



# RESPONSES OF PUGET SOUND PORTS TO CHANGES IN SUITABILITY GUIDELINES FOR OPEN WATER DISPOSAL

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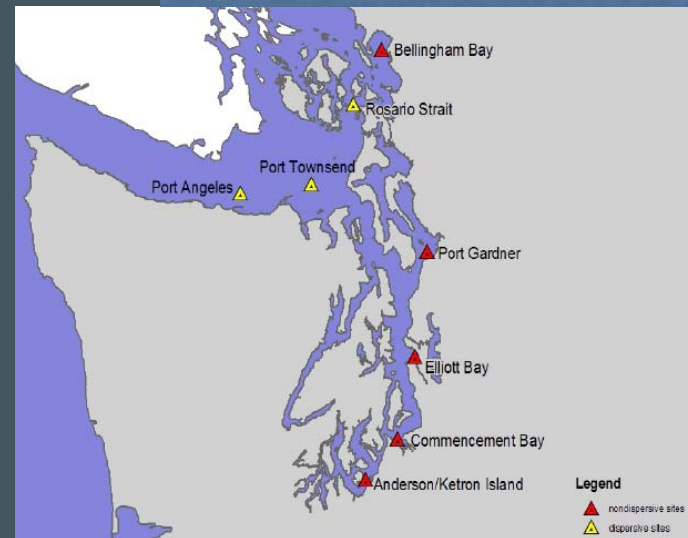
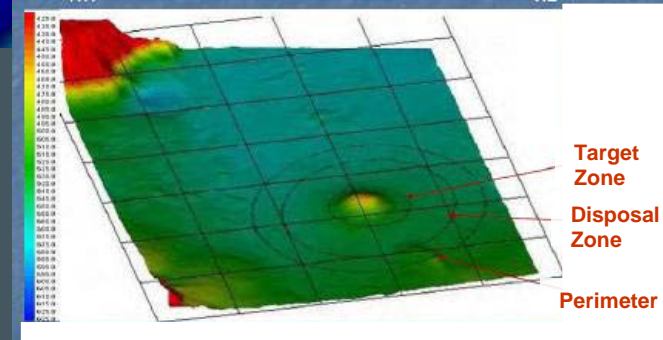
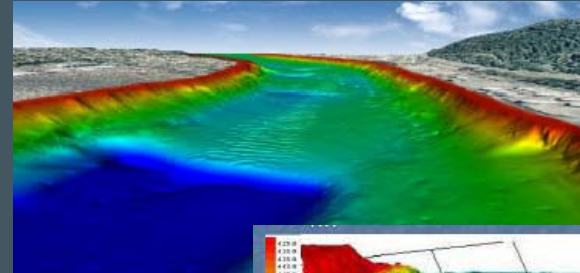
Port of Olympia: Rick Anderson

