UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 RENNER BOULEVARD
LENEXA, KANSAS 66219

IN THE MATTER OF: COMPTON'S LLC and SPECTRUM BRANDS, INC., Respondents	Docket No. CERCLA-07-2015-0006 Proceeding under Sections 104, 106(a), 107, and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9604, 9606(a), 9607, and 9622.

ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMOVAL ACTION

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I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement") is entered into voluntarily by the United States Environmental Protection Agency ("EPA"), Spectrum Brands, Inc., and Compton's LLC ("Respondents"). This Settlement Agreement provides for the performance of a removal action by Respondents at and in connection with the "Toastmaster-Macon Site" (the "Site") generally located at 704 South Missouri Street in Macon, Missouri.

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107, and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622, as amended ("CERCLA").

3. EPA has notified the State of Missouri (the "State") of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

4. EPA and Respondents recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondents in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondents do not admit, and retain the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of facts, conclusions of law, and determinations in Sections IV and V of this Settlement Agreement. Respondents agree to comply with and be bound by the terms of this Settlement Agreement and further agree that they will not contest the basis or validity of this Settlement Agreement or its terms.

II. PARTIES BOUND

5. This Settlement Agreement applies to and is binding upon EPA and upon Respondents and their successors and assigns. Any change in ownership or corporate status of a Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter such Respondent's responsibilities under this Settlement Agreement.

6. Respondents are jointly and severally liable for carrying out all activities required by this Settlement Agreement. In the event of the insolvency or other failure of any one or more Respondents to implement the requirements of this Settlement Agreement, the remaining Respondents shall complete all such requirements. However, EPA recognizes an indemnity exists between Respondent Compton's LLC and Respondent Spectrum Brands, as described in Paragraph 26. Based on this indemnity, Respondent Compton's LLC agrees to perform the Work required by this Order, and Respondent Spectrum Brands, should Respondent Compton be unable or unwilling to do so, agrees to provide financial assurance for the Work. This framework is acceptable to EPA, but does not affect the joint and several liability of the Respondents.

7. Respondents shall ensure that their contractors, subcontractors, and representatives receive a copy of this Settlement Agreement and comply with this Settlement Agreement. Respondents shall be responsible for any noncompliance with this Settlement Agreement, but shall receive notice of this noncompliance pursuant to Paragraph 81.

III. DEFINITIONS

8. Unless otherwise expressly provided in this Settlement Agreement, terms used in this Settlement Agreement which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601, *et seq.*

"Constituents of Concern" or "COCs" shall mean trichloroethene (TCE), 1,1-dichloroethene, cis-1,2 dichloroethene, trans-1,2- dichloroethene, and vinyl chloride.

"Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next working day.

"Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXXII.

"EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

"Facility" shall mean the property located at 704 South Missouri Street in Macon, Missouri, near the center of Northwest Quarter of the Northeast Quarter of the Southeast Quarter of Section 21, Township 57 North, Range 14 West in Macon County, Missouri.

"Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Paragraph 52 (costs and attorney's fees and any monies paid to secure access, including the amount of just

compensation), and Paragraph 57 (emergency response) and Paragraph 90 (work takeover).

"Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

"MDNR" shall mean the Missouri Department of Natural Resources and any successor departments or agencies of the State.

"National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

"Paragraph" shall mean a portion of this Settlement Agreement identified by an Arabic numeral.

"Parties" shall mean EPA and Respondents.

"Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States paid at or in connection with the Site from June 27, 2014 up to the Effective Date.

"RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901, *et seq.* (also known as the Resource Conservation and Recovery Act).

"Respondents" shall mean Compton's LLC and Spectrum Brands, Inc.

"Section" shall mean a portion of this Settlement Agreement identified by a Roman numeral.

"Settlement Agreement" shall mean this Administrative Settlement Agreement and Order on Consent and all appendices attached hereto (listed in Section XXX). In the event of conflict between this Settlement Agreement and any appendix, this Settlement Agreement shall control.

"Site" shall mean the Facility and all areas where the COCs from Facility operations have come to be located.

"State" shall mean the State of Missouri.

"Waste Material" shall mean any "hazardous substance" as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and/or any "pollutant or contaminant" as defined in Section 101(33) of CERCLA, 42 U.S.C. § 9601(33).

"Work" shall mean all activities Respondents are required to perform under this Settlement Agreement.

