Water Injection Dredging
NCSPA Design-Build and Demonstration

Governor's Conference on the Future of Water in Kansas

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North Carolina State Ports Authority (NCSPA)

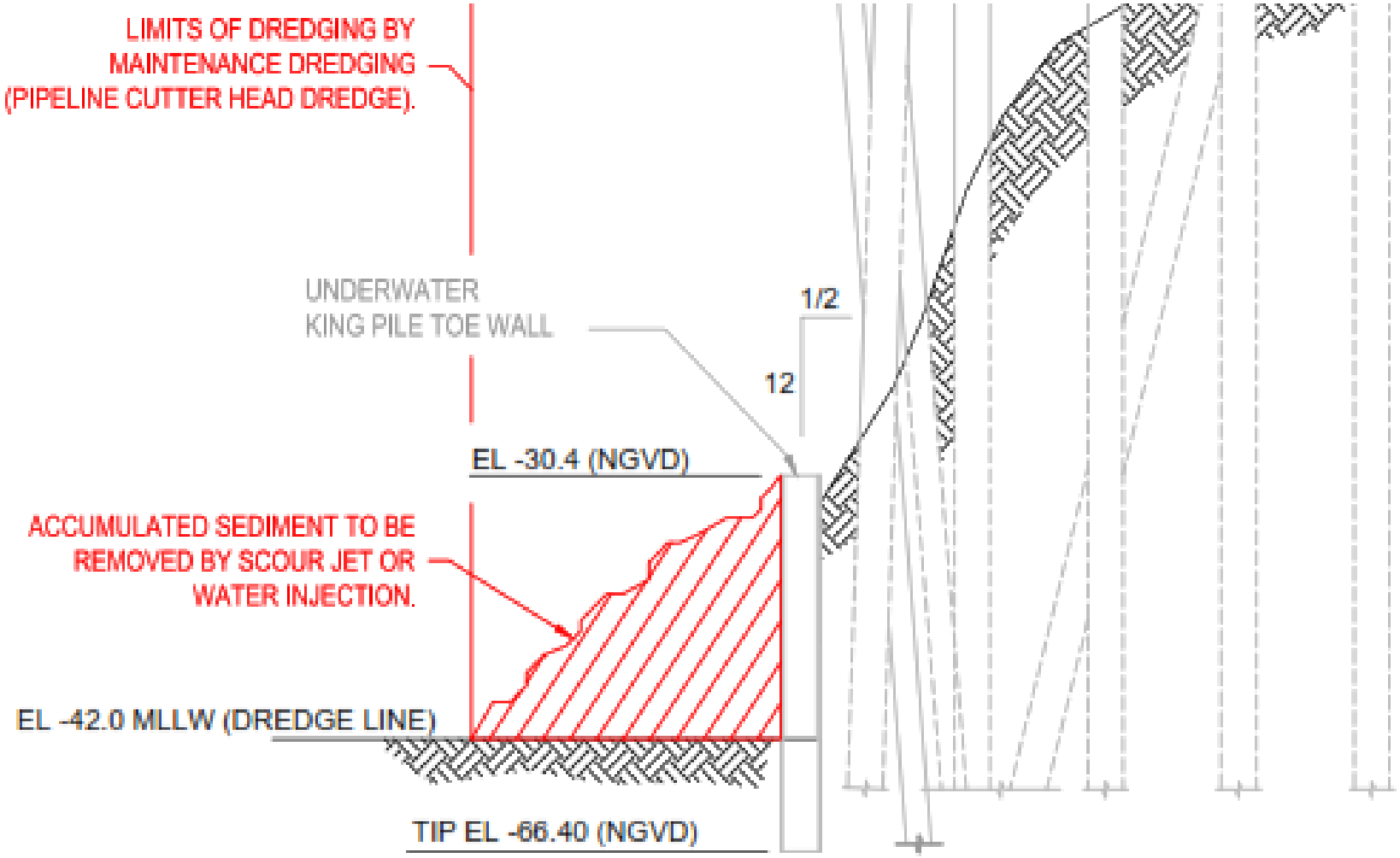
NCSPA Water Injection Dredge Design-Build and Demonstration

