Esquimalt Graving Dock Waterlot Remediation

Design, Contracting and Construction Challenges

Presented by:
Warren Sandes, Senior Director
Environmental Services
Tervita Corporation
Tainted soil in Highlands “horrifying”; Residents raise new concerns about groundwater contamination
“The physical characteristics of the dredgeate change significantly in the 48 hours between dredging and offloading. **We need to change our approach.**”

Myles Makortoff
Senior Project Manager
Esquimalt Graving Dock
Esquimalt seeks compensation for heavy truck traffic during Graving Dock project
History of Esquimalt Graving Dock

• Southwestern tip of Vancouver Island in Esquimalt, BC

• PWGSC owned & operated since 1927

• Largest shipbuilding facility on Canada’s Pacific Coast
Largest Project in B.C. in 2013

ESQUIMALT GRAVING DOCK
WATERLOT REMEDIATION PROJECT

Project Area

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

Canada

TERVITA
The Problem

- 150,000 m³ metals and PAH impacted sediment
- Prescribed sequence – 11 zones over 9 hectares
- No interruption of drydock activity – schedule driven
- Associated restoration and capping activities.
The Solution
The Project Team

- PWGSC
  - Anchor Environmental
    - Owner’s Engineer
  - SLR Consulting
    - Environmental Monitor
  - Klohn Crippen Berger
    - Structural Engineer
  - Golder Associates
    - Original Environmental Report & Baseline Study
  - Tervita
    - General Environmental Contractor
      - Remediation Services
      - Water Solutions
      - Landfill Services
        - FRPD
          - Marine Service Subcontractor
Dredging and Barge Loading
Dredging and Barge Loading

Three Dredging Methods

• Land based excavation
  – 4,000 m³

• Mechanical dredging with a clamshell
  - 145,000 m³

• Diver assisted suction dredging for sensitive structures – 50 m³
Dredging and Barge Loading

Dredging by Zone

• Sequential design
• Work two marine derricks concurrently
• Adapt sequence to EGD operational requirements
• Comply with DFO permit and restrictions
• CFSA Marina protection
Dredging and Barge Loading
Marine Derrick and Bucket Positioning

- Real Time Kinetic (RTK) Receivers
- Crane and Barge Positioning (Qinsy)
- Electronic depth control via line counters
- Surface updated daily from multi-beam survey and continuous from derrick software
Dredging and Barge Loading
Water Quality Management

- Silt curtains (6m deep)
- Sealed material barges
- No passive dewatering
- Environmental clamshell bucket
- Conducted under project Environmental Protection Plan
Barge Dewatering and Water Treatment
Barge Dewatering and Water Treatment

Dewatering

- High turbidity fluid recovered from dredgeate
- Debris and sludge
- High variability in dredgeate characteristics
- Design modified
Barge Dewatering and Water Treatment

Treatment

- 2 water process barges
- 3 days of combined storage on and below deck
- On-board power generation system
- Proprietary process for solid/liquid separation
Barge Dewatering and Water Treatment
Treated Water Discharge to Marine Environment

• Requirement: 40mg/L TSS (20 NTU)
• Actual: 2 NTU average
• Discharge based on inline turbidity analyzer
• Correlated to risk based criteria
Barge Transport and Offloading
Barge Transport and Offloading

Offloading

- Solidification of dredgeate
- 110 trips per day
- Secondary containment system
- Wheel wash for decontamination
- Storm water control berms
Upland Transportation and Disposal
Offload Site to Highwest Landfill

• Haul route planning
• Safety Monitoring
• Environmental Monitoring
• Community communications
Upland Transportation and Disposal
Disposal at Tervita Highwest Landfill
Summary
Managing Change in the Field

Do you have the budget and the skills to adapt in the field?
Summary
The Right People

Will the owner and other stakeholders have confidence in your team?
Summary
Communication Management

Does your communications team have the experience and are they ready?

“Plan for the worst, hope for the best”
VICTORIA, BRITISH COLUMBIA (March 28, 2013)

Rod Friesen, Director, PWGSC, Cameron McLean, Tervita ES President, and Kerry-Lynne Findlay, MP for Delta- Richmond East
Conclusion