IV. FINDINGS OF FACT

9. Respondent Compton's LLC is the current owner of the Facility. The Facility consists of approximately 10 acres and is located in an area that is primarily light industrial or residential. Structures at the Facility include an approximately 175,000 square-foot building, a metal canopy and shed adjacent to the west side of the building, and a concrete foundation that housed above-ground storage tanks prior to 1991.

10. Small-electronic appliance manufacturing operations were conducted at the Facility from approximately 1956 until 2001, and from 2001 until 2012 the Facility was used for warehousing purposes. Macon Industrial Development Corporation ("MIDC") owned all or part of the Facility and leased the property to McGraw-Edison Company beginning in the mid-1950s for use by its Portable Appliance and Tool Group division. In 1980, McGraw-Edison, as part of an asset sale, sold its Portable Appliance and Tool Group division as part of a leveraged buy-out, resulting in the formation of Toastmaster, Inc. ("Toastmaster"). In October 1983, Toastmaster was acquired by Magic Chef, Inc. and was operated as a wholly-owned subsidiary of Magic Chef, Inc. until acquired by Maytag Company in 1986. Toastmaster was then sold to a portion of its management team in January 1987. In 1992, Toastmaster became a publicly-traded company. On January 8, 1999, Toastmaster was acquired by Salton, Inc. Salton, Inc. later changed its name to Russell-Hobbs, Inc. and Toastmaster operated as a wholly-owned subsidiary of Russell-Hobbs, Inc. Spectrum Brands, Inc. acquired Russell-Hobbs in 2010. Toastmaster, Inc. has now been, or soon will be, merged into Spectrum Brands, Inc.

11. From 1956 until at least 1996, TCE was stored and used in operations at the Facility. Until 1991, TCE was stored in a 5,000 gallon above-ground storage tank. After 1991, TCE was stored within the Facility in 55 gallon drums.

12. In 1991, during Toastmaster's ownership and operation of the Facility, a pinhole leak was discovered in the 5,000 gallon fuel oil above-ground storage tank (AST) located outside, directly adjacent to the manufacturing building. A 5,000 gallon AST containing TCE was also located next to the fuel oil storage tank. Both of these tanks were located within a concrete foundation on a gravel bed. A subsequent investigation by MDNR reported that TCE use since 1956 resulted in spillage during storage tank filling occurred over a long period of time.

13. In September 1991, after discovering the fuel leak, Toastmaster contracted to perform a soil gas survey to evaluate the potential presence of volatile organic compounds

(VOCs) in soils under and adjacent to the AST area, and estimate the quantity of VOCs that may have been released in this area. Soil gas sampling was conducted on September 14-16, 1991. This sampling revealed the presence of total VOCs and TCE, along with traces of benzene and toluene, in the storage area.

14. Based on the results of the soil gas survey, Toastmaster initiated a Phase II Environmental Site Assessment (ESA) to verify the results of the soil gas survey and to delineate the vertical and horizontal extent of the VOC contamination. At that time, a Phase I ESA had not been completed. Field work on the Phase II ESA began on January 20, 1992, which included the installation of ten groundwater monitoring wells.

15. The Phase II ESA documented that soils down-gradient and cross-gradient from the former location of the TCE and diesel fuel ASTs were contaminated with VOCs. The Phase II ESA also documented that groundwater in both an upper water-bearing zone and a lower water-bearing zone were contaminated with VOCs, most significantly, TCE.

16. On June 17, 1992, Toastmaster reported a spill of TCE at the Facility to the National Response Center. This report indicated that Toastmaster had performed a site assessment and discovered off-site contamination of TCE in groundwater. The contamination was reported to be a result of historical leaks of TCE at the AST.

17. On September 17, 1993, MDNR received a Cleanup Assessment Report for the Toastmaster site from the Missouri Department of Health. The report concluded that a health risk existed at the Site based on the high levels of VOCs, especially TCE, in the soil and groundwater. However, the magnitude of the health risk could not be determined without additional information regarding the presence and vulnerability of public and private water supplies near the Site.

18. After the Phase II ESA was completed, Toastmaster contracted to design and oversee the response to subsurface TCE contamination. In January 1995, groundwater from the monitoring wells was sampled. Some samples showed a slight increase, while some showed a slight decrease, from the 1992 sampling results.

19. In December 1995, Toastmaster installed thirteen additional monitoring wells to further characterize the extent of contamination and the direction of groundwater flow.