Port of Wilmington & Port of Morehead City

NORTH CAROLINA PORTS®

Port of Wilmington

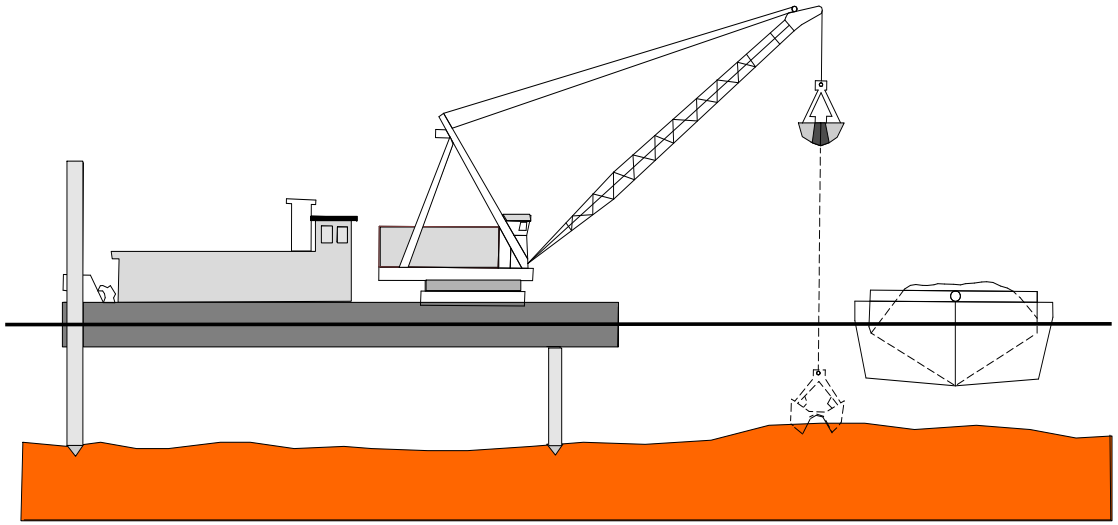
Dredging Template

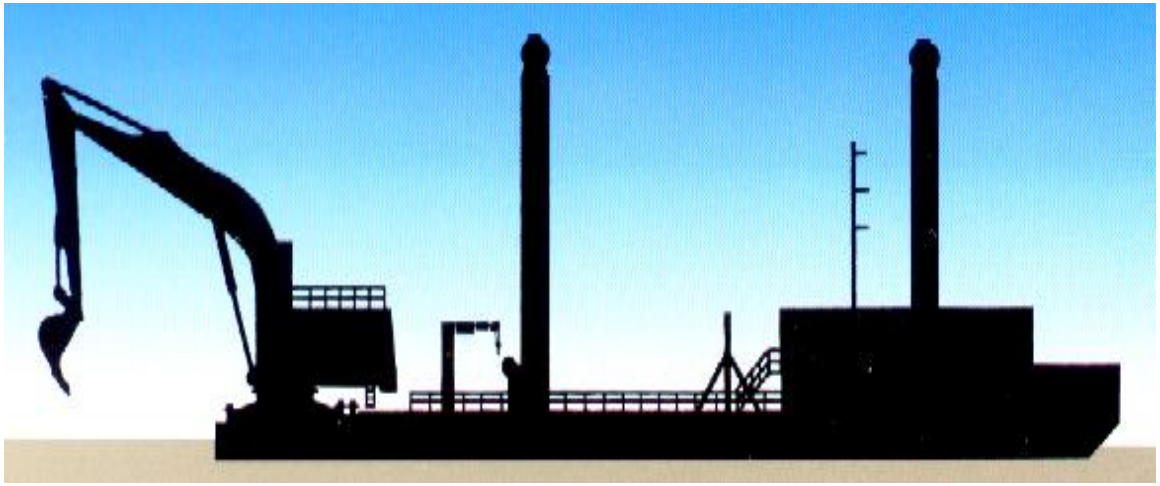


Sediment Management through Dredging (Mechanical & Hydraulic)

