

Former Marble Quarry Landfill Brownfield Site Tuckahoe, New York

By Lenny Siegel
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The Former Marble Quarry Landfill Brownfield Cleanup Program (BCP) site in Tuckahoe, New York illustrates the inherent challenges facing New York State's extensive program to rehabilitate contaminated brownfields sites. Remediation of the former landfill is fragmented into three parts. The hotel developer enrolled in the BCP as a *volunteer* is remediating its own property, but "is not responsible for investigating or remediating off-site contamination that has migrated from the BCP site, or that was disposed off-site (i.e., the remainder of the landfill)." In the absence of finding and holding accountable a *responsible party*, the state's Department of Environmental Conservation (DEC) is addressing the other two parts using State Superfund money. Further confusing the situation, ambient air sampling by DEC near the site has uncovered another source of TCE contamination, an operating business directly across the street from the old landfill. Even if the state manages to harmonize the on-site and off-site responses, it's easy to see why many people in Tuckahoe do not have confidence in the program.



Construction at Former Marble Quarry Landfill brownfield, Tuckahoe, New York¹

Tuckahoe is a village of nearly 7,000 people in the Town of Eastchester in Westchester County, New York. From the mid-19th Century through the 1930s, the site served as a 6-acre quarry supplying high-quality marble to the nation, including the New

¹ Both photos in this report were taken by Lenny Siegel on July 12, 2017.

York Public Library and the Washington Monument. Quarrying ceased in the 1930s, and the site was dormant until the early 1950s, when the village began using it for the disposal of municipal incinerator ash, road debris, and chemical wastes from local industries. After 1958, it was used for auto repair and car storage, and most recently for surface parking.

Local residents report that materials were haphazardly dumped into the 100-foot-deep quarry holes, and that fires frequently erupted when hot ash was mixed with combustible refuse or chemical waste. During these 20-plus years, wastes containing heavy metals, pharmaceuticals, semi-volatile organic compounds, petroleum hydrocarbons, and chlorinated volatile organic compounds (VOCs) such as Freon, TCE, and tetrachloroethylene (PCE) were dumped into the deep, unlined pit of fractured rock.

In 2014, Bilwin Development Affiliates purchased 3.45 acres in the middle of the elongated property, successfully applying for inclusion of those 3.45 acres in the New York State Department of Environmental Conservation (DEC) Brownfields Cleanup Program. Bilwin, with support from Village leaders, is building a 153-room, multi-story Marriott Springhill Suites hotel, a restaurant, and parking lots totaling about 200 spaces.

In March 2016 DEC released for public comment a proposed Remedial Action Work Plan prepared by Bilwin's consultants. It included the excavation of ten so-called "hot spots"; capping of the former landfill with buildings, concrete, and other impermeable surfaces; vapor mitigation for the hotel and restaurant buildings; institutional controls; and a site management plan.

Dozens of people attended DEC's April 2016 public meeting, and many more submitted written comments. Many community members opposed the project because they believed it would provide insufficient protection of public health, and that the remedy was incomplete since only one-half of the landfill was being addressed. They asked whether construction, with dozens of pilings penetrating the landfill, would disturb and spread contamination. In addition, there were many details of the construction plan, including compaction of the soil with heavy weights, which had not yet been worked out. They also expressed concern that the plan did not address the migration of groundwater and vapors off site.

Subsequently, based upon its review of the proposed remedy, DEC added soil vapor extraction to the project. It also required additional soil characterization prior to grading and excavation. And it required both shallow and bedrock groundwater sampling to monitor groundwater contamination during remediation and site development. Still, rejecting a report by a consultant allied with project opponents, it concluded that significant migration of contaminated groundwater southward toward Bronxville is unlikely. As of this writing, there are still no monitoring wells downgradient of the site.