20. MDNR submitted a CERCLIS Site Identification Form to EPA for the Site on February 8, 1996. Toastmaster submitted an application to MDNR's Hazardous Substances Environmental Remediation Program for the remediation of contaminants under the review and oversight of MDNR. Toastmaster was accepted into MDNR's Voluntary Cleanup Program by a letter dated March 29, 1996. MDNR requested that Toastmaster conduct a Phase I ESA, which was completed on June 14, 1996.

21. In April and July 1996, MDNR issued two comment letters on previous investigations conducted at the Site. In July 1998, a pump and treat system was evaluated as a

remediation technique. In October 1998, MDNR issued a third comment letter requiring the installation of additional monitoring wells including wells drilled to bedrock, sampling of intermittent streams down-gradient from the Site, and investigation of the TCE source area. In March 1999, MDNR approved the well installation work plan, including wells drilled to bedrock.

22. In January 2001, MDNR issued a letter to Toastmaster indicated that, although characterization was not yet complete, response actions were necessary at the Site. In April 2001, MDNR approved a pilot test for the use of Hydrogen Release Compound at the Site. In October 2001, MDNR requested additional sampling at the Site and approved Toastmaster's sampling plan in November 2001.

23. On April 14, 2004, MDNR issued a letter stating that the use of Hydrogen Release Compound at the Site had been effective, but that it should be combined with another remediation technology that will be effective in the source area.

24. In March 2005, MDNR issued a letter to Toastmaster indicating that a new guidance document would be used in the investigation and/or remediation of the Site with respect to source areas, indoor air, groundwater, and its associated contaminant plume.

25. In April 2010, MDNR issued a letter to Toastmaster indicating that additional Site investigation was needed. In June 2011, the Site investigation work plan was approved by MDNR. In March 2012, MDNR issued a letter requesting additional investigation and remedial action.

26. In June 2012, Compton's LLC purchased the Facility and assumed, by contractual indemnity, all environmental liabilities associated with the Facility. MDNR received a letter of agreement enrolling Compton's LLC in MDNR's Voluntary Cleanup Program (VCP) on May 23, 2012.

27. On June 13, 2013, MDNR issued comments on the groundwater monitoring report, and again set a deadline for submission of a remedial action plan. On December 11, 2013, MDNR established a thirty-day deadline for remedial action plan submittal, or the Site would be terminated from MDNR's VCP. On January 16, 2014, the Site was terminated from Missouri's VCP.

28. In May 2014, MDNR conducted indoor air sampling to determine whether COC vapors from subsurface contamination were resulting in exposures within the building at the Facility. The sampling documented elevated levels of TCE in the indoor air within the building.

29. In June 2014, MDNR requested that EPA take action to respond to vapor intrusion exposures within the building at the Facility, and address the source of those exposures.

30. In July 2014, MDNR conducted indoor air, and sub-slab soil gas sampling at residences in the immediate vicinity of the Facility to determine whether the COCs from the Facility were impacting nearby residences. The results of this sampling, received by MDNR in

August 2014, documented elevated indoor and/or sub-slab levels of TCE in two of the nearby residences. In September 2014, MDNR referred the Site to EPA, requesting that EPA investigate and respond to contamination at the Facility, as well as contamination emanating from the Facility. On October 2, 2014, EPA conducted a fund-lead removal action and installed sub-slab vapor mitigation devices in the two residences that had elevated levels of TCE.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

31. Based on the Findings of Fact set forth above, and the Administrative Record supporting this removal action, EPA has determined that:

a. The Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The contamination found at the Site, as identified in the Findings of Fact above, includes "hazardous substance(s)" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

c. Each Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

d. Each Respondent is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and is jointly and severally liable for performance of the response action and for response costs incurred and to be incurred at the Site.

i. Respondent Compton's LLC is the "owner" and/or "operator" of the Facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

ii. Respondent Spectrum Brands, Inc. was the "owner" and/or "operator" of the Facility at the time of disposal of hazardous substances at the Facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2).

e. The conditions described in the Findings of Fact above constitute an actual or threatened of "release" of a hazardous substance from the Facility as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

f. The removal action required by this Settlement Agreement is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Settlement Agreement, will be

consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

VI. SETTLEMENT AGREEMENT AND ORDER

32. Based upon the foregoing Findings of Fact, Conclusions of Law, Determinations, and the Administrative Record for this Site, it is hereby Ordered and Agreed that Respondents shall comply with all provisions of this Settlement Agreement, including, but not limited to, all attachments to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VII. DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR, AND ON-SCENE COORDINATOR

33. Respondent Compton's LLC has retained, and EPA does not disapprove of, Barr Engineering Company as its contractor to perform the Work.