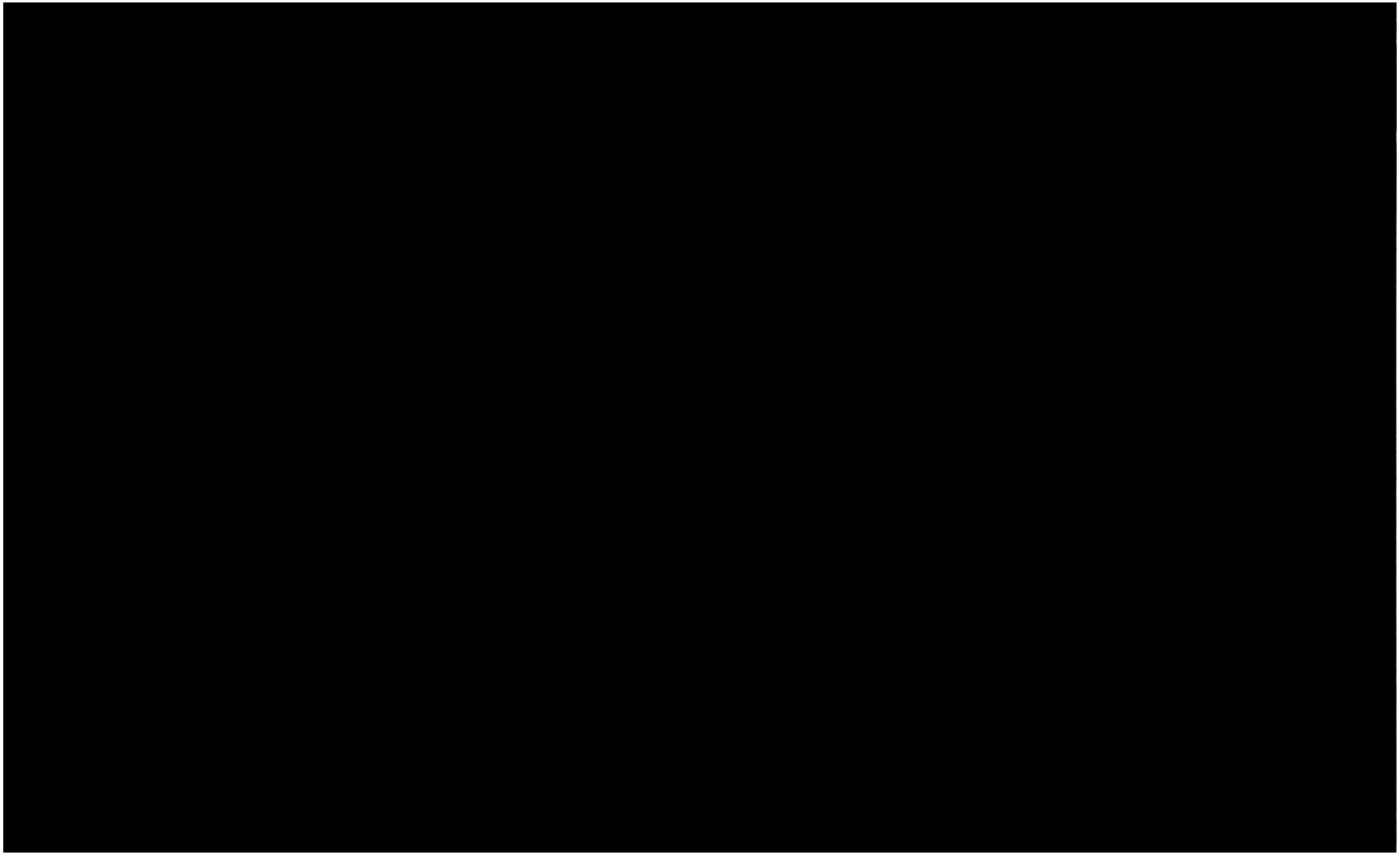
NCSPA Water Injection Dredge Design-Build and Demonstration

