DESIGN/BUILD - ROCK BAY REMEDIATION PROJECT STAGE 3

REMTECH
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PRESENTATION OVERVIEW

• Brief Background and Site History
• Remedial Objectives
• Project Design
• Construction Plan
• Challenges and Changes to Design
• Work to be Completed
SITE LOCATION

- Location:
  - Victoria Harbour
  - 1.7 km to BC Legislature
  - 1.1 km to Downtown Victoria
  - Commercial / Industrial Area

- Transport Canada land (red)
  - Uplands (1.7 ha)
  - Harbour Floor (2.0 ha)
SITE HISTORY

• 1862 – 1953: coal gasification plant in operation
  – Provided gas for street lighting and heating

• Afterwards, light industrial and commercial operations; last used as a school bus parking lot.
INFILLING OF ROCK BAY

- One Rock Bay
- 1924 Six Harbours Agreement
  - Established boundary of federal/provincial property in Victoria Harbour
OTHER SITE HISTORY

North area
Late 1800s – tannery
Early 1960s - sawmill closed

Early 1900s - sawmills
1973 - concrete plant opened

West area
Early 1900s to 1948 - sawmill at Barclay Pt.
1949 - propane tanks

1992 - propane tanks removed
SITE CONTAMINATION

Soil and Sediments:

PAHs > CSR CL and Hazardous Waste (HW)

Metals and hydrocarbons > CSR CL.

[Map showing contamination levels]
SITE CONTAMINATION

Rock Bay (Stage 3)
North uplands

Weathered Victoria Clay
Sand seam
Victoria Clay
1996 – Transport Canada and BC Hydro notified of a potential order to remediate contamination identified on site.

2003 *Revised Recommended Remedial Strategy* accepted by BC MOE, DFO and Environment Canada

- **Uplands**: remove soil > CL
- **Marine**: remove sediment > hazardous waste
ROLES & RESPONSIBILITIES

• Transport Canada
  – Custodial department
• PWGSC
  – Project management and contracting authority
• Quantum Murray LP
  – Design Build / Prime contractor
• Anchor QEA
  – Construction monitoring
• Hemmera
  – Environmental monitoring
  – Confirmation sampling
  – Neighborhood Air Quality Monitoring Program
• Golder Associates
  – Quality assurance
  – Construction risk assessment
  – Budget estimation and schedule assessment
Transport Canada required that:

- All excavation to be conducted in the dry; eliminate risk of mobilization and residual contamination.

- Excavation of contaminated soils up to upland property lines.

- Excavation of the sand seam within the clay along the south property line and installation of a sand seam seal plug ($1 \times 10^{-8}$ m/sec).

- Treatment and/or destruction of waste and hazardous waste material.

- No intrusion on neighboring properties.

- Backfilling and shoreline restoration.
CONSTRUCTION PLAN

- Site preparation
- Cofferdam to seal off the bay
- Bypasses for the 626 and 627 storm sewers
- Shoring along upland property lines
- Draining of the bay
- Excavation and transport of an estimated 90,000 tonnes of material
- Treatment and disposal of contaminated soils
- Backfilling and shoreline restoration
- Construction Submittals
PROJECT SCHEDULE

• In water works end – February 15, 2015

• In water works start – July 1, 2015 (meaning we can pull sheets)

• Site works complete by November 30, 2015

• All treatment by January 30, 2016

• Closeout Submissions Due – February 15, 2016
PROJECT SCHEDULE

[Diagram of project schedule with timelines and milestones]
SITE PREP

- Jun 2014 – mobilization
- Jun to Jul 2014
  - Clearing and Grubbing
  - Paving of stockpile storage area
  - Site trailers
  - Services and Facilities
  - Security
SITE PREP

- Truck Washes
- Scales
- Grading and catch basins
- Water Services
SITE PREP

- Jul 2014 – Crane mobilized to site.
SHORING & COFFERDAM BOX
SHORING & COFFERDAM BOX

SHORING

TYPICAL SHEETPILE DETAIL AT PROPERTY LINE
SCALE 1:25

TYPICAL SHEETPILE SECTION
SCALE 1:25

H500x55 continuous waler extending 3m beyond slot cut required. If slot cut is to be left open more than 16 hours.

Sheetpile length adapted to excavation depth

Excavation up to 1m deep
Excavate to 3m, slot cut to 3m
4m slot width max. with 2:1:1:1 sides

Typical Cofferdam Box Half Plan
1:200
SHORING ON PROPERTY LINE

- Aug to Dec 2014 – shoring along south property line
- Sept 2014 to Feb 2015 – 626 storm sewer bypass construction
- Dec 2014 - excavation and backfilling in SCD1
SHORING ON PROPERTY LINE
COFFERDAM CONSTRUCTION
COFFERDAM CONSTRUCTION
COFFERDAM CONSTRUCTION
COFFERDAM CONSTRUCTION

• Aug to Nov 2014 – main cofferdam construction
• Nov 2014 to Feb 2015 – northern cut-off wall
OUTFALL BYPASS
OUTFALL BYPASS
OUTFALL BYPASS/SHORING
OUTFALL BYPASS
CLOSING OFF THE BAY

Feb 2015 – closing off of the bay and draining
FISH REMOVAL

- Approximately 3,600 fish removed
- Stickleback, surf smelt, sculpin and halibut
DEWATERING
COAL TAR
BULK EXCAVATION

March 2015 – Bulk Excavation Begins

Coal Tar Seeping out of Geoduck Hole
DEBRIS
BULK EXCAVATION

[Image of a construction site with excavation machinery]
EXCAVATION & BACKFILL
BACKFILL
BACKFILL & RESTORATION
TRANSPORTATION

23 Barges Exported

6,700 Trucks
TREATMENT & DISPOSAL

SEQUENCE FOR THERMAL TREATMENT PROCESS

1. TRANSPORT TO FACILITY

2. RECEIVE MATERIAL

3. STOCKPILE IN DESIGNATED LOCATION

4. CONDITION PLANT FEEDSTOCK

5. MOVE FEEDSTOCK TO PLANT

6. PROCESS WITH THERMAL DESORPTION PLANT
   - Pre-conditioned material fed into the Thermal Desorber;
   - Rotary kiln heats soil and desorbs hydrocarbons from soil;
   - Cyclone removes dust and particulates from air stream and returns materials for processing;
   - Oxidizer destroys hydrocarbons by converting them to CO₂ and water;
   - Baghouse removes fine particulate from air stream and transfers material to Soil Conditioner;
   - Soil Conditioner cools and stockpiles treated soil discharge;
   - Extract Waste Scrubber controls any dust or mist generated;
   - Stack emissions continually monitored and recorded by Continuous Emissions Monitoring System (CEMS).

7. STOCKPILE PROCESSED SOIL AT HOLDING AREA

8. MOVE TO TRANSFER PAD

9. MOVE TO DISPOSAL LOCATION
WORKS TO BE COMPLETED

2015

- Shoreline restoration; restore 626 and 627 storm sewer outfalls; re-flood the bay.
- Removal of main cofferdam and perimeter shoring
- Treatment and disposal of contaminated soil and sediment
- Demobilization

2016

Post Construction Sumbittals
DOCUMENTATION

Pre-construction Submittals – 17

On-Site Notification – 365

On Site Instructions – 260

Post Construction Submittals -
SPECIAL THANKS

PWGSC
Transport Canada
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WSP Engineering
Envirogreen Technologies
Volk Transport
Thurber Engineering
To All the Rock Bay Staff
QUESTIONS?

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