Port of Tacoma: Jason Jordan

October 2011

# DMMP Has Operated Safely for Over 20 Years

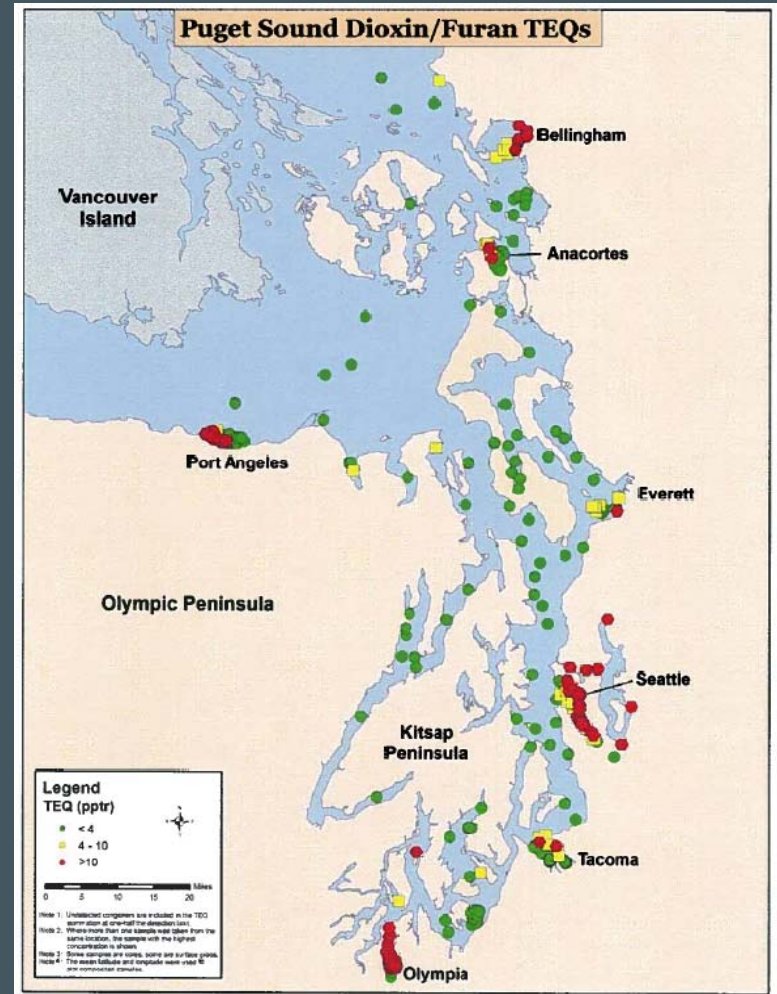
- Cost-Effective Disposal
- Regional Success Story
  - Multi-Agency Program
  - Extensive Siting Studies
- Project Review Process
  - Testing Protocols
  - Suitability Guidelines
- DMMP Site Monitoring
- Adaptive Management



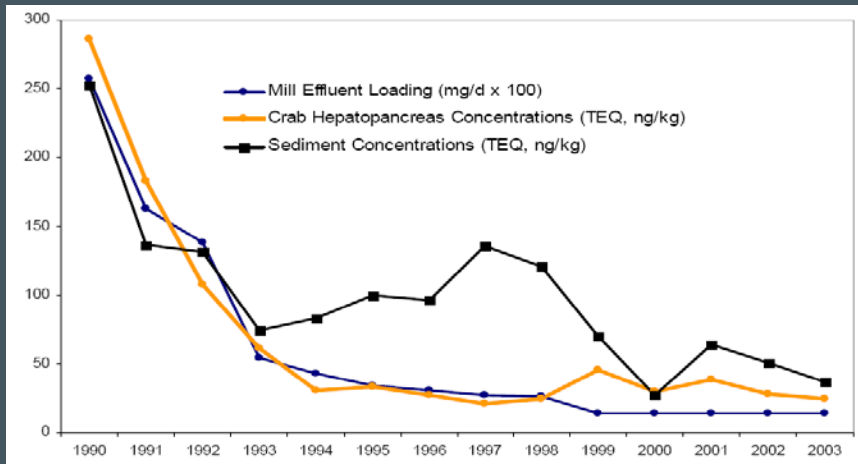
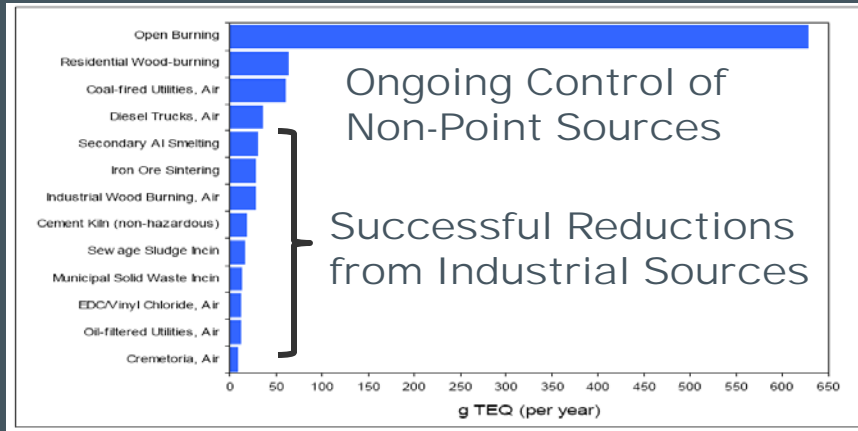


