King County

Barton, Murray, Magnolia, and North Beach




CSO Facilities

Morgan Junction Community Meeting
April 21, 2010

carollo
Engineers...Working Wonders With Water™

TETRA TECH

And Associated Firms

Meeting Purpose

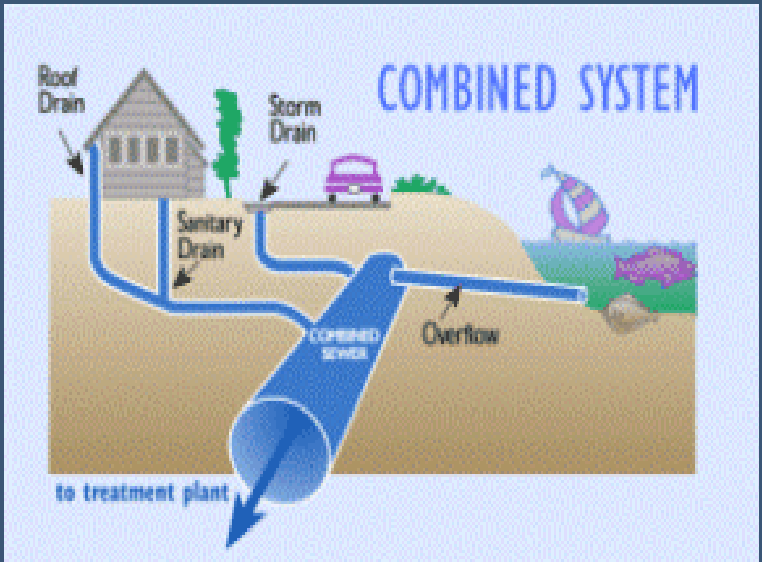
- To present three alternative means for CSO control in the Murray basin
- To present how these alternatives were developed
- To explain why the three alternatives are being considered for further evaluation
- Hear from the community about the alternatives

Public Input Opportunities To Date

- 2007 – 2009
  - Community groups and service organizations
  - Community meetings
  - Newsletters and website
- October 2009 – Public Open Houses on CSO control approaches
- March 2010 – Public meetings on alternative means for CSO control

CSO Control Program Overview

The Combined Sewer System



- Conveys wastewater & stormwater to treatment plants
- Pipelines & pump stations were sized to captured most of the flow
- Relief points – CSOs – were built to discharge when flows exceed capacity
- Newer systems manage sewage and stormwater separately

What is the CSO Control Requirement?

- Set by State Ecology Regulations (WAC 173-245)
- No more than one untreated event per year on a 20 year average
- CSO control schedule to protect public health, environment, and aquatic life by 2030.
- Department of Ecology set deadlines for project milestones in the West Point NPDES permit.
  - CSOs must be controlled to the state regulation
  - Ecology & EPA can use various means of enforcement, including fines and court issued compliance orders
  - EPA is tracking King County's compliance schedule

CSO Control Approaches

CSO Control Approaches

- Approaches Considered
  - Storage
  - On-site Treatment
  - Conveyance & Treatment
  - Peak Flow Reduction (Demand Management)
- Combination of Approaches

