

REDOX TECH, LLC



"Providing Innovative In Situ Soil and Groundwater Treatment"

A CASE STUDY FOR THE APPLICATION OF OBC⁺ TO TREAT GROUNDWATER CONTAMINATED WITH BTEX

Redox Tech and Longworth Environmental collaborated on a project where OBC⁺ injection successfully reduced BTEX at a former gas station in Schenectady, NY. The mixture in OBC⁺ supports long-term bioremediation via anaerobic oxidation under sulfate reducing conditions. OBC⁺ contains several soluble sulfur salts each with a different purpose. Magnesium sulfate (epsom salts) provides the main source of sulfate electron acceptors as well as magnesium, which is essential for cell growth and function. Other compounds in the mixture help maintain the proper conditions for anaerobic oxidation of petroleum. During anaerobic oxidation with sulfate, bacteria utilize the oxygen on the sulfate to convert petroleum to harmless carbon dioxide and water.

BTEX contamination was found in wells covering approximately 0.4 acres. NAPL was found in three wells while three others had concentrations exceeding 10,000 ppb total BTEX. From February 2004 to March 2006, contaminants were periodically removed using a vacuum truck. In January 2007, a dual phase extraction (DPE) system was installed and it operated on site until November 2009. After DPE, two of six wells still had NAPL. In October 2010, approximately 10,000 lbs of OBC⁺ was injected through 15 temporary injection points and six wells. By June 2012, no NAPL was observed in any of the monitoring wells and sulfate concentrations were less than 25 mg/L in all monitoring wells on site. As of February 2013, no NAPL has been observed in any of the monitoring wells and two of the former NAPL wells have concentrations of total BTEX less than 500 ppb. Groundwater from one well with previous concentrations as high as 14,000 ppb was non-detect. Concentrations in all of the monitoring wells have been steadily decreasing since the OBC⁺ injection. The large original plume has receded and separated to two smaller plumes centered around two wells (MW-13 and 903). Concentrations in these wells are decreasing at a rate of approximately 25% per year.

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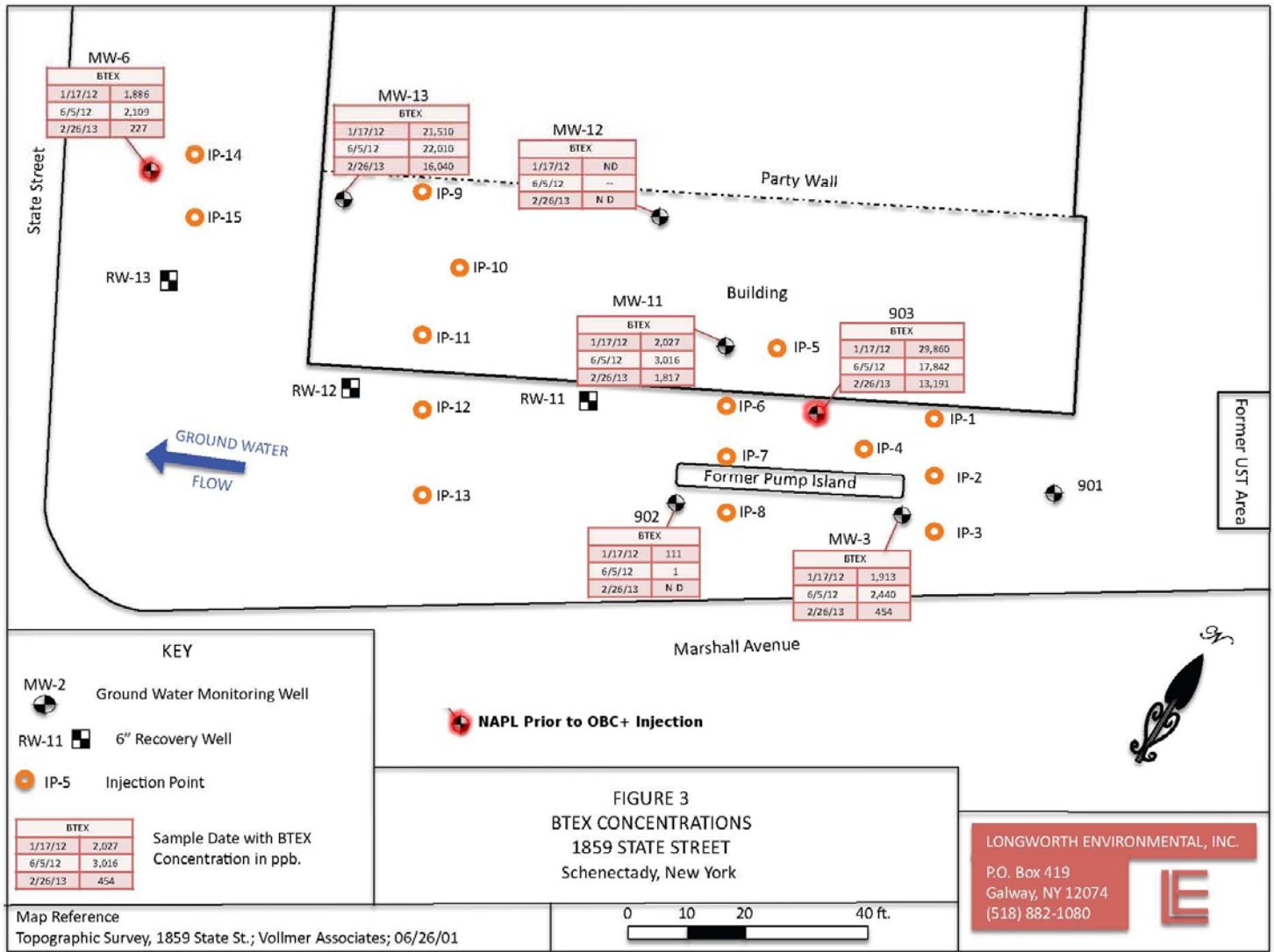


