

18 December 2023

Mr. Joseph T. Martella II, Senior Engineer
Site Remediation Program
Office of Waste Management
RI Department of Environmental Management
235 Promenade Street
Providence, RI 02908

*RE: Quarterly O&M Status Report No. 65
Alvarez High School, 333 Adelaide Avenue, Providence, Rhode Island
Case No. 2005-029
EA Project No. 15066.11*

Dear Mr. Martella:

On behalf of the City of Providence School Department (City), EA Engineering, Science, and Technology, Inc., PBC (EA) is providing this Quarterly Operations and Maintenance (O&M) Status Report in accordance with Provision 6(f) of the Order of Approval and amendments (Amended OA) for the referenced Alvarez High School site (the Site, formerly Adelaide Avenue High School).

This O&M Report summarizes recently completed Site activities related to compliance sub-slab vapor and indoor air sampling for the period from September 2023 through November 2023.

If you have any questions or require additional information, please contact me at (401) 287-0370.

Sincerely,

EA ENGINEERING, SCIENCE,
AND TECHNOLOGY, INC., PBC



Jonathan Alvarez, CPG
Senior Project Manager

cc: Superintendent, Prov. Dept. of Public Schools Director, Prov. Dept. of Public Property
A. DeGrace, Prov. Redevelopment Agency Knight Memorial Library Repository
R. Dorr, Neighborhood Resident Principal Biah, Alvarez High School
Rep. Scott Slater

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Quarterly O&M Status Report No. 65

Summarizing Sub-slab Depressurization and Indoor Air Monitoring and Sampling Activities

Alvarez High School Site (Formerly Adelaide Avenue High School) Providence, Rhode Island

Prepared for

City of Providence School Department
797 Westminster Street
Providence, Rhode Island 02903

Prepared by:

EA Engineering, Science, and Technology, Inc., PBC
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(401) 736-3440

EA Project No. 15066.11
December 2023

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TABLE OF CONTENTS

1.	INTRODUCTION AND BACKGROUND	1
2.	SUMMARY OF SSD SYSTEM AND INDOOR METHANE MONITORING SYSTEM PERFORMANCE	2
	2.1 SSD SYSTEM AND RELATED MONITORING	2
	2.1.1 Sub-Slab Monitoring	2
	2.1.2 Rooftop Extraction Fans	3
	2.1.3 Engineered Cap	3
	2.2 INDOOR METHANE MONITORING SYSTEM	4
	2.3 AMBIENT OUTDOOR AND INDOOR AIR SAMPLING	4
	2.4 SUB-SLAB VAPOR SAMPLING AND EVALUATION OF POTENTIAL VOC REBOUND EFFECT	5
	2.5 SUMMARY OF ROOFTOP VOC EMISSIONS	6
3.	CONCLUSIONS	8
4.	FUTURE ACTIVITIES AND NEXT QUARTERLY SUMMARY REPORT	10

FIGURES

FIGURE 1:	SITE LOCATION MAP
FIGURE 2:	INDOOR AIR SAMPLING AND METHANE MONITORING SYSTEM DIAGRAM
FIGURE 3:	AS-BUILT SUB-SLAB MONITORING AND SAMPLING PLAN
FIGURE 4:	PARCEL C SHOTPUT & DISCUS THROWING FIELD

APPENDICES

APPENDIX A:	O&M FIELD FORMS
APPENDIX B:	INDOOR AND AMBIENT OUTDOOR AIR ANALYTICAL SUMMARY
APPENDIX C:	SUB-SLAB VAPOR ANALYTICAL SUMMARY
APPENDIX D:	INDOOR AMBIENT AIR CONTINGENCY SAMPLING ANALYTICAL SUMMARY
APPENDIX E:	ROOFTOP EMISSION ANALYTICAL SUMMARY
APPENDIX F:	INDOOR AIR, AMBIENT OUTDOOR AIR, AND SUB-SLAB VAPOR LABORATORY ANALYTICAL REPORTS
APPENDIX G:	LABORATORY DETECTION LIMITS CORRESPONDENCE

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1. INTRODUCTION AND BACKGROUND

On behalf of the City of Providence School Department (the City), EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared this Quarterly Operations and Maintenance (O&M) Status Report No. 65 for the Parcel B area of the former Gorham Manufacturing site in Providence, Rhode Island, formerly referred to as Adelaide Avenue High School and now referred to as Dr. Jorge Alvarez High School (the Site). A Site Location Map is provided as Figure 1. This report has been prepared to satisfy provision 6(f) of the Rhode Island Department of Environmental Management (RIDEM) Order of Approval (OA) issued in June 2006, as amended in February 2007, July 2007, and July 2009. For the purposes of this report, the original and the amended OA will collectively be referred to as the Amended OA.

The Amended OA specifies the details of the approved remedy for the Site including, but not limited to, the installation of a sub-slab depressurization (SSD) system, installation of a continuous indoor air methane monitoring system, and implementation of an associated periodic monitoring and sampling program. In August 2007, the RIDEM-approved remedy for the Site was completed and a Remedial Action Closure Report (RACR) was submitted to RIDEM. In July 2009, the periodic indoor air and sub-slab vapor sampling schedule was reduced to quarterly sampling from previously required monthly sampling.

This report summarizes the O&M, monitoring, and sampling activities completed at the Site for the three-month period from September 2023 through November 2023 (Quarterly Reporting Period No. 65). Please refer to Quarterly O&M Status Reports No. 1 through No. 64 for information regarding monitoring and sampling at the Site during the previous quarters. The RACR and previously submitted monthly correspondence contain details regarding the results of the monitoring and sampling program for the period prior to Reporting Period No. 1.

2. SUMMARY OF SSD SYSTEM AND INDOOR METHANE MONITORING SYSTEM PERFORMANCE

2.1 SSD SYSTEM AND RELATED MONITORING

The following SSD system performance parameters were inspected and/or monitored at the frequencies indicated below in accordance with the Amended OA and through discussions with RIDEM to evaluate system performance:

- Monthly indoor air monitoring of vapor-phase constituents and methane (15 September 2023, 25 October 2023, and 15 November 2023) at 12 monitoring locations, as illustrated on the Indoor Air Sampling and Methane Monitoring System Diagram provided as Figure 2.
- Monthly sub-slab monitoring of vacuum pressure, vapor-phase constituents, and methane (15 September 2023, 25 October 2023, and 15 November 2023) at 11 monitoring locations, as illustrated on the As-Built Sub-slab Monitoring and Sampling Locations provided as Figure 3.
- Monthly inspections and monitoring (air velocity and vacuum) of the three rooftop fans to verify proper operation and effluent concentrations.
- Monthly inspections of the electronic monitoring system associated with each of three SSD system extraction fans and the methane sensor system (automatic alarm notification via audible signal and phone notification).
- Monthly inspections of the RIDEM approved engineered cap.
- Quarterly sampling (25 October 2023) of eight indoor air locations, one ambient outdoor air location, six sub-slab points, and three rooftop fans.
- Contingency sampling (15 September 2023, 9 October 2023, and 15 November 2023 and 29 November) of seven indoor air locations

Copies of O&M field forms summarizing SSD System monitoring data collected during this reporting period are provided in Appendix A.