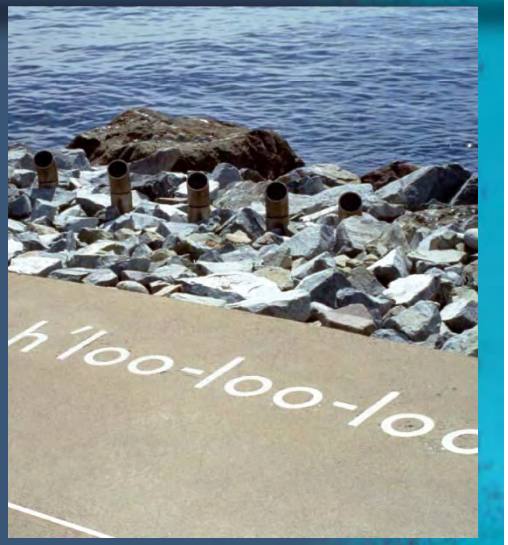
All approaches evaluated for each basin

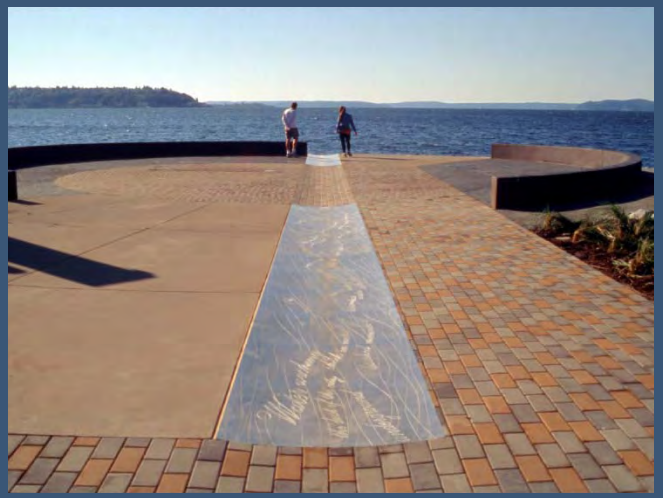
Storage Approach

- May be “centralized” at bottom of basin, centralized higher in basin, or distributed within basin
- Majority of facility is typically underground
  - Associated facilities located above ground
- Peak flows diverted into storage during wet weather
- Stored flow drained back to collection system following wet weather

Storage Examples – North Creek

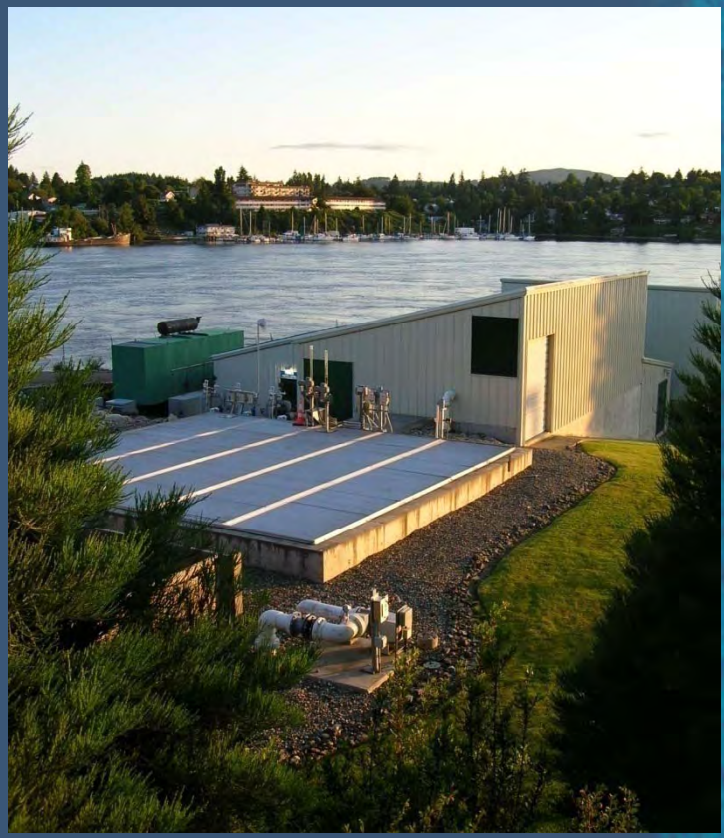
Storage Examples – Elliott West





On-site Treatment Approach

- Treatment facilities located near the CSO point
- Peak flows are treated and discharged
- Facilities operate only during wet weather events



Conveyance & Treatment Approach

- Increase pump station and pipeline capacity to convey flow downstream for treatment
- Dry weather flow treated at West Point treatment plant
- Peak flows treated at "Wet Weather" facility, in this case Alki treatment plant