# Recent Agency Concerns Regarding Dioxin/Furans in Urban Sediments

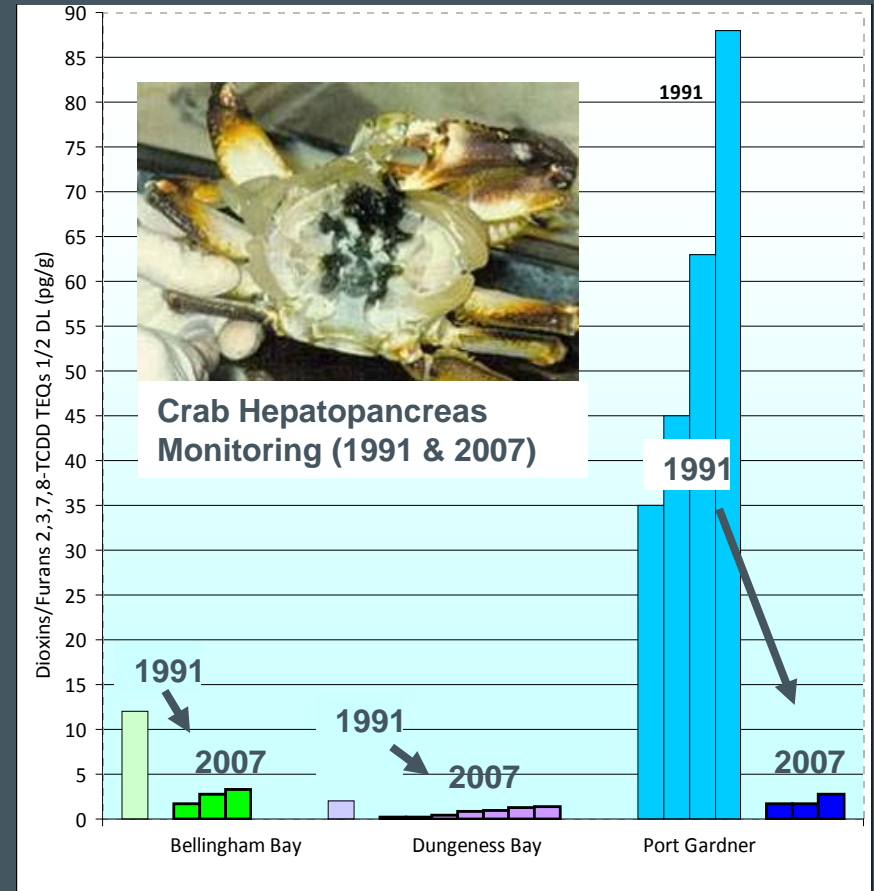
- Previous Guidelines
  - "Reason to Believe"
  - Limited Testing Since 1993
- Recent Puget Sound Data
  - Cleanup Studies
  - Ambient Monitoring
- 2006 Project Evaluation
  - Port of Olympia
  - USACE Federal Channel
- Expanded Interest



