

Port of Seattle Terminal 91 Underwater Regrading

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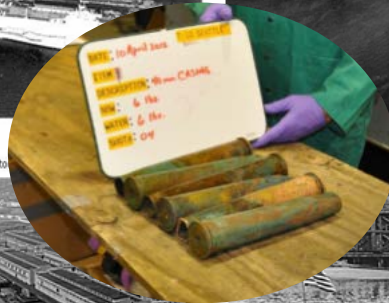
Terminal 91



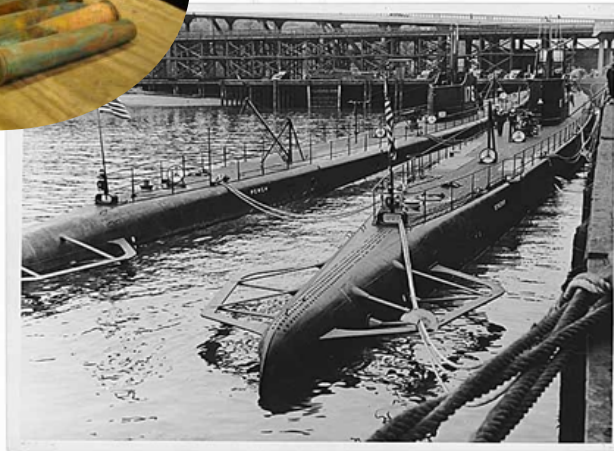
T-91 Historical Uses



Property of MSCUA, University of Washington



Property of Museum of History & Industry, Seattle



Property of Puget Sound Maritime Historical Society

T-91 Current Uses



T-91 Underwater Regrading

- May 2013: Shoal discovered
- 300 CY of high spot dredging
- Can you dredge it this winter?
- July 2013: Dredging permit application submitted
- Fall 2013: Meetings with the agencies. Critical issues:
 - DMM screening and cost impact
 - Regrading discussed as alternative

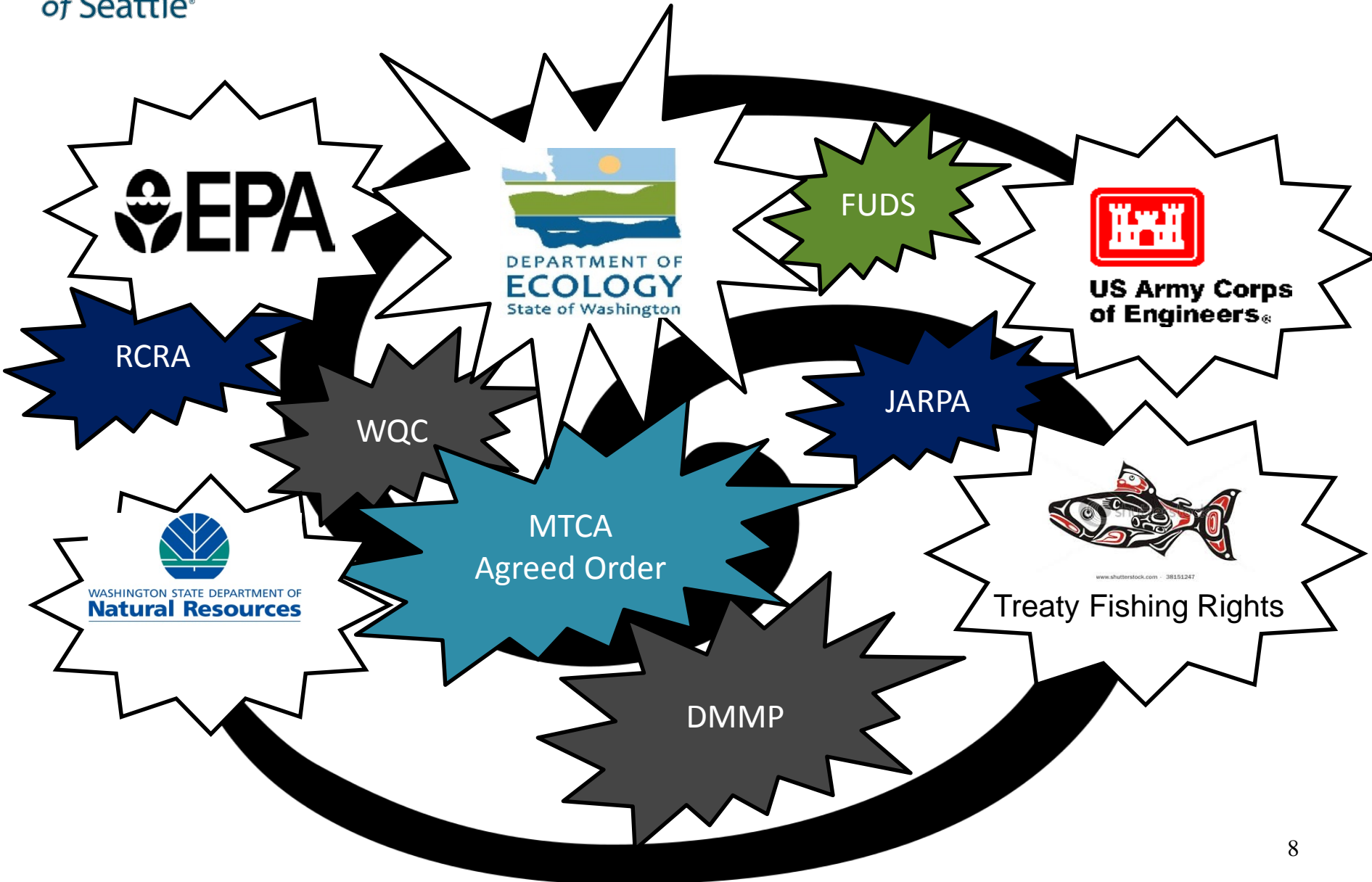
T-91 Underwater Regrading Year Two of Design & Permitting

