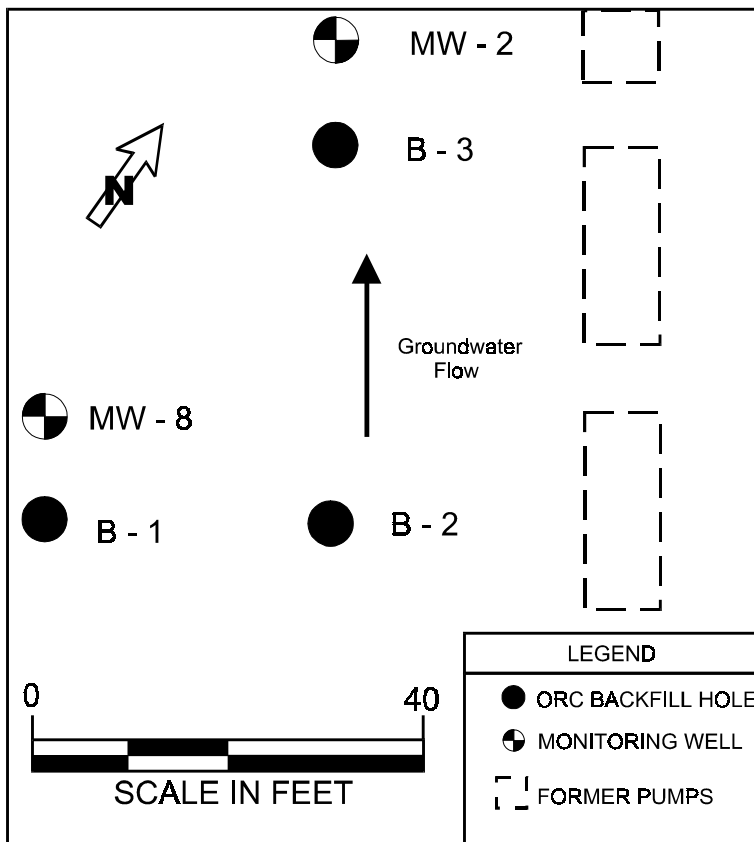


## Slurry Backfill BTEX, MTBE, & Naphthalene Remediation in Florida

Contaminants	Application Method	Soil Type	Groundwater Velocity
BTEX, MTBE, Naph.	Slurry Backfill	Sand	0.5-5 ft/day

An active gas station site in Florida was impacted with a dissolved phase hydrocarbon plume and after conventional high-cost remedial activity some pockets of contamination remained. To correct this residual problem three bore holes were prepared and backfilled with ORC in order to affect the problem areas represented by two monitoring wells (MW-2 and MW-8). Contaminants on the site included BTEX, naphthalene and MTBE.

### Site Description and Remedial Design



The groundwater flow direction is towards the North under a gradient of 0.005. The water table is between 4 and 8 feet below ground surface. Groundwater velocity is estimated to be between 0.5 and 5 feet per day in the sandy aquifer.

Three bore holes, each 3 inches in diameter, were augered in at the points shown above. B-1 and B-3 are 5 feet upgradient of MW-8 and MW-2, respectively, and would be expected to have the most influence on those wells. A 7 foot column of ORC slurry containing about 21 pounds of ORC was applied to each of the three bore holes. The total ORC cost was \$614. The bore holes were completed with bentonite and cement.

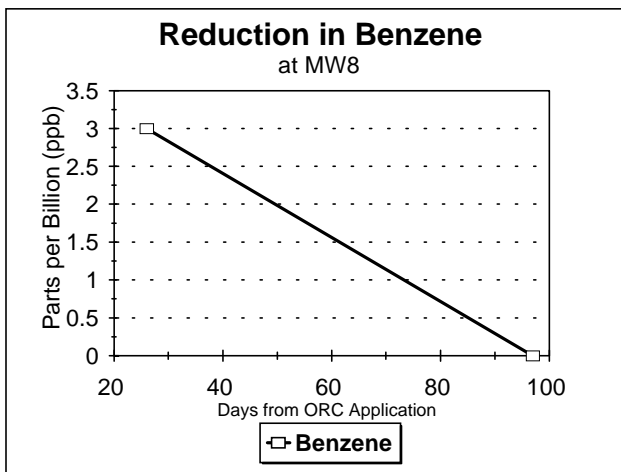
## Results

The ORC was installed April 10, 1996; no baseline data was obtained at this time. The first measurements were taken on May 6 (Day 26) and the most recent data set was taken on July 16 (Day 97). It is likely, based on groundwater flow rates, that oxygen reached the monitoring wells and impacted the hydrocarbons before Day 26, such that the levels at Day 0 were probably higher. By Day 97 the results of bioremediation activity are clear. Dramatic reductions are noted in the Figures below.

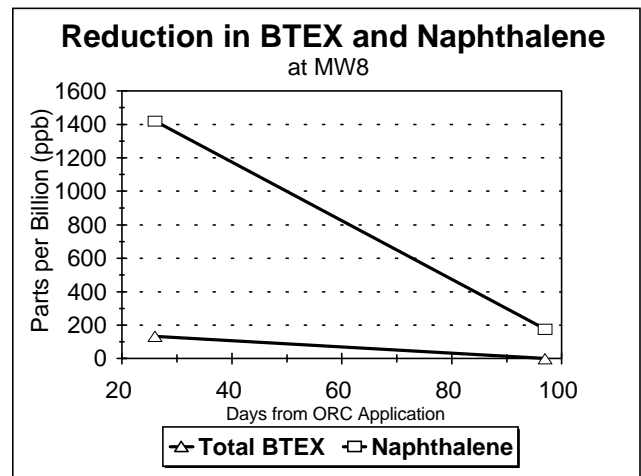
MW-8 was taken to non-detect for all BTEX components and naphthalene was reduced 88%. There was no MTBE in MW-8.

At MW-2, toluene and MTBE were taken to non-detect and the other components were reduced as follows: xylenes were reduced 95%, ethylbenzene was reduced 93%, benzene was reduced 54% and naphthalene was reduced 66%. Only benzene and naphthalene were slightly above standard, however, these results were only at the mid-point of the average ORC longevity cycle and only within the first application.

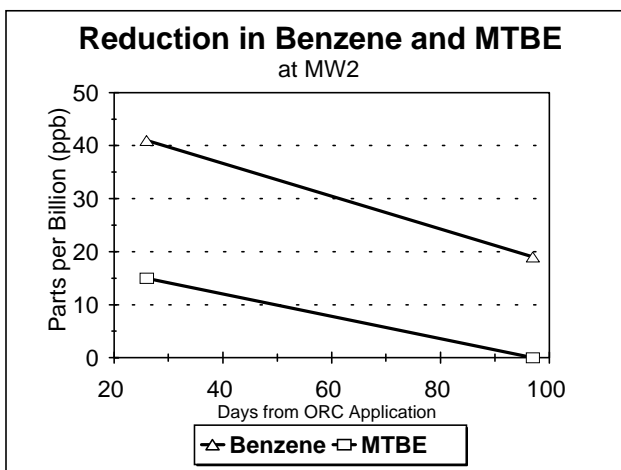
**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**