2.1.1 Sub-Slab Monitoring

Vacuum measurements taken at each interior and perimeter sub-slab monitoring/sampling locations ranged from 0.037 to -0.118 in. of water column. Positive pressure points were observed at MP-1 and MP-3 in October and November. Zero pressure readings were observed in MP- 6 and MP-7 in October and November, respectively. All rooftop fans were observed to be operating correctly during this reporting period; pressure and air velocity recorded at all rooftop fans were within normal ranges. During the September to November 2023 quarter, indoor

subslab monitoring points have had higher than normal PID readings despite adequate vacuum pressures below the slab. During the 25 October sampling event, IMP-2 and IMP-3 had PID readings of 10,000 and 15,000 parts-per-billion (ppb), respectively. During the 15 November monitoring event, IMP-2 and IMP-3 had PID readings of 3,170 and > 20,000 ppb, respectively. IMP-3, located on the eastern side of the school, has continued to exhibit elevated PID readings. EA recognized this as a newly developed condition which may be related to increasing subslab vapors (March 2022) and the shutdown of the groundwater treatment system (March 2023) on Parcel A (Former Stop and Shop).

2.1.2 Rooftop Extraction Fans

The rooftop extraction fans were replaced with upgraded models on 20 October 2023 as part of the proposed mitigation strategy to address VOCS in the subslab. Each fan had inspection ports installed along their position on the 1st floor to allow for measurements of pressure between the slab and the roof. Each of these three trunk lines was shown to have adequate vacuum on the 1st floor. In addition, on 7 November 2023 the SSD system was video inspected to determine if blockages existed in the PVC trunk lines below the slab. The video inspection found open trunk lines and sump pits in each line accessible by the video system, representing 50% of the installed sub-slab piping/sump pit network. These trunk lines and sump pits that were clear were SP-4, SP-5, SP-7, and SP-8.

The pressure sensors on each rooftop fan are connected to an alarm panel and autodialer system, which is triggered when a change in pressure is detected in the rooftop exhaust fans. The exhaust fan alarm system is connected to back-up battery packs in the control panel, which have sufficient capacity to operate for multiple days in the event of an electrical outage or power disruption to the system. Negative fan vacuums and fan speeds observed at the site were within normal ranges. Sub-slab pressures observed at the site were mostly negative with four exceptions of zero or positive values.

2.1.3 Engineered Cap

The engineered cap appeared in good condition. Previously eroded areas of the cap on Parcel B were filled with clean loam and seeded on 7 July 2022. EA will continue to monitor the cap for any future deficiencies.

EA observed the school's public garden to have been razed as PPSD indicated that they would do to preserve the integrity of the engineered cap.

In April 2020, the City installed two 10-foot (ft) by 20-ft by 4-in thick concrete throwing pads in the southwestern corner of Parcel C on the grassed recreation field between Dr. Jorge Alvarez High School and Mashapaug Pond. The pads were constructed in accordance with the Temporary Parcel C Cap Disturbance Notification letter submitted to RIDEM on 31 March 2020. The concrete pads remain in place as part of the engineered cap and concrete pad inspections have been incorporated into the routine monitoring events. The concrete pads appeared to be in

good condition and no cracks or chips were observed. Shotput and discus landing zones also appeared in good condition and no erosion damage to the cap were present. A site plan depicting the location of the shotput and discus throwing pads is included as Figure 4.

Any and all future landscaping work, including gardening at Alvarez High School (Parcel B), and/or the shot-put and discus throwing field (Parcel C) must adhere to the Soil Management Plan and the Amended OA to ensure the engineered cap is not damaged and the protective cover soil layer is maintained. EA will continue to inspect the pads on a monthly basis and report findings and routine maintenance in the Quarterly O&M Status Reports.

2.2 INDOOR METHANE MONITORING SYSTEM

Indoor methane concentrations were monitored by an indoor methane monitoring system equipped with automatic alarm notification via audible signal and phone notification within the school at eight RIDEM-approved locations (refer to the Indoor Air Sampling and Methane Monitoring System Diagram provided as Figure 2) during this reporting period. The methane monitoring system was inspected during each monitoring event and the filters were replaced on 25 October 2023. The next filter replacement is scheduled for January 2024.

2.3 AMBIENT OUTDOOR AND INDOOR AIR SAMPLING

Nine indoor air samples and one ambient outdoor air sample were collected at the site at RIDEM-approved sampling locations during the quarterly sampling event on 25 October 2023. The samples collected on 25 October 2023 were submitted to Pace Analytical Laboratory (Pace) for analysis of VOCs via Method TO-15 Selective Ion Monitoring (SIM). Each summa canister used during this monitoring period was individually certified to ensure that all containers were devoid of residual contamination. The typical summa canister certification process occurs in batches. However, individual certification was requested by RIDEM for this and future sampling events after residual contamination affected the 1 August 2014 sampling results.

Sample results were compared to the State of Connecticut's Draft Proposed Indoor Residential Targeted Air Concentrations (CT RTACs) and the RIDEM approved threshold level in accordance with the Amended OA. Sampling locations for the indoor air samples are illustrated on Figure 3. The 25 October 2023 ambient outdoor air sample was collected upwind (east-southeast) of the school. A data summary table is provided as Appendices B and D and a copy of the laboratory data reports associated with the sampling events are provided in Appendix F.

Five analytes were identified in indoor air above the CT RTACs and RIDEM threshold levels during the 25 October 2023 quarterly sampling event: Carbon Tetrachloride, Chloroform, 1,2-Dichloroethane, 1,2-Dichloropropane, and Methylene Chloride.

Exceedances of carbon tetrachloride were identified in the elevator hallway, Room 118, Room 145, Room 152, and the outdoor ambient air sample at levels between 0 and 0.08 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) above the indoor limit of 0.5 $\mu\text{g}/\text{m}^3$. Exceedances of chloroform were identified in the kitchen storage room and Room 145 at levels of 1.1 and 0.22 $\mu\text{g}/\text{m}^3$,

respectively, above the indoor limit of $0.5 \mu\text{g}/\text{m}^3$. Exceedances of 1,2-Dichloroethane were identified in the kitchen storage room and Room 145 at levels of 0.13 and $0.04 \mu\text{g}/\text{m}^3$, respectively, above the indoor limit of $0.08 \mu\text{g}/\text{m}^3$. Exceedances of 1,2-Dichloropropane were identified in the kitchen storage room and in Room 145 at levels of 0.1 and $0.38 \mu\text{g}/\text{m}^3$, respectively, above the indoor limit of $0.13 \mu\text{g}/\text{m}^3$. An exceedance of methylene chloride was identified in the kitchen room storage at a level of $2 \mu\text{g}/\text{m}^3$ above the indoor limit of $5 \mu\text{g}/\text{m}^3$.