Figure 1. Site Map and Injection Locations

Ground Water Quality Summary : August 2009 - February 2013

Total BTEX
 1859 State Street
 Schenectady, NY

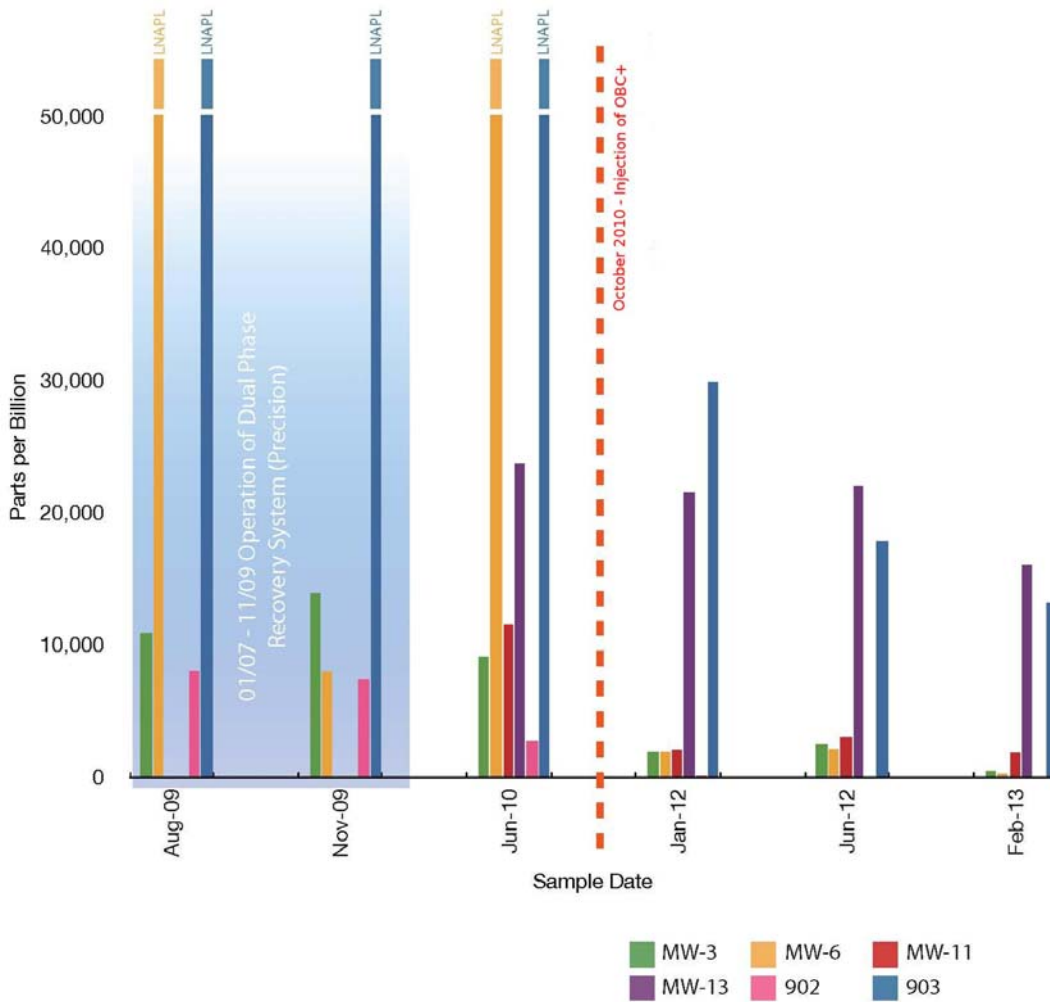


Figure 2. Monitoring Well Results for Total BTEX