City of Burlington Flood Issues

and

Impacts to Sedro-Woolley

Council Work Session

January 6th, 2009

CITY OF Burlington

SKAGIT COUNTY, WASHINGTON INCORPORATED 1902

Overview

- Current Situation
- Concern
- Levee certification concepts and impact on Sedro-Woolley
- BNSF Bridge Problem
- Puget Settlement Flood Control
- Questions/Discussion

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Current Situation

- FEMA Flood Insurance Study ongoing
  - No preliminary maps published yet
  - The data is in! Three hydrology reports:
    - Corps of Engineers, May 2008
    - Pacific International Engineering, October 2008
    - Northwest Hydraulic Consultants, October 2008
  - FEMA expected to decide mid-winter 2009
- Corps General Investigation (GI) Study is stalled
  - But COE has identified “Burlington Ring Dike” as highest cost/benefit of 37 proposed measures
- Burlington / Dike District 12 Levee Certification Project
  - Consultant on board to pursue “certified levee segment” concept; submit Conditional Letter of Map Revision
  - This can only work if hydrology is corrected
  - Mount Vernon’s flood wall project may help resolve the hydrology issue

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Our Concerns

- FEMA remapping of Base Flood Elevations will raise construction throughout the city by 3-7 feet
  - increases development/redevelopment expense;
  - decreases home/business property values;
  - insidiously reduces growth in economic base;
  - negatively impacts property tax-base supported services, especially schools
- City will adopt higher base flood elevations; but, for our long term economic well-being and future quality of life, we need to bring the base flood elevations back down.
- The only way to do this is to get our levees certified

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Levee Certification Concepts for Burlington and Dike District 12