The MDLs for several VOCs reported via TO-15 analysis were greater than the respective CT RTACs/RIDEM threshold levels even though analysis was performed using the method with the lowest available detection levels (SIM procedure). The elevated MDLs occurred primarily with analytes that are not the constituents of concern (COCs) for the project. Additionally, many of these analytes have never been detected in indoor air at concentrations greater than the applicable standards. Therefore, the slightly elevated MDLs for some analytes were not considered significant and do not disqualify the dataset. Refer to Appendix F for an MDL verification letter from Con-Test verifying that where MDLs are not able to be met, the detection limit was the lowest currently achievable.

2.3.1 Contingency Plan and Sampling

Contingency sampling occurred on 15 September 2023 in Room 116, on 9 October 2023 in Rooms 115, 116, 117 and the wall space between rooms 116 and 117, on 25 October 2023 in Room 116, on 15 November 2023 in Rooms 116, 145, 152 and the kitchen storage room, and on 29 November 2020 in Rooms 116, 145, 152, and the kitchen storage room..

Room 116 was sampled first in June of 2023 in response to abnormally high PID readings in MP-4 and was found to be exceeding in select analytes. In accordance with the mitigation plan, Room 116 has been sampled consecutively for 3 months, from September to November in addition to being part of the bi-weekly sampling plan of Rooms 145, 152, and kitchen storage. These three rooms are being sampled in response to exceedances of select VOCs during the 25 October 2023 sampling event. Results of the contingency samplings are shown in Appendix D.

2.4 SUB-SLAB VAPOR SAMPLING AND EVALUATION OF POTENTIAL VOC REBOUND EFFECT

A total of 11 RIDEM-approved sub-slab sampling locations are installed at the Site. Six sub-slab samples were collected on the rotating schedule in accordance with the Amended OA and analyzed for VOCs via US EPA Method TO-15 SIM. Two interior sub-slab vapor samples and four exterior sub-slab vapor samples were collected on 25 October 2023. The sub-slab analytical results are presented in Appendix C and a copy of the laboratory data reports associated with the sampling events are included in Appendix E. The locations for sub-slab sampling are illustrated on Figure 3.

2.5 SUMMARY OF ROOFTOP VOC EMISSIONS

Previous rooftop effluent sampling rounds conducted in March 2007 (immediately after SSD system startup), June 2007, June 2008, September 2009, and annually in July thereafter (2010 – 2022) indicated compliance with all Air Pollution Control Permit Applicability Thresholds. Additionally, in October 2014 RIDEM conducted roofline and downwind outdoor air sampling to determine if rooftop fan exhaust was possibly infiltrating the building or impacting downwind air. The roofline and downwind sample concentrations were approximately the same as the upwind sample concentration and significantly lower than those concentrations observed in the rooftop fan exhaust, indicating that exhausted vapors from the rooftop fans were well dispersed and are not causing significant impacts downwind or inside the building.

The Amended OA requires that rooftop VOC sampling be completed on an annual basis. Concentrations of VOCs in rooftop fan vents continue to be evaluated based on the regulatory thresholds and their effect to background air at the school and the nearby residential neighborhood. Rooftop fan sampling was last conducted on 18 July 2023. No exceedances of the RIDEM Air Pollution Control Permit Applicability Thresholds for hourly, daily, or annual emissions were observed. A summary of historical rooftop fan emission data is summarized in Table 1 below.

Table 1 Annual Rooftop Fan Emissions

Annual Monitoring Date	Total Emissions ^a (lbs/year)
-	RIDEM Threshold: 50,000 ^b
20 July 2012	4.08
9 July 2013	3.47
1 August 2014	2.45
22 October 2014	2.83
21 July 2015	2.93
20 July 2016	2.86
26 July 2017	2.07
27 July 2018	0.412
29 July 2019	3.82
23 July 2020	1.47
21 July 2021	0.690
28 July 2022	2.21
18 July 2023	2.41

^a Sum of all three rooftop fan emissions; emissions based on measured flow speed and EPA Method TO15-SIM air sample analysis
^b RIDEM Air Pollution Control Regulation No. 9 [Amended April 2004]
 RIDEM = Rhode Island Department of Environmental Management
 lbs/year = pounds of gas per year

All emissions are below the RIDEM Air Pollution Control Regulations. Fluctuations in emissions since July 2021 may be indicative of abnormally high subsurface concentrations of VOCs along the eastern portion of the school. One possible explanation for this variability may be fluctuating depths to the groundwater table in the vicinity of the school. As the depth to

groundwater decreases, soil gas emissions to the extraction system are anticipated to increase due to increase pressure from the capillary fringe of the site and adjoining area that is largely capped with asphalt. Full analytical results of rooftop fan sampling are summarized in Appendix D and Quarterly Monitoring Reports No. 1 – No. 64. The next annual rooftop effluent VOC sampling event is scheduled for July 2024.

3. CONCLUSIONS

The following conclusions are made based upon the completed inspections, monitoring, and sampling performed during this reporting period:

- Measured sub-slab pressures were not consistently negative, which would suggest the potential for soil vapor intrusion into Alvarez High School. The results of contingency indoor air testing have prompted further investigation of indoor sub-slab points.
- The 20 November 2023 replacement fans resulted in a measurable increase of flow at the roof with the goal of increasing the vacuum in the sub-slab.
- The 6 November 2023 installation of cleanout ports and subsequent inspection indicated that the SSD system is unobstructed between the rooftop fans and the sub-slab interface.
- The 7 November 2023 video inspection of the SSD system trunk lines below the slab showed clear and open piping serving five of the eight sump pits and open sump pits at 4 locations. The video inspection was limited by tight turns and could not reach the entire SSD system.
- The continuous operation of the SSD System and confirmation of continuous sub-slab vacuum beneath the school illustrates ongoing, effective operation of the SSD System. However, continuous process improvements will continue to eliminate indoor air exposures.
- The school's outdoor garden has been removed to prevent garden crops from penetrating the engineered cap via their roots. The concrete pads and throwing areas on Parcel C appeared to be in good condition and no signs of cap degradation or erosion were observed.
- The sub-slab data was evaluated for potential rebound in accordance with the Amended OA. Evidence of increasing VOCs beneath the school has been observed. Significant fluctuations in concentrations were noted during this reporting period; these variations may constitute an increasing trend. EA and the PPSD have been in close communications with RIDEM and the ownership team associated with Parcel A upon notification of increasing sub-slab vapors since March 2022 and vinyl chloride detections on the perimeter of the school in groundwater. In addition, the groundwater treatment system on Parcel A was shutdown between March and December 2023 without notifications to RIDEM/PPSD. This system has since been restarted and the results of this activity on the indoor air at the school will continue to be evaluated.
- The use of certified clean summa canisters, as requested by RIDEM, yielded confidence in the samples collected throughout the September to November 2023 quarter. EA will continue to use certified clean canisters in the upcoming sampling events.