- Sept 2014: Regrading permit application submitted
- Fall 2014: WA Ecology takes the lead under MTCA Agreed Order
- Can you dredge it this winter??
- Critical issues:
 - Munitions
 - PCB and other COCs
 - Anti-degradation
 - Prop wash
- 2014-2015: Studies, meetings, studies... Lots of them

T-91 Underwater Regrading Year Three

- Can you dredge it this winter???
- Fall 2015: On-call contract executed
- Jan 2016: AO Amendment signed
- February 2016: Secured consent from the tribes
- February 2016: All permits received!
- February 2016: Construction completed
- Since March 2016: Follow up studies continue

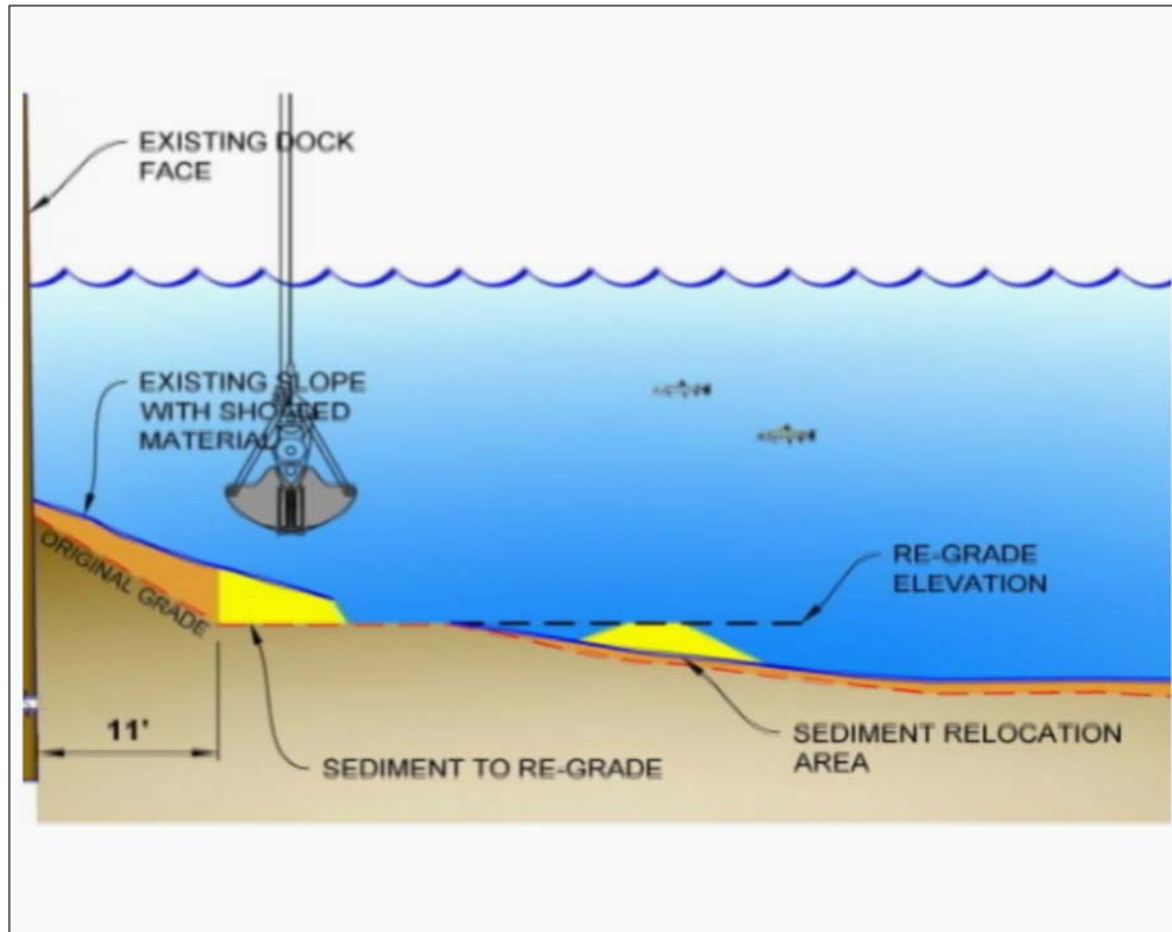
Regulatory Minefield



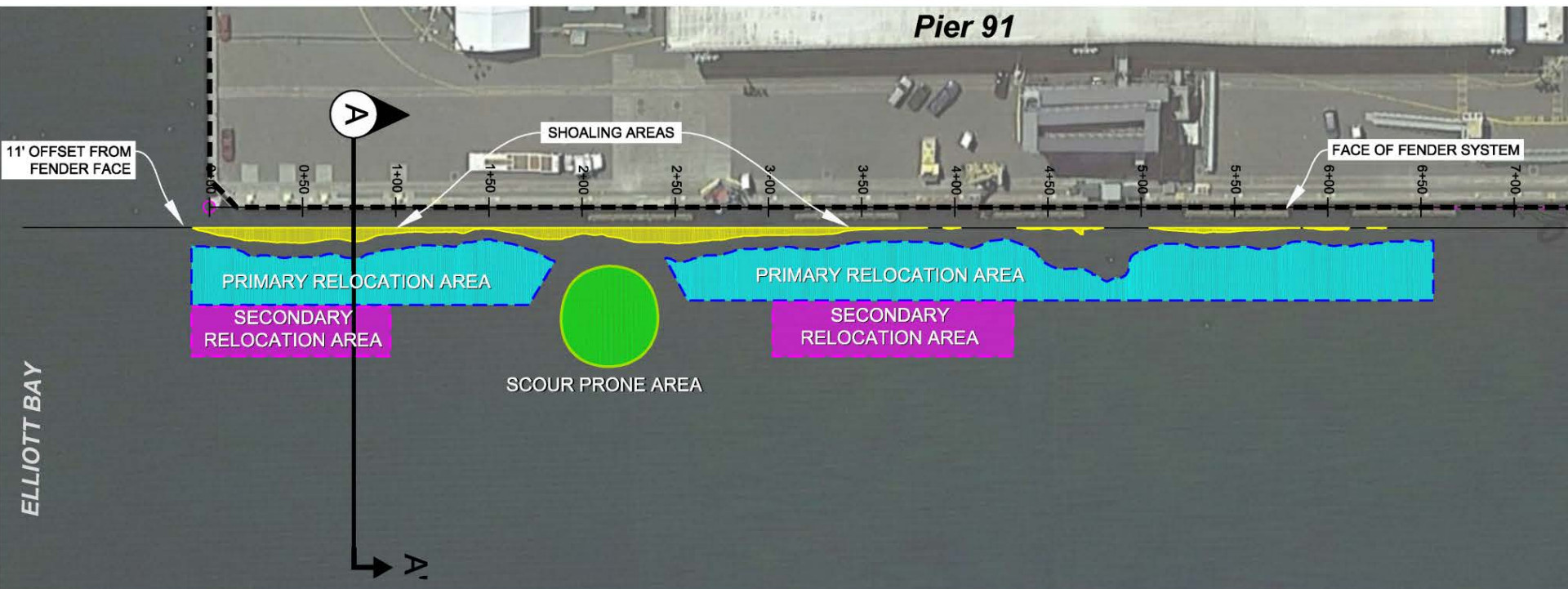
Underwater Regrading Background

- Bed-leveling, beam-dragging, underwater grading, high spot knockdown, underwater regrading... It's not a new concept
- Lessons learned in the past
- Port of Portland Underwater Grading
- Port of Long Beach Knockdown Dredging
