EXHIBIT R-1

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
BOARD OF REGISTRATION OF
HAZARDOUS WASTE SITE CLEANUP PROFESSIONALS

In the Matter of:	
Richard J. Cushing,	**Docket No. LSP 12 AP 01**
Respondent.	

AFFIDAVIT OF RICHARD J. CUSHING

I, Richard J. Cushing, under the pains and penalties of perjury, state that I am the Richard J. Cushing whose prepared direct testimony is attached to this affidavit. I further state that, if asked the questions contained in the text of such testimony, I would give the answers that are set forth in the text of such testimony. I adopt the aforesaid answers as my direct testimony in this proceeding.

Signed under the pains and penalties of perjury this 10th day of January, 2013.

Richard J. Cushing

COMMONWEALTH OF MASSACHUSETTS
BOARD OF REGISTRATION OF HAZARDOUS WASTE SITE CLEANUP PROFESSIONALS
before the
OFFICE OF APPEALS and DISPUTE RESOLUTION

In the Matter of Richard J. Cushing **Docket No. LSP 12 AP 01**

Prepared Direct Testimony of
Richard J. Cushing
Witness in opposition to the Initial Determination of the
Board of Registration of Hazardous Waste Site Cleanup Professionals

Q. Please state your name and business address.

A. My name is Richard J. Cushing. The primary business address of Cushing, Jammallo & Wheeler is 464 High Street, Clinton, Massachusetts.

Q. Are you introducing any exhibits (other than the exhibits pre-marked as Joint Exhibits) in addition to your direct testimony?

A. Yes. I am introducing Exhibit R-2, Cushing *Curriculum Vitae*, Exhibit R-3, a Phone Log dated February 19, 2004, and Exhibit R-3A, Air Exposure Criteria found at 310 CMR 40.1512(4).

Q. Please describe your educational background.

A. I have Bachelors of Science degrees in Chemical Engineering and Paper Engineering from the University of Lowell and a Masters of Science in Chemical Engineering from Northeastern University.

Q. Please describe your professional experience.

A. I have over 30 years of experience in the areas of chemical and environmental engineering, specializing in the fields of site characterization and clean-up. I have conducted numerous remedial investigations to characterize site conditions involving a

wide range of chemical constituents and performed numerous feasibility studies, including Alternative Remedial Strategy Evaluations needed to demonstrate Technical Impracticability. I have provided numerous licensed site professional (LSP) opinions in support of a wide range of environmental activities.

I have also been responsible for the design and implementation of a variety of remedial projects specializing in the areas of innovative remedial technologies. I have designed numerous in-situ remedial systems utilizing air sparging, vacuum extraction and dual extraction technologies in the design and installation of groundwater pump and treat systems and large-scale application of land farming for the bio-remediation of petroleum contaminated soils. I have been responsible for the design and construction of low permeability caps and the closure of a number of industrial impoundments containing PCB's and other industrial chemicals.

I have been responsible for the environmental management of an operating facility of a Fortune 500 industrial chemical manufacturer. In this capacity, I was responsible for all facility regulatory compliance activities, including industrial hygiene, OSHA compliance, hazardous waste management, Toxic Substance Control Act (TSCA) compliance, Clean Water Act and NPDES permitting, waste water pretreatment, Clean Air Act compliance and air permitting. I have conducted numerous regulatory compliance audits and have worked with many industrial facilities to enhance their compliance programs. I have been the LSP of record for over 368 sites since the program began, including several sites that contain chlorinated solvents, including Tetrachloroethylene or "PCE".

Additional details regarding my professional background are provided in my resume, Exhibit R-2.

Q. Did you provide Licensed Site Professional services in connection with a property located at 211 West Main Street, Ayer Massachusetts (the "Site").

A. Yes.

Q. Who hired you as the Licensed Site Professional ("LSP") for the Site?

A. I was hired by Ducharme & Wheeler. The owner of the Site, Le-Mack Realty Trust hired Ducharme & Wheeler to perform a site assessment and Ducharme & Wheeler engaged me as the LSP.