- The contingency sampling conducted in Room #116 showed exceedances of the indoor air standards. Follow-up began in September and continued through October and November. Results are reported in Appendix D.

4. FUTURE ACTIVITIES AND NEXT QUARTERLY SUMMARY REPORT

The following activities will be completed in accordance with the Amended OA during the next quarterly status reporting period from December 2023 to February 2024:

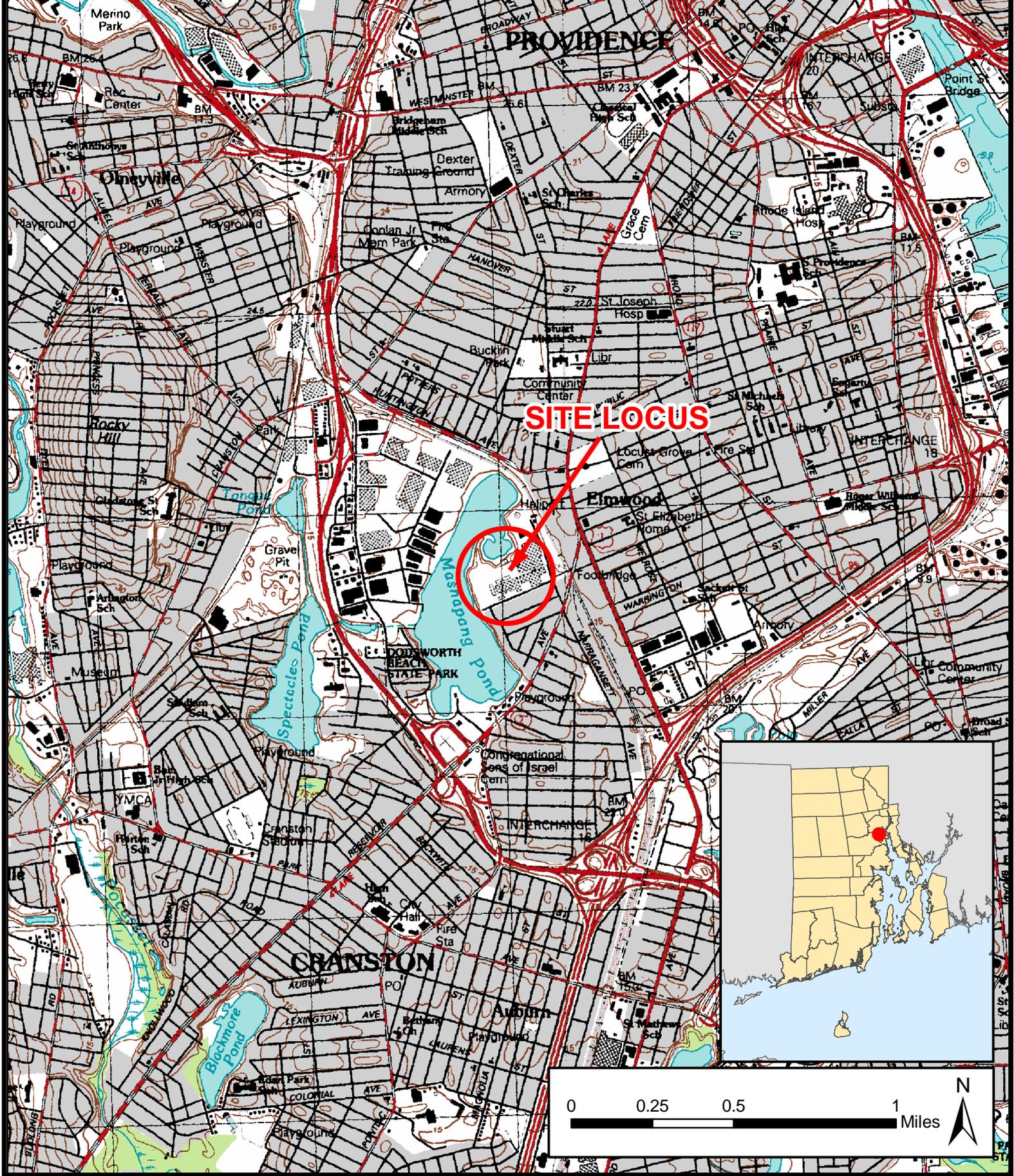
- Continuous monitoring of the operational status of the three rooftop extraction fans;
- Monthly site inspections and monitoring using a calibrated photoionization detector with part-per-billion sensitivity and a Landtec multi-gas meter;
- Collection of air samples from nine indoor locations, one ambient outdoor location, and six sub-slab monitoring points in January 2024;
- Collection of air samples from four indoor locations as part of additional bi-weekly sampling on an as-needed basis in December 2023.
- The engineered cap on Parcel B as well as the concrete throwing pads on Parcel C will be inspected during the routine monthly sub-slab inspections and reported in future Quarterly O&M reports;
- EA will continue to work with PPSD and RIDEM to ensure that the Parcel A remedial systems are maintained and data reported in accordance with regulations.
- Any future landscaping projects and erosion repairs by the City must be conducted in accordance with the site-specific Soil Management Plan and the Amended OA to prevent damage to the engineered cap.

These activities will be summarized in the next status report (Quarterly Status Report No. 66), expected to be submitted by the end of March 2024.

4.1 FUTURE CORRECTIVE ACTION AND INVESTIGATION

Over the upcoming monitoring period between December 2023 and February 2024, EA will collect monthly ambient air samples from Rooms 116, 145, 152 and the kitchen storage room to investigate exceedances. Sampling will occur until three consecutive months of samples are below threshold levels.