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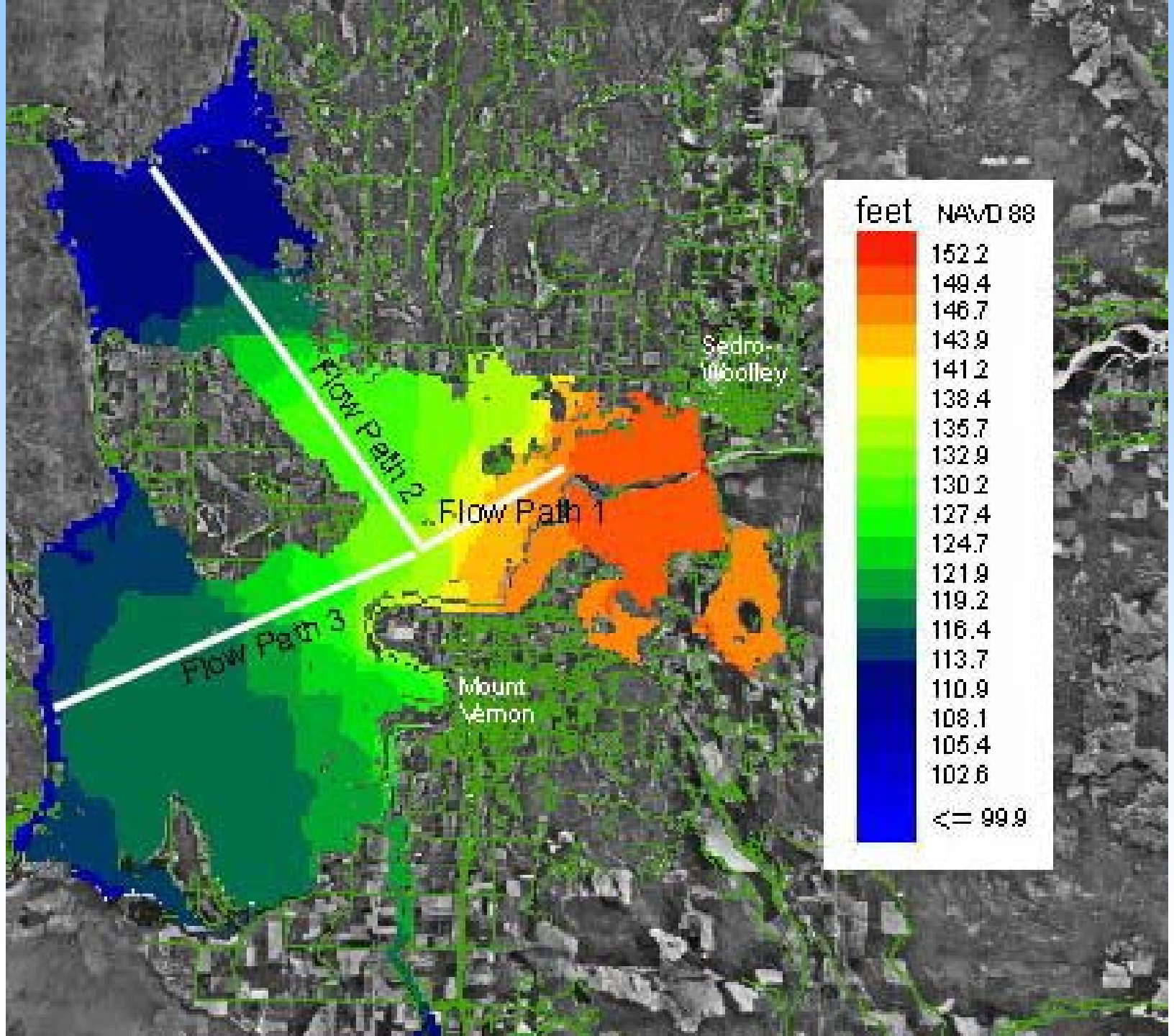
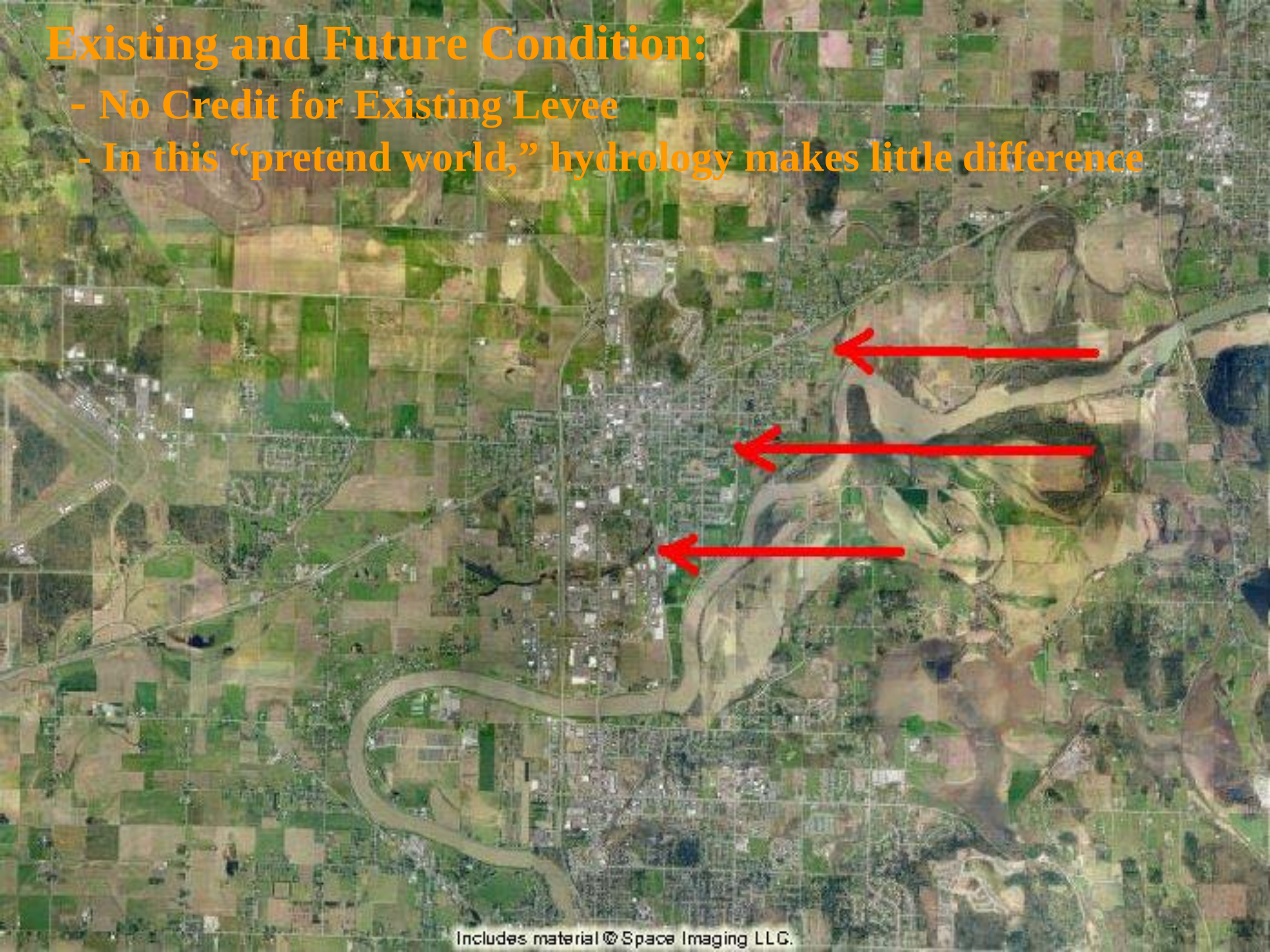

feet NAVD 88
152.2
149.4
146.7
143.9
141.2
138.4
135.7
132.9
130.2
127.4
124.7
121.9
119.2
116.4
113.7
110.9
108.1
105.4
102.6
<= 99.9
Flow Path 1
Flow Path 2
Flow Path 3
Sedro-Woolley
Mount Vernon

Existing and Future Condition:

- No Credit for Existing Levee
- In this "pretend world," hydrology makes little difference