# Declining Dioxin Source Inputs and Aquatic Food Chain Concentrations



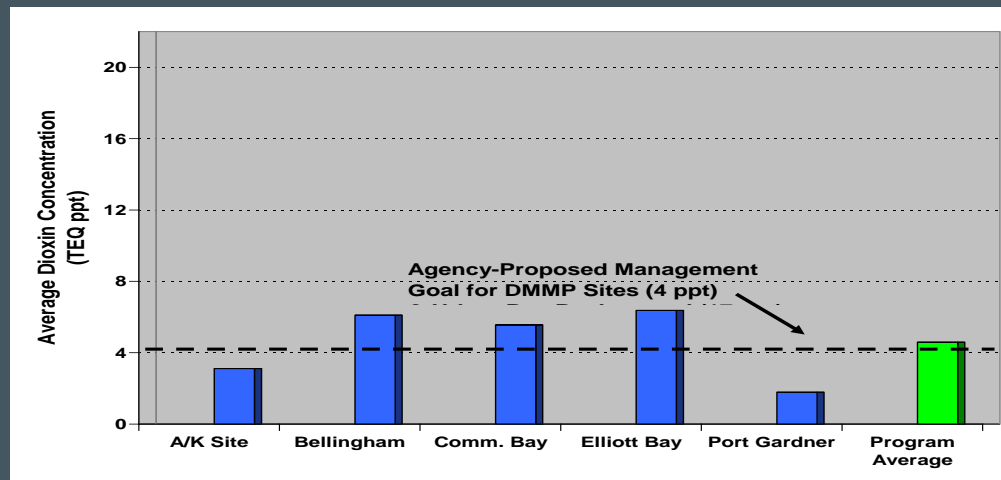
Dioxin Inventory Data from EPA, 2005. Pulp Mill and Crab Monitoring Data from Environment Canada



Crab Hepatopancreas Data From EPA, 1991; SAIC 2008 & Malcolm Pirnie, 2007

# No Evidence of Impact at Disposal Sites

- Millions of Cubic Yards Safely Managed (1989-2009)
  - Puget Sound Sites > 15 Million cyd
  - Grays Harbor / Willapa Bay > 24 Million cyd
- Monitoring – Sites Remain Similar to Surroundings



*From SAIC, 2008 and Seattle DMMO, 2009.*



# USACE / Port of Olympia 2006 Maintenance & Widening Project

- Channel Sediments
  - 458,734 cyd
  - Dioxin/Furans
- Review by DMMP
  - Risk Concerns
  - Disposal Site Background
- Project Decision
  - DMMU Avg <3.8 ng/kg
  - 238,234 cyd Failing



# Olympia Decision in Context

## Typical Sediments

EPA & National Academy of Sciences, 2006  
(1 to 20 ppt)

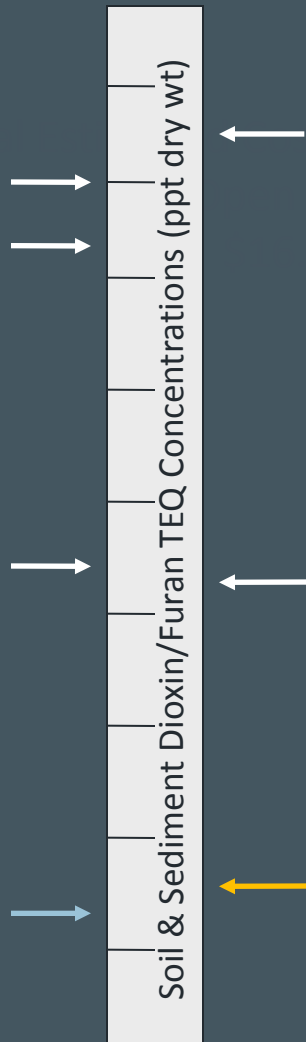
## Budd Inlet Average

**Surface Concentration**  
Department of Ecology  
(19 ppt)

## Natural Background In Puget Sound

**Deep-Water Sediments**  
Bold Data Set, 2008  
(up to 11.8 ppt)

**2006 Project Criteria**  
**(3.8 ppt average)**



## Typical Urban Soils

Ecology Urban Seattle Soils Study, 2011  
(mean 19 ppt, 90%-tile 46 ppt)

EPA & National Academy of Sciences, 2006 (up to 21ppt)

## Washington Cleanup Level for Residential Soils

MTCA Method B  
(11 ppt)

**Current DMMP Suitability  
Guideline (4.0 ppt average)**

ppt = parts per trillion (ng/kg)

# Recent Updates to Dioxin/Furan Suitability Guidelines

1990-  
2006

- Testing Requirements / “Reason to Believe”
- Few Impacted Projects

2006

- Project-Specific Decision - Olympia
- Stated Application Only to Project

2007

- Interim Guidelines - Non-Dispersive Sites
- Disposal-Site Background Comparison

2009

- Draft Proposal - Uniform 4/10 Criteria
- Feedback from Stakeholders & Regulated Community

2010

- Updated Guidelines (4 avg. /10 max.)
- Bioaccumulation & Case-By-Case Decision Options

Future

- Proposed Additional Changes...



