



## ISCO Treatment Program: MGP Related Impacts

### Site

- Former Manufacturing Gas Plant, Upstate, NY

### Contaminants of Concern

- VOCs/ SVOCs
- PAHs
- TPH-GRO
- TPH-DRO
- NAPL

### Geology/Hydrology

- Site geology consists of a very thin coarse gravel and fine sand layer located in between two confining layers of silty clay. Majority of remaining COCs were believed to be present within the thin gravel/sand layer.

### ISCO Treatment Program

- MFR and BASP treatments.
- Three treatment events.
- Treatment Area = 4,900 ft<sup>2</sup>
- Treatment interval 9-18 ft bgs.
- Injection pathway system consisted of 43 permanent well injection locations installed in an active roadway.
- A total of 38,693 gallons of reagents were injected over the course of three events.
- Continuous air/dust monitoring was performed due to the sensitivity of the location.

### Results

- MFR and BASP treatments.
- Three treatment events.

## ISOTEC Case Study No. 83

### ISCO TREATMENT PROGRAM: MGP RELATED IMPACTS VIA MODIFIED FENTON'S REAGENT (MFR) AND BASE ACTIVATED SODIUM PERSULFATE (BASP)

Former Manufacturing Gas Plant  
Upstate, New York

### INTRODUCTION

ISOTEC was retained to implement an *In-Situ Chemical Oxidation* (ISCO) treatment program within the downgradient residual plume area of a former Manufactured Gas Plant (MGP) site utilizing a combination of modified Fenton's reagent (MFR) and base activated sodium persulfate (BASP) to address impacted soils and groundwater. The oxidants and dosages were selected based on bench scale testing that ISOTEC collaborated on. Target contaminants of concern (COCs) included volatile organic contaminants (VOCs), semi-volatile organic contaminants (SVOCs), poly-aromatic hydrocarbons (PAHs), total petroleum hydrocarbon gasoline range organics (TPH-GRO) and diesel range organics (TPH-DRO) and free-phase NAPL impacts.

### SITE BACKGROUND/GEOLOGY

Past MGP operations at the site resulted in soil and groundwater COC impacts. The ISCO target treatment area was located on an neighborhood roadway/sidewalk lined with residential and commercial properties. Numerous



subsurface utilities existed within the target area and each proposed injection point location was initially pre-cleared down to ~5 feet (ft) below ground surface (bgs) to ensure that no lines were damaged during drilling. The treatment area was approximately 4,900 square feet (ft<sup>2</sup>) and targeted a very narrow layer (0.5 to 4 feet) of coarse gravel/fine sand located in between two confining layers of silty clay. Injection well screens were selectively placed within the overall 9-18 ft bgs depth interval based on data collected from past soil borings and from new soil borings overseen by ISOTEC during the injection well installation. Selective placement of each well screen allowed for an effective method of delivering injected ISCO reagents where the significant mass of MGP impacts were located and traveling within the narrow coarse gravel/fine sand layer.

## ISCO TREATMENT PROGRAM AND IMPLEMENTATION



The ISCO treatment program was implemented over three planned injection events lasting 15-20 injection days per event. A total of 43 PVC permanent injection wells were installed at a spacing of approximately 12 feet. Due to the sensitive site setting located within an active neighborhood roadway and along portions of the adjacent sidewalks, extreme caution and thorough planning of the injection approach was taken into account for the actual field implementation. Through coordination with the City DPW and first responders, daily road closure of the targeted area was implemented during each injection event to minimize contact between field personnel/chemicals and both pedestrian and vehicular traffic. As an added precaution, chemicals were staged within a fenced area each day/night and the injection equipment/process was staged within a box truck that contained all reagents and chemicals to minimize contact with

nearby residents and allowed for quicker daily equipment setup and breakdown each day. All pumps and batching were conducted from the back of a box truck with hoses out to active injection wells that were designed to allow for quick disassembly in case emergency personnel/vehicles needed to access the work zone roadway. For added precaution to protect the surrounding community, dust/air monitoring was performed every day, active injection points were covered up with poly-sheeting to prevent accidental spraying of reagents, and venting of completed injection points through a carbon knock-out drum was performed to mitigate release of impacted vapors into the breathing zone. To minimize disruption to nearby residents, the impacted work areas were opened back up each night to allow normal vehicular/pedestrian activity to commence. Modifications to the ISCO strategy, oxidant sequencing, and amendment dosages were made in collaboration with the consultant during and between events to improve remedial performance and maintain safety working in a high-profile, residential road.

Three injection events were conducted over a 16 month time period with a total of 38,693 gallons safely injected into the subsurface within a very sensitive site setting. Upon completion of the 3 full-scale injection applications, a significant reduction of total BTEX and PAHs was noted across the treatment area. Following ISCO, groundwater concentrations reduced sufficiently to transition to long-term monitoring consistent with the Record of Decision.