Q. Why were the services of an LSP needed at the Site?

A. On May 3, 2002 a Downgradient Property Status Submittal ("DPS") was filed with the DEP by a neighboring property owner Shell Oil Company. In performing a site assessment of its property Shell Oil found PCE and TCE in groundwater samples that it had taken from the Site. The DPS submittal identified the former Esquire cleaners at the Site as the source of the contamination. Five months later, on November 8, 2002, The Department of Environmental Protection ("DEP") sent a Notice of Responsibility ("NOR") to Le-Mack Realty Trust (Le-Mack). (See Joint Exhibit 4). In order to respond to the NOR, Le-Mack hired Ducharme & Wheeler and subsequently I was hired as the LSP around January 2003.

Q. Please describe the Site as it existed when you were first hired as an LSP.

A. The Site contains approximately 8,976 square feet (0.21 acres) of land located in a commercial use area in Ayer. There was a one-story building with a basement on the Site (the "Building") which housed a video rental store. To the best of my knowledge the

Building is still in use and now houses a second hand store. No known institutional properties exist within 500 feet of the disposal site. The surrounding properties were also commercial in use.

The Site is located within a Zone II and a Medium Yield Non-Potential Drinking Water Source Area. The Site is located approximately 100 feet south and east from a Natural Heritage and Endangered Species Program Wetlands Habitat. The Site is located approximately 500 feet southeast of a High Yield Potentially Productive Aquifer. A public drinking water supply well is located approximately 1,800 feet northwest of the site. An Interim Wellhead Protection Area is located approximately 2,100 feet to the northwest of the site. Willow Brook is located approximately 700 feet to the west of the site and the Nashua River is located approximately 1,500 feet to the west of the site. There are no Areas of Critical Environmental Concern located within 0.5 miles of the Site. More detail regarding the site description is set forth in the Phase I Submittal marked as Joint Exhibit 6.

Q. Once you were hired as the LSP what is the first thing you did?

A. The first thing I did was to visit the Site and research the history of the Site. I learned that the Building on the Site had been used for dry cleaning businesses from approximately 1981-1993. My review of the DEP files revealed that in 1993 the DEP received a report from a former employee of Esquire Cleaners (one of the dry cleaning businesses that operated on the Site) that Esquire Cleaners had been dumping PCE on the ground behind the Building. On June 7, 1993, the Emergency Response Branch assigned case number C93-0281 to the Site and investigated the alleged disposal of PCE on the ground behind the Building (See Joint Exhibit 1). Two months later, on August 23, 1993

the case was referred by Emergency Response to site discovery and Emergency Response closed its case. (See Joint Exhibit 2). After the August 23, 1993 report there was no further information regarding the release in the DEP files. Since the dry cleaning operations ceased in 1993, the PCE release had occurred on or before that date.

Q. What happened next?

A. After a preliminary evaluation of the Site and determining the history of the Site we conducted assessment activities to determine the extent of the release of PCE. This included the installation of borings and groundwater monitoring wells to assess the extent of contamination in soil and groundwater and the installation of a series of soil gas monitoring points to assess the potential for vapor migration into the Building.

Q. What did you do in order to test the groundwater for PCE?

A. Six monitoring wells already existed at the Site and had been installed at the Site by Enviro-Trac as part of its site assessment activities for 215 West Main Street, the Shell Oil property. We added eight additional groundwater monitoring wells between March 2003 and October 2003.

Q. What monitoring wells did you install and when did you install them?

A. On March 26, 27 and 28, five groundwater monitoring wells, identified as MW-1, MW-2, MW-3, MW-3D and MW-4, were installed at the Site. Monitoring wells MW-1, MW-2, and MW-3 were installed to a depth of 30 feet below grade. Monitoring wells MW-3D and MW-4 were installed to a depth of 50 feet below grade. The details of the sampling are outlined in the Phase I Report marked as Joint Exhibit 6.