# Current Guidelines are Stringent and Expand Testing Requirements

- D/F Testing at Most Urban Sites
  - Expanded “Reason to Believe”
- Background-Based Site Management Goal
  - 4 ng/kg dry weight
  - Goal for All Disposal Sites
- Dispersive Site Guidelines
  - All DMMU < Goal (4 ng/kg)
- Non-Dispersive Site Guidelines
  - DMMU Average < 4 ng/kg
  - Max DMMU = 10 ng/kg

# Comments from the Public Ports on the 2010 Draft Guidelines

*"...the Proposal's approach to dioxin represents a quantum leap...data from recent maintenance dredging projects shows that about 70% of the DMMUs from these projects would fail the new dioxin criteria..."*

*"The economic impact of DMMU failures is magnified by the extremely large cost differential between open water disposal and all other options."*

Washington Public Ports Association

June 2010

# Dec 2010 Guidelines Were Issued with Three Additional Provisions

- Bioaccumulation Testing
  - Stringent Reference-Based Evaluation
  - No Projects Have Yet Utilized to Date
- DMMP Case-by-Case Determinations
  - Sequential Disposal , or...
  - Coordination of Separate Projects
  - Must Evaluate Other Bioaccumulatives
- Provision for Small Businesses



# Additional Changes are Anticipated by the DMMP

*“Note that these guidelines remain “interim” as dioxin policies will continue to be refined in concert with the development of guidelines for other bioaccumulatives, especially dioxin-like PCBs.”*

DMMP Guidelines, December 2010

# Case Studies Illustrate Response of Puget Sound Ports to Changing Guidelines

- Port of Olympia
  - Cleanup Dredging with Upland Disposal
  - Ongoing Evaluation of Federal Channel
- Port of Bellingham
  - Gate 3 Marina Project - Integrated Cleanup Action
    - Sediment Solidification & Reuse for Landfill Capping
  - Whatcom Waterway Project
    - Amended to Include Confined Aquatic Disposal
- Port of Tacoma
  - Husky Terminal Project
    - Reuse as Upland Fill at Port Property

# Port of Olympia

- Project Purpose
  - Partial Remediation of Berth/Under-Pier Sediments
  - MTCA Interim Action
  - Pilot Study to inform cleanup
- Economic Impacts of Cleanup
  - Supports Continued Marine Terminal Uses





# Port of Olympia

- Project Elements
  - 10,000 cyd Dredging
  - Transload to Rail
  - Upland Disposal
  - Sand Cover Placement
  - Extensive Monitoring
  - Completed Feb 2009
- Construction Costs
  - Total \$1.9 Million
  - \$115/cyd (T&D)



# Port of Olympia

- Project Complexities
  - Time & Costs to Complete MTCA Process
  - Additional Project Approvals
  - Additional Rail & Landfill Coordination
  - Requirements for Sand Cover Placement & Monitoring After Dredging
    - Remaining Sediments Not Fully Removed
  - Dependence on Local Toxics Account Grant Funding