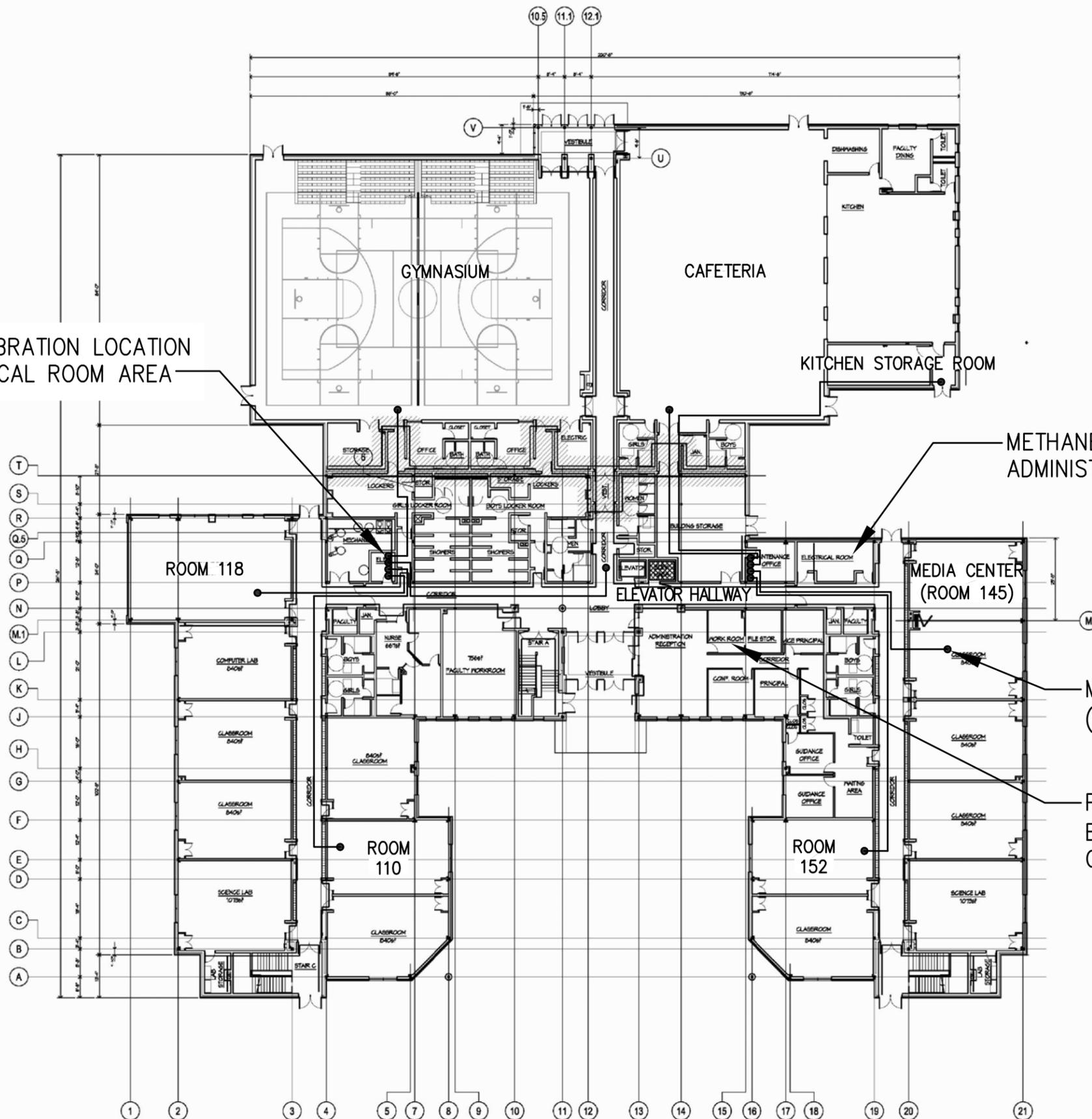
FIGURES



ALVAREZ HIGH SCHOOL
 333 ADELAIDE AVENUE
 PROVIDENCE, RHODE ISLAND

FIGURE 1
 SITE LOCUS

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
FP	PT	PT	FP	1:24,000	FEBRUARY 2010	14687.01	SITE_LOCUS.MXD



METHANE SENSOR CALIBRATION LOCATION
IN WEST WING; ELECTRICAL ROOM AREA

METHANE SYSTEM CONTROLLER LOCATION;
ADMINISTRATION WORK ROOM

METHANE SENSOR LOCATION
(TYP.)

PLC LOCATION IN EAST WING;
ELECTRICAL ROOM/MAINTENANCE
OFFICE AREA

PROJECT NORTH



NOTE: NOT TO SCALE



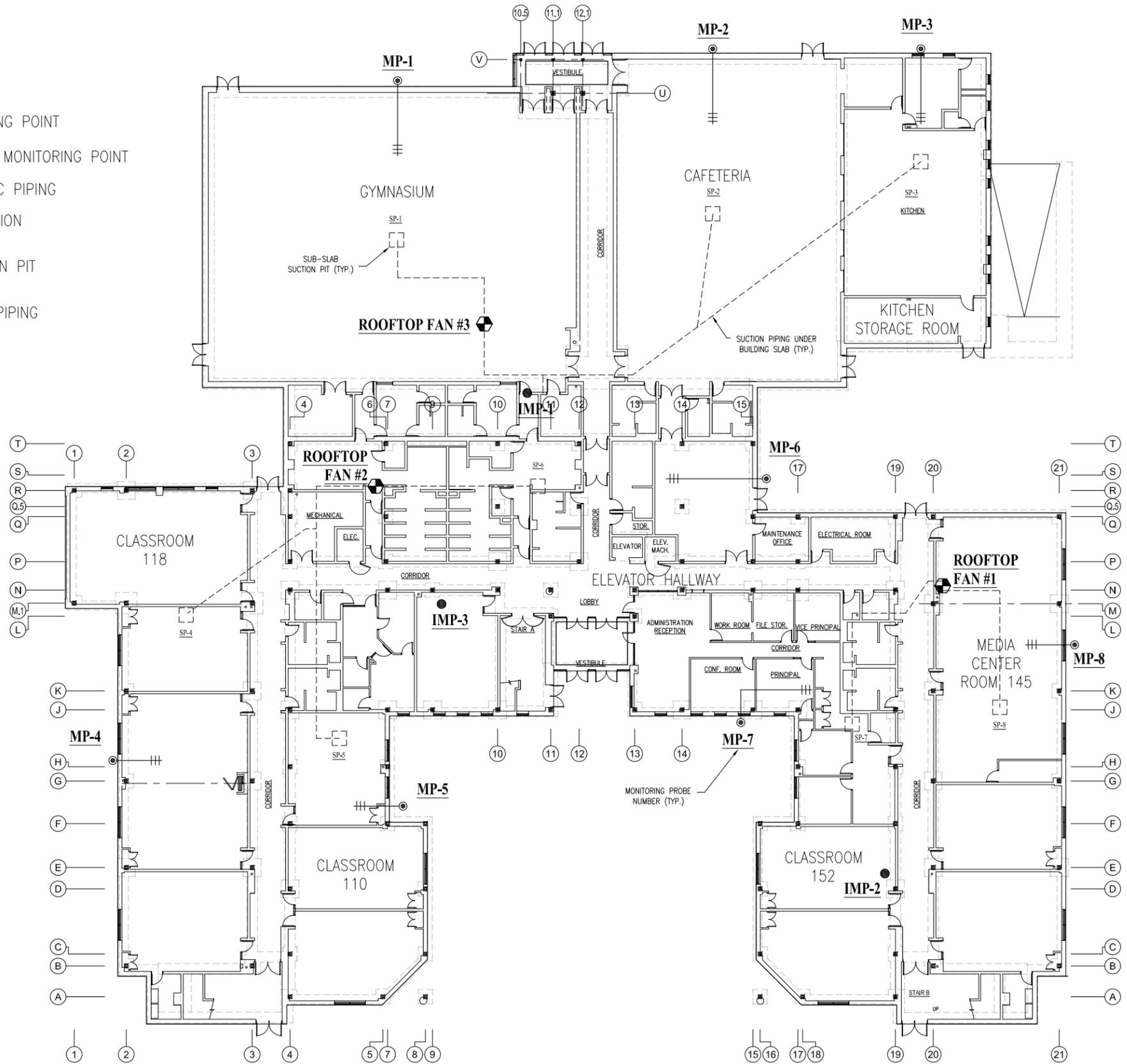
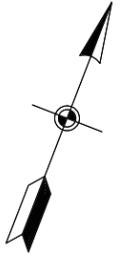
DESIGNED BY RGM	DRAWN BY DPA	DATE OCT. 16, 2013	PROJECT NO. 15066.01	FILE NAME ALVAREZ LAYOUT
CHECKED BY FBP	PROJECT MGR. FBP	SCALE NTS	DRAWING NO. -	FIGURE 2

