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16 April 2007

Mr. Joseph T. Martella II, Senior Engineer
RIDEM - Office of Waste Management
Site Remediation Program
235 Promenade Street
Providence, Rhode Island 02908

RE: 22 March 2007 Air Sampling Event/Order of Approval Compliance Follow-Up Letter
Adelaide Avenue School, 333 Adelaide Avenue, Providence, Rhode Island
Case No. 2005-029
EA Project No. 61965.01

Dear Mr. Martella:

On behalf of the Providence Department of Public Property (City), EA Engineering, Science, and Technology, Inc. (EA) is providing this letter in accordance with Item 6(e)(vi) of the Department's Order of Approval (OA) issued in June 2006 and amended in February 2007 for the referenced site.

As communicated via telephone message to the Rhode Island Department of Environmental Management (the Department) at approximately 4:30 pm on Tuesday, 10 April 2007, several volatile organic compounds (VOCs) were identified in indoor air at the site in concentrations that exceed the applicable Indoor Air Action Levels during the sampling event completed on 22 March 2007. We have attached a table summarizing the pertinent data, a figure illustrating the indoor sampling locations, and a copy of the laboratory analytical report for your reference. Please note that the attached table only includes the VOC compounds in indoor air that exceeded the applicable Indoor Air Action Level in at least one sample.

Based upon our preliminary review of the data, we offer the following observations:

- The 22 March 2007 laboratory data was collected (per Department Ordered schedule) during a time when some VOC-emitting construction activities were still ongoing within the building. As such, multiple VOCs related to construction activities and/or building materials were detected within indoor air. The majority of these indoor air concentrations are significantly less than the indoor air concentrations measured during the sampling event on 15 March 2007.

- Nine VOCs known to be related to construction activities and/or found in cigarette smoke which were detected at concentrations exceeding applicable Indoor Action Levels on 15 March 2007 (Acetone, Methylene Chloride, 1,2-Dichloropropane, 1,2-Dichloroethane, 1,1,2,2-Tetrachloroethane, Bromodichloromethane, Styrene, total Xylenes, and 1,3,5-Trimethylbenzene), were not detected above the applicable Indoor Air Action Levels during this sampling event. This significant decrease is indicative of the fact that less VOC-emitting construction activities were ongoing during the 22 March 2007 sampling event as opposed to the previous sampling on 15 March 2007, and due to dissipation of construction related VOCs.

- The usefulness of VOC data obtained from sub-slab air sampling ports installed beneath the building floor continues to be limited since two VOC compounds (Acetone and 2-Butanone) continue to be present at relatively high concentrations within each sub-slab sampling location (MP-1 through MP-8). These two VOCs are primary components of PVC primer and solvent cement used to connect sections of PVC piping during installation of the sub-slab sampling ports and SSD System piping components. The presence of these two compounds at these concentrations necessitated sample dilutions at the laboratory which, in turn, elevated the reporting limits for all the VOCs being analyzed. Therefore, although all other VOCs in the sub-slab air were reported to be "Not Detected" by the laboratory, the reporting limits are greater than the Indoor Air Action Levels (applicable to indoor air only), and said compounds may or may not be present in the sub-slab air at concentrations less than the 22 March 2007 reporting limits. However, as a result of construction-related VOC dissipation and effective operation of the SSD System between the 15 March and 22 March 2007 sampling events, the concentrations of Acetone and 2-Butanone were significantly less than those reported by the laboratory for the 15 March 2007 sampling event. Similarly, the reporting limits of all other VOCs analyzed within sub-slab air were also significantly less than those provided for the previous week's data. As the VOCs resultant from the sub-slab piping construction and installation process continue to dissipate over time, and the SSD system continues to operate, the concentrations of Acetone and 2-Butanone are expected to continue to decrease and the laboratory reporting limits will match those being reported for indoor air samples.

  With respect to compliance with OA Provision 6(e)(v), indoor air samples from locations that correspond to the sub-slab sampling locations (i.e., are located above the sub-slab locations) were collected at the same time as the sub-slab samples on 22 March 2007, and another series of sub-slab and indoor air samples are scheduled to be collected in April 2007. Therefore, compliance with OA Provision 6(e)(v) has been achieved.

