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WEDA
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Alternative Approaches for Managing Dredged Sediment

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AGENDA

Introduction

Minimizing Sediment Quantities

Sediment Reuse

On-site Consolidation

Concluding Thoughts

Quantity and Quality of Dredged Sediment

Waterways are dredged for navigational channel maintenance, flood control and environmental restoration.

Over 200 million m^3 sediment dredged annually to deepen harbors and shipping lanes.

Up to 9 million m^3 sediments are contaminated and need special, often costly, handling.

Up to 300 Superfund sites have contaminated sediment to some degree.

Minimization of Dredged Quantities – Avoiding Removal Altogether

Agency required the presumptive remedy of sediment removal.

Site-specific data and conditions used to support no action:

1. Solubility
   - Reduced dissolution at lower local average temperatures
   - Lower solubility of hydrophobic compounds
2. Partitioning
   - Aging effects reduce rate of desorption
   - High partition coefficients for PAHs overall
3. Ongoing atmospheric contributions
4. Contribution of PAHs from parking lot sealant

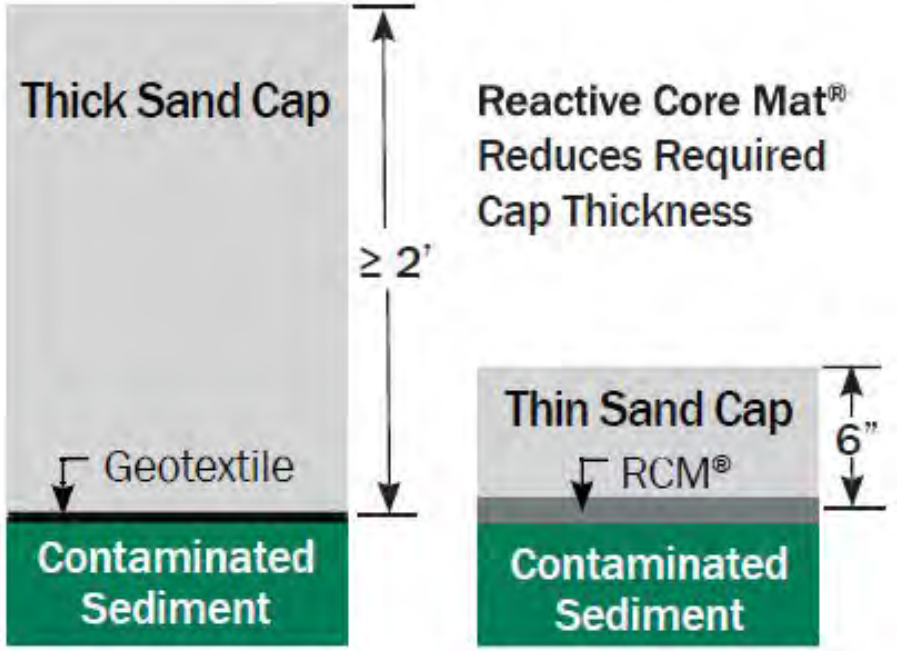
Use of Alternative Technologies

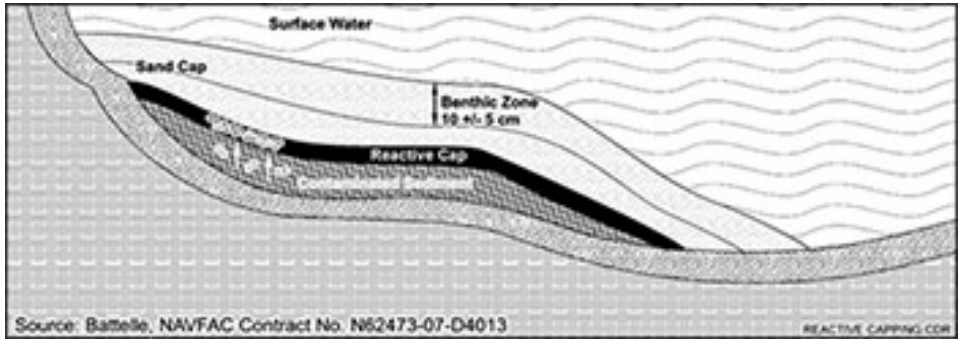
Combination remedies

- Addresses various zones of a site
- Substitutes alternative technologies for dredging
- Same protectiveness but less costly than dredging