INDOOR AIR SAMPLING AND METHANE MONITORING
SYSTEM DIAGRAM - ALVAREZ HIGH SCHOOL
PROVIDENCE, RHODE ISLAND

QUARTERLY STATUS REPORT
FIGURE 2

LEGEND :

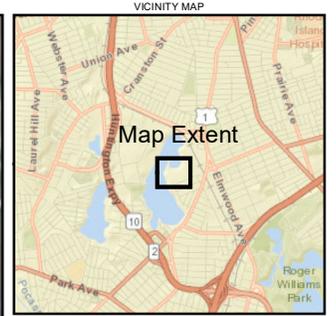
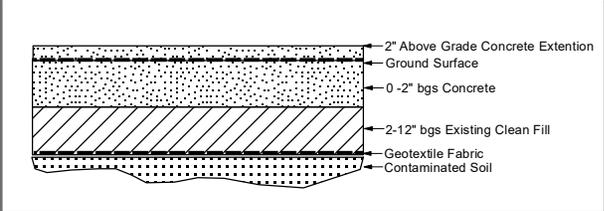
- SUB-SLAB MONITORING POINT
- INTERIOR SUB-SLAB MONITORING POINT
- ||— SLOTTED 1 INCH PVC PIPING
- ⊕ ROOFTOP FAN LOCATION
- SP-1
□ SUB-SLAB SUCTION PIT (TYP.)
- - - - - SOLID 4 INCH PVC PIPING



DESIGNED BY RGM	DRAWN BY DPA	DATE OCT. 16, 2013	PROJECT NO. 15066.01	FILE NAME FIG 3
CHECKED BY FBP	PROJECT MGR. FBP	SCALE NTS	DRAWING NO. N/A	FIGURE 3

AS-BUILT
SUB SLAB MONITORING AND SAMPLING LOCATIONS
ALVAREZ HIGH SCHOOL
PROVIDENCE, RHODE ISLAND

QUARTERLY STATUS REPORT
FIGURE 3



- Legend**
- Area of 12" Soil Cap with Geofabric
 - Supplemental Loam Padding
 - 4" Thick Concrete Pad
 - Temporary Fence

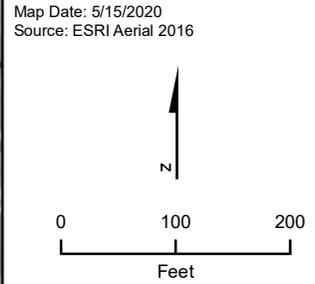


Figure 4
Gorham Parcel C
Temporary Cap Disturbance
Alvarez High School
Providence, Rhode Island

APPENDIX A

O&M Field Forms



Alvarez High School - SSD & Interior Methane Monitoring System O&M

Date of O&M: 9/15/23 & 9/19/23

Performed by: TC/JA & GJ

PID/Methane Calibration? yes (yes/no)

PID Calibration Result: 10

Date of last Methane Sensor Filter

Replacement: 7/18/2023

Replaced this O&M Visit? No (yes/no)

General Status of SSD System: Good

General Status of Methane

Monitoring System: Good

Eng. Cap/Fence Inspection

Performed/Notes:

(take photographs of any deficiencies noted)

Monitoring/ Sampling Location	Sub-slab or gauge vacuum	Air Velocity (fpm)	VOC Monitoring	Methane Monitoring			Air/Vapor Sample Collection					Comments/Notes (Ambient weather conditions, status of HVAC, possible monitoring/sampling interferences, etc continue on separate sheet)	
			PID (ppb)	Indoor Sensor (ppm)	(% Gas)	(% LEL)*	Summa Can ID	Controller ID	Start Time	Start Vac (inches Hg)	End Time		End Vac (inches Hg)
Gymnasium	NA	NA	0	0	0.1	2							
Cafeteria	NA	NA	0	0	0.1	2							
Kitchen Storage Room	NA	NA	0	0	0.1	2							
Elevator Hallway	NA	NA	0	0	0	0							
Room 145	NA	NA	0	0	0.1	2							
Room 152	NA	NA	322	0	0	0							
Room 118	NA	NA	1444	0	0	0							
Room 110	NA	NA	200	0	0	0							
MP-1	-0.014	NA	0	NA	0.1	2							
MP-2	-0.075	NA	0	NA	0.1	2							
MP-3	-0.014	NA	0	NA	0	0							
MP-4	-0.027	NA	0	NA	0	0							
MP-5	-0.05	NA	0	NA	0	0							
MP-6	-0.03	NA	0	NA	0	0							
MP-7	-0.009	NA	0	NA	0	0							
MP-8	-0.118	NA	0	NA	0	0							
IMP-1	-0.022	NA	1460	NA	0	0							
IMP-2	-0.03	NA	0	NA	0.1	2							
IMP-3	-0.012	NA	0	NA	0	0							
Roof-Top Fan 1	-0.02	2176	0	NA	0.1	2							
Roof-Top Fan 2	-0.02	2183	0	NA	0.1	2							
Roof-Top Fan 3	NM	NM	NM	NA	NM	NM							could not access roof
Ambient Outdoor Air	NA	NA	0	NA	0.1	2							

NA: not applicable.

NM: not monitored on this date.

NS : not sampled on this date.

