# ASTM BMP Selection Case Study
# LSP Association Training

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# Introduction

- Project history and overview
- Remedy discussion
- Green BMP Evaluation Process
- Notable green BMPs
- How the greener cleanup process helped the overall project

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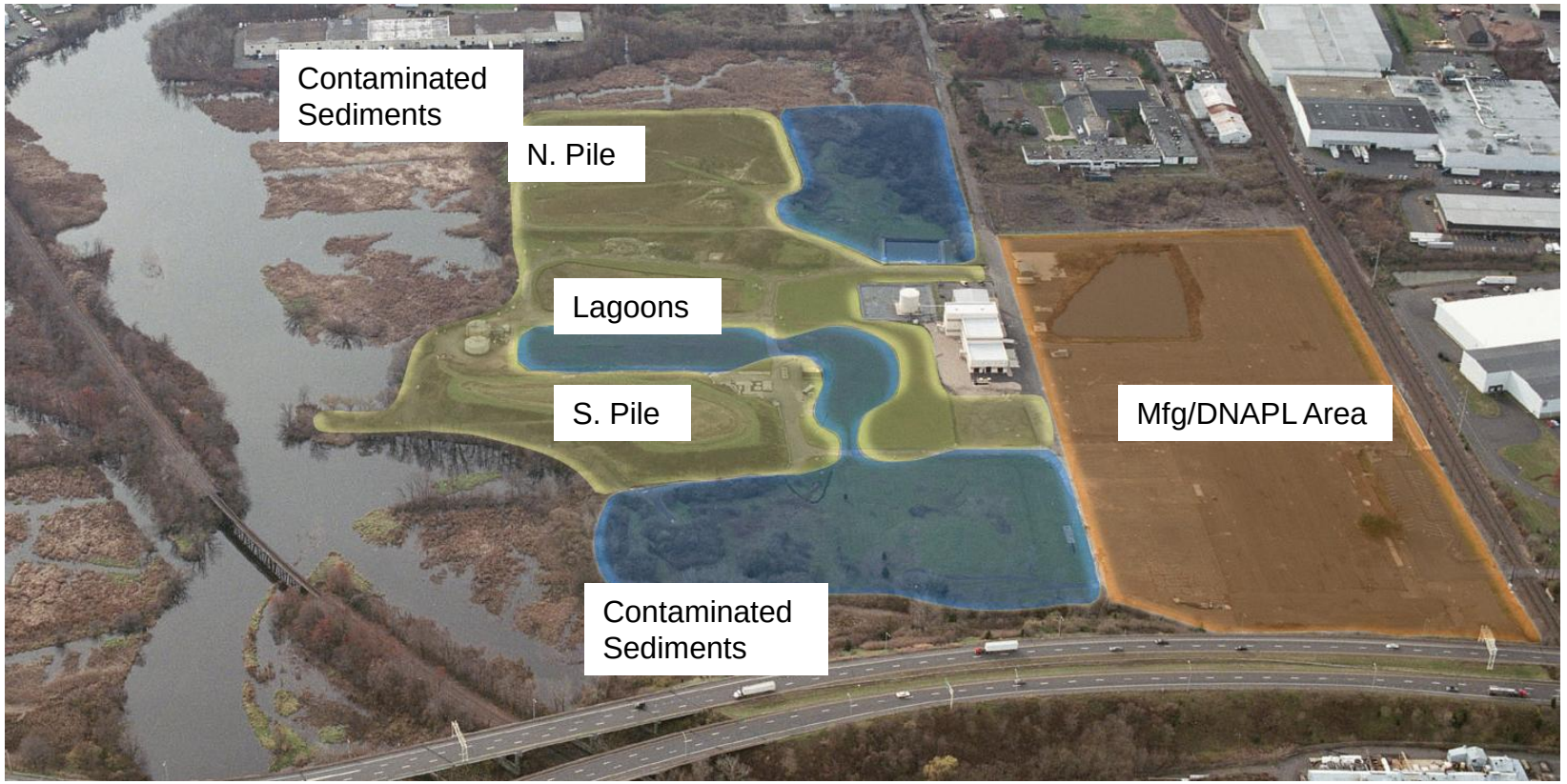
# Project Overview



