

**RELEASE ABATEMENT MEASURE STATUS REPORT NO. 20**

**129 COMMERCIAL STREET  
MALDEN, MASSACHUSETTS**

**RELEASE TRACKING NUMBER 3-0362**

April 2008

*Prepared For:*

**nationalgrid**

National Grid  
25 Research Drive  
Westborough, MA 01582

*Prepared By:*



Innovative Engineering Solutions, Inc.  
25 Spring Street  
Walpole, Massachusetts 02081  
(508) 668-0033

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Michael Lotti, L.S.P.  
Project Manager and LSP of Record  
License Number 4208

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Joseph E. Higgins, P.E., L.S.P.  
Project Reviewer

## **Release Abatement Measure Status Report No. 20**

### **129 Commercial Street Malden, Massachusetts 02148 DEP Release Tracking Number: 3-0362**

This Release Abatement Measure (RAM) Status Report has been prepared by Innovative Engineering Solutions, Inc. (IESI) on behalf of Massachusetts Electric Company d/b/a/ National Grid in accordance with the requirements of the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000). This RAM is being conducted at the 129 Commercial Street portion (Parcel B) of the former Malden manufactured gas plant (MGP) site (the "Site") in Malden, Massachusetts. The 129 Commercial Street property is currently occupied by a commercial bakery and is bounded to the north by Charles Street, to the east by Commercial Street, to the south by Adams Street, and to the west by the MBTA Orange Line commuter railway. The Massachusetts Department of Environmental Protection (DEP) assigned Release Tracking Number (RTN) 3-0362 to the Malden MGP Site. Figure 1 depicts the site locus and Figure 2 depicts the location of the property in relation to the disposal site boundary of the former MGP.

This RAM was initiated to address the potential migration of volatile organic compounds (VOC) to indoor air at 129 Commercial Street. Although VOCs were historically detected in indoor air in the building at 129 Commercial Street, the detected concentrations did not constitute an imminent hazard for workers in the building, and were less than applicable occupational standards set by the US Occupational Safety and Health Administration (OSHA). However, remedial actions were implemented to reduce potential migration of VOCs to indoors air.

As indicated in the RAM Plan that was submitted to the DEP on July 2, 1998, the objective of the RAM was to reduce VOC concentrations in indoor air; this was initially attempted by sealing portions of the floor slab. The sealing of the floor was not completely successful in reducing indoor air concentrations, and the RAM was modified in April 1999 to include the installation of a sub-slab venting system (SSVS). The SSVS was installed in October 1999 and consists of five 2-inch diameter soil vapor extraction points installed horizontally through the foundation wall beneath the floor slab. The vapor extraction points extend approximately 5 feet beneath the building. These points are connected to a 3 horsepower regenerative blower that removes vapors from beneath the floor slab and directs them through two granular activated carbon (GAC) drums (capacity of 165 pounds) for treatment. The blower and carbon drums are stored in a temporary building located east of the building along Commercial Street. Treated vapors are emitted through a 4-inch diameter vent pipe to the atmosphere. Figure 3 presents the locations of the extraction points and the system enclosure.

The Risk Characterization included in the Phase III Remedial Action Plan (Haley & Aldrich, 2003) reports a condition of No Significant Risk for workers inside the facility. The data used for the Risk Characterization included indoor air data collected while the system was operational and it was assumed in the Class C Response Action outcome (Haley & Aldrich, 2005) that this system is required to maintain a condition of No Significant Risk at this time.

The content of this report has been structured to address the specific information requirements set forth in 310 CMR 40.0445 (2)(a) through (e). This report was submitted electronically to the DEP via the eDEP website and a copy of the RAM Transmittal Form (BWSC-106) is included in Appendix A. In addition, in accordance with DEP requirements, the Remedial Monitoring Report (RMR) forms BWSC-106 A/B were submitted electronically via the eDEP website and a copy of the RMR is included in Appendix A. This RAM Status Report details on-going operation and maintenance of the sub-slab venting system, and summarizes monitoring data collected from October 7, 2007 through March 31, 2008.