U.S. Army Corps
of Engineers ®
Seattle District

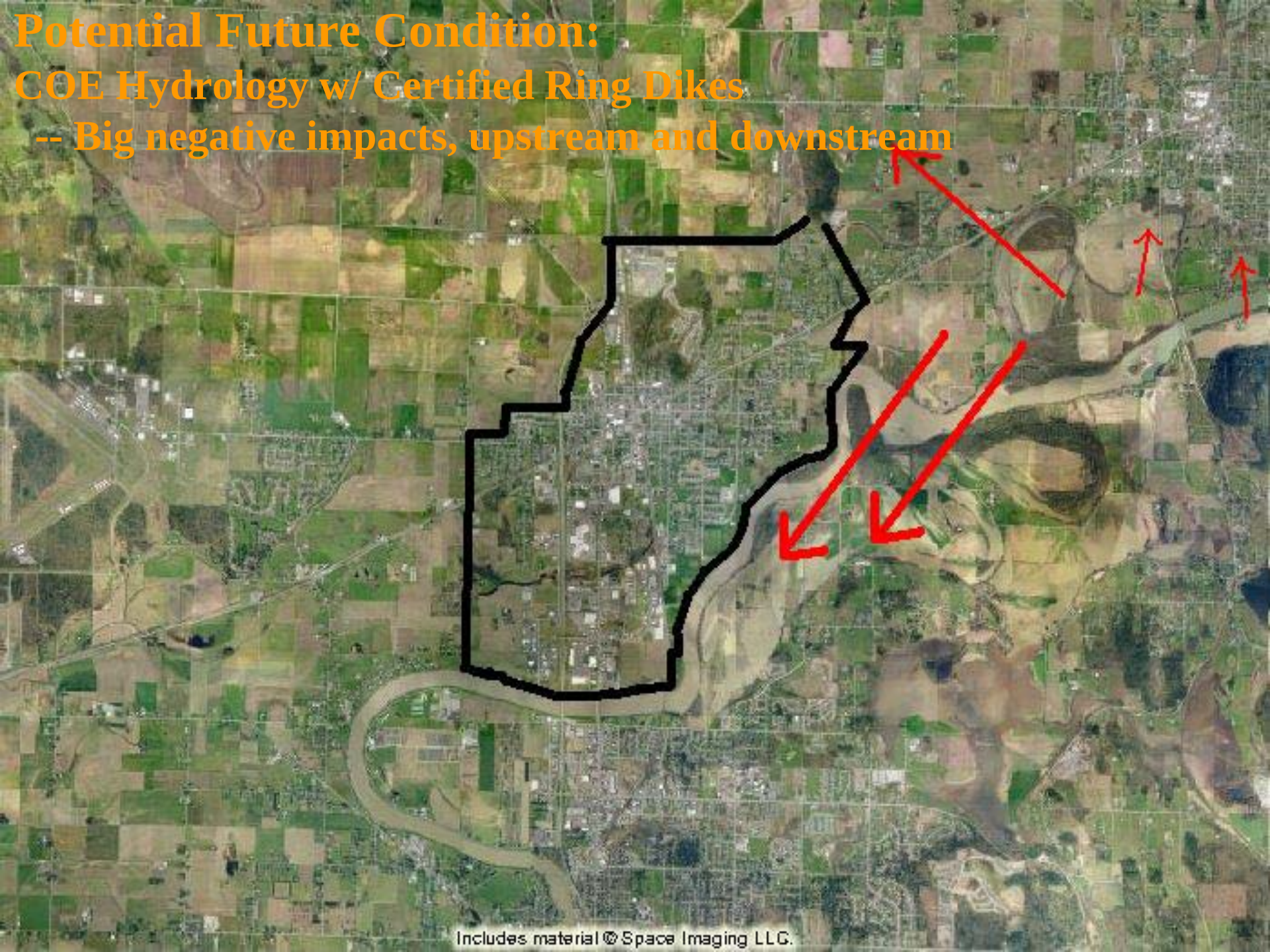
Measure 31
Burlington Ring Dike

- Description:
  - A levee would be constructed to protect Burlington from flooding.
- Preliminary Construction Costs: ~$10.9 million
  - Does not include infrastructure modifications, pumping, real estate, mitigation or O&M.