Mechanical Dredge Classifications

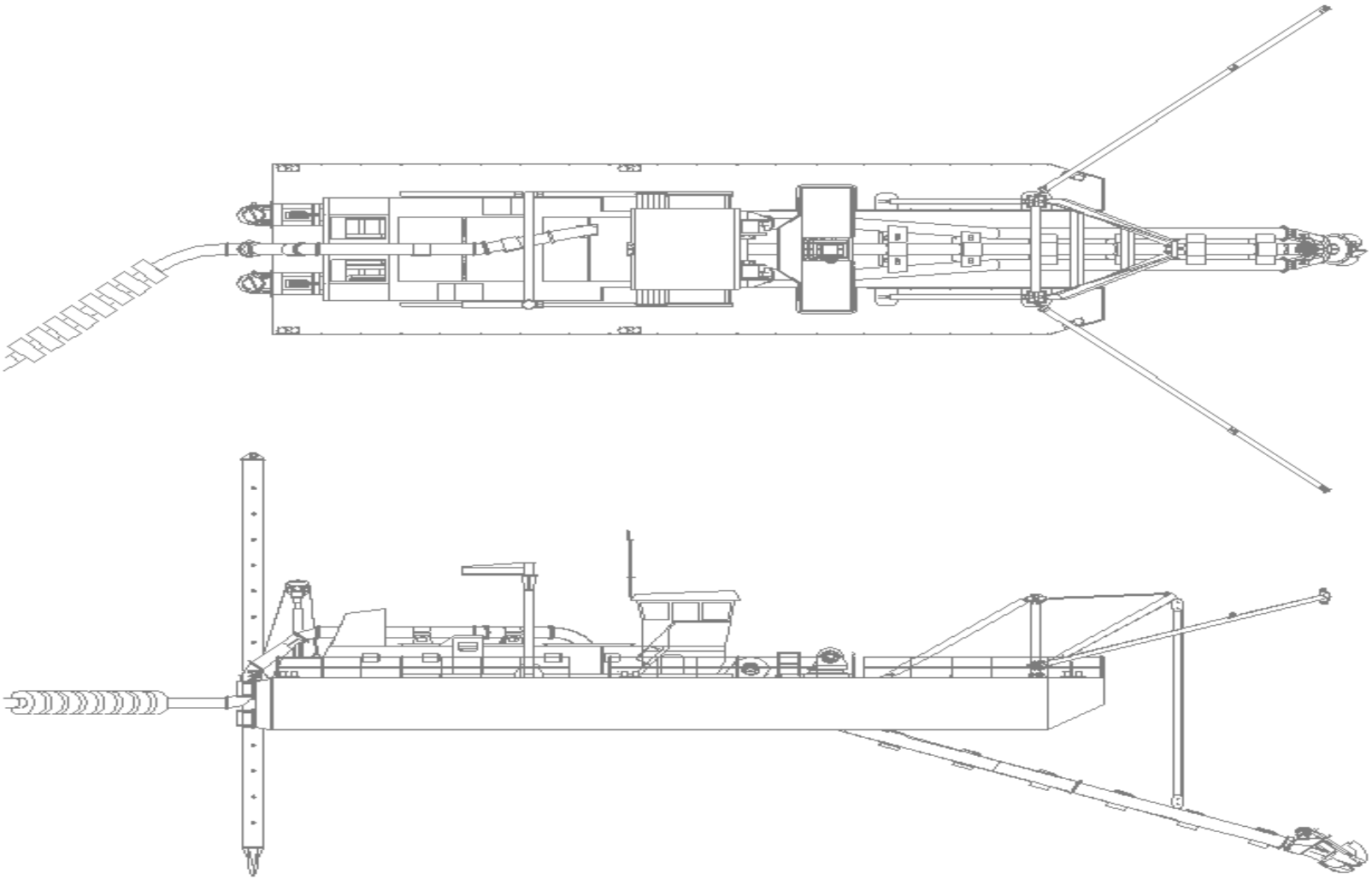




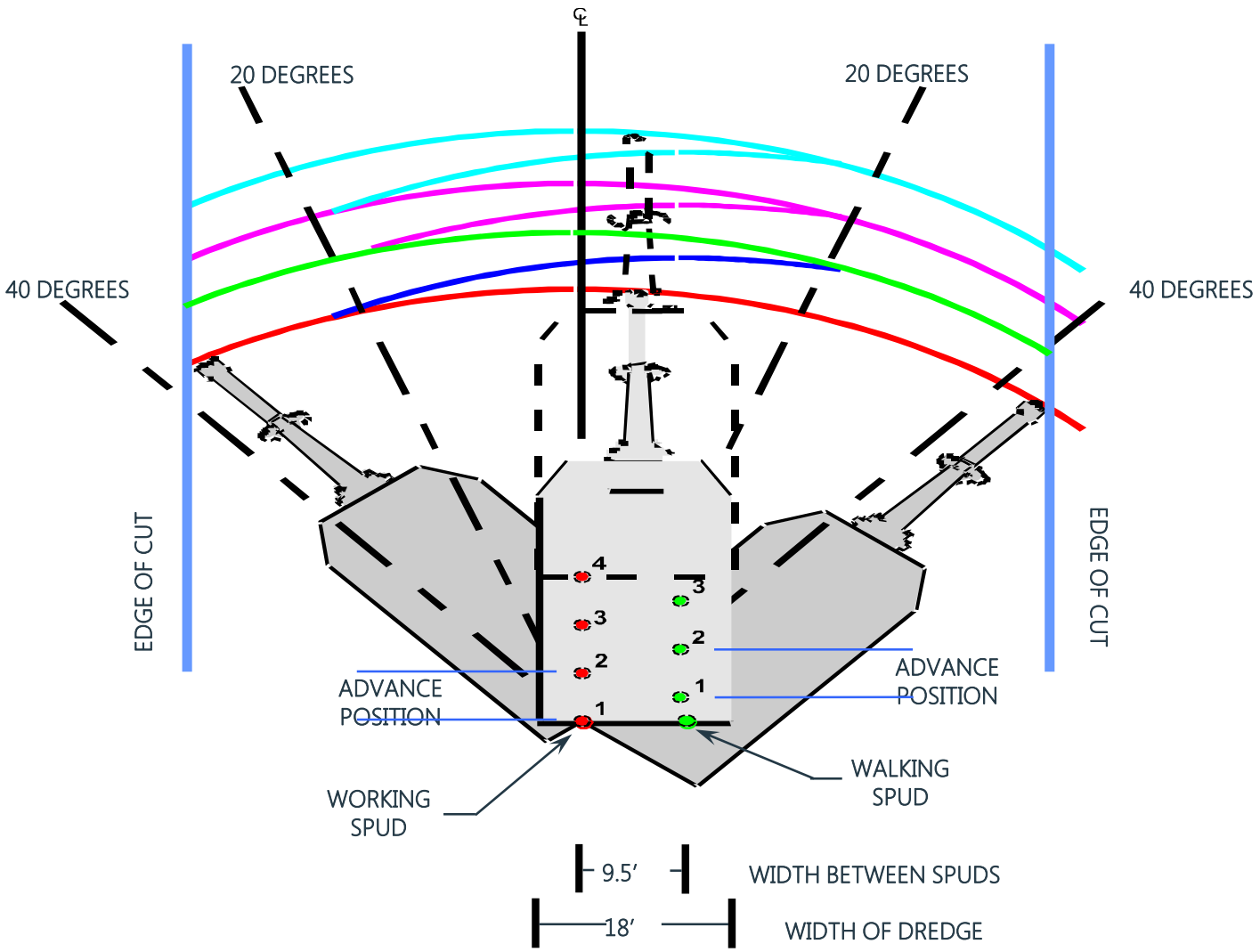
Clamshell Dredge Operation



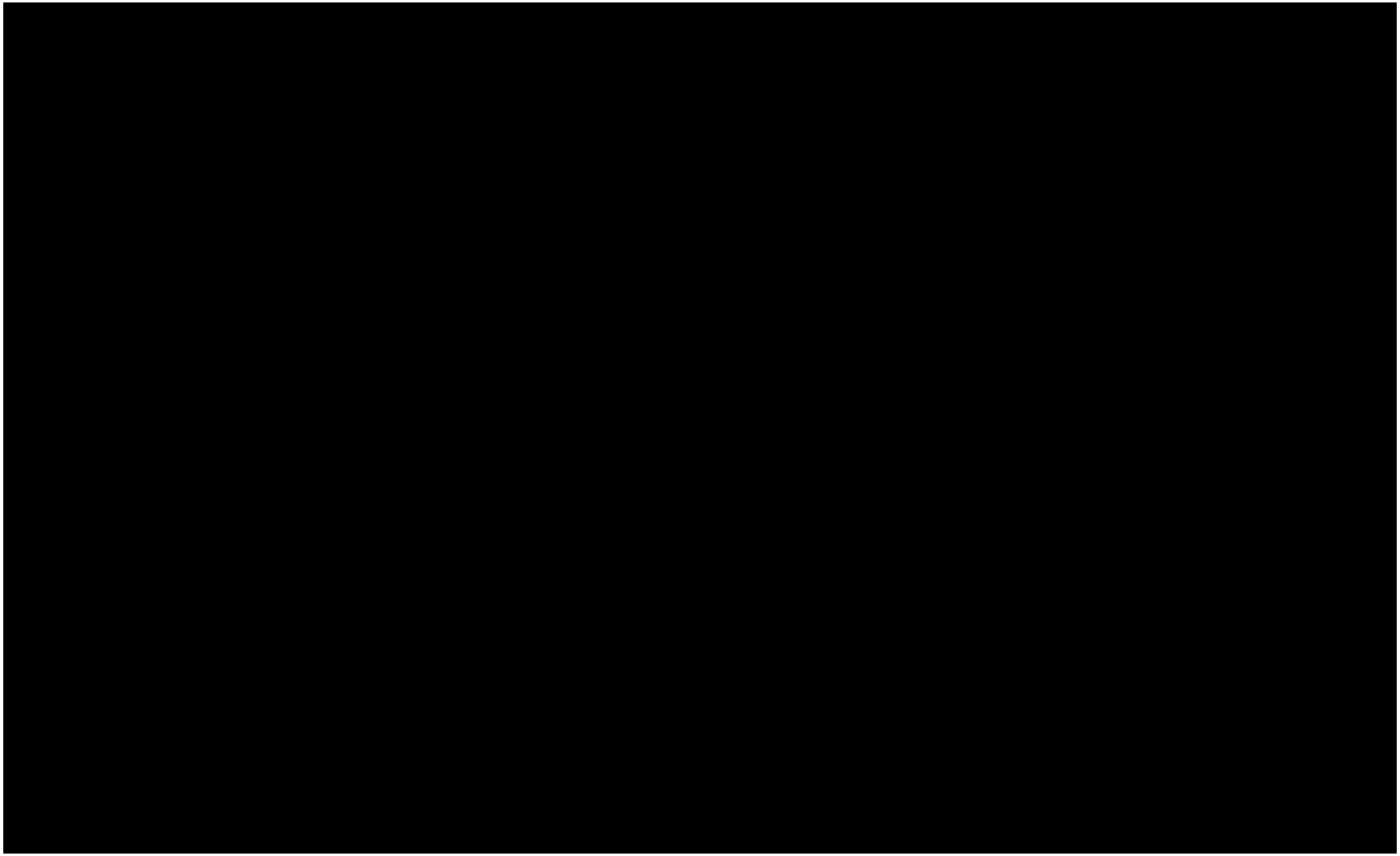
Hydraulic Pipeline



Hydraulic Pipeline Advancement



Hydraulic Pipeline Operation



Water Injection Dredging

NCSPA Water Injection Dredge Design-Build and Demonstration

Agitation Dredging Techniques

- **Two phases** are needed for agitation dredging:
  1) Equipment that resuspends the bottom sediments
  2) Flow that transports the resuspended sediment away from the site

- Various equipment can be used for this process, including
  - Prop-Wash
  - Hopper Dredge Agitation
  - Vertical mixers or Air Bubbles
  - Drag beams or Rakes
  - **Water Injection**

- The objective is to remove the material from a selected area by taking advantage of the **natural tides, currents, or other hydrodynamic forces**

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NCSPA WID Design-Build and Demonstration

NCSPA Water Injection Dredge Design-Build and Demonstration

Procurement Fact Sheet

Task	Date
NCSPA Water Injection Dredge Procurement Fact Sheet	
Issued to Potential Interested Parties	December 06, 2018
Responses from Potential Parties Due	December 21, 2018