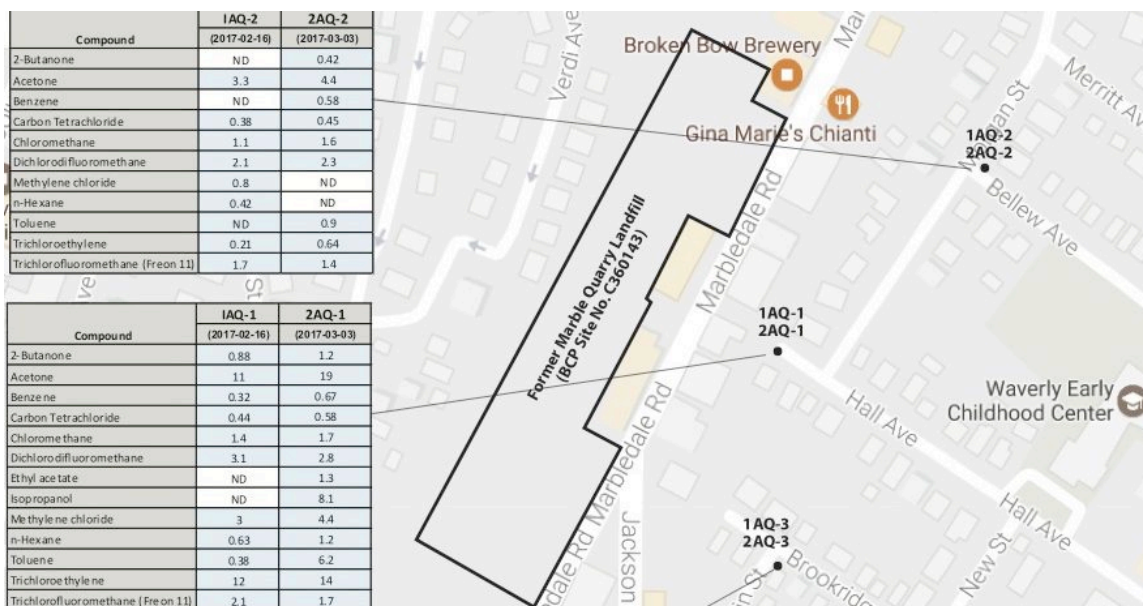
In response to the community's concerns, DEC promised:

The Department has also identified over three additional acres of the former Marble Quarry landfill as a potential ("P") inactive hazardous waste disposal site.

This will require an investigation of the remaining portions of the landfill, to be performed by the parties responsible for disposal at the site or, if such parties decline or are not viable, to be performed by the State.²

DEC began “P” site field work in September 2017 after planning and achieving access to the properties that make up the P-site.

The state began “off-site” work in March, 2016. It conducted vapor intrusion sampling—that is, indoor air, slab soil gas, and some outdoor air sampling—at a couple of dozen nearby buildings, including 22 residential buildings. In February 2017, two commercial buildings on Marbledale Road, on the same (west) side as the project, showed what appeared to be unacceptable levels of vapor intrusion.



Results of air monitoring in Eastchester, situated just east of the brownfield site. AQ1 marks the spot where high levels of TCE were found in outdoor air.³

Indoor air concentrations of TCE exceeded New York’s guideline at a fitness center, but vapor intrusion was only deemed “possible” because the owner had not agreed to slab soil sampling that might have confirmed a likely migration from the subsurface. The New York State Department of Health recommended increased ventilation and the sealing of floor openings, as well as slab soil sampling.

At a brewery, DEC found high levels of TCE and PCE in the soil gas, as well as elevated levels indoors from an earlier sampling round. It determined that vapor intrusion was potentially occurring, and it offered a vapor mitigation system. At another commercial building, enough contamination was found in the soil gas to require additional sampling.

² DEC identified several possible responsible parties, including local governments.

³ Source: Ecosystems Strategies, “Letter Report of Ambient Air Quality Sampling conducted in the Town of Eastchester,” March 22, 2017

After an unsuccessful attempt to require responsible parties to mitigate these impacts, a referral was made to the State Superfund to enable the installation of sub-slab depressurization systems at these locations and continue off-site sampling and monitoring.

Outdoor Air

In April 2017, DEC conducted sampling of 14 nearby homes, to the west and east of the brownfield site. This showed slightly elevated indoor vapor concentrations of TCE that best correlated with an outdoor source.⁴ That is, vapor intrusion was not the best explanation, since sub-slab samples did not generally have elevated levels of TCE. However, at one home the indoor and outdoor air readings surpassed the state's indoor air guideline of 2 $\mu\text{g}/\text{m}^3$.



AQ-1 Sampling location

The most telling data came from outdoor air sampling commissioned by the town of Eastchester. On February 16 and March 3, 2017, consultants collected outdoor air

⁴ I would like to thank Don Hughes of Hughes Environmental Consulting Services for his July 12, 2017 presentation, "Toxic air contaminants Tuckahoe, NY." Don analyzed the data in greater detail than I. and came up with the same conclusion.

samples east of the former quarry (selected results shown above). On a residential street just 150 feet from Marbledale Road, they found $12 \mu\text{g}/\text{m}^3$ in February and $14 \mu\text{g}/\text{m}^3$ in March. The report states that the first round of sampling was intended to establish a baseline before site activity was expected to release contamination into the air, while the second was to determine releases caused by excavation. In reality, however, site activity was minimal on both days. So both sets of data represent conditions when little construction was underway.

Despite the high levels of TCE found, the consultant dismissed these levels:

these values, however, represent concentrations typical for commercial or industrial zones and the absence of any meaningful change in concentrations between rounds suggests that the source of this compound is not the [Brownfield Cleanup Program] Site.