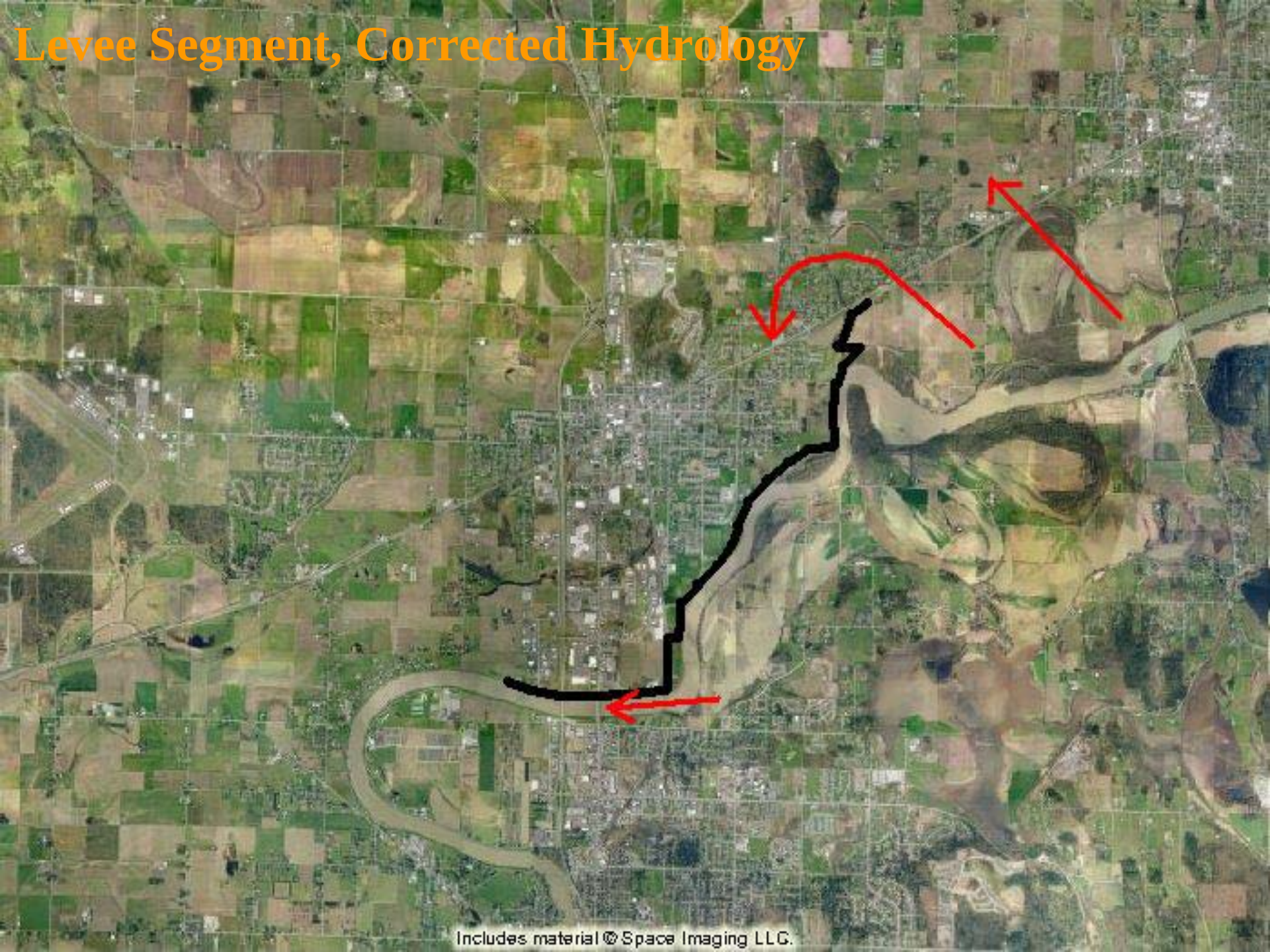
- Benefit/Cost Ratio: 46.9

(Note: from presentation to Community August 18, 2008)

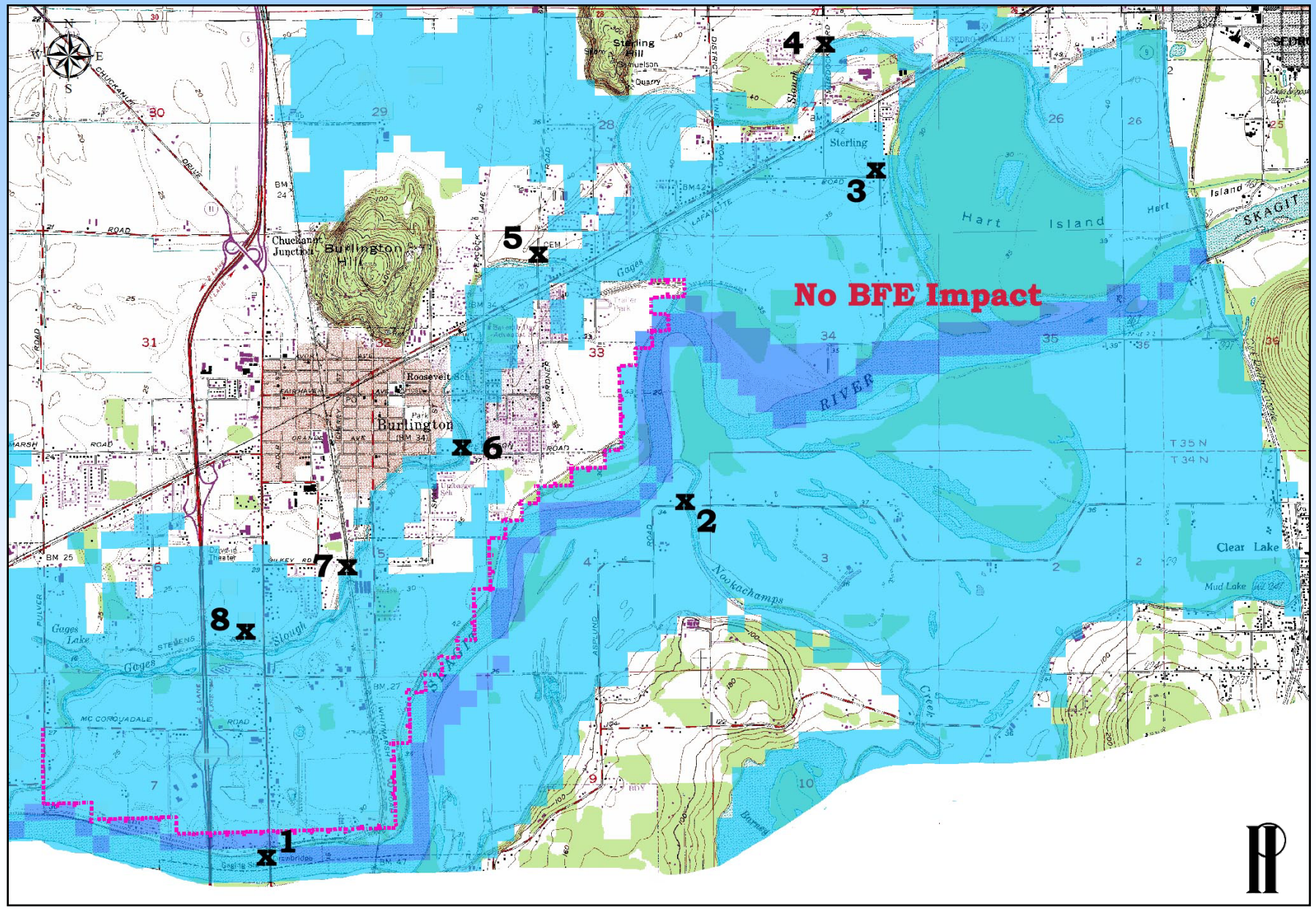
Potential Future Condition:
COE Hydrology w/ Certified Ring Dikes
-- Big negative impacts, upstream and downstream



