Chehalis Basin Strategy
Other Large- and Local-scale Flood Protection Actions
Outline

• Overview of proposed design and operations
• Moderate to significant adverse impacts and mitigation
• Benefits resulting from implementation
• Results of the economic analysis
Design and Operation
Other Large- and Local-scale Flood Damage Reduction Actions

• Airport Levee Improvements
• I-5 Projects
• Aberdeen/Hoquiam North Shore Levee
• Local Scale
  o Floodproofing
  o Local Projects
  o Land Use Management
  o Flood Warning System Improvements
Action Locations

- Aberdeen/Hoquiam North Shore Levee
- Airport Levee Improvements
- Flood Retention Facility
- L-5 Projects
Airport Levee Improvements and I-5 Projects
Aberdeen/Hoquiam North Shore Levee

- Provides 100-year coastal flood protection to Aberdeen and Hoquiam
- Approximately 5.8 miles of levees
Local-scale Flood Damage Reduction

• Floodproofing
  o Protect homes and businesses
    • Elevating above flood levels
    • Building levees or floodwalls around them
    • Demolishing or purchasing the structure
  o Protecting livestock and farm investments
    • Constructing farm pads
    • Creating evacuation routes
Local Projects
  - Area-specific projects aimed at protecting key infrastructure and priority areas including:
    - Wastewater treatment plants
    - Roads and infrastructure

Land Use Management
  - Protect remaining floodplain functions and avoid future flood damage through:
    - Improving regulatory flood data, increasing floodplain protections, and creating higher construction standards

Flood Warning System Improvements
  - Weather tracking and flooding event notification systems
Overview of Moderate to Significant Adverse Impacts and Mitigation
Airport Levee Improvements

• For majority of elements of the environment, not likely to result in long-term significant adverse impacts

• Moderate adverse impacts:
  o Increases in flood extent upstream and downstream of the levee
  o Disruption of the groundwater flow regime within the footprint of the levee
  o Potential loss of fewer than 5 acres of wetlands

• Moderate to significant adverse impacts on cultural resources
I-5 Projects

• For majority of elements of the environment, not likely to result in long-term significant adverse impacts

• Minor to moderate adverse impact
  • Increases in localized flood elevations and depths
  • Potential for localized disruptions in the shallow ground flow regime due to footings for walls and levees

• Moderate adverse impact due to potential loss of fewer than 5 acres of wetlands

• Moderate to significant adverse impacts on cultural resources
Aberdeen/Hoquiam North Shore Levee

• For majority of elements of the environment, not likely to result in long-term significant adverse impacts

• Moderate adverse impacts to shallow groundwater regimes due to placement of the subsurface (toe) levee and sheetpile wall

• Moderate to significant adverse impacts to cultural resources
Local-scale Flood Protection Actions

• Floodproofing, Local Projects, Land Use Management, and Flood Warning System Improvements
  • Not likely to result in any long-term significant adverse impacts
Proposed Mitigation

• Compensatory water storage in areas upstream of the actions where flood levels are anticipated to increase

• Compensatory mitigation that could be proposed for shallow groundwater flow impacts has not been identified

• Creating, enhancing, or restoring wetlands (similar to Flood Retention Facility)

• Data recovery, archaeological monitoring, ethnographic studies, etc., for impacts to cultural resources
Overview of Benefits
Airport Levee Improvements and I-5 Projects

Airport Levee Improvements

• Reduced flood extents in portions of the Chehalis River floodplain, resulting in beneficial effects to land use, transportation, public services and utilities, and environmental health and safety

I-5 Projects

• Reductions in Chehalis River floodplain extents, resulting in beneficial effects to land use, transportation, public services and utilities, and environmental health and safety
• Reduction in extent of coastal flooding for the Aberdeen and Hoquiam communities, resulting in potential long-term beneficial effects to surface water quantity

• Flood protection along the low, tidally influenced portions of the Wishkah and Hoquiam rivers, resulting in beneficial effects on environmental health and safety through the reduced demand for emergency response and better access during floods
Floodproofing and Local Projects would primarily result in beneficial effects due to reduction of flood damage to structures, infrastructure and roads, and agricultural uses.

- Land Use Management changes

- Flood Warning Systems Improvements would result in increased accuracy with regard to forecasting flood timing and extents, and increased public safety
Results of Economic Analysis
Costs & Impacts

- Airport Levee Improvements - Included
- I-5 Projects - Included
- Aberdeen/Hoquiam North Shore Levee – Not included
- Local Scale
  - Floodproofing - Included
  - Local Projects – Not included
  - Land Use Management – Not included
  - Flood Warning System Improvements – Not included
Costs – Airport Levee Improvements and I-5 Projects

• Airport Levee Improvements
  o Capital Costs: $4.5 million in 2014 – escalated to 2016
  o O&M&R: $8,000 per year

• I-5 Projects
  o Capital Costs: $100 million in 2014 – escalated to 2016
  o O&M&R: $5,000 per year

<table>
<thead>
<tr>
<th></th>
<th>Capital Costs</th>
<th>Annual O&amp;M</th>
<th>Interest During Construction</th>
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<tbody>
<tr>
<td>I-5 Projects</td>
<td>$101,696,000</td>
<td>$5,000</td>
<td>$1,658,000</td>
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<tr>
<td>Airport Levee</td>
<td>$4,576,000</td>
<td>$8,000</td>
<td>$71,000</td>
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## Costs – Flood Proofing

<table>
<thead>
<tr>
<th>FLOOD PROOFING</th>
<th>Buildings in 100-year floodplain</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
<th>Alternative 4</th>
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</thead>
<tbody>
<tr>
<td>Residential &amp; Ag Buildings</td>
<td>1,014</td>
<td>597</td>
<td>987</td>
<td>970</td>
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<tr>
<td>Non-Residential Buildings</td>
<td>349</td>
<td>207</td>
<td>288</td>
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<tr>
<td>Total Buildings</td>
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<td>804</td>
<td>1,275</td>
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<td>Total Buildings Floodproofed&lt;sup&gt;1&lt;/sup&gt;</td>
<td>848</td>
<td>500</td>
<td>812</td>
<td>802</td>
<td>645</td>
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<td>Cost, Millions</td>
<td>$74.0</td>
<td>$40.5</td>
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Note:
1. Applies to 75% of residential buildings in the 100-year floodplain and 25% of commercial buildings within the floodplain.
Questions/Comments