Hydrocarbon Impacts and Remedial Action at an Active Service Station

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Remediation Technologies Symposium 2006
Fairmont Banff Springs Hotel
October 11, 2006
WHAT WE LEARNED

- Value in Early Communication with Stakeholder Groups
- Spend Time to Choose the Right Team
- Do Not Hesitate to Innovate
BACKGROUND

- Retail Location Since 1920’s
- Chevron Retail Outlet Since 1950’s
  - Currently Four 46,000L Fiberglass USTs
- Maintenance Upgrade Work in the 1990’s
- Early Investigation Work in Late 1990’s
- On Site Source Removal in Late 1990’s
PROJECT GOALS

- Ensure Safety of All Receptors
- Manage Contamination Issue and Liabilities
- Obtain CoC for Off-Site Stakeholders

How to Obtain These Goals:

- Define and Delineate Hydrocarbon Plume
- Abate Further Migration
- Remove Existing Contamination
- Retain Future Lingering Contamination to Site
- Execute Monitoring Strategy
SITE CHARACTERIZATION

- Keystone Environmental Conducts Detailed Site Investigation
  - 62 Boreholes Advanced On and Off-Site
  - Analyzed > 400 Soil samples for Hydrocarbon Indicators
  - Analyzed > 500 Ground Water Samples for Hydrocarbon Indicators
  - Developed Detailed Conceptual Site Model

- Conducted Indoor Air Quality Monitoring

- Regular Liaison with Stakeholders (i.e. Residents, Local and Provincial Governments)
SITE LAYOUT

Work Area
INVESTIGATED AREAS

Soil Data

- Concentration(s) less than the applicable CSR standards
- Concentration(s) equal to or greater than applicable CSR standards
INVESTIGATED AREAS

Groundwater Data

- CONCENTRATION(S) LESS THAN THE APPLICABLE CSR STANDARDS (AW)
- CONCENTRATION(S) EQUAL TO OR GREATER THAN APPLICABLE CSR STANDARDS (AW)
SOIL AND GROUNDWATER PLUME
PROJECT PLANNING

- Evaluate Remedial Options
  - Series of Options Developed
  - Economic Evaluation of Options
- Select Remedial Option
- Agreement with Stakeholders, Internal and External
- Assemble Project Team
- Coordinate with Municipality, Utilities, Residents and Neighbours
REMEDICATION

- Underpinning and Shoring
  - Piles and grade beams installed on 4 homes
  - One home demolished

- Excavation
  - Removed all backyard improvements
  - Removed soil from backyards and under homes

- Barrier Wall Installation
  - 45m by 5.5m organic reactive barrier wall installed on retail station property line
UNDERPINNING AND SHORING
UNDERPINNING AND SHORING
UNDERPINNING AND SHORING
UNDERPINNING AND SHORING
UNDERPINNING AND SHORING
UNDERPINNING AND SHORING
EXCAVATION LIMITS
EXCAVATION
EXCAVATION
EXCAVATION
EXCAVATION
EXCAVATION
EXCAVATION
EXCAVATION
BARRIER WALL INSTALLATION
BARRIER WALL INSTALLATION
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BARRIER WALL INSTALLATION
POST REMEDIATION ACTIVITIES

- Install Post Remediation Confirmatory Wells
- Reinstate Structures (eg. floor slabs)
- Reinstate Rear Yards, Fences, Garages
- Reconnect Utilities
- Performance Monitoring of Barrier Wall
- Preparing Closure Reports for Certificates of Compliance on Off-Site Properties
PROJECT PARTICIPANTS

- Chevron Canada Limited (Environment, Public and Government Affairs, Legal, and Engineering)
- Keystone Environmental Ltd. (Environmental and Contract Administrator)
- Hazco Environmental Services Ltd. (Remediation Contractor)
- City of Burnaby (Engineering, Planning, Traffic)
- GeoPacific Consultant Ltd. (Geotechnical)
- Sommerset Engineering Group (Structural)
  - PLUS several other sub-contractors
CONCLUDING REMARK

Treat project as an investment, not an expense
THANK YOU