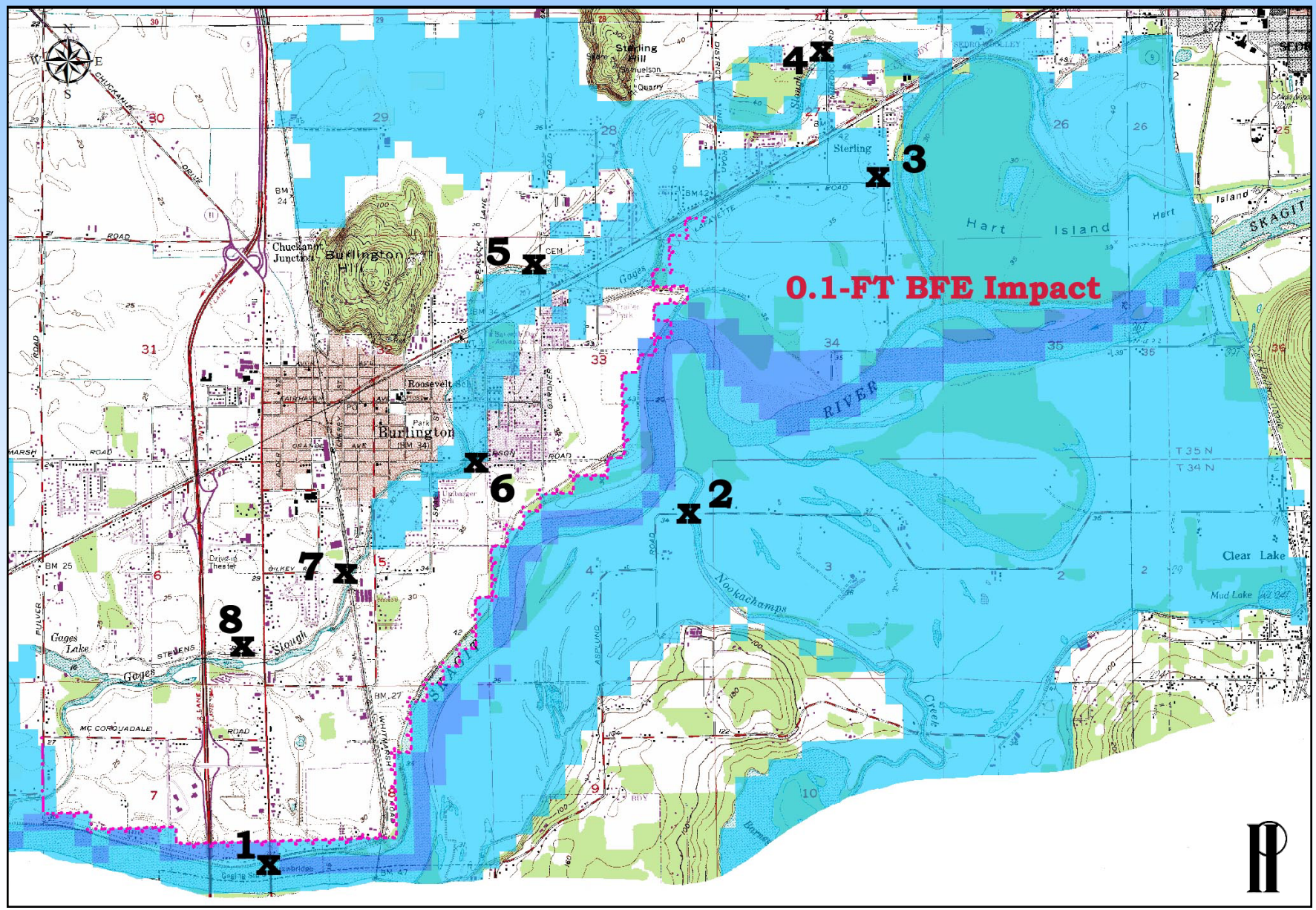
Levee Segment, Corrected Hydrology



Certified Levee Alternative 1: 100-year Flood Area in Burlington (PIE Hydrology)



