

**Adelaide Avenue Environmental Justice Coalition**  
**60 Crescent Street**  
**Providence, Rhode Island 02907**

May 20, 2007

Mr. Michael Murphy  
Mactec Engineering and Consulting, Inc.  
Senior Principal Scientist  
107 Audubon Road, Bldg. 2, Suite 301  
Wakefield, MA. 01880

**Re: Soil Vapor Investigation-Parcel A**  
**Abandoned Stop & Shop Retail Complex**  
**Conditions for No Further Investigation**

Dear Mr. Murphy:

We are in receipt of Mactec's recent Soil Vapor Investigation letter submitted to the Rhode Island Department of Environmental Management (**RIDEM**). The stated objective of this investigation is to assess soil vapor concentrations beneath and in the immediate vicinity of the retail complex at the former Textron/Gorham Manufacturing Site (**Site**). The community is hopeful this investigative process will ultimately lead to testing the indoor air at the recently abandoned Super Stop & Shop located on "Parcel A", a twelve (12) acre part of the abovementioned thirty-eight (38) acre Site at 333 Adelaide Ave in South Providence, Rhode Island.

As the community understands it, vapor intrusion is defined as vapor phase migration of volatile organic and/or inorganic compounds into occupied (or, in this instance, abandoned) buildings from underlying contaminated ground water and /or soil. It is also clear to everyone that contaminant exposure via vapor intrusion can pose a serious and significant risk to the public, especially children and compromised groups and individuals within our communities.

When used in conjunction with indoor air, outdoor air, and soil gas and/or ground-water sampling, sub-slab gas sampling can be used to differentiate indoor and outdoor sources of volatile organic and/or inorganic compounds from compounds emanating from contaminated subsurface medium. This information can then be used to assess the need for

sub-slab depressurization or other risk-reduction technologies, which can be implemented to reduce present or potential future indoor air contamination due to vapor intrusion. The community continues to hope that Textron will be willing to remediate the actual source of these vapors in the ground. The consensus has been that any mitigation effort should be considered a temporary measure, until such time as Textron and their consultants and engineers can identify and eliminate the source of the problem on the site. Textron and the RIDEM should view mitigation as a short-term solution and mutually state the intention will be to ensure that steps are taken to remediate the soil and groundwater.

The RIDEM has not yet developed vapor intrusion criteria, and therefore has incorporated the state of Connecticut's most recently promulgated values. With such limited resources and manpower constraints within the RIDEM, the department's use of these established criteria is understandable and prudent. Connecticut's action values and volatilization criteria were developed using the most recent science and toxicological data, and is a practical and protective approach for evaluating vapor intrusion risk given the uncertainties related to the cancer potency of halogenated organic compounds. One of the many compounds of concern at Textron's Site is Trichloroethylene (**TCE**), just one of a number of degreasing agents used extensively throughout their facility.

TCE exposure is associated with a number of adverse health effects, including liver toxicity, kidney toxicity, developmental toxicity, neurotoxicity, toxicity to the immune system, endocrine effects, and several types of cancer. (U.S. EPA, 2004). Children exposed to the same levels of TCE vapor as adults may receive a larger dose because they have greater lung surface area to body weight ratios and increased minute volumes to weight ratios. These concerns are reflected in most agency's risk-based indoor air concentrations, and are appropriate because they indirectly address other toxicity concerns, such as protection of susceptible populations (*i.e., Environmental Justice communities, children, and those with certain diseases*) and cumulative risk and effects.

The Connecticut Department of Environmental Protection (**CT-DEP**) uses an indoor air background-based volatile organic compound (**VOCs**) concentration to develop "volatilization criteria" for groundwater and soil vapor. For example, both the residential and the industrial/commercial background-based TCE concentration for indoor air is one microgram per cubic meter (1 ug/m<sup>3</sup>). This value is then used to back-calculate TCE soil and/or groundwater concentrations protective of indoor air. That said, please note the community's observations and concerns relevant to Textron's proposed soil investigation:

- Mactec will install "*temporary sampling ports by drilling nine, 1.5-inch holes through the concrete slab*" floor of the Stop & Shop retail complex. Since the majority of the cost of this task is installation and labor; why not make the sampling ports permanent fixtures? As dedicated sampling points, they could be used in the future to evaluate subsequent pressurization differentials during seasonal climate changes; when the need for resampling occurs, or simply be available to future owners for monitoring, and evaluating the unknown long-term consequences due to the unremediated soil and groundwater contamination on site.