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# Project Approach – Community Engagement

- Developed project website
- Worked with town council to establish a Community Advisory Panel
- Involved community in remedy selection
- Recognized community members with awards
- Implemented community relations plan
- Stakeholder-driven re-use planning process for both commercial and ecological areas

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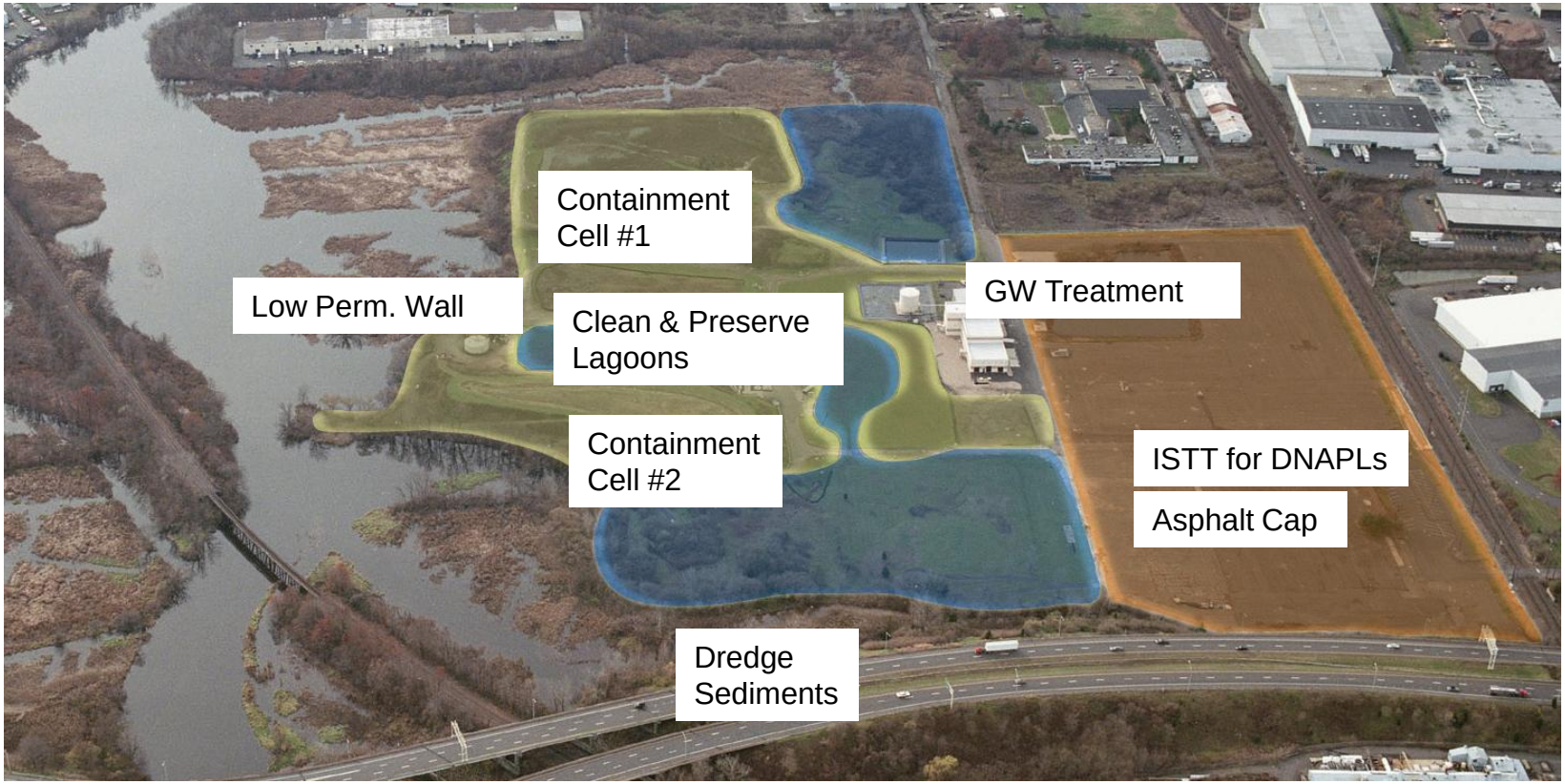
# Remedial Strategy



