

# ENVIRONMENTAL FRACTURING APPLICATIONS



## FRACTURE NETWORK FOR INJECTION OF MODIFIED FENTON'S REAGENT

... fracturing allowed non-intrusive *in situ* chemical oxidation of PCE impacted soils and groundwater at low cost without resorting to disruptive and expensive excavation considered for the site.

### PROBLEM

High concentrations of tetrachloroethylene (PCE) present in clay soils underlying a former dry cleaning site at an urban shopping mall. Excavation was unfeasible due to buried utility corridors and existing buildings.

### OBJECTIVES

- to create a network of permeable pathways in soils to facilitate the injection and subsurface distribution of MFR oxidizing solution.

### FIELD PROGRAM

A fracture network of 42 fracture pathways was emplaced between 4.5 and 8.0m depth at 13 locations within the PCE plume. A total of 30 tonnes of highly permeable sand was placed in subsoils with no impacts to buried utility corridors or surface structures. Nine MFR injection wells were installed. Fracturing was conducted over 5 days with little disruption to normal business operations of surrounding mall stores.

### EVALUATION

The soil fracturing program resulted in:

- improved delivery of MFR oxidizing solution into impacted clays and ground water via fracture pathways from dedicated injection wells
- A 50% reduction in PCE concentrations within the first two months of MFR injections
- no need for excavation at mall

Soil fracturing of PCE impacted clays underlying a former dry cleaning site at a major shopping mall in Alberta.

