Dredged Material Capping

Presented at the World Dredging Congress
WODCON XXI

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Instructors

Dr. Michael R. Palermo - Mike Palermo Consulting, Inc.

Dr. Danny Reible – Texas Tech University

Summary of Course Content

Subaqueous capping is an option for management of contaminated dredged material from navigation projects as well as for remediation of contaminated sediments in-situ. This short course describes methods for design, construction, and monitoring of capping projects. Topics include key issues and principles for dredged material capping versus remediation capping, design of caps for physical and chemical isolation, stability against erosion, use of active capping materials, equipment and methods for cap placement, cap construction tolerances, and cap monitoring equipment and approaches. Course content is partially based on the USACE technical guidance for dredged material capping and USEPA technical guidance for in-situ capping for remediation. New information on approaches and field experience on active caps and demonstration of the CAPSIM and other capping models will be included. The intended audience includes stakeholders (agency personnel, potentially responsible parties, design consultants, and contractors) involved in the evaluation and design of capping projects.

Instructors

Dr. Michael R. Palermo - Mike Palermo Consulting, Inc.

Dr. Michael R. Palermo is a consulting engineer with over 40 years of experience in Dredged Material Management and Contaminated Sediment Remediation, serving both private sector and government clients. Prior to entering consulting practice in 2003, Dr. Palermo served for 36 years with the U.S. Army Corps of Engineers, and served as Director of the Center for Contaminated Sediments at the Waterways Experiment Station (WES). He has authored numerous publications in the area of dredging and dredged material disposal technology and remediation of contaminated sediments, including USACE and USEPA guidance documents for subaqueous capping, contaminated sediment remediation, and environmental dredging for sediment remediation. He was the lead author of the USACE *Guidance for Subaqueous Dredged Material Capping* and the USEPA *Guidance for In-Situ Subaqueous Capping of Contaminated Sediments*. He currently provides design services and technical review and oversight for clients, both in the U.S. and abroad, on a wide range of sediment remediation and navigation projects involving contaminated sediments to include major Superfund sites such as the Hudson River, Housatonic River, Fox River, Onondaga Lake, Portland Harbor and Gowanus Canal sites. Dr. Palermo is a Registered Professional Engineer, and a member of the Western Dredging Association and American Society of Civil Engineers (ASCE). He has served on the adjunct faculty at Texas A&M University and Mississippi State University, and is also Associate Editor for the WEDA Journal of Dredging Engineering.

Dr. Danny Reible – Texas Tech University

Dr. Reible is the Donovan Maddox Distinguished Engineering Chair in the Department of Civil, Environmental, and Construction Engineering and the Department of chemical engineering at

Texas Tech University. In 2013 he joined the Texas Tech University after 23 years in the Department of Chemical Engineering at Louisiana State University (LSU) and 10 years in The University of Texas at Austin. He holds a B.S. in Chemical Engineering from Lamar University, and an M.S. and Ph.D. in Chemical Engineering from California Institute of Technology. Dr. Reible's research career has been focused on understanding the fate and transport of contaminants in the environment, evaluating the risks posed by these contaminants, and devising effective measures for risk mitigation. He has been active in technical and policy issues associated with the assessment and in-situ remediation of contaminated sites. He has coauthored four National Research Council committee reports on risk assessment and remediation of contaminated sites, is the author of the textbooks "Fundamentals of Environmental Engineering" and "Diffusion Models of Environmental Transport", and has authored more than 100 refereed technical papers. Dr. Reible currently serves on the National Research Council Board of Environmental Studies and Toxicology. He is an Associate Editor of the Journal of the Air and Waste Management Association, the Journal of Environmental Forensics, and the Journal of Environmental Engineering. Dr. Reible is a Fellow of the American Institute of Chemical Engineers and the American Association for the Advancement of Science. He is a Board Certified Environmental Engineer, a Professional Engineer (LA) and in 2005 was elected to the National Academy of Engineering for the "development of widely used approaches for the management of contaminated sediments."

Agenda

8:00 AM	**Capping as a Sediment Management Approach** • Introduction of Instructors and Students • Goals of the Course • Dredged Material Capping vs. In-Situ Capping • Cap Components – The Layer Cake • Capping Project Design Requirements and Sequence • Dredged Material Open Water Capping • CAD Design Considerations	Mike Palermo	**Tab A**
8:45 AM	**Cap Design for Stability and Isolation** • Design Objectives • Capping Material Selection • Assessment of Stability Against Erosion • Armor Layer Design • Chemical Isolation Layer Design • Active Cap Component Design	Danny Reible	**Tab B**
10:00 AM	**BREAK**		
10:15 AM	**Capping Models** • Model Selection • Modeling Parameters • Demonstration of the CAPSIM Model	Danny Reible	**Tab C**
11:00 AM	**Cap Placement Operations** • Cap Placement Equipment and Approaches • Cap Construction Tolerances	Mike Palermo	**Tab D**
11:30 AM	**Cap Monitoring** • Monitoring Equipment • Cap Construction Monitoring • Cap Long-Term Effectiveness Monitoring	Danny Reible	**Tab E**
12:00 PM	**Adjourn**		