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Practical Solutions

In-Situ Remediation of Diesel-Contaminated Soils using Hydrogen Peroxide, Edmonton, AB

GES Geotech in association with University of Calgary completed an extensive research program on Hydrogen Peroxide injection and usage of Fenton's reagent to remediate diesel-contaminated soils for sites located in Edmonton, AB. GES demonstrated the success of the hydrogen peroxide injection technology, demonstrating its cost-effectiveness and short treatment time in areas of restricted access.



Based on field and laboratory experience, the following conclusions may be drawn:

- Use of hydrogen peroxide is a viable technology for treatment of hydrocarbon-impacted soils.
 - If sufficient iron is present in the soil, external iron amendments to the soils will not have any added benefit.
- Hydrogen peroxide (H_2O_2) treatment may lead to volumetric change in soil, depending on the concentrations of H_2O_2 and the contaminant.
 - The concentration and volume of H_2O_2 were the most significant process variables in Fenton's reaction; high concentration of H_2O_2 increased the diesel degradation efficiency.
 - Gas generation, specifically oxygen, can be in large quantities during Fenton's reaction, and the large volume of gases generated may lead to a change in soil structure.
 - Gas generation may decrease the hydraulic conductivity of soils and this should be considered in estimating the volume of hydrogen peroxide required for treatment of hydrocarbon-contaminated sites.
 - The degradation of hydrocarbons will be highest at locations close to the point of injection.
 - Volume reduction may be linked to decomposition of organic matter and the consequent re-arrangement of soil particles.
 - The application of the results of the research to contaminants other than hydrocarbons requires further work.

GEOTECHNICAL SERVICES

- Remediation of diesel-contaminated soils
- Hydrogen Peroxide remediation technology
- Project management
- Contract administration
- Field reviews