- Contacted over 70 organizations (dredge manufactures and other possible sources of relevant information)
  - Dredging related electronic newsletters - e.g., *DredgeWire*, *Dredging Today*
  - Trade publications- e.g., *Marine News*, *Maritime Reporter and Engineering News*
  - Trade show membership and attendance- e.g., *Western Dredging Association*
  - Annual dredging related directories- e.g., *International Dredging Review*, *World Dredging Mining & Construction*
  - Hydraulic agitation dredge operators working in the Southeastern or Gulf region of the United States- e.g., *Biblia, Inc. (Savannah Marine)*

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The Jones Act

"Section 1 of the Act of May 24, 1906 (34 Stat. 204; 46 U.S.C. App. 292), provides that, "a foreign-built dredge shall not, under penalty of forfeiture, engage in dredging in the United States unless documented as a vessel of the United States."

Procurement Fact Sheet (Continue)

- Solicit feedback from dredge manufacturers and other regarding several crucial project factors.
- These key factors includes:
  - Preliminary schedule
  - Duration of time needed to fabricate and transport the dredge to the NCSPA
  - Other factors included those similar to those required of any NCSPA purchase of large, expensive equipment, such as cranes
    - Maintenance,
    - Warranties
    - Proof of concept demonstrations
    - Training requirement
    - Operation manuals
    - Etc.

Request for Pre-Qualifications

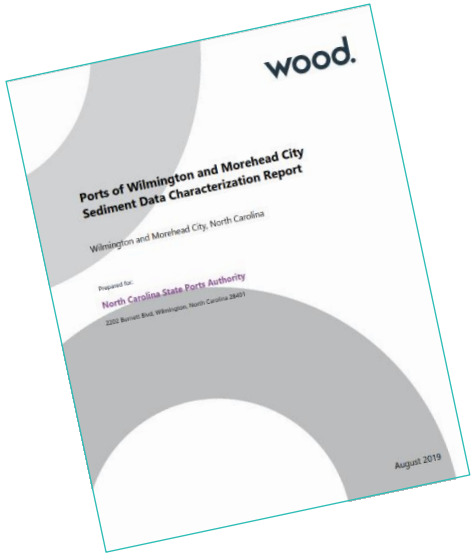
Task	Date
NCSPA Water Injection Dredge Prequalification Form	
Issued to Potential Interested Parties	December 21, 2018
Responses from Potential Parties Due	January 25, 2019
Notification of Qualification Letter sent to Selected Teams	**March 02, 2019**

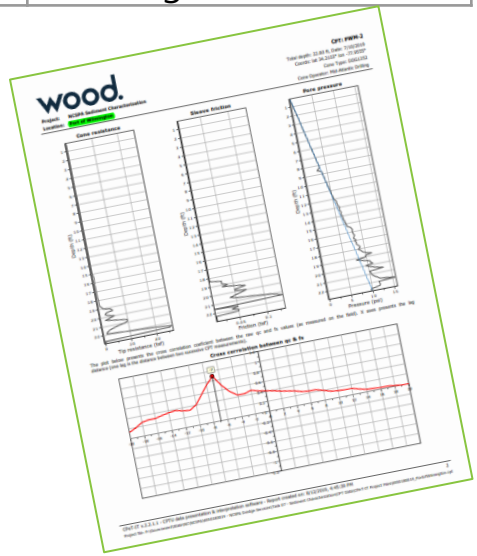
Project sequence includes the following work items:

- Commissioning of a fully equipped Water Injection Dredge (WID)
- Delivery of WID to the NCSPA Port of Wilmington dockside
  - Execution of a Port operator's training program
  - Demonstration of a full week at the Port of Wilmington
- Delivery of WID to the NCSPA Port of Morehead City
  - Demonstration of a full week at the Port of Morehead City
- Receipt of report summarizing the Contractor's executed proof of concept, including pre- and post- dredge hydrographic survey data
- Modification of the WID plan, as necessary, and handover to NCSPA