### **310 CMR 40.0445 (2)(a)      The status of response operations:**

The SSVS is monitored monthly as part of an ongoing operation and maintenance (O&M) schedule. Total VOC levels in influent and effluent vapor from the off-gas control device (sub-slab venting treatment unit) are measured during these visits with a photoionization detector (PID) calibrated to a 100 parts per million (ppm) standard to respond as benzene. In addition, influent and effluent vapor samples were collected and analyzed by gas chromatography (GC) in October and November 2007. The results are summarized in Table 1 and discussed below. As of December 2007, IESI is monitoring and performing O&M activities on the SSVS.

Indoor air samples were not collected during this reporting period. The next round of indoor air samples is scheduled to be collected in April 2008.

### **310 CMR 40.0445 (2)(b)      Any significant new site information or data:**

At the request of National Grid, in December of 2007, IESI took over O&M of the SSVS. The monitoring program and operation of the SSVS will continue as specified in the RAM Plan except for the monthly collection of soil vapor samples for GC analysis and the use of two GAC vessels to treat the SSVS effluent. IESI has reviewed the GC analysis data collected to date and has determined that the PID results correlate very well with the results of the GC analysis and the GC data is not necessary for the purpose of monitoring the concentration of the extracted soil vapor and for determining the effectiveness of the vapor treatment. It is important to note that the PID response to the extracted soil vapor (i.e., the influent) has not been above the detection limit of the PID (0.1 ppm) since 2001. In addition, the results of the GC analysis have been below the detection limits (reported to be 1 microgram per liter) since 2004. As indicated above, samples for GC analysis were collected in October and November 2007 by Haley & Aldrich; the results of the GC analysis of these samples were below the detection limits, as discussed below. IESI will continue monitoring the system with a PID.

During our initial evaluation of the SSVS in December 2007, IESI observed that the system was shutting down more frequently than expected, and determined that the likely cause for the shutdowns was excess back pressure on the SSVS blower (which triggered a high-amp shutdown) from the GAC vessels. As such, IESI removed one of the two GAC vessels from the system; the two GAC vessels were plumbed in series. With one of the two GAC vessels taken off-line, the operating amperage of the blower dropped significantly as did the discharge temperature and pressure. The second vessel was removed on December 3, 2008 and the SSVS has run continuously since. As previously stated, the influent concentrations have been below detection limits since 2001; therefore, removal of one of the GAC vessels will not reduce the treatment efficiencies of the SSVS.

O&M visits have been conducted regularly throughout the reporting period. The monitoring data collected during this reporting period are summarized on Table 1 and discussed below.

Vacuum conditions are monitored with fixed vacuum gauges on the influent piping prior to the blower and on the knockout drum. A portable vacuum gauge is used to periodically measure vacuum at the individual extraction points (EP-1 through EP-5). Vacuum conditions at extraction points EP-1 through EP-5 ranged from 0.0 inch of water to 2.5 inches of water during this reporting period. Vacuum at the blower ranged from 4 to 11 inches of water, vacuum at the knockout drum ranged between 2 and 5 inches of water, and discharge pressure ranged between 40 and 55 inches of water during this period. These vacuum measurements are generally consistent with other recent vacuum data for this system.

VOC levels are screened with a PID at 2 locations along the vapor stream: Influent (pre-carbon) and Effluent (post-carbon). PID readings of the influent were at background levels (0.0 ppm) as measured throughout the reporting period. Effluent PID readings were also at background levels (0.0 ppm) throughout the reporting period.

Air samples were collected by Haley & Aldrich on October 30 and November 28, 2007 in Tedlar bags and analyzed with a GC. Samples were collected from the influent, mid-carbon (Effluent-1), and post-carbon (Effluent-2) positions. VOCs were not detected in the influent, mid-carbon (Effluent-1), or post-carbon (Effluent-2) samples collected during this reporting period.

Air flow in and out of the system is measured with a Dwyer Air Velocity Meter. During this reporting period, the influent flow rate ranged from 29 cubic feet per minute (cfm, not adjusted for temperature and pressure) to 65 cfm and the effluent flow rate ranged from 110 cfm to 157 cfm.