Q. When did you install the remaining three wells?

A. On September 10 and October 9, 2003, three additional groundwater monitoring wells, identified as MW-5, MW-6, and MW-7 were installed at the Site. The details of the sampling is outlined in the Phase I Report marked as Joint Exhibit 6.

Q. Did you collect samples from the wells?

A. Yes. Between January 2003 and October 2003, we collected groundwater samples from the monitoring wells, as well as measured the groundwater elevation.

Q. What did you find?

A. According to the laboratory analytical results, concentrations of PCE detected in groundwater collected from monitoring wells MW-203, MW-303, and MW-304 (all Shell monitoring wells), MW-1, MW-2, MW-3, MW-3D, MW-4, MW-5, MW-6 and MW-7 exceeded the Method 1 risk characterization standard for the applicable groundwater categories for PCE. (See Joint Exhibit 6, Phase I Report, Page 8). Additionally, naphthalene was detected in the ground water sample from MW-7 in a concentration that exceeded the Method 1 risk characterization standard. (See Joint Exhibit 6, Phase I Report, Table 3 and Appendix E).

The ground water measurements showed that the groundwater within 30 feet of the Building was greater than 15 feet deep. (See Joint Exhibit 6, Phase I Report, Table 1).

Q: What is the significance of the groundwater within 30 feet of the Building being greater than 30 feet deep?

A: According to the MCP, if groundwater within 30 feet of a building is greater than 15 feet deep, the GW-2 Standards do not apply to the Site and there is a presumption that indoor air is not being impacted as a result of groundwater contamination.

Q. Did you conclude your investigation at this point?

A. No. Despite this presumption, to be safe, on September 10, 2003, we conducted a soil gas survey consisting of five soil gas points, SG-1 through SG-5, along the northwest and south west sides of the building foundation. Samples were field screened for the presence of VOCs. Additionally, samples were collected and sent to the laboratory for analysis. Laboratory analytical results indicated the presence of PCE in SG-1 and SG-5 at concentrations of 159,000 micrograms per cubic meters (ug/m^3) and 2,400,000 ug/m^3 respectively.

Q. After you received the soil gas results what did you do?

A. Once I received the soil gas results showing that the survey point SG-5 measured 2,400,000 ug/m^3, I wanted to know whether indoor air sampling needed to be done immediately or whether it could be done in Phase II. The concentration of PCE in soil gas is not what people are breathing inside the building; but the risk assessor can use the soil gas measurements to extrapolate potential indoor air risk. I am not a risk assessor and am not qualified to render a risk analysis on soil gas results. I sent the data to a risk assessor, O'Reilly, Talbot and Okun ("OTO") to be analyzed and to determine whether immediate indoor air testing would be necessary. I was told by the risk assessor that she would do modeling to determine if indoor air needed to be tested now or could be done in Phase II. The risk assessor at OTO who performed the analysis was Debra Listernick.

Q. What did Ms. Listernick determine?

A. After Ms. Listernick modeled and analyzed the laboratory results, she verbally informed me that although the results of her calculations were greater than No Significant Risk (NSR), there was not an Imminent Hazard situation; i.e. an imminent hazard evaluation did not need to be performed at that time. We agreed that based on these

findings, indoor testing could be performed as part of Phase II, which is when indoor air is normally tested. Given that the ground water was not in a GW-2 setting and the measured levels of PCE in the groundwater did not exceed Upper Concentration Limits (UCLS), I accepted and relied upon Ms. Listernick's expert advice that there was not a potential imminent hazard requiring an immediate Imminent Hazard Evaluation. (See Joint Exhibit 20 for Listernick explanation of October 2003 Evaluation).

Q: Did Ms. Listernick provide you with a copy of her worksheets used to analyze the October 2003 soil gas results?

A: No.