34. Respondent Compton's LLC has designated Tony Schroer as Project Coordinator. The Project Coordinator shall be responsible for administration of all actions by Respondents required by this Settlement Agreement. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site work. If EPA subsequently disapproves of the designated Project Coordinator, Respondents shall retain a different Project Coordinator and shall notify EPA of that person's name, address, telephone number, and qualifications within 14 days following their receipt of EPA's disapproval. Notification to Respondent Compton's LLC will be made to its Project Coordinator. All notifications to Respondent Spectrum Brands shall be made to Daniel Hutter, DVP, Global EHS & Compliance Assurance, Spectrum Brands, Inc., 3001 Deming Way, Middleton, Wisconsin 53562-1431, (608) 278-6625, daniel.hutter@spectrumbrands.com, with copy to Andrew Perellis, Seyfarth Shaw LLP, 131. S. Dearborn Street, Chicago, Illinois 60603, (312) 460-5813, aperellis@seyfarth.com.

35. EPA has designated John Frey of the Emergency Response South Branch, Superfund Division, EPA Region 7, as its On-Scene Coordinator ("OSC"). Except as otherwise provided in this Settlement Agreement, Respondents shall direct all submissions required by this Settlement Agreement to EPA's OSC at 8600 NE Underground Dr., Pillar 253, Kansas City, Missouri, 64161. Reports, correspondence, notices or other submittals to EPA shall be delivered by U.S. Postal Service, private courier service, or e-mail, as specified by EPA. All submittals and correspondence shall include a reference to EPA Docket No. CERCLA 07-2015-0006.

36. EPA and Respondents shall have the right, subject to Paragraph 35, to change their respective designated OSC, Project Coordinator, or designated contact. Respondents shall notify EPA three days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notice.

VIII. WORK TO BE PERFORMED

37. Respondent Compton will perform the work detailed in the attached Removal Action Work Plan ("RAWP"), titled Facility Vapor Intrusion Mitigation System Design & Implementation/Residential Investigation Work Plan, Appendix I. The attached RAWP has been approved by EPA. The RAWP shall be incorporated and become fully enforceable under this Settlement Agreement.

38. Respondent Compton shall commence implementation of the Work in accordance with the schedule included in the RAWP. Respondent Compton shall not commence any Work except in conformance with the terms of this Settlement Agreement.

39. Unless otherwise provided in this Settlement Agreement, any additional deliverables that require EPA approval under the RAWP shall be reviewed for approval by EPA in conformance with the terms of this Settlement Agreement.

40. In the event EPA determines that Respondent Compton has ceased implementation of any portion of the Work required by this Settlement Agreement or the RAWP, is seriously or repeatedly deficient or late in its performance of the Work, or is implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA (subject to the Reservation of Rights provided in Section XXI of this Settlement Agreement) may request Respondent Spectrum Brands to undertake or assume performance of that Work. In such case, Respondent Spectrum Brands shall do so, provided however, that upon request, EPA will first confer in good-faith with Spectrum Brands with respect to the requested performance and any modifications to the Work or the RAWP that Spectrum Brands may suggest. Any request for modification shall be in accordance with Section XXVIII of this Settlement Agreement.

IX. QUALITY ASSURANCE AND DATA ANALYSIS

41. Health and Safety Plan.

Within 30 days after the Effective Date, Respondents shall submit for EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-Site work under this Settlement Agreement. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C.F.R. Part 1910. Respondents shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the pendency of the Work.

42. Quality Assurance and Sampling.

a. All sampling and analyses performed pursuant to this Settlement Agreement shall conform to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondents shall ensure that any laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate EPA guidance. Respondents shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondents shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, March 2001), or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements.

b. Upon request by EPA, Respondents shall have such a laboratory analyze samples submitted by EPA for QA monitoring. Respondents shall provide to EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.

c. Upon request by EPA, Respondents shall allow EPA or its authorized representatives to take split and/or duplicate samples. Respondents shall notify EPA not less than 30 days in advance of any sample collection activity, unless shorter notice is agreed to by EPA. EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow Respondents to take split or duplicate samples of any samples it takes as part of its oversight of Respondents' implementation of the Work.

