

Slurry Backfill BTEX Remediation in Washington

Contaminants	Application Method	Soil Type	Groundwater Velocity
BTEX	Slurry Backfill	Sand	3.0 ft/day

ORC was installed at a Washington State site in an application which took advantage of certain hydrogeological conditions on the property. The results of the project were published in Pollution Engineering, February 1997. The treatment zone was approximately 30,800 sq. ft. and contained 33 pounds of BTEX. The range of BTEX contamination in the wells was 0.5 - 2.0 ppm with a high value of 10 ppm (See Figure 1). The anaerobic core of the plume was on the order of 100 ppm gasoline range organics (GRO).

As illustrated in Figure 2, 15 borings about 8" in diameter were installed upgradient of the area to be treated. Groundwater flowed to the west at 3 feet per day in a shallow, thin aquifer - a factor the engineers took advantage of. With the high velocity, the strategy was to treat the source using a linear array of borings as illustrated, and to sweep oxygen rapidly through the contaminated zone. The 15 borings were each filled with approximately 65 pounds of ORC at a total cost of about \$10,000. With other capital and operating expenses the total application cost was \$40,000. This was a dramatic savings over the estimated \$250,000 that would have been necessary to implement more active remedial technologies.

Results

There was a significant reduction of BTEX in 4 of 5 wells after three months. The monitoring well at the leading edge of the plume (MW-11) presented a 95% reduction while a well on the south end of the property (MW-9) presented a 58% decrease. Benzene and BTEX reductions are illustrated in Figures 3 and 4. It is important to note that the 10 ppm isopleth was pulled back toward the source and away from MW-11. This is a classic example of the impact of ORC on the enhancement of natural attenuation - hastening the shrinkage of the plume. A recent data point on GRO shows that even the very core of the anaerobic plume is beginning to show signs of rapid remediation. Levels dropped from 120 ppm to 110 ppm between Days 0 and 93; however, between Days 93 and 220, readings fell to 30 ppm. Consulting engineers expect to close the site in 18 to 36 months.

Figure 1

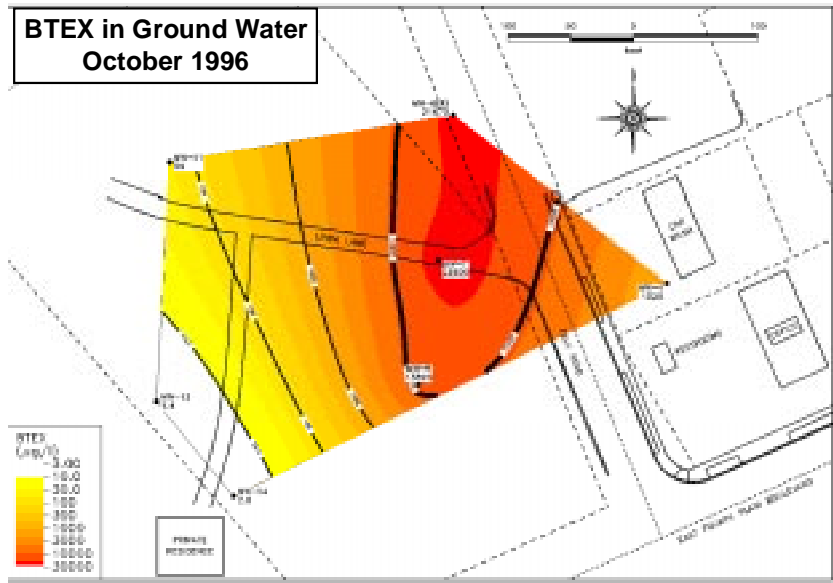


Figure 2

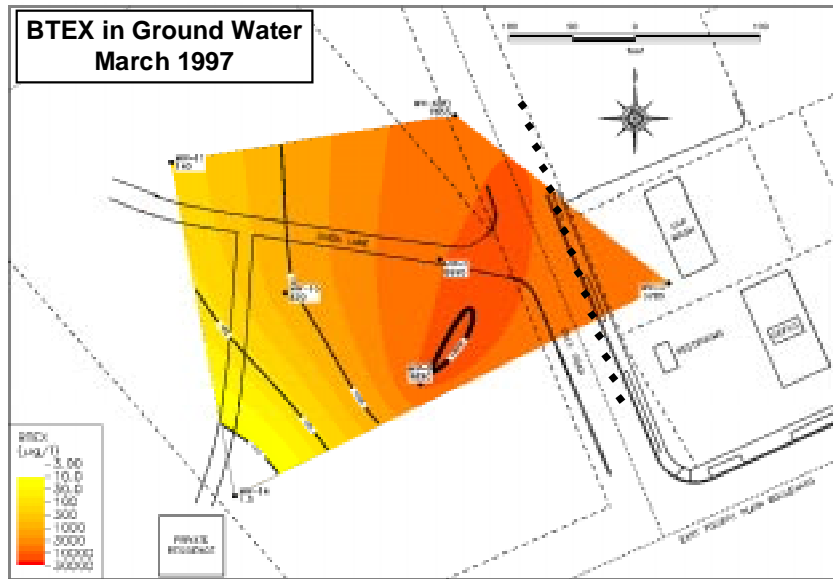


Figure 3

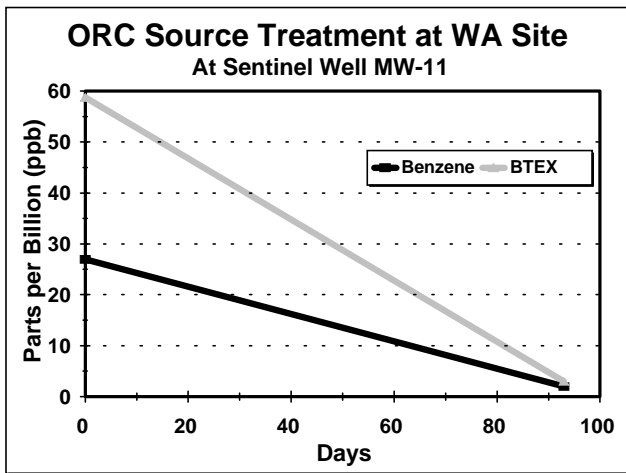


Figure 4