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# Site Development Strategy




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# Vision for Piles

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# Vision for Wetlands

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# Greener BMP Review Scope of Work

- Preliminary discussion with Client's project management team to review the project history and cleanup activities
- Review of critical corrective action documents, including: the EPA's Statement of Basis, EPA's Final Decision and Response to Comments, and the Corrective Measures Design
- Screening of potentially applicable BMPs and developing a list of green BMPs incorporated into the project design.
- Discussions with the Client's project management team regarding which green BMPs in Gnarus' list were implemented
- Implementation of ASTM review process, including adding BMPs to the Appendix X3 BMP table
- Prioritization of the applied or planned BMPs
- Preparing summary report following ASTM format

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# BMP Evaluation (Section 6)

- Step 1 – BMP Opportunity Assessment
  - Created tables for each aspect of the remedy
    - Sampling and Analysis
    - Containment/Capping
    - Groundwater Pump & Treat
    - In-situ Thermal Treatment
  - Expanded table with BMPs not previously included
  - Checked all PMPs that were potentially applicable
- Step 2 – BMP Prioritization
  - Checked core elements, added columns for priority and retained
  - Ranked BMPs as 3 (high), 2 (medium) or 1 (low)
  - Sorted table
  - Repeated for each aspect of the remedy

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# Applying BMP Table to the Site (Section 6)

| | | Core Element Addressed (at Site Level) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Category | IN-SITU THERMAL TREATMENT | Energy | Air | Water | Materials and Waste | Land and Ecosystems | In-situ Thermal Treatment | Priority | Retained? |
| Materials | Maximize the reuse of existing wells for sampling, injections or extractions, where appropriate, and/or design wells for future reuse | X | X | | X | X | X | 3 | ✔ |
| Materials | Select well / heater materials and treatment equipment to facilitate reuse. For example, carbon steel casings may resist chlorine stress corrosion better than stainless steel. Prevent condensation in metal extraction piping via pipe insulation, jacketing and heat tracing to preserve equipment. Add caustic where needed to minimize acid corrosion of materials and equipment and thereby enhance their longevity and reuse. Select more robust materials of construction. | | | | X | | X | 3 | ✔ |

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# BMP Evaluation (Section 6)

- Step 3 – BMP Selection
  - Added comments column and included explanation of why not retained
  - Used professional judgment to identify BMPs
  - Checked table with selected BMPs
  - Sorted table
  - Repeated for each aspect of the remedy

| Category | SUBSURFACE CONTAINMENT & BARRIERS | Priority | Retained? | Comments |
|---|---|---|---|---|
| Wastewater Management | Redirect influx of upgradient groundwater into the treatment area by adding engineering controls (e.g., installation of subsurface barriers to divert groundwater). | 3 | No | Considered, but not implemented because would cause flooding |

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# BMP Evaluation (Section 6)

- Step 4 – BMP Implementation
  - Determined which BMPs could be or were applied
  - Documented why BMPs retained from Step 3 were not implemented
- Step 5 – Prepared Report

# Environmental BMPs Implemented

**Over 75 Environmental BMPs**

- Site assessment – 9 BMPs
- Capping/containment – 20 BMPs
- In site thermal treatment – 16 BMPs
- Groundwater treatment – 25 BMPs
- Dredging – 8 BMPs

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# Environmental BMPs Implemented

- Remedy consolidated majority of contaminated materials under engineered caps
- Creating on-site wetlands
- Utilizing blast furnace slag for hydraulic barrier wall construction
- Utilizing geotextile bags for dewatering contaminated sediments

# Environmental BMPs Implemented (cont.)

- Operating P&T in pulsed mode and adjusting pumping to match river's tidal elevation changes
- Selecting re-vegetation requiring minimal mowing
- Managing drilling wastes on-site under caps
- Used field screening DNAPL dyes to control investigation progress real-time

# Environmental BMPs Implemented (cont.)

## Environmental BMPs Identified for ISTT

- 15 BMPs for thermal treatment alone
- Examples include:
  - Insulating piping
  - Recovering electrodes
  - Using local labor and labs, when possible
  - Employing variable frequency drives
  - Segregating drilling waste and placing under cap (if possible)