43. Reporting.

a. Respondents shall submit a written progress report to EPA concerning actions undertaken pursuant to this Settlement Agreement every 30th day after the effective date of this Settlement Agreement and continuing until its termination, unless otherwise directed in writing by EPA's OSC. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the

developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

b. Respondents shall submit two copies of all plans, reports or other submissions required by this Settlement Agreement, or any approved work plan. Upon request by EPA, in lieu of or in addition to paper copies, Respondents shall submit such documents in electronic form.

c. Any Respondent who owns or controls real property at the Site shall, at least 30 days prior to the conveyance of any interest in such property, give written notice to the transferee that the property is subject to this Settlement Agreement and written notice to EPA of the proposed conveyance, including the name and address of the transferee. Respondents who own or control property at the Site also agree to require that their successors comply with the immediately preceding sentence and Sections X (Site Access) and XI (Access to Information).

44. Final Report.

a. Within 30 days after completion of the Work, Respondents shall submit for EPA review and approval a final report summarizing the actions taken to comply with this Settlement Agreement. The final report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP entitled "OSC Reports". The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Settlement Agreement, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal action (*e.g.*, manifests, invoices, bills, contracts, and permits). The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

> "Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

45. Off-Site Shipments.

a. Respondents shall, prior to any off-Site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to the On-Scene Coordinator. However, this notification requirement shall not apply to any off-Site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

i. Respondents shall include in the written notification the following information: 1) the name and location of the facility to which the Waste Material is to be shipped; 2) the type and quantity of the Waste Material to be shipped; 3) the expected schedule for the shipment of the Waste Material; and 4) the method of transportation. Respondents shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

ii. The identity of the receiving facility and state will be determined by Respondents following the award of the contract for the removal action. Respondents shall provide the information required by Paragraph 45(a) and 45(b) as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

b. Before shipping any hazardous substances, pollutants, or contaminants from the Site to an off-site location, Respondents shall obtain EPA's certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondents shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence.

X. SITE ACCESS

46. If the Site, or any other property where access is needed to implement this Settlement Agreement, is owned or controlled by a Respondent, such Respondent shall, commencing on the Effective Date, provide EPA and its representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Settlement Agreement.

47. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use their best efforts to obtain all necessary access agreements within 30 days after the Effective Date, or as otherwise specified in writing by the OSC. Respondents shall immediately notify EPA if after using their best efforts they are unable to obtain such agreements. For purposes of this Paragraph, "best efforts" includes at a minimum, a certified letter from Respondents to the present owner of such property requesting access agreements to permit Respondent, its contractors, EPA and EPA's representatives to enter such property. Respondents shall describe in writing their efforts to obtain access. EPA may then assist Respondents in gaining access, to the extent necessary to effectuate the response actions described in this Settlement Agreement, using such means as EPA deems appropriate. Respondents shall reimburse EPA for all costs (including payment, if any, of reasonable sums of money to the property owner in consideration of access) and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XVI (Payment of Response Costs).

48. Notwithstanding any provision of this Settlement Agreement, EPA retains all of its access authorities and rights, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XI. ACCESS TO INFORMATION

49. Respondents shall provide to EPA, upon request, copies of all documents and information within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondents shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

50. Respondents may assert business confidentiality claims covering part or all of the documents or information submitted to EPA and the State under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA, or if EPA has notified Respondents that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondents.

51. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondents assert such a privilege in lieu of providing documents, they shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondents. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

52. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XII. RECORD RETENTION

53. Until 10 years after Respondents' receipt of EPA's notification pursuant to Section XXIX (Notice of Completion of Work), each Respondent shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 10 years after Respondents' receipt of EPA's notification pursuant to Section XXIX (Notice of Completion of Work), Respondents shall also instruct their contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work.

54. At the conclusion of this document retention period, Respondents shall notify EPA at least 90 days prior to the destruction of any such records or documents, and, upon request by EPA, Respondents shall deliver any such records or documents to EPA. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondents assert such a privilege, they shall provide EPA with the following: (a) the title of the document, record, or information; (b) the date of the document, record, or information; (c) the name and title of the author of the document, record, or information; (d) the name and title of each addressee and recipient; (e) a description of the subject of the document, record, or information; and (f) the privilege asserted. However, no documents, reports or other information created or generated pursuant to this Settlement Agreement shall be withheld on the grounds that they are privileged.