**310 CMR 40.0445 (2)(c)      Details of and/or plans for the management of Remediation Waste, Remedial Wastewater, and/or Remedial Additives:**

No remediation waste was generated or disposed of during this reporting period. According to Haley and Aldrich, approximately 7,755 pounds of spent carbon have been removed from the site since start-up of the sub-slab ventilation system in 1999.

**310 CMR 40.0445 (2)(d)      Any other information that the Department during its review and evaluation of a Status Report determines to be necessary to complete said Status Report, in view of site specific circumstances and conditions; and:**

The DEP has not required any additional information

**310 CMR 40.0445 (2)(e)      An LSP Opinion as to whether the Release Abatement Measure is being conducted in conformance with the RAM Plan and any conditions of approval established by the Department.**

Having reviewed the requirements of the RAM Plan and the response actions completed to date, we are of the opinion that the RAM is being conducted in accordance with the RAM Plan and the DEP Conditional Approval letters dated June 19, 1999 and July 27, 1999. DEP approval was necessary because at that time there was an ongoing Immediate Response Action (IRA) at the 100 Commercial Street property which is separate from the 129 Commercial Street property but part of larger Site RTN 3-0362. There are currently no ongoing IRA's at this location.

If you require additional information or have any questions regarding this status report, please contact Michael S. Lotti, LSP of IESI at (508) 668-0033 (x 231).

## FIGURES

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Innovative Engineering Solutions, Inc.  
25 SPRING STREET  
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0 2000