* RIDEM Action Level for methane %LEL beneath the building is 10% and within the building is 1%.

If these methane levels are exceeded, immediately notify EA Project Manager to initiate response protocol.



Alvarez High School - SSD & Interior Methane Monitoring System O&M

Date of O&M: 10/25/2023

Performed by: TC, SP, CT

PID/Methane Calibration? No (yes/no)

PID Calibration Result: _____

Date of last Methane Sensor Filter

Replacement: 7/18/2023

Replaced this O&M Visit? yes (yes/no)

General Status of SSD System: Good

General Status of Methane

Monitoring System: Good

Eng. Cap/Fence Inspection

Performed/Notes: _____

(take photographs of any deficiencies noted)

Monitoring/ Sampling Location	Sub-slab or gauge vacuum	Air Velocity (fpm)	VOC Monitoring	Methane Monitoring			Air/Vapor Sample Collection						Comments/Notes (Ambient weather conditions, status of HVAC, possible monitoring/sampling interferences, etc continue on separate sheet)
			PID (ppb)	Indoor Sensor (ppm)	(% Gas)	(% LEL)*	Summa Can ID	Controller ID	Start Time	Start Vac (inches Hg)	End Time	End Vac (inches Hg)	
Gymnasium	NA	NA	0	0	0	0	1131	4695	853	-29	925	-5	
Cafeteria	NA	NA	0	0	0	0	2033	4694	855	-30	933	-5	
Kitchen Storage Room	NA	NA	0	0	0	0	1239	4562	858	-20	923	-2	
Elevator Hallway	NA	NA	0	0	0	0	1700	4658	850	-30	920	-3	
Room 145	NA	NA	0	0	0	0	1866	4637	904	-27	943	-3	
Room 152	NA	NA	370	0	0	0	2155	4617	906	-29	945	-1	Switched Tag
Room 118	NA	NA	126	0	0	0	1095	4581	910	-29	950	-1	
Room 110	NA	NA	223	0	0	0	1719	4582	912	-26	951	-4	
Room 116	NA	NA	0	0	0	0	1697	4686	916	-26	954	-1	
MP-1	0.028	NA	11	NA	0	0	NS	NS	NS	NS	NS	NS	Positive Pressure
MP-2	-0.078	NA	0	NA	0	0	2147	4708	1142	-26	1208	-1	
MP-3	0.019	NA	0	NA	0	0	NS	NS	NS	NS	NS	NS	Positive Pressure
MP-4	-0.04	NA	0	NA	0	0	NS	NS	NS	NS	NS	NS	
MP-5	-0.061	NA	0	NA	0	0	1803	4702	1127	-30	1155	-2	
MP-6	0	NA	0	NA	0.1	2	NS	NS	NS	NS	NS	NS	
MP-7	-0.002	NA	0	NA	0	0	2036	4701	1122	-30	1152	-1	
MP-8	-0.081	NA	0	NA	0	0	1745	4707	1159	-29	1225	-1	
IMP-1	-0.002	NA	0	NA	0	0	1839	4591	932	-27	1002	0	
IMP-2	-0.028	NA	10000	NA	0	0	NS	NS	NS	NS	NS	NS	
IMP-3	0	NA	15000	NA	0	0	1695	4592	1046	-29	1115	-2	
Roof-Top Fan 1	-3	2422	48	NA	0	0	NS	NS	NS	NS	NS	NS	
Roof-Top Fan 2	-3	2262	75	NA	0	0	NS	NS	NS	NS	NS	NS	
Roof-Top Fan 3	-3.75	1945	0	NA	0	0	NS	NS	NS	NS	NS	NS	
Ambient Outdoor Air	NA	NA	0	NA	0	0	1472	4561	1112	-30	1141	-3	

NA: not applicable.

NM: not monitored on this date.

NS : not sampled on this date.

* RIDEM Action Level for methane %LEL beneath the building is 10% and within the building is 1%.

If these methane levels are exceeded, immediately notify EA Project Manager to initiate response protocol.



Alvarez High School - SSD & Interior Methane Monitoring System O&M

Date of O&M: 11/15 + 11/20

Performed by: TC

PID/Methane Calibration? No (yes/no)

PID Calibration Result: _____

Date of last Methane Sensor Filter

Replacement: 10/25/2023

Replaced this O&M Visit? no (yes/no)

General Status of SSD System: Dialer functional

General Status of Methane

Monitoring System: Good

Eng. Cap/Fence Inspection

Performed/Notes: _____

(take photographs of any deficiencies noted)

Monitoring/ Sampling Location	Sub-slab or gauge vacuum	Air Velocity (fpm)	VOC Monitoring	Methane Monitoring			Air/Vapor Sample Collection						Comments/notes (Ambient weather conditions, status of HVAC, possible monitoring/sampling interferences, etc continue on separate sheet)	
			PID (ppb)	Indoor Sensor (ppm)	(% Gas)	(% LEL)*	Summa Can ID	Controller ID	Start Time	Start Vac (inches Hg)	End Time	End Vac (inches Hg)		
Gymnasium	NA	NA	6	0	0	0								
Cafeteria	NA	NA	22	0	0	0								
Kitchen Storage Room	NA	NA	48	0	0	0	1834	4100	1130	-30	1208	-4		
Elevator Hallway	NA	NA	0	0	0.1	2								
Room 145	NA	NA	102	0	0	0	1719	4104	1124	-30	1210	-2.5		
Room 152	NA	NA	0	0	0	0	2156	4298	1118	-30	1148	-4		
Room 118	NA	NA	6	0	0	0								
Room 110	NA	NA	0	0	0	0								
Room 116	NA	NA	0	0	0	0	2043	4294	1110	-29	1140	0		
MP-1	0.037	NA	0	NA	0	0								
MP-2	-0.091	NA	0	NA	0	0								
MP-3	0.034	NA	0	NA	0	0								
MP-4	-0.031	NA	0	NA	0	0								
MP-5	-0.04	NA	0	NA	0	0								
MP-6	-0.028	NA	101	NA	0	0								
MP-7	0	NA	0	NA	0	0								
MP-8	-0.086	NA	380	NA	0	0								
IMP-1	-0.064	NA	130	NA	0	0								
IMP-2	-0.023	NA	3170	NA	0	0								
IMP-3	-0.016	NA	20000+	NA	0	0								
Roof-Top Fan 1	-3	2110	0	NA	0	0								
Roof-Top Fan 2	-3	2028	0	NA	0	0								
Roof-Top Fan 3	-3.75	2361	130	NA	0	0								
Ambient Outdoor Air	NA	NA	0	NA	0	0								

NA: not applicable.

NM: not monitored on this date.

NS : not sampled on this date.

* RIDEM Action Level for methane %LEL beneath the building is 10% and within the building is 1%.

If these methane levels are exceeded, immediately notify EA Project Manager to initiate response protocol.