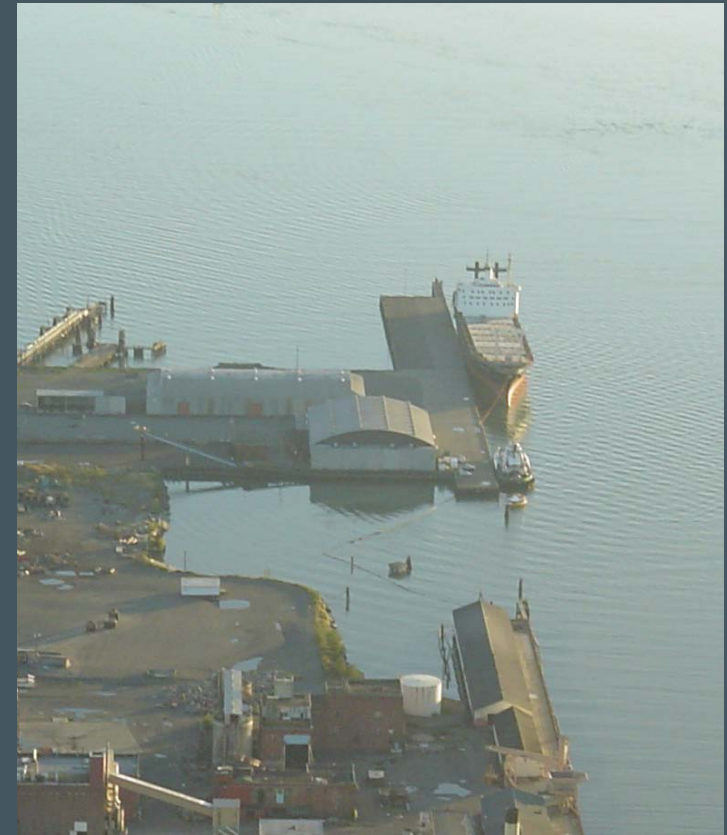
# Port of Olympia

- Ongoing Evaluation in Channel Areas
  - Corps Evaluations Under WRDA
  - Environmental RIFS Studies Under MTCA
- Approximately 250,000 cyd Impacted Sediment in Channel
  - Sediment exceeds current DMMP dioxin/furan criteria for open-water disposal
- Schedule and Funding for Additional Actions Uncertain