Q. Can you perform an Imminent Hazard evaluation with soil gas results?

A. No. A risk assessor can model the potential indoor air exposure from a soil gas result. Obtaining this information, as I did from Ms. Listernick, would tell me if I had a potential Imminent Hazard. If there was a potential Imminent Hazard, I would need to do indoor air testing immediately and perform an Imminent Hazard Evaluation.

Q. Why did you accept a verbal report from Ms. Listernick in October 2003?

A. By 2003, I had utilized Ms. Listernick's risk assessor services for approximately 25 years without issue. In general, Ms. Listernick's work was top notch and the opinions she rendered were well reasoned. By 2003, I had developed a high level of trust for Ms. Listernick's work. Indeed, the LSP community holds Ms. Listernick in very high regard and she has since been appointed to the LSP Board. I relied upon Ms. Listernick's conclusions and advice regarding assessment of the risk in order to guide my strategy for the site cleanup. In addition, when you are in the field asking for a preliminary analysis

as I did here, it is not uncommon for an LSP to receive a verbal report as to whether or not he needs to perform immediate further testing.

Q. What did you do after you received Ms. Listernick's conclusions regarding the risk analysis of the soil gas results?

A. After receiving Ms. Listernick's conclusion that a potential Imminent Hazard did not exist and that indoor air testing was not immediately required, I prepared and filed my Phase I Report with the MassDEP. The Phase I Report was filed on January 21, 2004. (See Joint Exhibit 6). At the time I submitted the Phase I Report, I was not aware of any evidence supporting the need for an Imminent Hazard Evaluation or that an Imminent Hazard existed at the Site and I noted such in the Phase I Report.

Q: Did you plan to test the indoor air for PCE?

A: Yes. In the Phase I Report, I stated that indoor air at the Premises would be tested as part of the Phase II Conceptual Scope of Work. (See Joint Exhibit 6, Phase I Report, Section 9.2). In order to obtain authorization from the Site owner for that testing, on February 11, 2004, I submitted to Le-Mack, the owner of the Site, a Recommended Closure Strategy (RCS), which included an estimate for 14 hours of indoor air sampling. (See Exhibit 7, RCS, Cost Estimate, Table 2). I expected and planned to have the indoor air tested at the Premises as part of Phase II.

Q: Did you collect indoor air samples as part of the Phase II work?

A: No. Before we could begin our sampling, the DEP contacted me on February 3, 2004, and requested the collection of indoor air samples at the Building to determine possible exposures to PCE. At the time of the request, no one emphasized the need to collect the samples on an expedited basis. For that reason, samples were collected as the

work schedule allowed, on February 10-11, and the samples were submitted to the analytical laboratory for a standard turnaround (usually 5-7 business days). Air sample results were received on February 17 and forwarded to OTO for interpretation.

Q. Did Ms. Listernick review the results?

A: Yes.

Q: What was Ms. Listernick's conclusion regarding the indoor air results?

A. On February 19, 2004, I spoke with Ms. Listernick, who told me that she had reviewed the indoor air sampling results for the Building. She informed me that there was no Imminent Hazard present at the Site for its current use as a video store, although the results were above the ELCR. Ms. Listernick told me that she was preparing a letter with her analysis. Exhibit R-3 is a true and accurate copy of a Phone Log memorializing my conversation with Ms. Listernick.

Q. Did you receive a copy of a written report from Ms. Listernick?

A. On or about February 23, 2004, I received a copy of the Indoor Air Evaluation from Ms. Listernick (the "February 23 Listernick Report"). (See Joint Exhibit 9). The conclusion of the written report confirmed Ms. Listernick's prior verbal report. The next day, I hand delivered the February 23 Listernick Report to the MassDEP (See Joint Exhibit 9).