- Port of Seattle tried to include it in the maintenance dredging permit for East Waterway
- Lower cost and less impact

T-91 Underwater Regrading Design Concept



T-91 Underwater Regrading Design



T91 Underwater Regrading Construction



T-91 Underwater Regrading WQ Monitoring Results



Monitored by
Water sampling
Sonar imaging

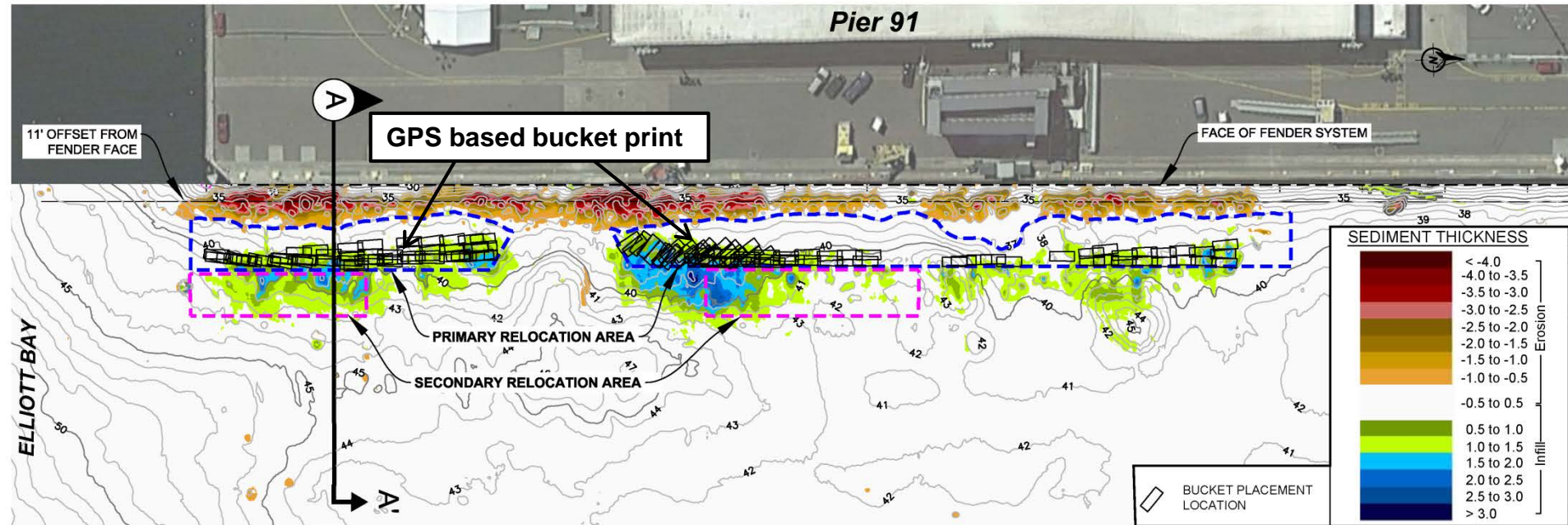


Regulatory Compliance
<5 NTU (Nephelometric Turbidity Unit)
above background
150' from regrading location

