



Combined Remedy of Petroleum Compounds using OBC™ at an Active Service Station in North Carolina

Project Location

Service Station
Louisburg, NC

Contaminants

Petroleum; BTEX,
MTBE & Naphthalene

Product Used

OBC™

Scope and Media

Injection Points

Results

BTEX reduced >99%
MTBE reduced >94%
Naphthalene reduced
>99%
NFA Letter Issued

Groundwater beneath an active service station in North Carolina was successfully remediated using direct-push injection of OBC™. A single injection event achieved greater than 99% reduction in total BTEX and naphthalene concentrations, and the site received a “No Further Action” (NFA) determination from the state regulatory agency.

SITE BACKGROUND

The site is located near the physiographic boundary between the North Carolina Piedmont and Coastal Plain. The service station has operated since the late 1980s, and a petroleum UST release to soil and groundwater was reported in 2016. Initial investigations identified free-phase LNAPL in soil and groundwater, with total BTEX concentrations exceeding 50,000 µg/L. Impacted lithology consists primarily of lean clay and silty soils.

APPLICATION METHODS

LNAPL was recovered using multi-phase extraction; however, dissolved-phase groundwater concentrations remained above regulatory standards. In September 2023, an OBC™ injection program was implemented. OBC™ was selected for its combined chemical oxidation and biologically mediated sulfate reduction mechanisms, providing rapid initial contaminant destruction followed by sustained long-term treatment. Approximately 11,500

pounds of OBC™ were mixed with 5,750 gallons of potable water and injected via direct push technology (DPT) at depths of 14 to 20 ft below ground surface. A total of 23 DPT points were installed, **Figure 1**, with minimal surface daylighting due to the low-permeability formation.

RESULTS

Post-injection monitoring demonstrated immediate and substantial reductions in BTEX, MTBE, and naphthalene, **Figure 2**. Groundwater concentrations decreased by 2 to 4 orders of magnitude. In monitoring well MW-3, which exhibited the highest baseline total BTEX concentration (54,090 µg/L), concentrations decreased to 132 µg/L, representing a 99.8% reduction. Similar proportional reductions were observed in other wells within the treatment area, resulting in greater than 99% overall reduction in total BTEX and naphthalene following a single injection event. Continued monitoring over a two-year period confirmed stable, low residual concentrations resulting in the state regulatory agency’s NFA letter, concluding that residual concentrations pose a low risk to environmental health.

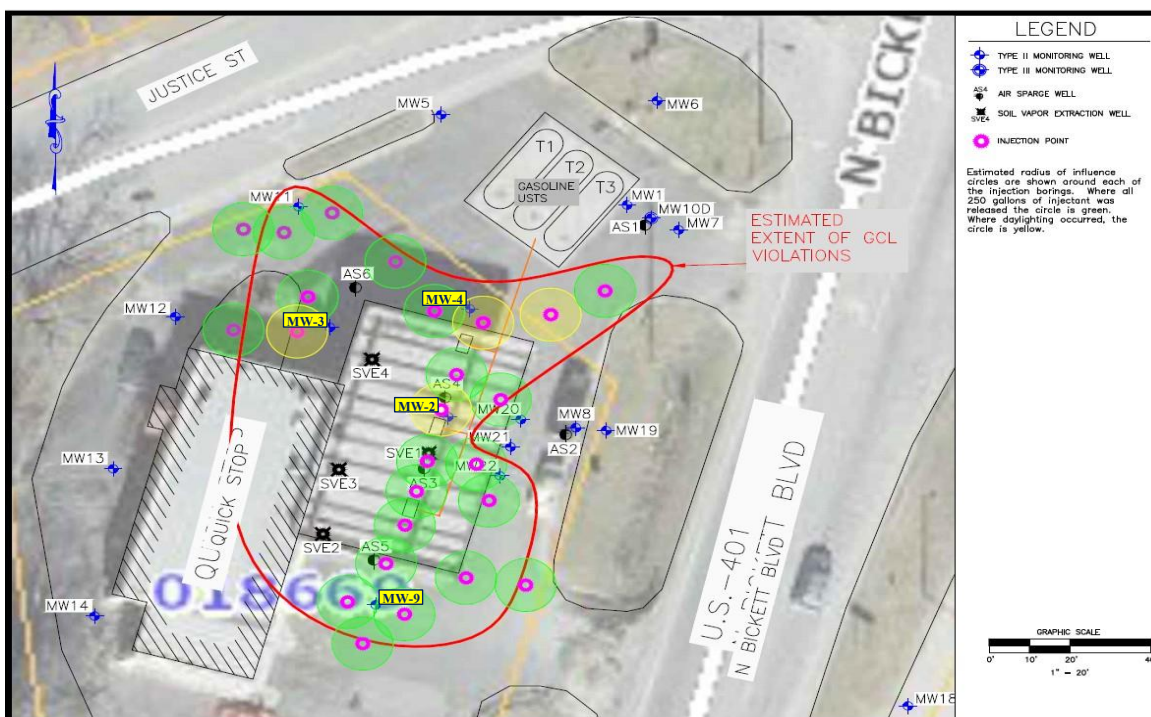


FIGURE 1: DPT Injection Points; the pink circles are DPT points, the blue circles are monitoring wells. Points without daylighting and associated radius of influence are shown in green, the yellow points experienced daylighting.



FIGURE 2: Groundwater Concentrations Over Time at MW-2, MW-3, MW-4 and MW-9.