 1929-1998 and Observed 1999-2005

Volume (Maf)

Columbia Available Flow

Alt A Annual Diversion
Irrigation Season
Canal Availability Window
Operational Modifications

• **Reclamation policy** - Any proposed operational modification cannot result in appreciable increased risk of dam failure

• **Risk analyses conducted to ensure modifications are “risk neutral”**

• **Detailed risk analyses conducted during next Study phase** (feasibility analyses)
Banks Lake Reservoir
Proposed Operational Modifications

• Draft reservoir below current drawdown elevations
  – Does not increase dam safety threshold risks

• Raise water surface elevation by 2 feet
  – Raise in normal high water operating level may increase dam safety threshold risks
Model Results: Banks Low Elevation

Odessa Subarea Special Study - Appraisal Level Analysis

Banks Lake End-of-Month Elevations
10% of Years at or Lower
CBP-RW Model Results for Period-of-Record 1929-2005
Banks Lake 2’ Raise
Proposed Structural Modifications

• Structural modifications required to both Dry Falls and North Dams and Grand Coulee Feeder Canal

• Dam crest raise of 2 feet

• Install vertical “crackstopper” filter

• Raise Grand Coulee Feeder Canal lining by 2 feet
Potholes Reservoir
Proposed Operational Modifications

- Shift portion of spring feed to fall season; store more water in fall / winter season (earlier than current operation)
- Raise winter operating level about 3 feet; require downstream evacuation route
- No change to normal high pool level
- Overall higher pool throughout year and higher annual “average” reservoir elevation may not meet Reclamation dam safety risk thresholds
Potholes Reservoir (O’Sullivan Dam)

Proposed Structural Modifications

• Modifications limited to section of dam on Lower Crab Creek side
• Raise dam crest by 5 feet
• Install vertical “crackstopper” filter
New Storage Reservoirs

- Dry Coulee (481,000 ac-ft)
- Rocky Coulee (126,000 ac-ft)
- Lower Crab Creek (200,000 ac-ft) (472,000 ac-ft)
Dry Coulee Dam / Reservoir Site Plan
Rocky Coulee Dam / Reservoir Site Plan
Appraisal Cost Estimates
Assumptions

• Based on preliminary engineering designs & analysis

• Relied heavily on previous investigations (from 1960s to 1980s)

• Supplemented with limited additional data
  – Geology and hydrology data
  – Preliminary hydrologic models

• Preliminary and not appropriate for determining actual construction costs or seeking construction authority or appropriations from Congress
Appraisal Cost Estimates

• Field costs – construction costs only

• Non-contract costs - Costs associated with work or services provided in support of project
  • Investigations
  • Design and specifications development
  • Construction management
  • Environmental compliance
  • Archaeological considerations

• Costs not included, but to be developed during feasibility design
  • Land Acquisition
  • Utilities Relocation
  • Mitigation
Appraisal Cost Estimate Range
Water Delivery Alternatives

- EHC (140,000 Acres)
- Portion of EHC & Expand ELC (127,300 acres)
- Expand ELC (70,100 Acres)
- Existing ELC (40,700 Acres)

Dollars (in Billions)
Appraisal Cost Estimate Range
Water Supply Options

- Banks Lake Drawdown
- Banks Lake 2' Raise
- Potholes Reservoir Reop
- Dry Coulee Reservoir
- Rocky Coulee Reservoir
- Lower Crab Ck (200,000 AF)
- Lower Crab Ck (472,000 AF)
Total Appraisal Cost Estimate Range
Water Delivery and Supply Options Combined

- EHC (140,000 acres)
- Portion EHC & Expand ELC (127,300 acres)
- Expand ELC (70,100 acres)
- Existing ELC (40,700 acres)

Dollars (in Billions)
Total Appraisal Cost Estimate Range
Water Delivery and Supply Options Combined
Cost per Groundwater Acre Served

- Alternative A (140,000 acres)
- Alternative B (127,300 acres)
- Alternative C (70,100 acres)
- Alternative D (40,700 acres)
Appraisal Engineering Investigation

Findings

- All alternatives and options technically viable from engineering and operational perspective
- Cost estimates reflect appraisal-level methods, appropriate for relative comparison between alternatives and options
- Additional data collection and analyses required for feasibility-level cost estimates before seeking construction funding
Study Objectives

• Replace all or portion of groundwater use with Project surface water.

• Maximize use of existing infrastructure.

• Retain the possibility of full Project development.

• Address Endangered Species Act (ESA) issues.

• Provide environmental and recreational enhancements.

• Minimize potential delay in the study schedule.

• Be developed in phases.
Next Steps

Current to 2011

• Public Comment on Appraisal Investigation through Nov. 30
• Select Alternative / Options for Feasibility Investigation
• Conduct Feasibility Investigation
• Conduct Environmental and Regulatory Compliance
• Select Preferred Alternative
• Begin Repayment Contract Negotiations

After 2011

• Obtain Construction Authority and Federal Appropriations
• Prepare Final Construction Design & Specifications
• Award Contract for Construction
Feasibility Criteria

The agency preferred alternative must . . .

– Be technically viable
– Protect Indian Trust Assets
– Comply with the National Environmental Policy Act, the Endangered Species Act, and other environmental regulations
– Be socially and environmentally acceptable
– Be economically justified and financially feasible
Contact Information

Comments by November 30, 2007

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Questions?