Q. What happened after you delivered the February 23 Listernick Report to the MassDEP?

A. On March 8, 2004, the DEP informed me that the DEP did not agree with the interpretation of the analytical data concluding that an Imminent Hazard was not present at the site. The DEP told me that OTO had used an EPA unit inhalation risk factor rather

than a DEP unit inhalation risk factor and that if the DEP risk factor had been used an Imminent Hazard would have been identified. At that point, OTO was contacted for clarification on their interpretation and I solicited a second opinion from another consultant qualified to render opinions in risk characterization. Based on the input from the second consultant, I immediately (on March 8, 2004) reported the Imminent Hazard to Nick Childs at the MassDEP. I provided an Immediate Response Action plan verbally to Mr. Childs and the verbal plan was approved. I also coordinated an evacuation of the Building and provided notification to the Town of Ayer Board of Health and the Ayer Fire Department.

Upon receiving MassDEP approval, I took immediate action to vent the Premises and to install a poly barrier separating the basement from the occupied portion of the building. On March 10, 2004, I notified the MassDEP that the evacuation was complete; that an exhaust blower had been in operation since the afternoon of March 8, 2012; and that a poly barrier was installed to separate the basement from the occupied portion of the Premises.

Q. Did you develop a plan to abate the Imminent Hazard?

A. Yes. In March 2004, we presented a clean-up plan to Le-Mack. (See Joint Exhibit 12, Recommended Strategy to Address Imminent Hazard Condition). However, the owner believed that the plan was too costly and sought the opinion of another LSP. Le-Mack hired a new LSP and I did not have the opportunity to implement any clean-up plan. As of March 23, 2004, I was no longer the LSP for this Site. (See Joint Exhibit 18).

Q: After March 23, 2004 did you take any other action related to the site?

A: Yes. Although I was no longer the LSP, I considered it my duty to submit a revised Numerical Rank System Score sheet to the MassDEP to account for the indoor sampling results. (See Joint Exhibit 15).

Q. Are you aware that the LSP Board claims that your Phase I submittal should have referenced an Imminent Hazard Evaluation and indicate that an IRA was required?

A. Yes.

Q. What is your response to that position?

A. As I previously stated, you cannot perform an Imminent Hazard Evaluation from soil gas data. What you can do is ask a risk assessor to model the potential for indoor air exposure by using the soil gas measurements. The results of that modeling would determine if an Imminent Hazard Evaluation was warranted. Since the risk assessor reported to me that an Imminent Hazard was not indicated, I did not report one in the Phase I submittal.

Q. Are you aware that the LSP Board claims that rather than stating indoor air should be tested "as appropriate", the Phase I report should have stated indoor air sampling should be done immediately?

A. Yes. Based on the information provided to me by the risk assessor, I did not believe, at that time, that indoor air needed to be tested immediately. However, the term "as appropriate" meant that we would test indoor air. In fact, as I previously stated, we presented a proposal to the client to test the indoor air. Although the letter to client outlining the recommended scope of services was dated and sent on February 11, 2004, the draft of that letter was prepared prior to the DEP's February 3, 2004 request for

indoor air testing, and no matter what the February 2004 results were that additional indoor air sampling would be required.

Q. The LSP Board also states that the NRS scoresheet should have scored indoor air as a "likely potential pathway". What is your position on this opinion?

A. The "Air Exposure Criteria" set out in 310 CMR 40.1512(4) does not have a designation of "likely potential pathway". (See Exhibit R-3A). This section of the MCP identifies a "potential exposure pathway" as a reasonable likelihood that indoor air quality will be impacted which should be scored as 100 points; or a "likely or confirmed exposure pathway" as a reasonable likelihood that indoor air quality is being affected, which should be scored as 200 points. At the time the Phase I Report was submitted, my understanding was that the Air Exposure Pathway Score of 100 points was appropriate since no actual indoor air testing data existed characterizing the indoor air concentration. Therefore, I characterized this as a "potential pathway" since there was a reasonable likelihood that indoor air would be impacted, but indoor air concentrations were not confirmed. I was aware that once we conducted the indoor air testing as part of Phase II, that designation might change.