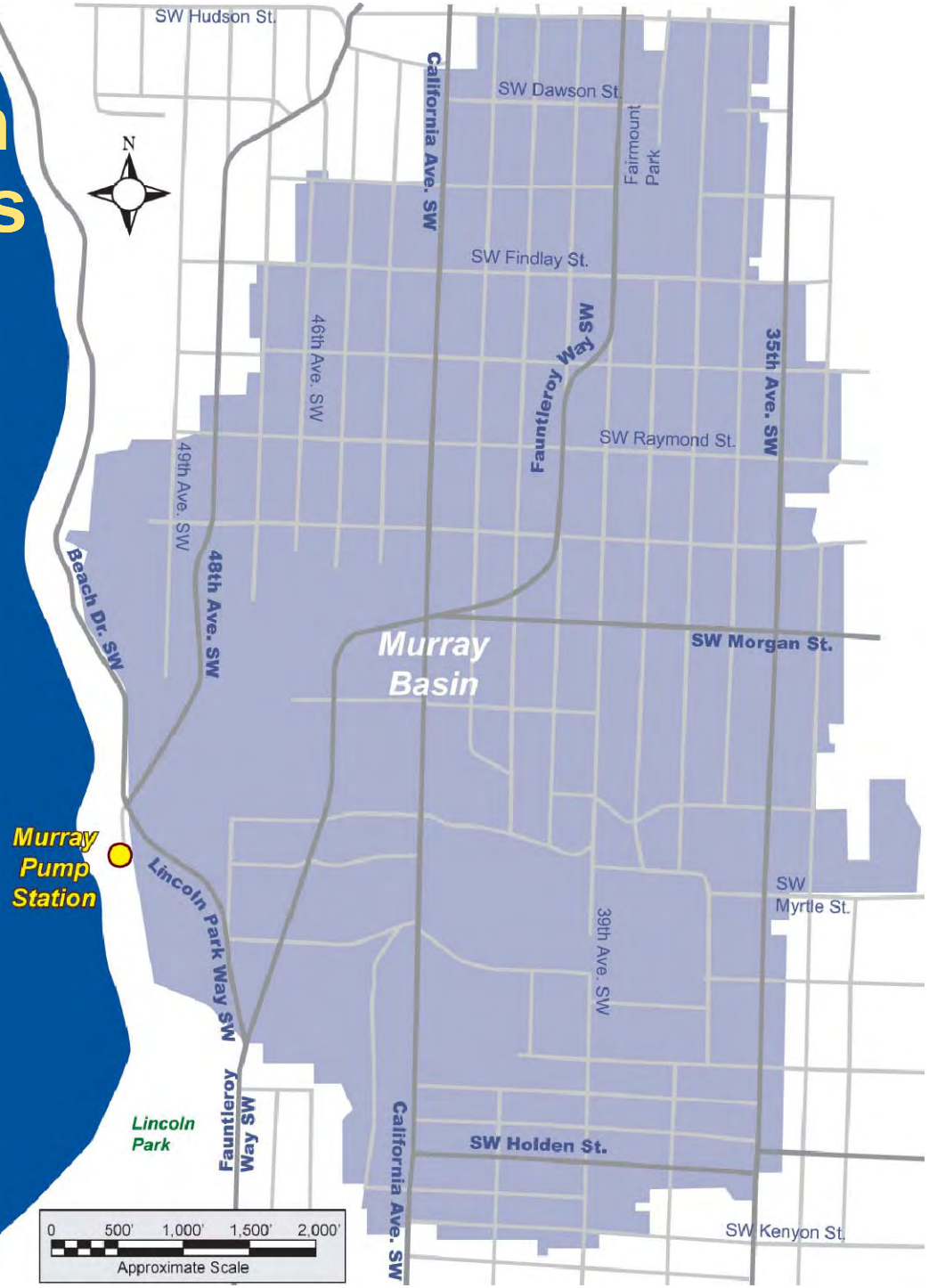
Peak Flow Reduction (Demand Management)

- Separate stormwater from combined system
  - Disconnect catch basins, roof drains, down spouts
- Re-route stormwater to new or existing storm drainage system
- Green Stormwater Infrastructure (GSI)
  - Roadside rain gardens
  - Green Roofs
  - Street Trees
  - Pervious Pavement