Request for Information & Geotechnical Data Collection

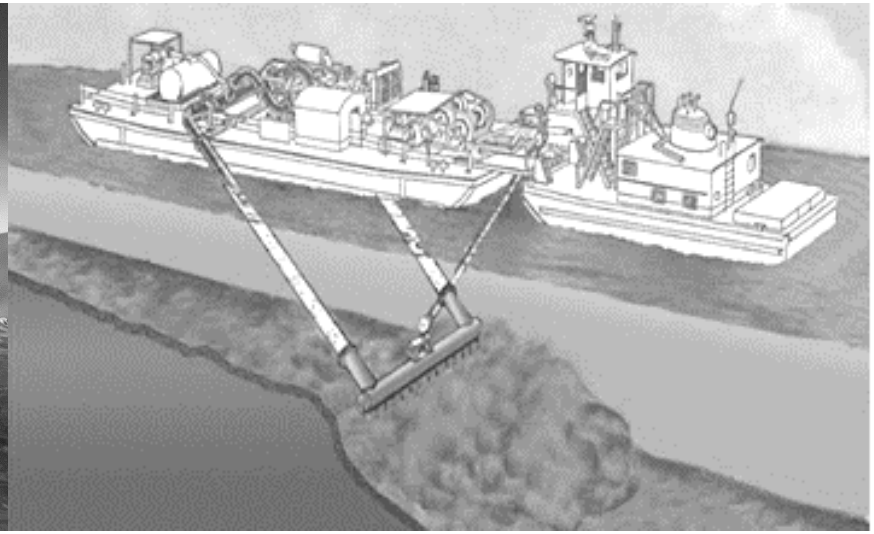
Task	Date
NCSPA Water Injection Dredge RFI for Geotechnical Data Collection	
Issued to Potential Interested Parties	March 08, 2019
Responses from Potential Parties Due	March 22, 2019
Updated Proposed Schedule sent to Selected Teams	**June 28, 2019**
Task	**Date**
Geotechnical Data Collection (CPT & Sediment Grab Samples)	
Mobilization to Port of Wilmington	July 08, 2019
Mobilization to Port of Morehead City	July 18, 2019
Final Reports for both Ports	August 15, 2019





Request for Proposals & Selection and Delivery

Task	Date
Design-Build Request for Proposals (RFP)	
Issue Design-Build Request for Proposals (RFP) to all teams	August 16, 2019
Technical Proposals and Sealed Price Proposals Due	September 26, 2019
Technical Presentations by Teams (alphabetical order)	October 01 -02, 2019
Task	**Date**
Selection and Delivery	
Recommend Selection - NCSPA Board of Directors Meeting	October 24, 2019
Final Selection - NCSPA Board of Directors Meeting	December 19, 2019
Contract Execution	January 02, 2019
Substantial Completion (dredge delivery, training materials, etc.)	December 11, 2020



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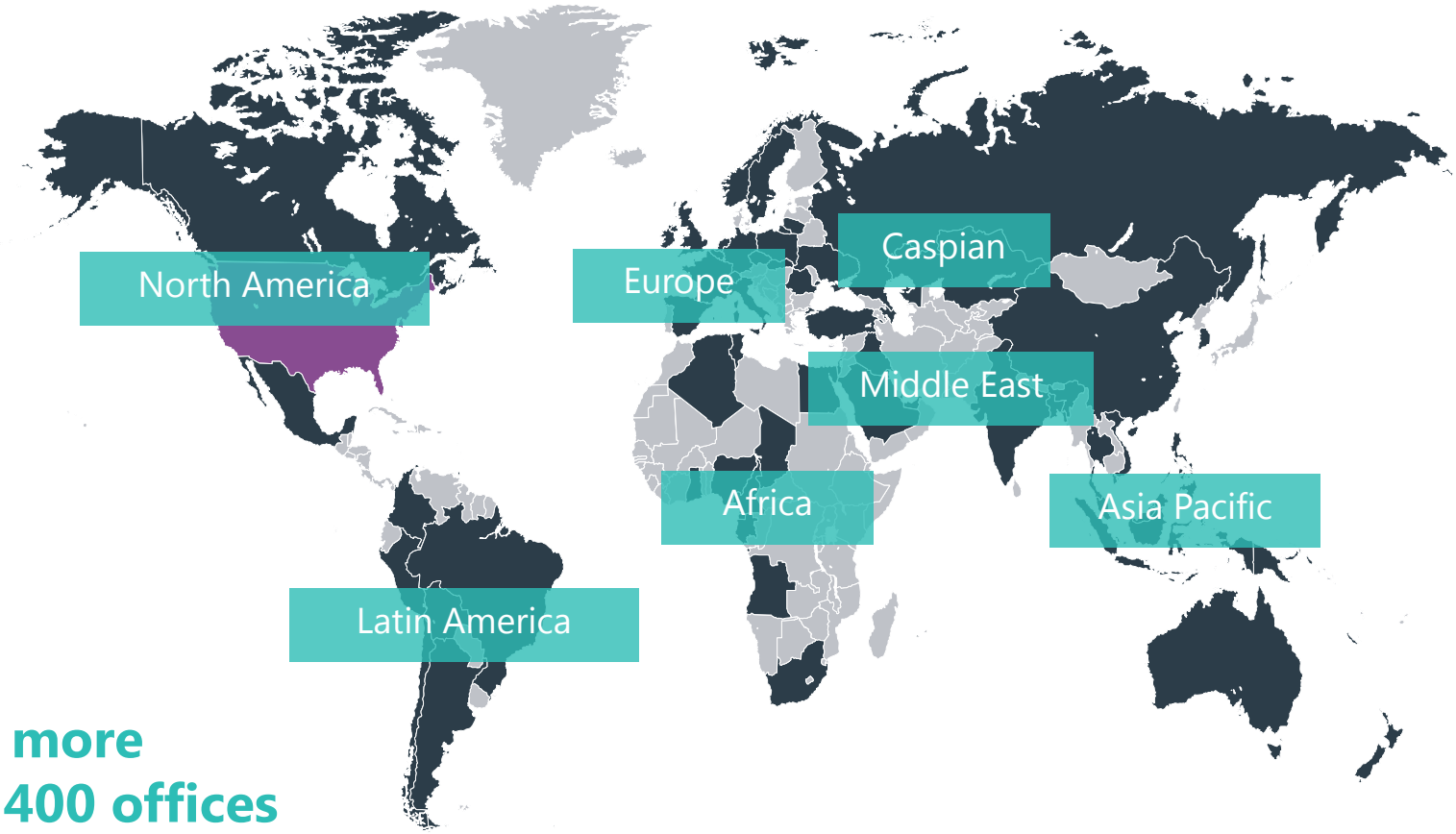
Wood Environment & Infrastructure Solutions, Inc. (Wood)

