In situ Thermal Procured under MATOC/PRAC Contract Vehicle to Ensure Closure at New Jersey Superfund Site

Andrew Small
Technology
Electricity is directed into the subsurface area.
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ERH Advantages

• No desiccation - under buildings & roads
• Steaming stops upon power loss
• Dial in results – easy to control
• Uniform heating
Misconceptions

• Perceived as expensive due to energy cost
• Electrical conductivity of matrix matters
• Vadose zone is challenging
Thermally Enhanced Mechanisms

• Hydrolysis
• Abiotic reactions with soil mineralogy
• Mass transfer
• Enhanced biodegradation
Contracting Options

• Standard Fixed Price Remediation (SFPR) – fixed fee
• Guaranteed Fixed Price Remediation (GFPR)
  • Transfers remediation risk from property owner to contractor.
  • Enforced by a large retainage.
  • Client determines remedial goal and method of verification only.
Minotola Contracting

• Thermal treatment remedial goals:
  • Heat to 88.5°C in saturated zone
  • Heat to 72°C in vadose zone
  • Hold temperatures for 60 days (with option to extend)
Project Objectives/Design Considerations

- Remediation Goals
- Occupied Buildings
- Geology
- Groundwater Flow
ERH Design (Site Plan)
Drilling
Installation
Equipment Compound
## Project Pricing

<table>
<thead>
<tr>
<th>Tasks and Description of Services</th>
<th>Task Funding Level</th>
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<tbody>
<tr>
<td>General Conditions</td>
<td>$243,320.00</td>
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<tr>
<td>System Installation and Start-Up</td>
<td>$606,301.00</td>
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<tr>
<td>System Operation – Base Period</td>
<td>$310,650.00</td>
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<tr>
<td>Site Restoration</td>
<td>$38,000.00</td>
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<tr>
<td>Remedial Action Completion Report</td>
<td>$19,770.00</td>
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<tr>
<td><strong>TOTALS</strong></td>
<td><strong>$1,218,041.00</strong></td>
</tr>
</tbody>
</table>
Project Results

**Site Average Temperature (°C)**

**VOC Mass (lbs)**

- Estimated Cumulative Mass by Laboratory Analysis
- Site Average Temperature

**Soil Temperature**

**Lab Data – Mass Removal**

- 1180 lbs VOCs Removed In 60 Days

**Dates**

- 9/16/2016
- 9/26/2016
- 10/6/2016
- 10/16/2016
- 10/26/2016
- 11/5/2016
- 11/15/2016
- 11/25/2016
- 12/5/2016
- 12/15/2016
- 12/25/2016