In my experience, these levels are not typical. I cannot remember ever seeing levels this high away from a TCE source. The similar levels, on both dates, suggest that area residents may have been exposed for a period of months, if not years. Furthermore, even short-term exposure is of concern. State and federal regulatory agencies believe that pregnant women exposed to these levels, even for a short period during the first trimester of pregnancy, have an unacceptable risk of bearing children with cardiac birth defects.

In response to my draft report, DEC explained that they too were concerned:

In response to the finding of TCE in ambient air, DEC, NYS [Department of Health], Westchester County [Department of Health] and the Village of Tuckahoe conducted an investigation of possible sources along the industrial corridor of Marbledale Road. This led to the discovery of a facility using and discharging TCE without VOC emission controls. In June 2017 that facility discontinued the use of TCE in their process.

That is, they had identified and addressed the outdoor air problem at AQ-1. It was *not* coming from the Marble Quarry Landfill. However, when I visited Tuckahoe in July, the public was unaware of these findings.

A Holistic Conceptual Site Model Is Needed

In my draft report I wrote, “New York State DEC should establish a conceptual site model identifying all of the PCE and TCE sources, pathways, and receptors in the area of the quarry.” DEC pointed me to the conceptual site model in the March 2016 Remedial Investigation Report, and they added, “CSMs are intended to be refined based on new data.”

But it’s difficult to create a conceptual site model when one is just studying a fragment of the problem. For example, thus far, I have found no explanation of the presence of VOCs in the soil gas under buildings that are not directly above the landfill. Perhaps some of the consultants or regulators have some ideas, but those should already

be public because it is on that basis that additional remediation should be designed. It is likely why soil vapor extraction was added. DEC has sampled homes in the area, but outsiders have no idea why they selected those homes. Furthermore, a robust, area-wide conceptual site model should be used to guide groundwater sampling, so the extent of contamination in both the shallow and bedrock aquifers can be delineated.

Without a full understanding of the sources, fate, and transport of contamination, it's hard to see how anyone could select an appropriate, complete remedy for the site. Construction activity—such as the driving of more than 200 micropiles, the pumping of water, and earth-moving itself—has the potential to spread contamination. The construction of buildings, parking, and other capping may make it difficult to address source areas in the future. Moreover, the installation of stormwater collection systems at the site provides another avenue for contaminated vapors to migrate offsite.

DEC told me:

EPA's Presumptive Remedy for CERCLA Landfill guidance recommends capping such landfills in place and managing the routes of potential exposure, such as soil vapor and groundwater. This was the remedy selected for the Marble Quarry Landfill BCP site....

It is essential that the site cap be properly integrated into the redevelopment and the soil vapor extraction system be properly designed to account of all avenues of off-site migration, such as the stone bedding typically used for utilities and stormwater structures.

But I am not convinced that the routes of potential exposure have been fully characterized. And as I have argued elsewhere, even if the remedy for a landfill is appropriate, that doesn't mean that it is safe in the long run to build work or living spaces on property with uncertain contaminant distribution and likely settling and off-gassing. This is why most communities redevelop old dump sites into parks and other open spaces.

Some in the community had hopes that U.S. EPA might bring a more thorough approach to the Marbledale Road cleanup. However, in response to letters from U.S. Representative Elliot Engel, U.S. EPA wrote in October 2016, "EPA concluded that the site does not present the minimum level of risk to public health needed to be considered for inclusion on the NPL [Superfund National Priorities List]." While EPA's new rule specifying how to consider vapor intrusion when calculating NPL eligibility might lead to a new assessment, listing would still be unlikely unless vapor intrusion were to be found in nearby residences.

The Marblehead Road Environmental Coalition organized to challenge the hotel and restaurant project. They brought in independent experts and mobilized hundreds of people to attend meetings sponsored by both DEC and the Village of Tuckahoe. Over 2,700 people signed a petition calling on the Village to perform a comprehensive Environmental Impact Statement before proceeding with the project. After the Village

Planning Board approved the project by a three-to-two vote in October 2016, Coalition members sued to stop the project, but in July 2017 a county judge denied their motion. The plaintiffs and the Coalition are currently considering an appeal.

New York's Brownfields Cleanup Program creates the opportunity to use development to address longstanding contamination. DEC argues that the Marble Quarry BCP voluntary cleanup eases the burden the underfunded State Superfund Program, so it can address "off-site" contamination. But I believe that fragmenting the response at seriously contaminated sites risks unacceptable exposures as well as the further migration of the hazardous substances. It's not too late to fix this problem in Tuckahoe, with the creation of a comprehensive conceptual site model, but time is running out.