NCSPA Water Injection Dredge Design-Build and Demonstration

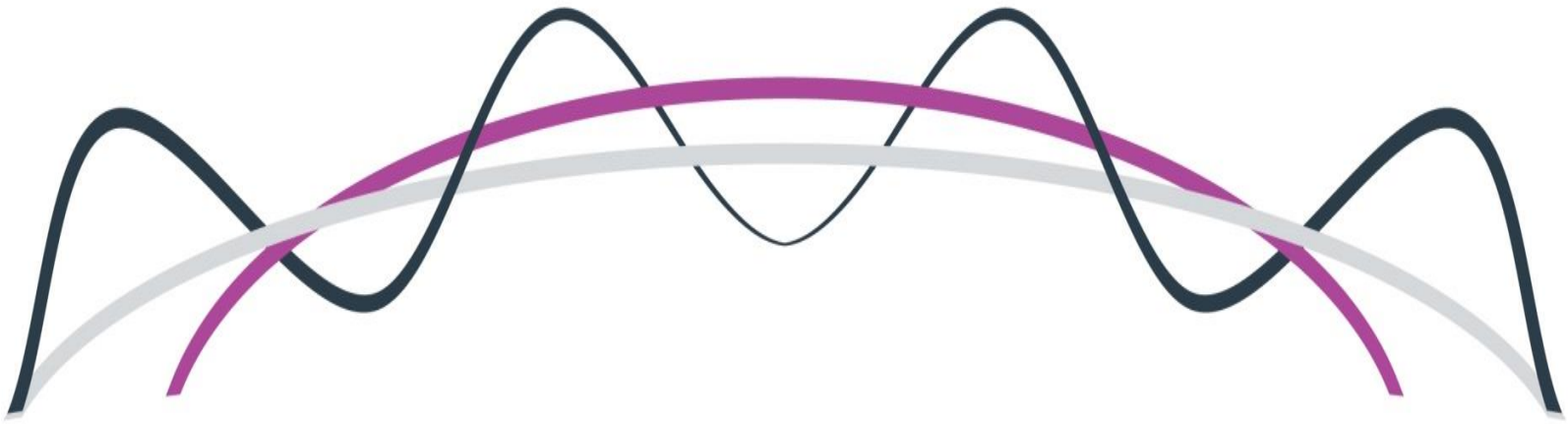
Our global footprint

Our global footprint



With more than 400 offices worldwide we have an unmatched global footprint.

Sector specific knowledge



Life cycle support	Sector specific knowledge	Specialist expertise
Environment and Infrastructure Solutions Environmental remediation Geotechnical & materials Engineering & construction Environmental studies, permitting & compliance Public infrastructure services	**Mining and minerals solutions** Mineral resources and project assessments Mine planning & design Mineral processing & metallurgy Engineering, design and project management Materials handling	**Subsea and export systems** Engineering, design & project management Operational support & integrity Engineer, procure, fabricate (EPF) Flow assurance Subsea, umbilical, riser & flowline (SURF) Pipelines & Marine Terminals

Dredging in the US

NCSPA Water Injection Dredge Design-Build and Demonstration

References, Publication, and Societies

www.dots.el.erdc.dren.mil

www.engineering.tamu.edu/ocean/events/index.html

Fundamentals of Navigation Engineering Series - Planning, Design, Dredging and Sustainability

- **Navigation Engineering: Understanding the Basics**
  - **October 2, 2019**
- **Introduction to Navigation Channel Design**
  - **October 22, 2019**
- **Dredging Fundamentals**
  - **November 15, 2019**
- **Ship/Tow Simulation of Navigation Design Studies (New)**
  - **December 5, 2019**
- **River Information Services: Basics and Plans for US**
  - **January 9, 2020**
- **Beneficial Uses and Reuses of Dredged Material (New)**
  - **February 21, 2020**
- **Navigation Engineering: Sustainability and Resilience**
  - **March 3, 2020**
- **Sustainable Sediment Management for Navigation**
  - **March 26, 2020**