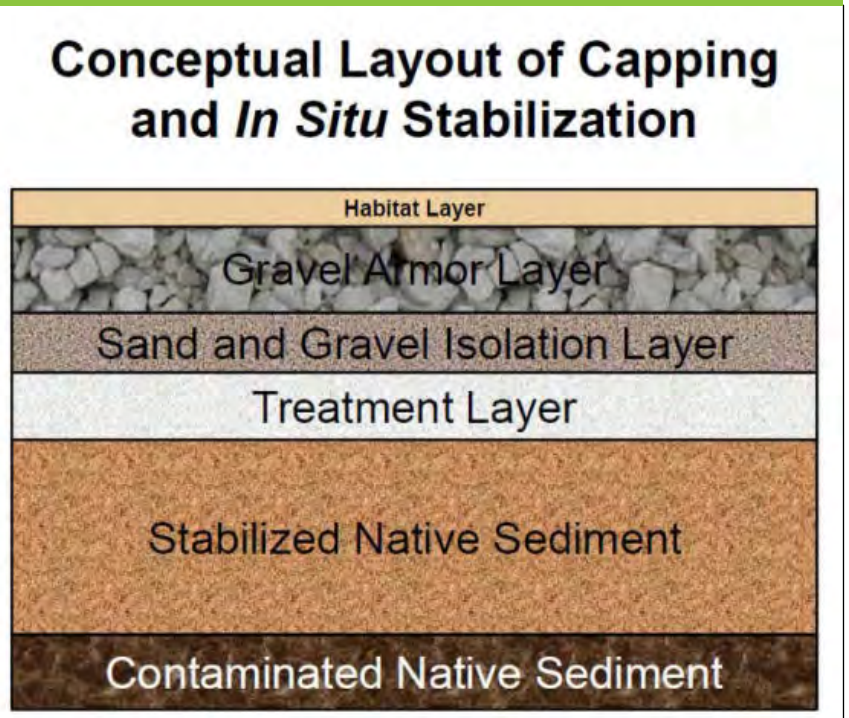
Includes use of in situ and passive technologies

- Monitored natural recovery (MNR)
- Enhanced MNR
- Capping
- Amended capping
- Activated carbon treatment
- In situ stabilization/ treatment





Example of a Combination Remedy



Gowanus Canal, NY

- 2013 ROD ($500 million +)
- CSO source control
- 460,000 m^3 of dredging
- Off-site treatment and disposal
- Multi-layer armored cap
- In situ solidification (ISS) of NAPL in native sediment

Reuse of Dredged Sediment –
Soil Enhancement and Land Reclamation

Land improvement – dikes/ berms for habitat creation; shore protection; filling, raising low-lying areas; improving low-quality land (e.g. mines and brownfields).

Recent Activities in the Great lakes Region - Ohio

Toledo-Lucas County Port Authority (TLCPA), Ohio - Great Lakes Dredged Material Center for Innovation.

30,000 m^3 sediment dredged in 2016 – looking at BMPs for use on farm fields.

Cuyahoga Valley Industrial Center (CVIC) reused 230,000 m^3 dredged sediment - CDF in Cleveland, Ohio.

Used at a 23-ha Brownfield site to create an elevated, buildable site.

Beneficial Reuse of Dredged Material – Industrial waste

Ponded Tar, with heat content between 20,000 to 30,000 BTU/kg

Highly acidic, contains 5% to 20% moisture, 2% to 6% sulfur, and high concentrations of VOCs

More than 16,000 m^3 removed and recycled

Used for fuel at an off-site kiln

Low Contamination Dredged Sediment – Re-Use as Fill

Drinking Water Canal, Northeast USA

- Low contamination sediment led to low water depths
- Assessed sediment quality and designed dredging program
- Identified local opportunity for **beneficial reuse** as fill
- Adjusted Schedule, as necessary
- Estimated cost savings of $2M+ (168 K m^3)

Breton Island Restoration

- 180 Ha
- 4 M m^3 sediment
- Habitat creation
- Beaches
- Dunes
- Marshes

On-Site Consolidation of Dredged Sediment In Lieu of Backfill – Former Manufactured Gas Plant Site

Record of Decision (ROD)

- Removal and off-site management of contaminated soils followed by backfilling.
- Dredging 61,000 m^3 sediment from harbor and contain in off-site cell.

Alternate Approach

- Remove larger volume of soils **on-site** to accommodate dredged sediment volume.

Estimated Cost Savings of $4 M

- Sediment transportation, off-site disposal and backfill costs.

On-Site Consolidation of Contaminated Dredged Sediment – Tarpon Springs, FL

- USEPA Superfund Site
- Low lying areas and adjacent to the Anclote River
- *In-situ* stabilization also utilized for soil
- Dredged 48,000 m^3 of contaminated sediment from River
- Relocation of 170,000 m^3 of materials on site
- Consolidated in the low areas
- Capped

On-site Consolidation of Dredged Sediment – Uncontaminated Water Storage Reservoir

20-acre raw water reservoir in Philadelphia

Accumulation rate of 5,000 m^3 per year in suspended solids in pumped river water

168,000 m^3 of in situ sediment; nearly 2.4-m thick

On Site Disposal of 160,000 m^3 dewatered sediment

Sediment mounded as a visible feature

On-site Consolidation of Dredged Sediment, Combination Remedy –

Shipping Terminal Site, NJ

Canal 23 m in width and 425 m in length.

North Cell		
Sheet pile cutoff wall	**In situ solidification (ISS)**	Multi-layer containment cap

South Cell		
Mechanical **dredging**	Disposal in northern cell	Carbon amended sand **cap**

Onondaga Lake, NY -

Sediment Consolidation Area
1.5 M m^3 dredged sediment

Concluding Remarks

- More viable alternatives for disposing of dredged sediment is needed
- There are many alternatives currently being explored
- Driven by larger projects but applicable to smaller ones
- Smaller sites allows for greater flexibility and creativity
- Innovation at smaller sites may be translatable to other small and/or larger sites.

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Thank you!

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