Remediation of a Former Dry Cleaner
Spruce Grove, Alberta

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REMTECH 2003
Site Location

Former Dry Cleaner

Avenue

Street

Laneway

Church Property
Background

- Dry cleaning facility for 25 years
- Land zoned for commercial land-use
- 11 adjacent businesses
- Off-site land contains a church (residential land use)
Location of Dry Cleaner Machines

Waste Storage Area
Geology

West

Commercial Property

Clayey Silt

Laneway

Church Property

East

Fill

Clayey Silt

Clayey Silt (Till)
Area of Impacted Soil and Groundwater (CCME 2002)

Tier 1 Soil Impacts

Tier 1 GW Impacts
Risk Management

Air Quality Monitoring

Risk Assessment - No risk to current occupants and adjacent businesses

Alberta Environment accepted risk management plan to conduct quarterly air monitoring and semi annual groundwater monitoring

Church accepted risk management plan

Vacated current dry cleaner tenant
Owner’s Business Objectives

- Wanted to sell property
- Property worth $3 Million in August 2000
- Property on market for 1 year
- Potential purchasers wanted significant “hair-cut” off the purchase price and for the owner to retain all environmental liability.
- Decision to remediate to avoid a significant reduction of purchase price.
Remediation Options

- Exsitu remedial techniques were limited due to distribution of contamination in the subsurface.
- Insitu remedial techniques did not meet owner’s time frame and were not feasible.
- Decision to derive Tier 2 soil and groundwater guidelines using the CCME 2000 and AENV 2001 methodology.
Guideline Tiers

- Tier 1 – Generic Guidelines
- Tier 2 – Modified Generic Guidelines
- Tier 3 – Site Specific Risk Assessment
## PCE Tier 2 Soil and Groundwater Guidelines

<table>
<thead>
<tr>
<th>Exposure Pathway</th>
<th>Guideline</th>
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</thead>
<tbody>
<tr>
<td>Human Soil Ingestion</td>
<td>2139 mg/kg</td>
</tr>
<tr>
<td>Human Dermal Contact</td>
<td>12435 mg/kg</td>
</tr>
<tr>
<td>Human Vapour Inhalation</td>
<td>39 mg/kg</td>
</tr>
<tr>
<td>Protection of Potable Groundwater</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Soil Contact</td>
<td>34 mg/kg</td>
</tr>
<tr>
<td>Protection of Aquatic Life</td>
<td>Not relevant</td>
</tr>
<tr>
<td><strong>Final Soil Guideline</strong></td>
<td>34 mg/kg</td>
</tr>
<tr>
<td><strong>Final Groundwater Guideline</strong></td>
<td>13.7 mg/L</td>
</tr>
</tbody>
</table>
Area of Impacted Soil and Groundwater (Tier 2)
Tier 2 Approach
90% Reduction in the Volume Requiring Remediation

$2 Million $0.5 Million
Source removal via soil excavation to meet Tier 2

Insitu chemical oxidation program (potassium permanganate) as contingency for impacted groundwater if required

Total Cost $800,000
Communication Plan

- Letter to Tenants
- Public Meeting (Flyer)
  - Presentation/Q&A
- Tenants’ Concerns
  - blocking fire lane and fire exits
  - blocking deliveries
  - vibrations (Bank)
- GMS Website
H&S and Air Quality

- Air quality monitoring (EHS group)
  - Two large fans used to vent working space
  - Air monitoring of all working spaces, staging area, and adjacent businesses
  - Intermittent (real-time) and long term (PCE, carbon dioxide, and asbestos)
The Approach

- Interior and exterior excavations
  - interior first, then exterior
  - several smaller manageable excavations
- Removal of piles and load-bearing elements
- Reinforcement of structure
- Slopes of excavation and safety of workers
- Compaction and settlement
Building Preparation
Slope Management
Interior Excavation
Exterior Excavation

- Power, gas, phone, water, sanitary sewer
- Mystery utilities - storm sewer & power
- Two options
  - re-route
  - manage in place
Contingency Oxidation System
Oxidant System Installation
Oxidant System Installation
Backfill & Compaction
The Final Result
Post Remediation Monitoring

- Confirmatory soil sampling met Tier 2
- 3 and 12 months after the remediation work, groundwater samples met Tier 2
- Report submitted to Alberta Environment for “Comfort” letter
- Received “Comfort” letter on July 8, 2003
- Two vacant units have been leased
- Property is “For Sale”