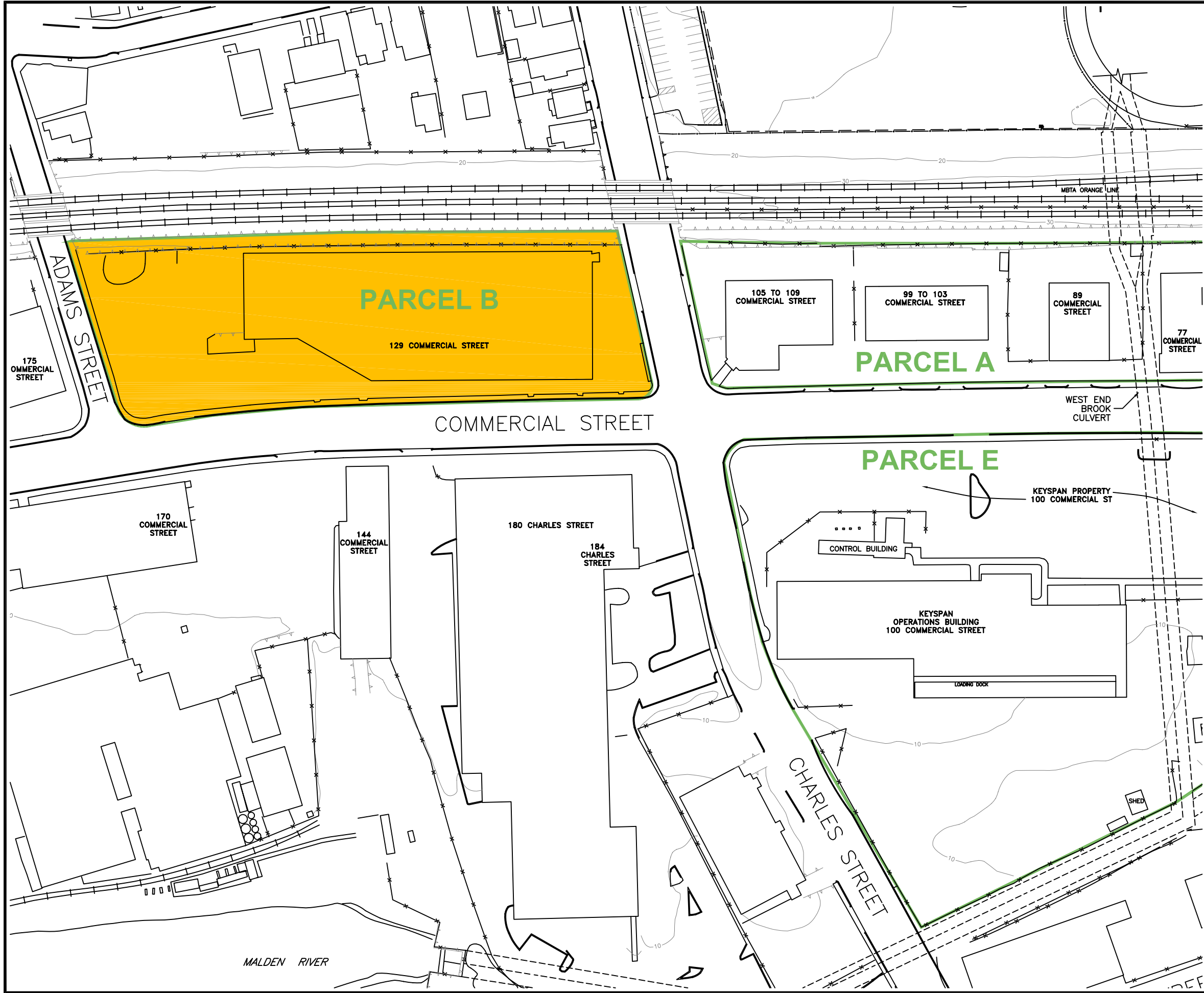
SCALE IN FEET  
1:24000

SITE LAT/LONG: 42°25'30"N 71°04'30"W  
UTM: 329,298E 4,699,051N ZONE 19  
USGS Topographic Map:  
Boston North, Massachusetts 1991

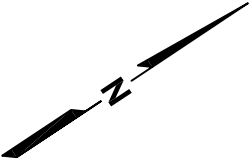
FIGURE 1  
**SITE LOCATION MAP**

Former Malden MGP Site  
Malden, Massachusetts





 RAM AREA



THIS PLAN BASED ON THE SITE PLAN DATED DECEMBER 2001  
BY HALEY & ALDRICH, INC.

HALEY & ALDRICH, INC. NOTES:

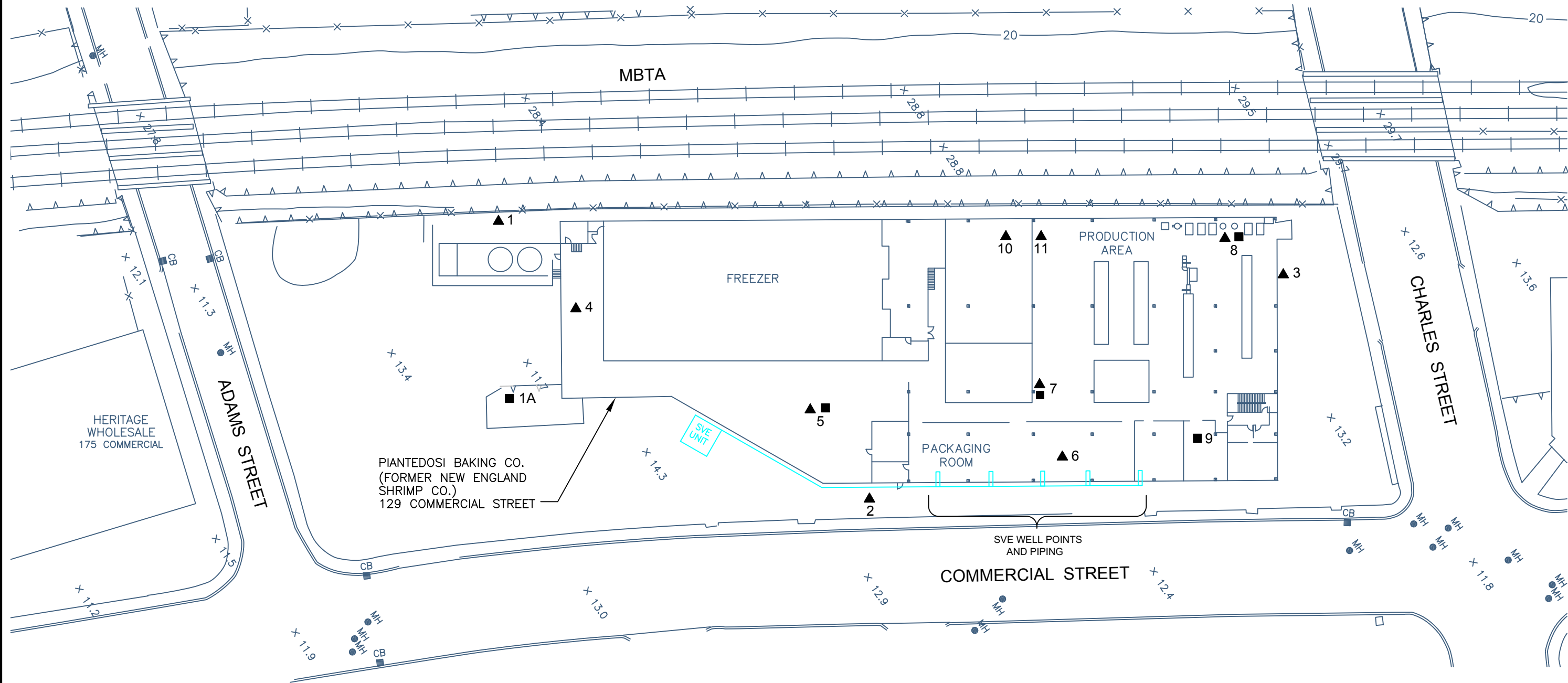
1. BASE PLAN ADAPTED FROM "TOPOGRAPHIC WORKSHEET OF THE MANUFACTURED GAS PLANT, MALDEN, MA" FOR MASSACHUSETTS ELECTRIC COMPANY, WESTBOROUGH, MA, BY EASTERN TOPOGRAPHICS, WOLFEBORO, NH, SHEETS 1 AND 2, AT A SCALE OF 1 IN. EQUALS 40 FT., JUNE 1995, AND CITY OF MALDEN ASSESSOR'S PLAN SHEET NO. 53, BY FAY, SPOFFORD & THORNDIKE, INC., BOSTON, MA, AT A SCALE OF 1 IN. EQUALS 40 FT., UPDATED JUNE 1976 AND REVISED 30 JULY 1979.
2. LOCATION OF TEST BORINGS AND TEST PITS WERE DETERMINED BY HALEY & ALDRICH, INC.



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TITLE				
RAM AREA				
SITE				
FORMER MALDEN MGP SITE				
CLIENT				
NATIONAL GRID				
DRAWN	CHECKED	FILENAME	DATE	FIGURE
DMR	ML	NG MALDEN RAM AREAS	3/28/08	2



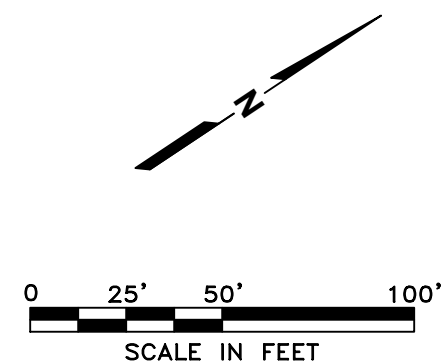



LEGEND

- 7 ▲ DESIGNATION AND APPROXIMATE LOCATION OF INDOOR AND OUTDOOR AIR SAMPLES OBTAINED BY ENVIRONMENTAL HEALTH & ENGINEERING, INC. AND HALEY & ALDRICH, INC. FROM NOVEMBER 1997 THROUGH FEBRUARY 2007
- 7 ■ DESIGNATION AND APPROXIMATE LOCATION OF INDOOR AIR SAMPLES OBTAINED BY OCCUHEALTH, INC., JUNE 1994
- ▣ DESIGNATION AND APPROXIMATE LOCATION OF "I" BEAM COLUMN LOCATION