Certified Levee Alternative 2: 100-year Flood Area in Burlington (PIE Hydrology)




Sedro-Woolley
Burlington
Mount Vernon
N
0
1.3mi
Includes material © Space Imaging LLC.

BNSF Bridge Problem

- Bridge built in 1916 needs to be replaced
  - Failed in the 1995 flood event
- Possible opportunity w/ Federal Infrastructure Investment Program?
- Burlington submitted a Freight Rail Assistance Application to WSDOT Rail Office
- Concept: engineering work for bridge replacement
  - BNSF has not yet concurred
  - Railroad believes bridge is adequate for next 50 years at least

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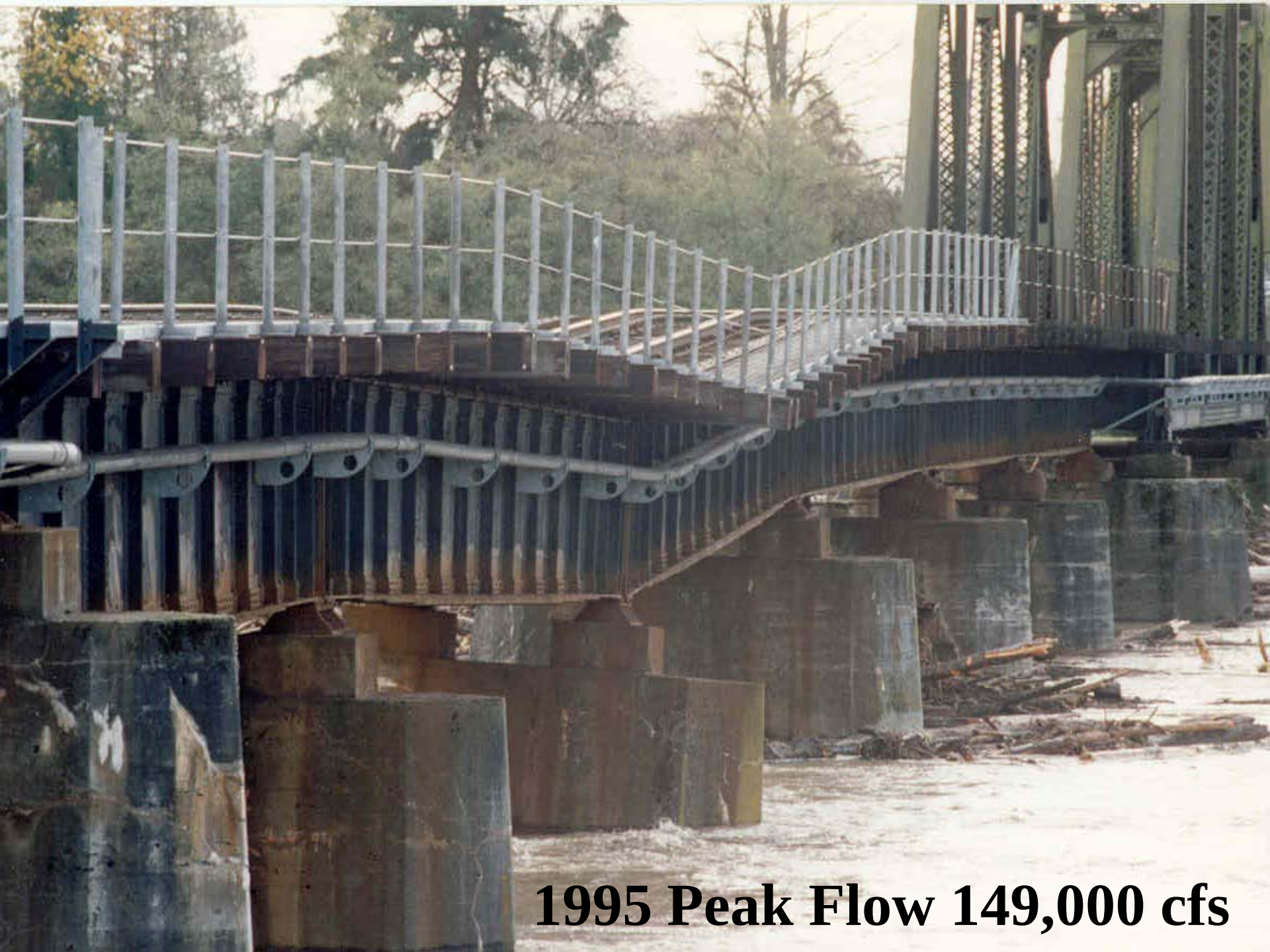
Problem: BNSF Railroad Bridge
Maximum Channel Capacity 160,000 cfs


