

RESTORATION OF AN ABANDONED GAS STATION IN NEW JERSEY USING BIOREMEDIATION: A CASE STUDY

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INTRODUCTION - BROWNFIELD REMEDIATION

We present a case study on the closure and restoration of a gas station in New Jersey that was abandoned in 1998. This gas station is located in a protected area under the NJ Pinelands Protection Act where the underlying groundwater is classified as Class 1-PL (Pinelands Preservation Area). The previous owners abandoned the gas station due to economic pressures and left an underground storage tank (UST) system in the ground.

FIGURE 1



USTs removed

FIGURE 2



Remediation of groundwater with HydroRemed

TANK CLEANUP AND RAO - UNRESTRICTED USE

The tanks were cleaned at the site before shipping them to the recycling station. Soil samples from each pit was collected and sent to the laboratory for analysis. HydroRemed was added to the groundwater in March 2020. In December 2020, the primary contamination due to BTEX was remediated. The year of 2021 was dedicated to monitoring secondary contaminants including Nitrogen and Arsenic. Subsequently, the site received Unrestricted Use Response Action Outcome (UU-RAO) in Jan 2022. Copies of the report are available on our website. <https://www.deeaarholdings.com>

PROJECT PERFORMANCE

This case study provides a developer with a roadmap for the successful commercialization of abandoned gas stations and other such contaminated sites. This site was closed at 30 % under budget and within 3 years, approximately half the time initially estimated for cleanup. Further, the overall cost of cleanup using HydroRemed was well below the median costs for bioremediation projects as outlined in Table 2.

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BACKGROUND

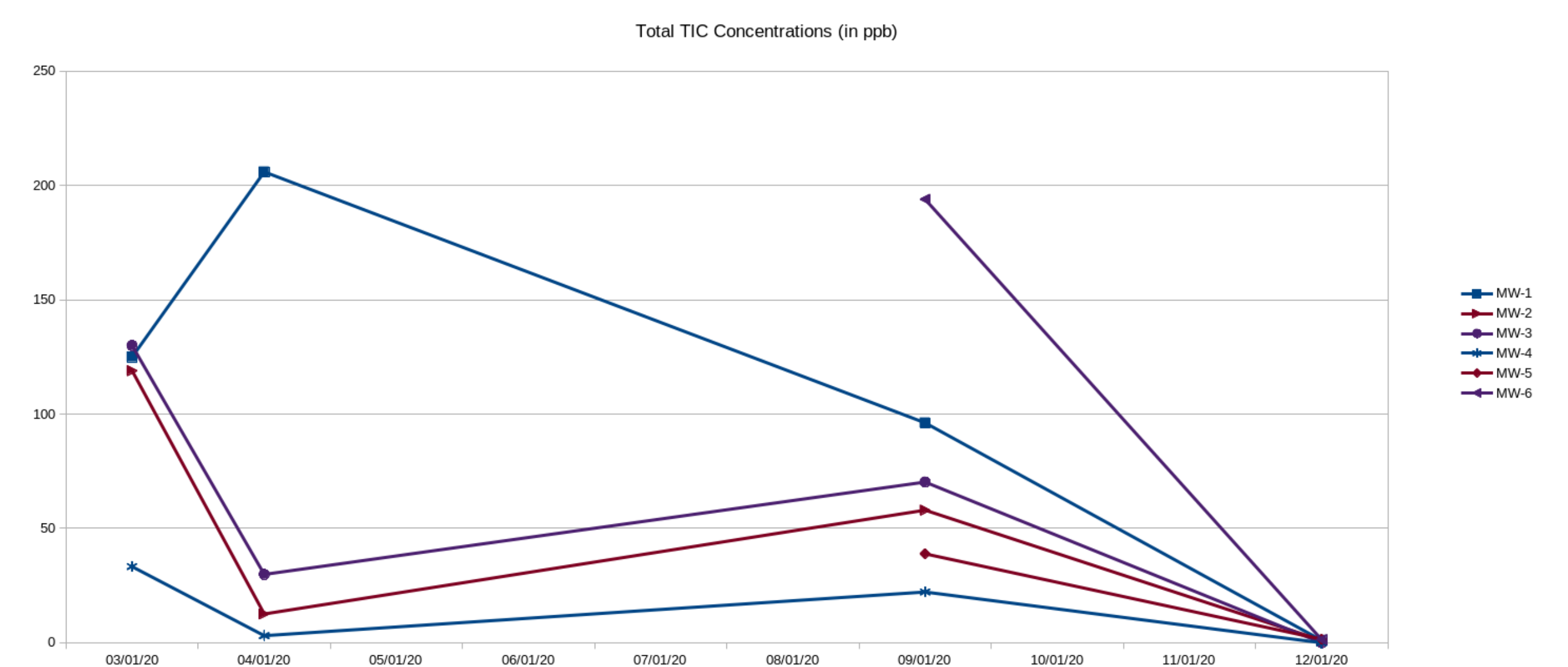
The contaminated site was an abandoned gas station located in Mays Landing, NJ, that operated a gas station with two delivery pumps. The previous owner of the gas station was compelled to abandon the property circa 1990 with several USTs still on site due to economic pressure.

THE PROCESS

According to the official records the site had 5 USTs. However, while the tanks were being removed another tank was located, thereby adding to the project risk. The *in-situ* bioremediation treatment event using HydroRemed occurred on March 27, 2020, and the site was cleaned of total identifiable compounds (TIC) by December 2020. The process involved the following steps:

- ▶ Retention of an LSRP
- ▶ Identification of the location of USTs
- ▶ Removal of USTs
- ▶ Dispatching of the tanks for recycling
- ▶ Baseline soil analysis
- ▶ Application of a Permit-by-rule for HydroRemed for remediation of groundwater
- ▶ *In-situ* Application of HydroRemed
- ▶ Analysis and remediation of contaminated groundwater
- ▶ Final monitoring before closure
- ▶ Submission of Remedial Action Report to the NJ DEP

FIGURE 3



TPH degradation curve

TABLE 1

Site Summary - All the tanks are connected to dispensers

Sl. no	Capacity	Quantity	Fuel type	Condition
1	8000	2	Unleaded gasoline	Good
2	3000	1	Leaded gasoline	Corroded
3	2000	1	Leaded gasoline	Good
4	1000	1	Kerosene	Good
5	3000	1	Two	Corroded

TABLE 2

Distribution of cleanup costs in USD

Cleanup Technology	Mean Costs	Median Costs
Air sparging or Soil Vapor Extraction	389,042.00	358,941.00
Bioremediation	446,098.00	139,506.00
Excavation	425,300.00	262,744.00
Pump-and-treat	574,038.00	230,000.00
Free product recovery	237,880.00	194,380.00