

Acetone and Petroleum Hydrocarbons Treated at Active Industrial Facility

Combined ISCO/Bioremediation Treatment Approach Reduces Contamination Levels

Project Highlights

- Acetone concentrations pre-remediation were as high as 54,000 µg/L
- Site access agreement required that existing site operations could not be interrupted for construction
- Site water was not allowed to be used therefore all water had to be trucked in and a separate water permit to access city water from fire hydrants was required

Project Summary

A former industrial facility in northern California operated as a gas manufacturing plant from the early 1900s until it was decommissioned in 2001 and sold. The property is currently leased by a bottled water distribution facility.

At this facility, acetone was used extensively in acetylene manufacturing. The acetone was stored on-site in underground storage tanks (UST) but no evidence of leaking acetone USTs was found.

However, high concentrations of acetone – a pre-remediation maximum of 54,000 micrograms per liter (µg/L) were found in one area of the site. Other dissolved chemicals of concern (COC) include gasoline and gasoline-range petroleum hydrocarbons from former USTs such as benzene, toluene, ethylbenzene and xylenes (BTEX).

The extent of contamination in the early 1990s extended to large portions of the site. A pump and treat system was used on-site in 2005, however contamination persisted. Contamination approximately 12 feet below ground surface was detected within the soil. A remediation plan using both ORC® Advanced and RegenOx® was used to treat the remaining contamination.

The site access agreement for this project required that existing site operations could not be interrupted for construction. In order to minimize disturbance to tenants and work within these constraints, all drilling field work was performed on weekends. Site water was not allowed to be used therefore all water had to be trucked in and a separate water permit to access city water from fire hydrants was required. In addition, multiple drill rigs and support vehicles operated within a small area, increasing logistical and safety concerns.

Remediation Approach

A mixture of 6,500 pounds of RegenOx and 3,000 pounds of ORC Advanced was injected at 45 locations using multiple direct-push drill rigs. The injection points were designed in a grid pattern with a nominal 15-foot spacing between injection points, but more densely placed in the area of highest contaminant concentration. Benzene concentrations in groundwater have stabilized at about 10 µg/L and acetone concentrations have stabilized at about 1,600 µg/L. Post-treatment monitoring results show that all the COCs in the treatment area have consistently remained below health-based cleanup levels since the treatment was applied.

Technology Description

Advanced Formula Oxygen Release Compound (ORC Advanced®) is a proprietary formulation of food-grade, calcium oxy-hydroxide that produces a controlled-release of molecular oxygen for periods of up to 12 months upon hydration.

RegenOx is an advanced chemical oxidation technology that destroys contaminants through powerful, yet controlled chemical reactions and not through biological means. This product maximizes in situ performance while using a solid alkaline oxidant that employs a sodium percarbonate complex with a multi-part catalytic formula.

Site Type: Industrial

Contaminant of Concern:
Petroleum Hydrocarbons,
Acetone

Remediation Approach:
Enhanced Aerobic
Biodegradation, In Situ
Chemical Oxidation

Soil Type: Clay, Silty Sand

Technology Used:
ORC Advanced, RegenOx