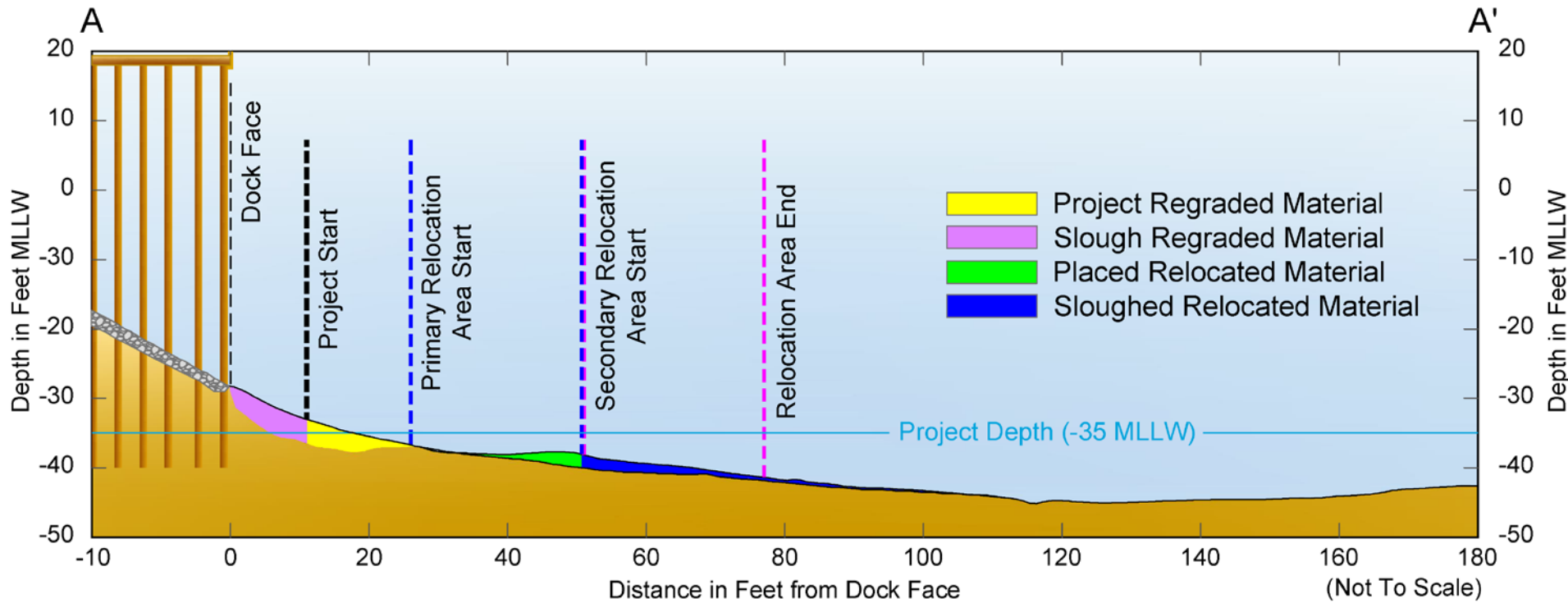


Results (average):
0.8 NTU at 150' compliance zone
0.8 NTU at 100' warning zone
1.3 NTU at 50' info-only zone