- The process of drilling through a concrete slab would be expected to reduce sub-slab vapor concentrations in the immediate vicinity of a penetration. An inch and a half hole (1 ½”) left open for the duration of the installation of a single probe (aprox. one hour) would obviously impact the soil gas within the sub-slab region of the floor system. It seems practical to assume that the radius of perturbation at each probe is a function of the time in which the hole is left open. Please explain how you would calculate the maximum equilibration time in the sub-slab region once the permanent vapor probe installation was sealed. Would this recharge period necessitate returning at a later date to actually retrieve the soil gas samples?

Mactec states in the **Conditions for No Further Investigation:**

- *“The analytical data from the sub-slab soil gas samples will be compared to the CT-DEP Proposed Soil Vapor Volatilization Criteria. Consistent with the proposed CT-DEP regulations, if the analytical results are below these criteria, no further investigation of the vapor intrusion pathway will be required for the retail building”.* This statement does not seem consistent with the intent and/or the application of the soil vapor volatilization criteria established by Connecticut, and also used by the RIDEM. As was indicated previously, these soil and groundwater volatilization values are back-calculated from the established risk-based indoor air concentrations. We believe these established soil vapor concentrations represent a soil gas measurement that would be located and identified in the “subsurface region”; defined as greater than five (5) feet below ground surface in soil and/or groundwater. If these vapor concentrations were encountered at depth; then the investigation would proceed, and would then include either a sub-slab sampling event, an analysis of the indoor air, or both. It is illogical and reckless to interpret the Connecticut soil volatilization criteria as target concentrations for the immediate sub-slab region.
- For example, the Connecticut Industrial/Commercial Soil Vapor Volatilization Criteria (SVVC) for TCE is 0.26 ppmv. First it would be necessary to convert parts per million by volume (**ppmv**) into micrograms per cubic meter (**ug/m3**). After converting 0.26 ppmv to 260 parts per billion by volume (**ppbv**) you then multiply the molecular weight of TCE divided by the volume of a cubic meter at an ambient temperature of 25 degrees Celsius. This formula would be:
  - Concentration (ug/m3) = Concentration (ppbv) \* MW/24.46 @ 25 C
  - Concentration (**ug/m3**) = Concentration (**260**) \* **131.39 / 24.46 @ 25 C.**
 Mactec is thus stipulating that the Industrial/Commercial Soil Vapor Volatilization Criteria for Trichloroethylene (TCE) would be **1,396.20 ug/m3**. The New York Department of Health (**NYDOH**) has established a rather complex matrix (find enclosed) for determining sub-slab soil gas concentration thresholds based on their promulgated indoor air action levels. Sub-slab concentrations for TCE vapor readings between 2.2 and 22 ug/m3 are to be resampled. Sub-slab concentrations greater than twenty-two (22) ug/m3 necessitate mitigation and further investigation. It is absurd for Mactec to suggest that Textron will use 1,396.20 ug/m3 as a sub-

slab action value for the retail complex on "Parcel A", especially in light of the fact the NYDOH has mandated any concentration over 22 ug/m3 will be mitigated. Therefore, please determine, and incorporate into your work plan what the actual immediate sub-slab region concentrations should be to establish "*Conditions for No Further Action*". It would be helpful to establish this sub-slab soil vapor volatilization criteria for all the volatile organic and/or inorganic compounds found on Textron's hazardous waste site.

- Mactec should include a number of ambient outdoor air tests in their sampling schedule. It would be insightful to identify the threshold VOC values around the outside of the building before establishing an indoor air target. The ambient outdoor air test results from the high school next door continue to exceed, by a full magnitude, typical urban background concentrations. Please indicate if similar conditions are present at the now abandoned Super Stop & Shop located on Parcel A.

The various community and stakeholder groups impacted by this site applaud Textron's efforts to further characterize and identify the outstanding and misunderstood contamination issues found on their site. We only hope that one-day the Textron/Gorham hazardous waste site is fully remediated, and successfully redeveloped with the public, and especially the children's, best interests in mind.

Very truly yours,

## **Adelaide Avenue Environmental Justice Coalition**

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