Murray Basin Requirements

Basin Description and Requirements

- 992 acres
- Murray CSOs
  - Average 5 events per year
  - Average 5 million gallons per year
- Control requirements
  - 1,000,000 gallons of storage, **or**
  - 28.5 mgd treatment capacity, **or**
  - 28.5 mgd additional conveyance capacity
  - Disconnection alone does not achieve control



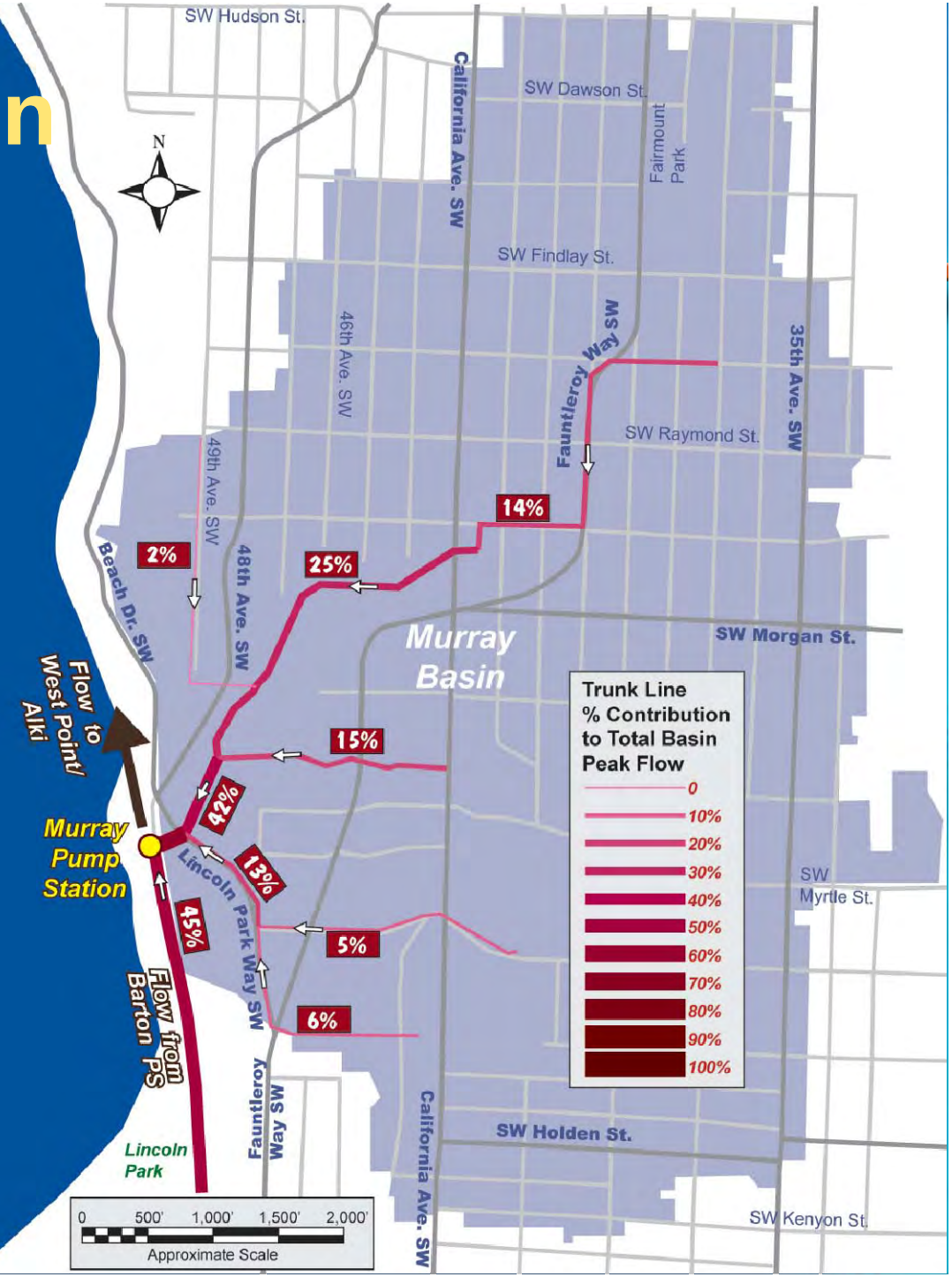
Murray Basin Alternatives

How were Alternatives Developed?