Q. The LSP Board claims that you should have identified inaccuracies in the February 23, 2004 Listernick Report including (1) the assumption that part-time workers were a more likely exposure scenario and/or (2) the conclusion that the calculated Excess Lifetime Cancer Risk ("ELCR") for full-time workers did not exceed the MCP Standard for an Imminent Hazard and that the failure to do so breached the standard of care of an LSP. What is your position on this opinion?

A. First, although the February 23, 2004 Listernick Report does state in one section of the Report that part-time workers were a more likely scenario, the risk assessor did an analysis for the full-time worker which was also discussed in the Report. The LSP Board allegations make it seem as if OTO neglected to evaluate the situation as it related to a full-time worker, which they did not.

Next, as I have previously testified, I had a phone conversation with Ms. Listernick on February 19, 2004, where she reported to me that no Imminent Hazard existed at the Site. The written conclusion in the report made the same statement. In hindsight, rather than rely on Ms. Listernick's verbal and written conclusion, it would have been a better practice for me to review the Report in more detail. But, based on my conversation with Ms. Listernick that there was no Imminent Hazard and my working relationship with her, I was comfortable with her conclusion.

Q. Did you receive a Notice of NonCompliance ("NON") from the DEP relative to your work on the Site?

A. Yes. On August 2, 2004 I received a NON letter from the DEP. The letter stated that indoor air testing should have been performed in order to prepare the Tier Classification submittal which would have changed the classification to Tier 1A rather than 1B; and once indoor air testing was performed there were errors in the risk calculations which resulted in a conclusion of no Imminent Hazard. The NON requested that I describe the events leading to the submission of my LSP opinion; explain the implications of noncompliance outlined in the DEP's letter; and explain steps I would take to prevent such non-compliance in the future.

Q. Did you follow the DEP's instructions in responding to the NON?

A. Yes. On August 31, 2004 I sent a letter to Mary Gardner at the DEP responding to the NON. (See Joint Exhibit 21). I am incorporating the contents of that letter into my testimony. (See Joint Exhibit 21). I also received support from Debra Listenick in the form of a letter which she provided to me regarding her risk evaluation process. Listernick's letter was submitted to the DEP with my NON response. (See Joint Exhibit 20).

Q. After receiving the NON from the DEP did you take any steps to change your standard practices regarding the detection of vapor intrusion?

A. After receiving the NON, I evaluated the conditions at all my other sites to confirm that an Imminent Hazard condition related to vapor transmission of PCE and other chlorinated solvents to an occupied building did not exist. Based upon the DEP's recommendation, I changed my interpretation of the MCP such that when there is a reasonable likelihood that a site chemical is present in indoor air, it should be considered, for purposes of a numerical ranking score, as a confirmed exposure pathway. Finally, I undertook to further educate myself on the issues raised in this matter by taking the following continuing education courses:

LSP COURSE NUMBER	TOPIC	DATE
1207-04	The MCP – Audit and Regulatory Training	November 23, 2004
1260	Vapor Intrusion Seminar	December 1, 2004
1309	2006 MCP Revisions	April 26, 2006
1207-06	The MCP Audit 2006 – A Case Study Approach	March 29, 2007

1284	Data Management in Support of the MCP	December 7, 2005
1352	Introduction to Short Forms for Human Health Risk Assessment	December 17, 2009
1371	Vapor Intrusion for LSP's – Investigating, Sampling and Mitigating	January 27, 2010

Q. Since receiving the NON have you made any other changes in your standard practices?

A. Yes. Rather than rely solely on a risk assessor' verbal opinion, I now ask the risk assessor for support for his/her work. I am not qualified to perform the risk assessment calculations and I do not believe that any LSP would be qualified to do so unless they are also a risk assessor.

Q: Prior to the time the DEP filed its Complaint against you in 2008, did you ever receive any notification from the DEP that your response to the August 2004 NON was not satisfactory?

A: No.

Q: Does this conclude your testimony?

A: Yes.