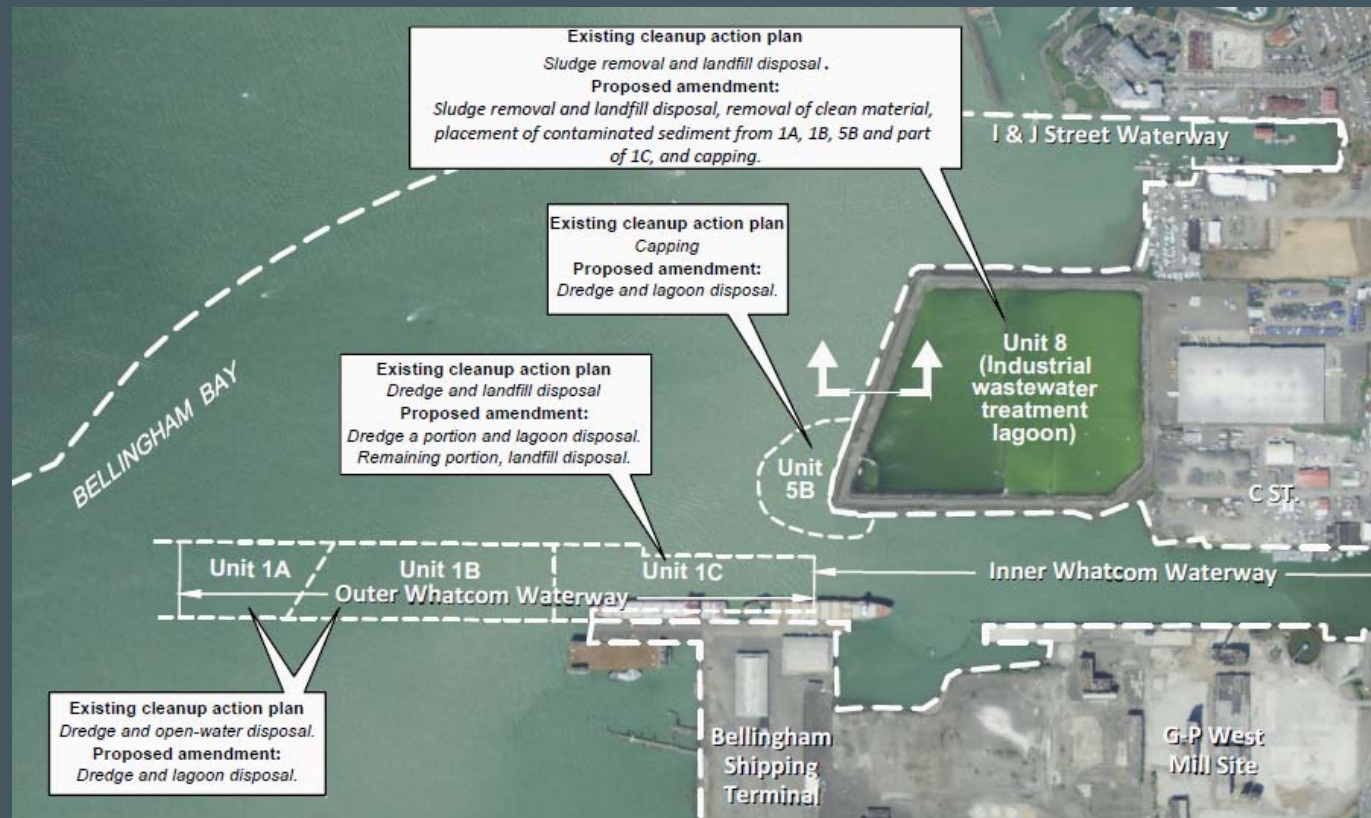
# Port of Bellingham - Whatcom Waterway

- Project Purpose
  - Manage Sediments from Outer Waterway Channel
  - Previously Suitable for DMMP
  - Not Suitable Due to Dioxin/Furans
- Economic Impact
  - Supports Continued Use of Bellingham Shipping Terminal



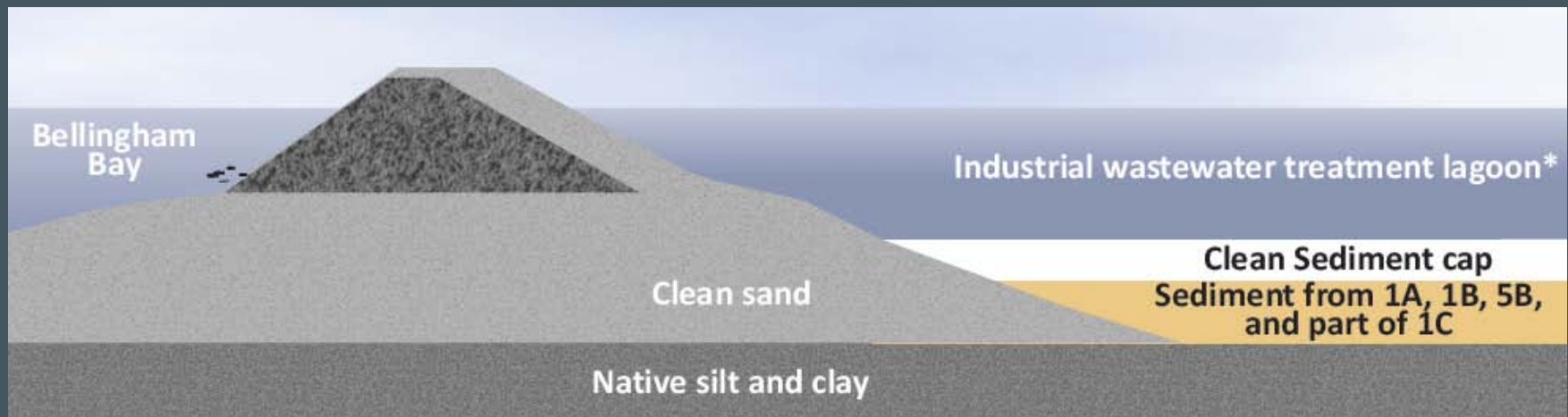
# Port of Bellingham - Whatcom Waterway

- Updates to Cleanup Plan (CD Amendment)



# Port of Bellingham - Whatcom Waterway

- Project Elements
  - Excavate Confined Aquatic Facility in Former Lagoon
    - Reuse Clean Sand Generated by Excavation
  - Place & Cap Dredged Sediments
  - Redevelopment of Facility for Recreational Marina