Pre-/Post-Regrade Isopach



Pre-/Post-Regrade Cross Section



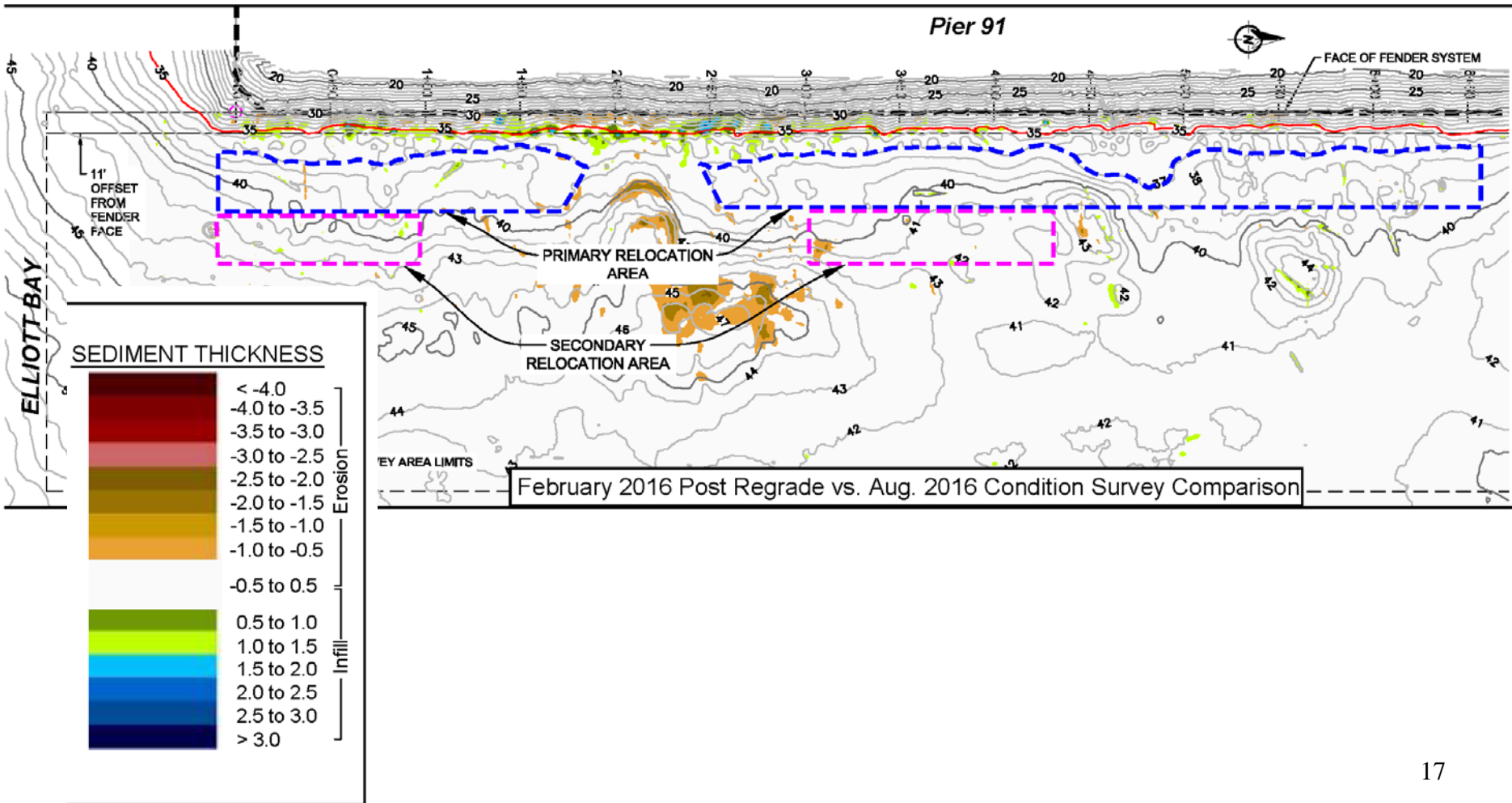
TYPICAL CROSS SECTION A-A'

Post-regrade Sampling

- Post-regrade sediment surface sampled
- Special H&S Plan and Munitions Management Plan
- Munitions expert onsite
- Sampler picked up an empty casing
- Additional studies will continue
 - Agreed Order
 - FUDS



Six-month Follow-up Survey



Project Costs

Type	Cost	% of Total
Design and Environmental Services (consultant services)	\$648K	57%
Port Management (PM & ENV MGMT)	\$413K	37%
Construction	\$50K	4%
Construction MGMT and Contract Administration	\$17K	2%
Total	\$1,128K	100%

An aerial photograph of a city and harbor, likely Seattle, showing a dense urban area, a large body of water, and industrial facilities. The word "Questions?" is overlaid in white text on the water. The image shows a mix of residential areas, commercial buildings, and industrial zones, with a prominent highway interchange in the foreground.

Questions?