1995 Peak Flow 149,000 cfs

Puget Settlement – Imminent Flood Drawdown Protocols

- Puget Sound Energy's new license has been issued
- Now it is time for Puget (or its follow-on company) to follow through on critically-needed flood control storage
- Settlement agreement provided a mechanism to achieve reservoir drawdown protocols in advance of a flood

4.1.1 Cooperation regarding Flood Control – Drawdown Target Elevations

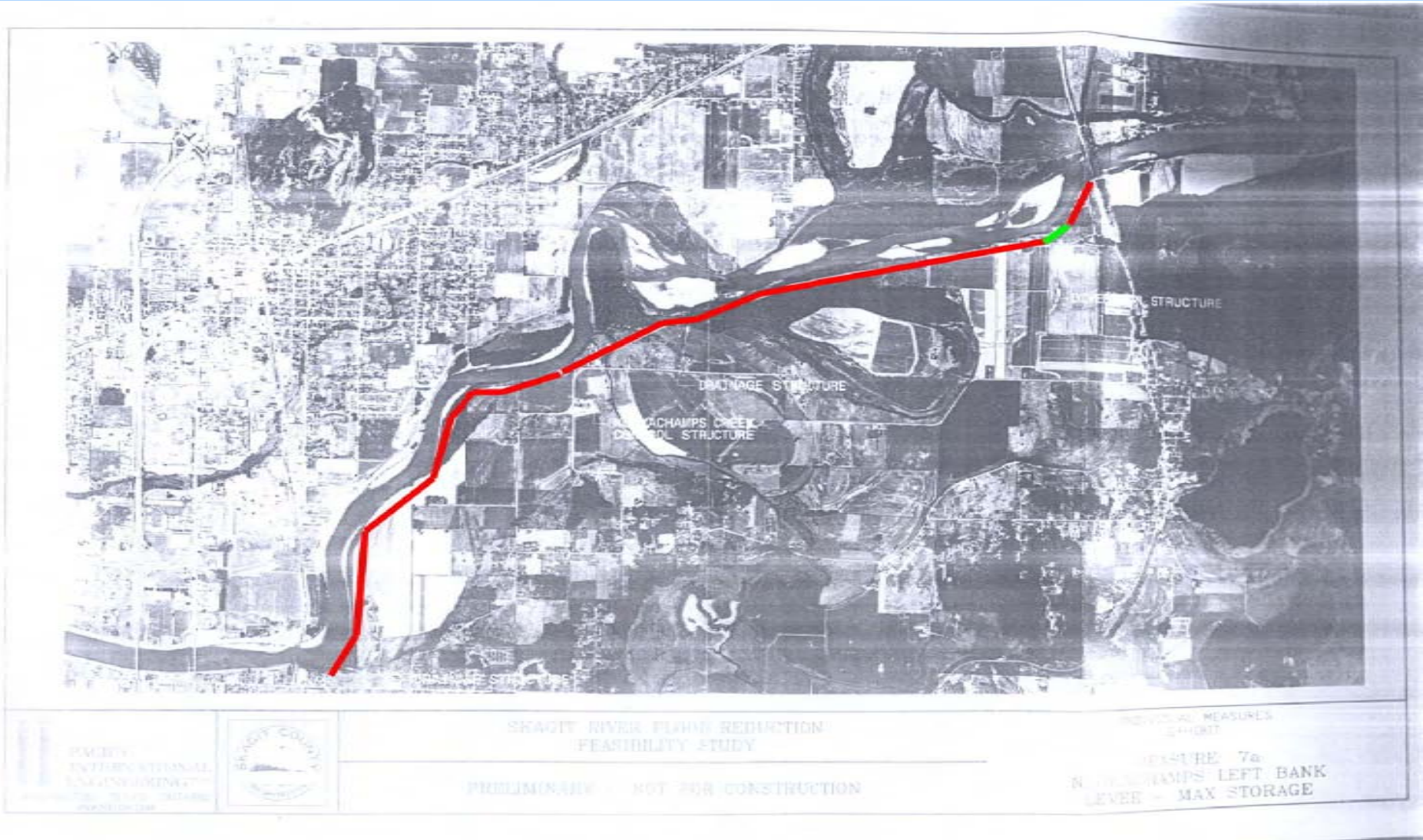
PSE typically utilizes operational reservoir buffers of approximately eight (8) feet in the Upper Baker Reservoir and approximately five (5) feet in the Lower Baker Reservoir. PSE and Skagit County agree that during the flood control season, PSE shall employ reasonable best efforts to achieve reservoir drawdown targets when a flood event is imminent that are within the operational buffer range used by PSE. The drawdown target elevation for Upper Baker Reservoir is 704.92 (NAVD 88) and the drawdown target elevation for Lower Baker Reservoir is 423.66 (NAVD 88). PSE shall maintain such drawdown for the duration of time as determined by the ACOE. PSE shall not seek compensation for operating the reservoirs in accordance with the foregoing protocol for reservoir drawdown.