# Port of Bellingham - Whatcom Waterway

- Construction Costs
  - Complex Multi-Component Project
  - Est. "Core" Costs for Confined Aquatic Disposal
    - 2010 Estimated Costs at \$30/cyd
    - Additional Project Costs Associated with CAD Construction
- Project Schedule
  - 2 Years Required to Modify Consent Decree
  - Construction as Two Projects
    - CAD Disposal is Part of Second Project
    - First Project Begins 2012



# Port of Bellingham - Whatcom Waterway

- Project Complexities
  - Time & Costs to Amend MTCA Consent Decree
  - Complex Integrated Project
    - Full Integration with Multi-Phase Cleanup Action
    - CAD Site Excavation & Material Reuse
    - Handling Contaminated Sediments Over Disposal Site Berm
    - Future Marina Reuse of Disposal Site
  - Availability of Port-Owned Land
  - Dependence on Local Toxics Account Grant Funding

# Port of Bellingham - Gate 3 Project

- Project Purpose
  - Maintain Existing Marina
  - Support Replacement of Failing Float System
- Economic Impact
  - Marina Viability
  - Construction Jobs
  - Recreational Users
  - Commercial Users



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# Port of Bellingham - Gate 3 Project

- Project Elements
  - Dredging 30,000 cyd
  - Offload at Port Site
  - Solidification with Portland Cement
  - Transport to Landfill Cleanup Site
  - Stockpiling for Future Use as Landfill Cap Material





# Port of Bellingham - Gate 3 Project

- Construction Costs
  - Bid Late Summer 2011
  - Total Project \$7 million
    - Transport, Offload, Solidify & Place = \$3 million
    - \$100/cyd
- Project Schedule
  - Work In Progress
  - Completion February 2012



# Port of Bellingham - Gate 3 Project

- Project Complexities
  - Time & Costs to Complete MTCA Process
    - Coordination with Other Project Timeline
  - Additional Project Approvals
  - Contract Solidification Requirements
  - Staging Area & Water Management
  - Dependence on Local Toxics Account Grant Funding
  - Future Project Phases

# Port of Tacoma – Husky Terminals Project

- Project Purpose
  - Maintain Depths at T3/T4 of Blair Waterway
  - Remove Shoaling for Safe Operations
- Economic Impact
  - Continued Use by Husky Terminals
  - Pacific-Rim Container Trade



# Port of Tacoma – Husky Terminals Project

- Project Elements
  - Very Low D/F Concentrations
    - Previous Blair Cleanup
  - Portion of Sediments Approved for DMMP
  - Upland Reuse of 16,000 cyd as Fill for Port Site
    - Offload & Dewatering
    - Truck Transport & Placement for Reuse at Port Property





# Port of Tacoma – Husky Terminals Project

- Construction Costs
  - Bidding Fall 2011
  - Final Costs Pending
- Project Complexities
  - Additional Project Approvals
  - Sediment Dewatering & Staging Requirements
  - Availability of Port Reuse Option for Sediments



# Summary – Recent Port Material Management Options and Costs

Project	Option	Approximate T&D Cost (\$/cyd)
Typical Open-Water Disposal Project	Transport and Disposal at DMMP Site	\$10
Port of Olympia Berth/Under-Pier Cleanup	Transload, Handling, and Upland Disposal	\$115
Port of Bellingham Gate 3 Project	Transload, Solidification, and Upland Beneficial Reuse	\$100
Port of Bellingham Whatcom Waterway	Confined Aquatic Disposal	\$30
Port of Tacoma Husky Terminal	Transload, Handling, and Upland Reuse as Fill	Pending

# Potential Impacts to Dredging Projects

- Project Deferrals or Cancellations
  - Re-scoping of Surviving Projects
  - Requirements for Additional Funding
- Longer Design, Permitting and Bidding Timeline
  - Additional Reviews, Project Requirements
- More Complex Construction
  - Additional Project Elements & Higher Costs
  - Increased Complexity & Risk
  - Production Rates Linked to Disposal Option
- More “Contaminated” Sites
  - Increased Monitoring Efforts

# Implications for The Future

- Reduced DMMP Site Use
- Increased Reliance on Alternative Disposal
  - Uncertainty of Landfill Pricing & Capacity
- Predicted Increase in Landfill Pricing