- One compound detected in indoor air at concentrations that slightly exceed the applicable Indoor Air Action Level, Carbon Tetrachloride, was also detected at approximately the same concentration in outdoor ambient air in the vicinity of the school building. Therefore, Carbon Tetrachloride within the indoor air is considered to be a background concentration at the site. For comparative purposes, all the Carbon Tetrachloride concentrations reported for this sampling event are less than the promulgated State of Connecticut Residential Target Air Concentration for this compound (1 ug/m^3).

- Chloroform, a known by-product of water chlorination processes, was detected in one of the eight indoor air samples at a concentration that exceeds the applicable Indoor Air Action Level for this compound. However, chlorination of the water supply to the school was in progress at the site within bathrooms, locker rooms, and corridors (water fountains) during the week prior to the time of sample collection. Additional, scheduled indoor air and sub-slab air sampling will provide more data to evaluate this compound.

- Concentrations of two VOCs, Ethylbenzene and 1,2,4-Trimethylbenzene, known to be resultant from smoking tobacco products and/or from building construction activities in progress at the time of, or noted prior to the sampling event (e.g., smoking, painting, adhesives, etc.), were found in several of the indoor samples collected during this sampling event at concentrations that exceed the applicable Indoor Air Action Levels. Due to dissipation of construction-related VOCs and the reduced amount of ongoing construction

activity in the school, the concentrations of these compounds were significantly less than those reported for the 15 March 2007 sampling event.

- Trichloroethene, found in adhesives and paint thinners but also found in historical soil vapor samples at the site, was detected in ambient outdoor air and within one of the eight indoor samples collected on 22 March 2007 at concentrations that exceed the applicable Indoor Air Action Level of 1 microgram per cubic meter (ug/m^3). The ambient outdoor air concentration was reported to be 2.74 ug/m^3, and the indoor sample collected within the Kitchen Storage Room was reported at 1.72 ug/m^3. For comparative purposes, both of these concentrations are less than the promulgated State of Connecticut Residential Target Air Concentration and the New York State Department of Health Air Guideline Value for Trichloroethane (both at 5 ug/m^3). Additional, scheduled indoor air and sub-slab air sampling will provide more data to evaluate this compound.

- The 22 March 2007 sampling round included sampling of the effluent air stream from each of the three rooftop fans installed as part of the SSD System. In accordance with condition 3(d)(vii)(7) of the Amended Order of Approval, the VOC data and measured air flow rates were used to calculate cumulative VOC emissions from the SSD System. A table summarizing the rooftop fan data, the individual and cumulative VOC emissions, and comparisons to the Department's Air Pollution Control Permit Applicability Thresholds is attached. The calculated individual and cumulative VOC emissions are several orders of magnitude less than the permit applicability thresholds.

Therefore, no SSD System modifications or other actions to address current site conditions are warranted or proposed at this time based upon these preliminary evaluations and in light of the following:

- Considering historical soil vapor sampling data, VOCs with the highest potential to be present in indoor air were not detected in the school building above the applicable Indoor Air Action Levels with the exception of two compounds that were also detected at similar or higher concentrations in background ambient samples.

- No building occupancy is scheduled until September 2007.

- The SSD System has been operating uninterrupted and according to design since 16 March 2007.

- Weekly field monitoring of sub-slab vacuum and VOCs at the site has demonstrated proper SSD System depressurization of the sub-slab region and the expected, consistent downward trend with respect to total VOCs both inside and beneath the building, respectively.

- A third complete round of indoor air and sub-slab air samples is scheduled for collection in April 2007.

In conclusion, we are encouraged by the results of the sampling efforts completed thus far at the site, and we are confident that additional, scheduled air monitoring and sampling events will provide the additional data necessary to continue to evaluate VOCs at the site.

We trust that this correspondence satisfies OA Provision 6(e)(iv). However, if you have any questions or require additional information, please do not hesitate to contact me at 401-736-3440, Ext. 216.

Sincerely,

EA ENGINEERING, SCIENCE,
AND TECHNOLOGY, INC.

Peter M. Grivers, P.E., LSP
Project Manager

Attachments

cc: J. Simmons, City of Providence
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