- Control approaches evaluated on a basin-specific basis
- Critical questions:
  - Is there sufficient room to site and construct the facility?
  - Is it feasible to construct?
  - Will the alternative capture sufficient peak flow?

Flow Distribution in Basin

- Barton Pump Station delivers approx. 45% of design event flow
- Murray basin flows deliver remaining 55% of design event flow
- Flows converge at the very bottom of the basin



How Were The Alternatives Evaluated?

- Individual alternatives were evaluated using a range of factors:
  - Land Use/Permitting
  - Environmental
  - Community
  - Costs
  - Operations & Maintenance
  - Design and engineering
- Your input used to shape and inform our work.

Evaluation Results

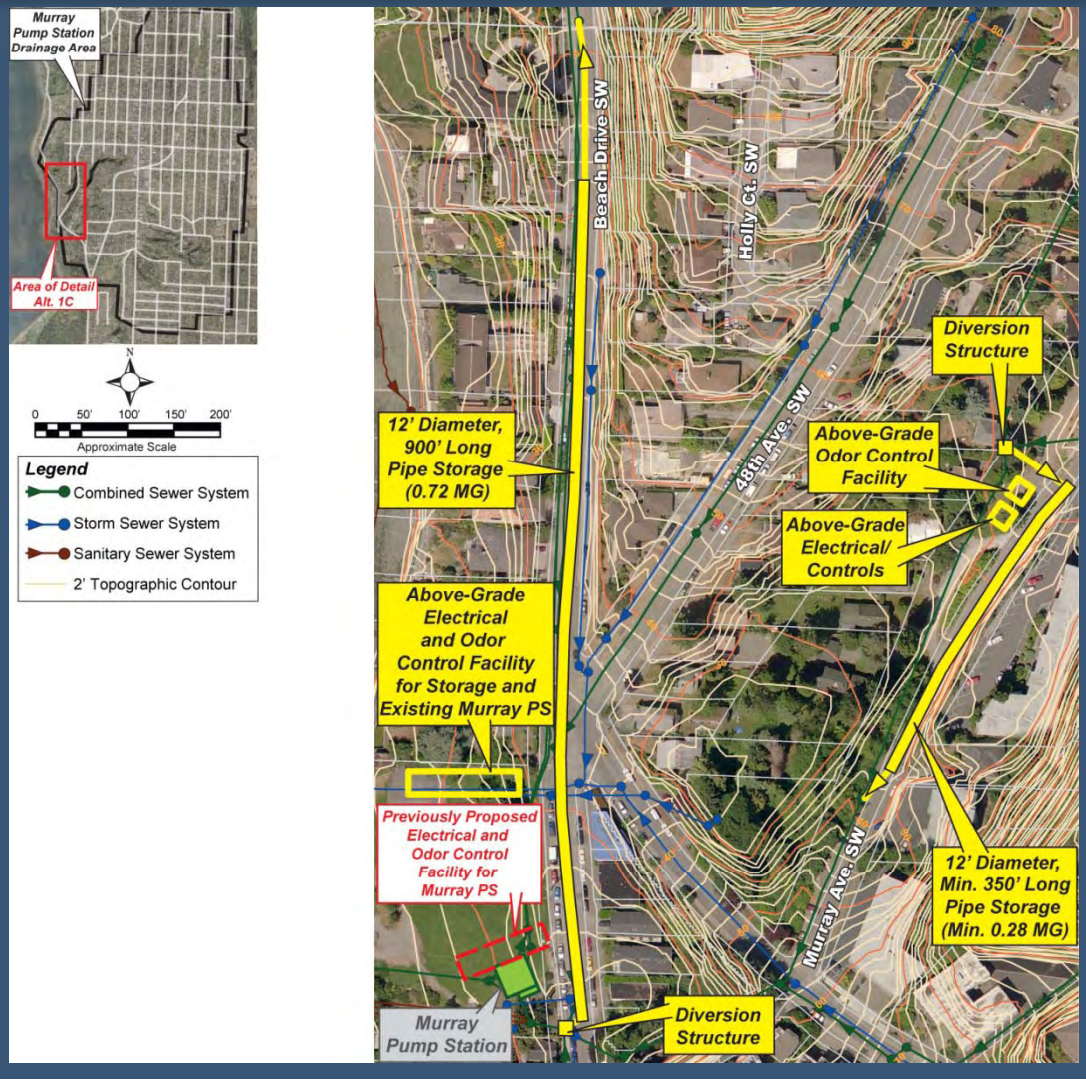
- On-site Treatment
  - Operational and maintenance requirements
  - Land use challenges
- Conveyance & Treatment
  - Downstream conveyance capacity limits
- Combine storage – Barton & Murray
  - Geotechnical/Tunneling risk
  - Major construction at both pump stations
  - Cost
- Peak Flow Reduction (Rooftop disconnection and GSI)
  - Connected impervious area too distributed throughout basin
  - Storage not eliminated