NOTES

1. BASE PLAN ADAPTED FROM "TOPOGRAPHIC WORKSHEET OF THE MANUFACTURED GAS PLANT, MALDEN, MA" FOR MASSACHUSETTS ELECTRIC COMPANY, WESTBOROUGH, MA, BY EASTERN TOPOGRAPHICS, WOLFEBORO, NH, SHEETS 1 AND 2, AT A SCALE OF 1 IN. EQUALS 40 FT., JUNE 1995, AND CITY OF MALDEN ASSESSOR'S PLAN SHEET NO. 53, BY FAY, SPOFFORD & THORNDIKE, INC., BOSTON, MA AT A SCALE OF 1 IN. EQUALS 40 FT., UPDATED JUNE 1976 AND REVISED 30 JULY 1979.
2. INTERIOR FACILITY LAYOUT ADAPTED FROM UNDATED PLAN PROVIDED BY PIANTEDOSI BAKING COMPANY, FEBRUARY 1998.
3. APPROXIMATE LOCATIONS OF INDOOR AIR SAMPLING LOCATIONS WERE DETERMINED BY HALEY & ALDRICH, INC.



		Innovative Engineering Solutions, Inc. 25 SPRING STREET WALPOLE, MASSACHUSETTS 02081 (508) 668-0033	
TITLE <b>SITE PLAN</b>			
FORMER MALDEN MGP SITE			
CLIENT NATIONAL GRID			
DRAWN DMR	CHECKED ML	FILENAME NG MALDEN RAM AREAS	DATE 3/28/08
			FIGURE <b>3</b>

**TABLE**

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**Table 1**  
**Sub-Slab Venting System Monitoring Data**  
**129 Commercial Street**  
**Malden, Massachusetts**

Monitoring Date	Influent Total VOC Concentrations		Effluent Total VOC Concentrations		Outdoor Ambient Air Temp. (°F)	Outlet Vapor Temp. (°F)	Flow Velocity (cubic ft./min)		System Vacuum (in. water)			Vacuum at Extraction Points (in. water)				
	PID (ppm)	H&A GC <sup>1</sup> (ug/L)	Effluent - 1 (ppm)	Effluent - 2 (ppm)			Influent	Effluent	Blower	Knockout Drum	Discharge	EP-1	EP-2	EP-3	EP-4	EP-5
9-Oct-07	-	-	-	-	60	-	-	-	-	-	-					
21-Oct-07	-	-	-	-	-	-	-	-	-	-	-					
22-Oct-07	-	-	-	-	65	-	-	-	-	-	-					
23-Oct-07	-	-	-	-	65	130	33	110	10	5	50	-	-	-	-	-
30-Oct-07	0.0	ND	0.0	0.0	60	130	29	110	10	5	50	-	-	-	-	-
18-Nov-07	-	-	-	-	-	-	-	-	-	-	-					
19-Nov-07	-	-	-	-	35	70	-	-	4	2	55					
24-Nov-07	-	-	-	-	-	-	-	-	-	-	-					
27-Nov-07	-	-	-	-	40	-	-	-	-	-	-					
28-Nov-07	0.0	ND	0.0	0.0	50	110	31	114	10	5	52	-	-	-	-	-
3-Dec-07												System operational, remove one GAC vessel				
17-Jan-08	0.0	-	-	0.0	34	84	65	157	10.5	2.8	40	1.7	2.1	0.0	0.0	2.5
18-Feb-08	0.0	-	-	0.0	64	90	60	140	9	2.7	41	2.1	2.3	0.0	0.0	2.4
28-Mar-08	0.0	-	-	0.0	37	96	59	145	8.2	1.6	47	0.0	1.5	0.0	0.0	1.6

**Notes & Abbreviations:**

IESI began operation of the SSVS system in December 2007

cubic ft./min = Cubic feet per Minute (actual in field measurement, not adjusted for temperature and pressure)

in. water = Inches of water pressure/vacuum

ppm = Parts per million

ug/l = Micrograms per liter (roughly equal to 1 part per billion)

°F = Degrees Fahrenheit

- = Not Available/Not Measured

ND = Non Detect; method detection limit < 1ug/L

1. Samples analyzed for benzene, toluene, ethylbenzene, m&p xylene, o xylene, and styrene by gas chromatograph at the Haley & Aldrich, Inc. Laboratory in Boston, Massachusetts



## **APPENDIX A**

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### **COPY OF RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM (BWSC-106) AND REMEDIAL MONITORING REPORT**