4.1.2 Cooperation regarding Flood Control – Amendment to the Water Control Manual

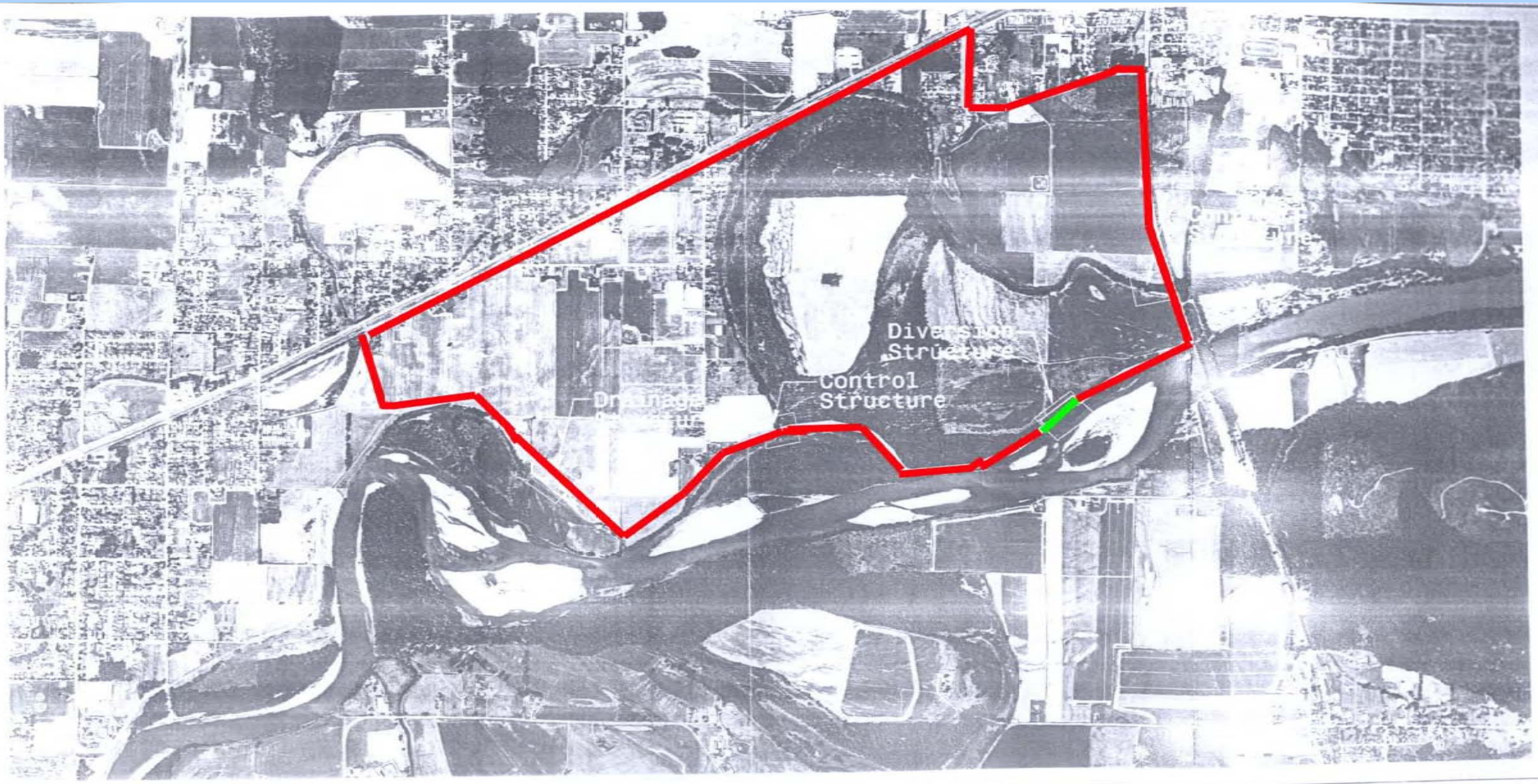
PSE and Skagit County shall seek an agreement with the ACOE to amend the ACOE Baker River Project "Water Control Manual" to reflect the following protocol for reservoir drawdown when a flood event is imminent:

> Upon receipt of notification from the National Weather Service or such other service as ACOE may rely upon to initiate flood control operations indicating that a significant storm with a reasonable likelihood of causing a flood event is imminent, the ACOE shall notify PSE per established communications protocol, and upon receipt of such notice per established communications protocol, PSE shall initiate drawdown, by all currently available and practicable means and methods, at the Upper Baker River reservoir to a target elevation of 704.92 (NAVD 88), and at the Lower Baker River reservoir to a target elevation of 423.66 (NAVD 88). PSE shall maintain such drawdown for the duration of time determined by ACOE in response to such notification and ensuing events. In the implementation of the foregoing protocol, PSE shall pursue such target reservoir levels, at the ACOE's direction, by employing its reasonable best efforts.

Nookachamps Concept



Hart Slough Concept



Questions / Discussion