N
Puget Sound
Beach Drive SW and Murray Avenue SW (Underground Storage)
Lowman Beach Park (Underground Storage)
Murray Pump Station
Beach Drive Area (Underground Storage)
Lincoln Park
Camp Long
421
419
420
SW EDMUNDS ST
SW DAWSON ST
SW FINDLAY ST
SW JUNEAU ST
SW RAYMOND ST
SW BRANDON ST
SW MYRTLE ST
SW OTHELLO ST
SW KENYON ST
SW THISTLE ST
CALIFORNIA AVE SW
40TH AVE SW
35TH AVE SW
49TH AVE SW
26TH AVE SW
FAUNTLEROY WAY SW
41ST AVE SW
39TH AVE SW
37TH AVE SW
2,000 1,000 0 2,000
Feet
KC-WTD Pump Station
KC-WTD Conveyance
KC-WTD CSO Outfall
Alternatives
Murray Basin
Park

Murray Pump Station Upgrade Project

- Installation of a generator
- Additional odor control measures
- Upgrades are independent of CSO control requirements
- Bottom of basin alternatives provide coordination opportunity

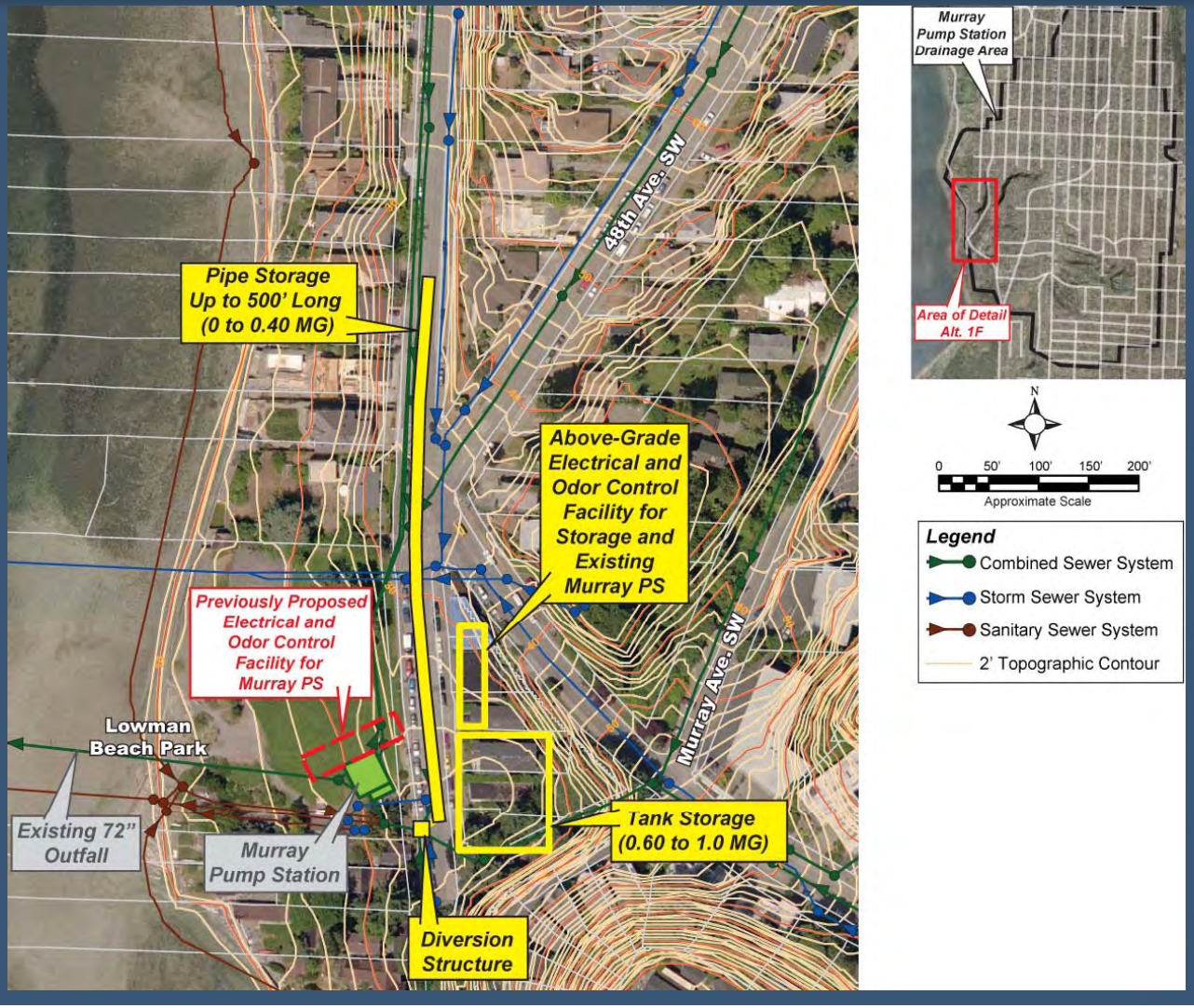
Distributed Storage in Beach Drive and Murray Avenue



Distributed Storage in Beach Drive and Murray Avenue

- **Benefits**
  - Reduces property acquisition
  - Similar to other King County facilities
- **Challenges**
  - Utility relocation will be required
  - Locations needed for odor control and electrical facilities
  - Traffic and residential access disruptions during construction
  - Location is not at bottom of basin; requiring larger facility size to achieve control
  - Lack of construction staging area