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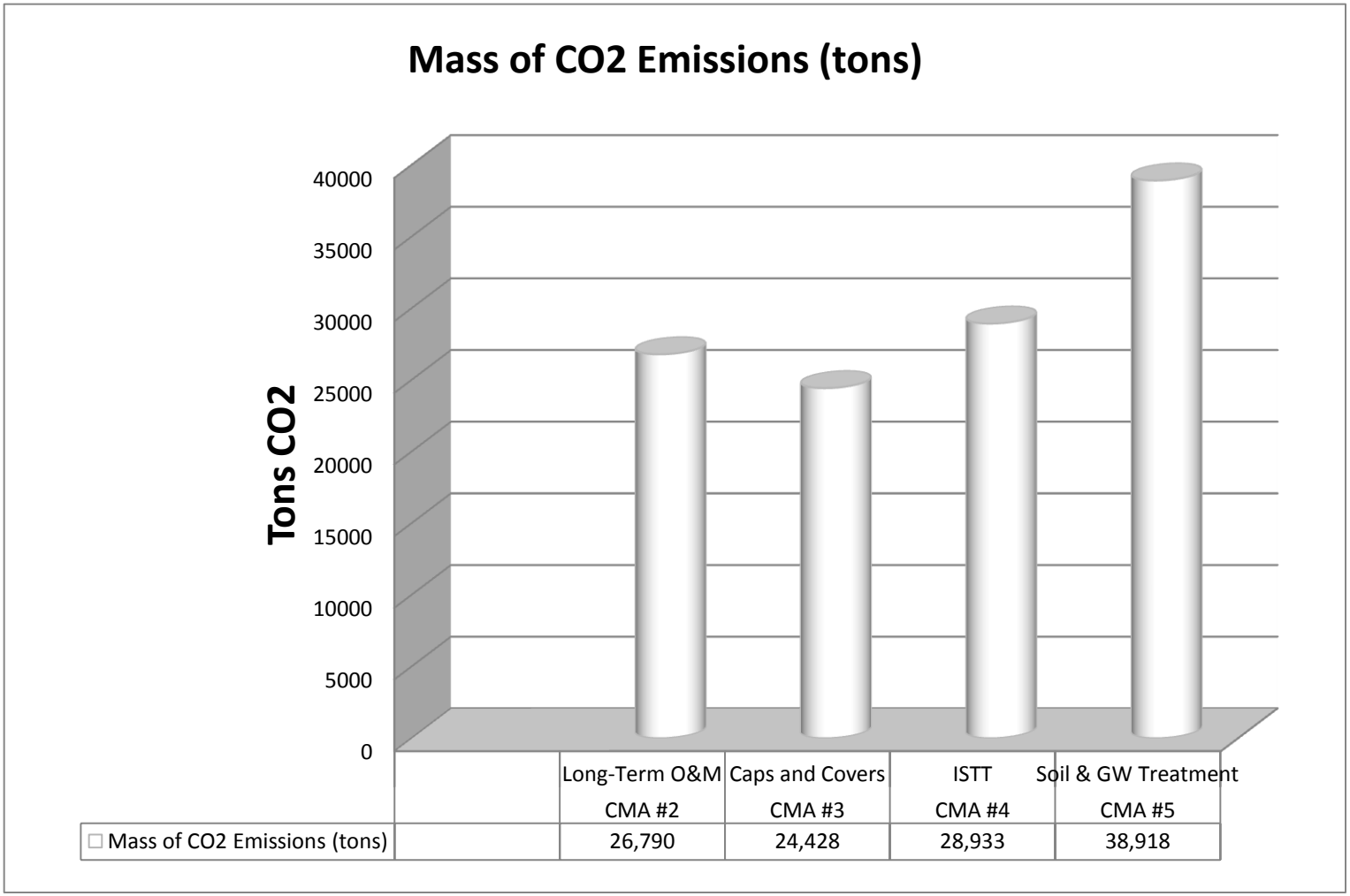
# Quantitative Evaluation



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# Examples of Green Remediation Benefits

- Promoting economical, yet green BMPs
- Shifted media and public perception from negative to positive – improved corporate social responsibility
- Community now feels cleanup is a benefit
- Created local jobs
- Community can utilize ecological resources

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# Questions?

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