APPENDIX B

Indoor and Ambient Outdoor Air Analytical Summary

Summary of Indoor and Ambient Outdoor Air Sampling Data - Alvarez School - Volatile Organic Compounds
February 2008 - October 2023

Volatile Organic Compounds via TO-15	CT Draft Proposed Indoor Residential Target Air Concentrations/ Interim RIDEEM-Approved Action Level	Sample Date	Kitchen Storage Room		Cafeteria		Gymnasium		Elevator Hallway		Room 118		Room 110		Media Center (Rm 145)		Room 152		Room 149		Room 234		Ambient Outdoor (AOA-1)			
			Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual
Bromodichloromethane	0.034/0.13	8-Feb-08	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U							0.130	U
		27-Mar-08	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U							0.134	U
		25-Apr-08	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U	0.134	U							0.134	U
		29-May-08	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U	0.130	U							0.130	U
		27-Jun-08	0.134	U	0.134	U	0.130	U	0.130	U	0.130	U	0.130	U	0.231	U	0.134	U							0.134	U
		25-Oct-23	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U	0.067	U							0.067	U

Summary of Indoor and Ambient Outdoor Air Sampling Data - Alvarez School - Volatile Organic Compounds
February 2008 - October 2023

Volatile Organic Compounds via TO-15	CT Draft Proposed Indoor Residential Target Air Concentrations/ Interim RIDEM-Approved Action Level	Sample Date	Kitchen Storage Room		Cafeteria		Gymnasium		Elevator Hallway		Room 118		Room 110		Media Center (Rm 145)		Room 152		Room 149		Room 234		Ambient Outdoor (AOA-1)			
			Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual
			2.740	U	2.740	U	2.740	U	2.740	U	2.740	U	2.740	U	2.740	U	2.740	U	2.740	U	2.740	U	2.740	U	2.740	U

Summary of Indoor and Ambient Outdoor Air Sampling Data - Alvarez School - Volatile Organic Compounds
February 2008 - October 2023

Volatile Organic Compounds via TO-15	CT Draft Proposed Indoor Residential Target Air Concentrations/ Interim RIDEEM-Approved Action Level	Sample Date	Kitchen Storage Room		Cafeteria		Gymnasium		Elevator Hallway		Room 118		Room 110		Media Center (Rm 145)		Room 152		Room 149		Room 234		Ambient Outdoor (AOA-1)			
			Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
			0.0028/0.15	0.150	U	0.150	U	0.150	U	0.150	U	0.150	U	0.150	U	0.150	U	0.150	U	0.150	U	0.150	U	0.150	U	0.150

Summary of Indoor and Ambient Outdoor Air Sampling Data - Alvarez School - Volatile Organic Compounds
February 2008 - October 2023

Volatile Organic Compounds via TO-15	CT Draft Proposed Indoor Residential Target Air Concentrations/ Interim RIDEEM-Approved Action Level	Sample Date	Kitchen Storage Room		Cafeteria		Gymnasium		Elevator Hallway		Room 118		Room 110		Media Center (Rm 145)		Room 152		Room 149		Room 234		Ambient Outdoor (AOA-1)			
			Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual
			0.120	U	0.120	U	0.120	U	0.120	U	0.120	U	0.120	U	0.120	U	0.120	U	0.120	U	0.120	U	0.120	U	0.120	U

Summary of Indoor and Ambient Outdoor Air Sampling Data - Alvarez School - Volatile Organic Compounds
February 2008 - October 2023

Volatile Organic Compounds via TO-15	CT Draft Proposed Indoor Residential Target Air Concentrations/ Interim RIDEEM-Approved Action Level	Sample Date	Kitchen Storage Room		Cafeteria		Gymnasium		Elevator Hallway		Room 118		Room 110		Media Center (Rm 145)		Room 152		Room 149		Room 234		Ambient Outdoor (AOA-1)			
			Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual	Conc	Qual
			Trichloroethene*	1.0	8-Feb-08	0.110		0.120		0.110	U	0.107	U	0.110	U	0.110	U	0.350	U	0.110	U					0.110

**Summary of Indoor and Ambient Outdoor Air Sampling Data - Alvarez School - Volatile Organic Compounds
February 2008 - October 2023**

Volatile Organic Compounds via TO-15	CT Draft Proposed Indoor Residential Target Air Concentrations/ Interim RIDEM-Approved Action Level	Sample Date	Kitchen Storage Room		Cafeteria		Gymnasium		Elevator Hallway		Room 118		Room 110		Media Center (Rm 145)		Room 152		Room 149		Room 234		Ambient Outdoor (AOA-1)	
			Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual
<p>* = Site Specific Compound of Concern per ATSDR Health Consultation, December 4, 2006. ** - Analyzed by Con-Test Analytical Laboratory † Elevated Data is a result of inadvertent cross-contamination at the laboratory, and not resultant from soil vapor intrusion. Media Center/Room 145 was resampled on 28 January 2008 with Tetrachloroethylene concentration not detected by the laboratory (MDL = 0.14 ug/m³). ‡ Elevated Tetrachloroethylene and Acetone data detected on 27 March 2008 was determined to be the result of cleaning products (e.g., graffiti remover, stainless steel polish, etc.) introduced to the school in February and March, and not the result of soil vapor intrusion. § All samples collected on 20 April 2016 except for the Kitchen Storage Room, which was collected on 25 April 2016 due to inaccessibility of the room during spring break. ¶ All samples collected on 17 April 2017 except for the Kitchen Storage Room, which was collected on 25 April 2017 due to inaccessibility of the room during spring break. ^ Summa canister had low pressure upon beginning sample collection, possible interference. Re-sampling effort on 25 April 2008 indicates no exceedences of applicable Acetone and Tetrachloroethylene Action Levels. ¯ Analyte found in associated blank as well as the sample but not expected to affect data due to sample concentration >10x concentration found in blank. ¯ Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the high side. ¯ Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the low side. ¯ Continuing calibration did not meet method specifications and was biased on the low side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the low side. ¯ Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side. ¯ Estimated result as the result was between the MDL and the RDL. ¯ Initial calibration verification did not meet standard. Reported value is likely to be biased on the high side. ¯ Initial calibration did not meet standard and was biased on the low side. Reported result is estimated. ¯ Elevated method detection limits due to failure of Con-test internal standards. Applies to Ambient Outdoor Air sample.</p> <p>NOTES: All data presented in micrograms per cubic meter (ug/m³). Two values displayed with a slash indicates dilutions resulting in two different concentrations U = Designation indicates that the compound was not detected by the laboratory. Reporting limit shown in the data column. NS = Not sampled. None = No Draft Proposed CT Residential TAC for this compound. = exceedance of interim RIDEM-approved action level</p>																								

APPENDIX C

Subslab Vapor Analytical Summary

