



TERRATHERM®

Commercial Project – MGP Gasholder

Project Name: In-Situ Thermal Desorption (ISTD) of Former Manufactured Gas Plant (MGP) Gasholder

Project Location: North Adams, Massachusetts. Property adjacent to commercial, industrial, and residential areas. **Owner:** Massachusetts Electric Company (MEC), a subsidiary of National Grid

Consultant: Brown and Caldwell

Time Frame: August 2003 - June 2005

Site Information: MGP operations began in the 1860s and continued until 1952. Abandoned gasholder contains approximately 2,010 cubic yards (cy) (1,537 m³) of soil and debris contaminated with coal tar. The 62 ft (19 m) diameter by 18 ft (5.5 m) deep gasholder has brick walls and a bottom believed to be constructed of concrete.

CoCs: Contaminants of Concern are as follows: Coal tar containing benzo(a)pyrene [B(a)P] concentrations as high as 650 mg/kg; naphthalene 14,000 mg/kg; benzene 6,200 mg/kg; and Total Petroleum Hydrocarbons (TPH) 230,000 mg/kg.

Soil Characteristics: Mixture of sand, gravel, cobbles, bricks, concrete fragments, ash, and clinker.

Groundwater: Perched water was encountered within the gasholder at 5.5 ft (1.7 m) below ground surface (bgs). The regional groundwater table is beneath the holder.

Contract Type, Project Goals: Guaranteed performance contract to achieve a Permanent Solution in accordance with the Massachusetts Contingency Plan (MCP), by eliminating DNAPL within the holder and reducing concentrations of VOCs, SVOCs, and TPH below MCP Upper Concentration Limits (UCLs), so that residual risk is minimized. **Achieved all remedial goals** (see table below).

**Pre- and Post-Treatment Soil Concentrations
Within the Construction Worker Exposure Depth**

Sampling Depth: 6 - 14' Average Concentrations

Constituent	Pre-Treatment mg/kg	Post-Treatment mg/kg	Reduction %
Benzene	2068	0.35	99.98%
Anthracene	19	0.48	97.47%
Benzo(a)anthracene	20	0.51	97.45%
Benzo(a)pyrene	20	0.33	98.35%
Chrysene	20	0.71	96.45%
Fluoranthene	43	1.02	97.63%
Naphthalene	679	5.7	99.16%
Phenanthrene	107	3.82	96.43%
Pyrene	65	1.12	98.28%
C11-C22 Aromatics, unadj.	4000	43.15	98.92%

All below UCLs

Project Time Line: Mobilized to the site in November 2003, with site construction beginning the same month. Dewatering/tar recovery began in February 2004. Full power heating began in July 2004 and was completed in March 2005, with demobilization completed June 2005.

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Before Treatment



During Treatment



After Treatment

Project Approach: Installation of 25 thermal wells spaced on ~12 ft (3.7 m) centers, to a depth of ~18 ft (5.5 m) bgs. Operate in three stages: 1) dewatering; 2) thermally-enhanced free-product recovery with gentle heating (produced > 16,000 gallons of coal tar); and, 3) ISTD to achieve target interwell temperatures of 617°F (325°C). Thermocouple arrays enable monitoring of subsurface temperatures. Water treatment by oil-water separator, clay-carbon media, liquid-phase granular activated carbon (GAC). Vapor treatment by regenerative thermal oxidizer with backup vapor-phase GAC.

Project Staffing: As General Contractor, TerraTherm, Inc., has provided all project design, construction, operation, and equipment.

Subcontracting: TerraTherm subcontracted for some labor, drilling, and electrical services.