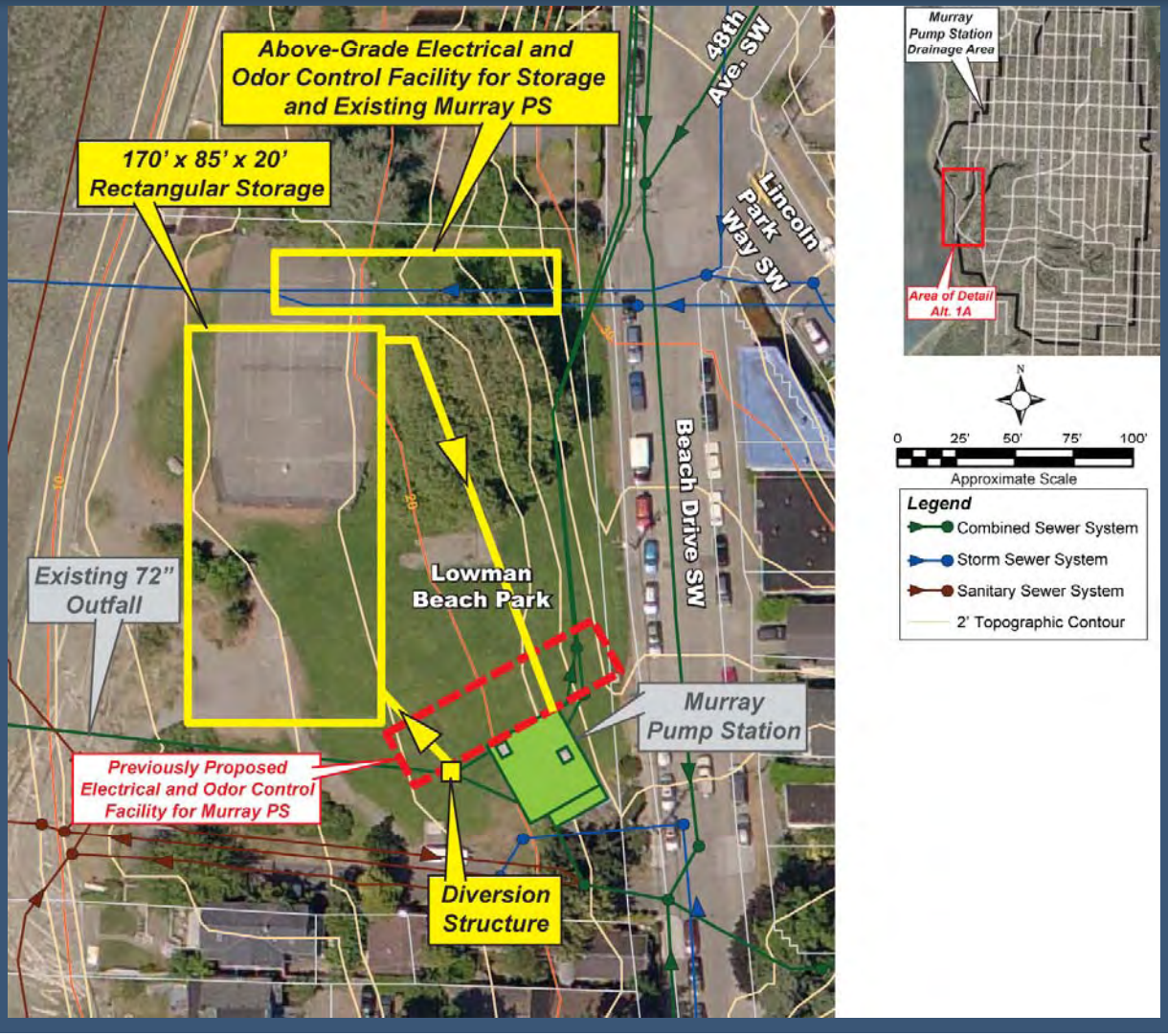
Combined Pipe and Tank Storage



Combined Pipe and Tank Storage

- **Benefits**
  - Bottom of basin
  - Similar operational complexity to single facility
- **Challenges**
  - Street use permits may be required
  - Property acquisition required
  - Two storage facilities to operate and maintain

Rectangular Storage in Lowman Beach Park



Rectangular Storage in Lowman Beach Park

- **Benefits**
  - Single facility at bottom of basin
  - Lowest level of complexity to operate and maintain
  - Similar to other King County facilities
- **Challenges**
  - Use of a portion of Lowman Beach Park
  - Permanent above-grade facilities may limit park use
  - Will disrupt park use during construction
  - Shoreline location

Questions, Responses, and Public Input

Contact Information to Provide Input

- Web: www.kingcounty.gov/csobeachprojects
- E-mail: CSOBeachProjects@kingcounty.gov
- Phone: (206) 684-1207
- Feedback forms
- Feedback and info received by end of April will be considered during evaluation of the three alternatives

Project Timeline – 2010 - 2011

- Spring 2010 –
  - Public meetings for 3 Alternatives
  - Refinement of Alternatives and Costs
- Early Summer 2010 –
  - Define Proposal for Further Review
- Summer to Fall 2010 -
  - Report back to public in how input used
  - Facility Plan Preparation begins
- December 31, 2010 –
  - Draft Facility Plan to Ecology
- Spring 2011 – Public comment on SEPA