55. Each Respondent hereby certifies individually that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to

its potential liability regarding the Site since notification of potential liability by EPA or the State or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927.

XIII. COMPLIANCE WITH OTHER LAWS

56. Respondents shall perform all actions required pursuant to this Settlement Agreement in accordance with all applicable state and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-Site actions required pursuant to this Settlement Agreement shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental or state environmental or facility siting laws.

XIV. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

57. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, Respondents shall immediately take all appropriate action. Respondents shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify EPA's OSC or, in the event of his/her unavailability, the Regional Duty Officer of the incident or Site conditions. In the event that Respondents fail to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondents shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XVI (Payment of Response Costs).

58. In addition, in the event of any release of a hazardous substance from the Site, Respondents shall immediately notify EPA's OSC at (913) 281-0991 and the National Response Center at (800) 424-8802. Respondents shall submit a written report to EPA within 7 days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004, *et seq.*

XV. AUTHORITY OF ON-SCENE COORDINATOR

59. EPA's OSC shall be responsible for overseeing Respondents' implementation of this Settlement Agreement. EPA's OSC shall have the authority vested in an OSC by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement Agreement, or to direct any other removal action undertaken at the Site. Absence of EPA's OSC from the Site shall not be cause for stoppage of work unless specifically directed by EPA's OSC.

XVI. PAYMENT OF RESPONSE COSTS

60. Reimbursement of Past Response Costs. Following the Effective Date, EPA will send Respondents a bill requiring payment, which includes an itemized cost summary, for Past Response Costs. Respondent Compton shall pay such bill within 30 days after its receipt of such bill.

61. Reimbursement of Future Response Costs. On a periodic basis, EPA will send to Respondents a bill requiring payment that includes an itemized cost summary. Respondent Compton shall make all payments within 30 days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 66 (Contested Costs) of this Settlement Agreement. If Respondent Compton fails to do so, then Respondent Spectrum Brands shall make all payments within 60 days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 66 (Contested Costs) of this Settlement Agreement.

62. All payments under this Section shall be made per instructions available at: http://www.epa.gov/ocfo/finservices/payment_instructions.htm. The total amount to be paid by Respondents shall be deposited by EPA in a Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

63. Payments shall be accompanied by a statement identifying the name and address of the party making the payment, the Site name, the EPA identifier "B792", and the EPA docket number that appears on the cover of this Settlement Agreement.

64. At the time of payment, Respondents shall send notice that payment has been made to EPA's OSC.

65. If Respondents do not reimburse EPA for costs as provided in this Section, they shall pay Interest on the unpaid balance. Interest shall begin to accrue on the date of Respondents' receipt of the bill and shall continue to accrue until the date of payment. If EPA receives a partial payment, Interest shall accrue on any unpaid balance. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to EPA by virtue of Respondents' failure to make timely payments under this Section, including but not limited to, payments of penalties pursuant to Section XIX.

66. Contested Costs. Respondents may contest payment of any costs hereunder if they believe that: (a) EPA has made an accounting error; (b) that EPA incurred excess costs as a direct result of an EPA action that was inconsistent with CERCLA and/or regulations promulgated thereunder; and/or (c) EPA included cost items that do not qualify as Future Response Costs. Such objection shall be made in writing within 30 days of receipt of the bill and must be sent to the EPA's OSC. Any such objection shall specifically identify the contested costs and the basis for objection. In the event of an objection, Respondents shall, within the 30 day period, pay all uncontested costs to EPA. Simultaneously, Respondents shall establish an interest-bearing escrow account in a federally-insured bank and remit to that escrow account funds equivalent to the amount of the contested costs. Respondents shall send to EPA's OSC a copy of the transmittal letter and check paying the uncontested costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, Respondents shall initiate the Dispute Resolution procedures in Section XVII (Dispute Resolution) for all contested costs. If EPA prevails in the dispute, within 15 days of the resolution of the dispute, Respondents shall pay the sums due (with accrued Interest) to EPA in the manner described in this Section. If Respondents prevail concerning any aspect of the contested costs, Respondents shall pay that portion of the costs (plus associated accrued Interest) for which Respondents did not prevail to EPA. Respondents shall be disbursed any balance of the escrow account and Respondents shall be relieved from paying any portion of the contested costs for which Respondents prevailed in establishing that the costs were inappropriate. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XVII (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding Respondents' obligation to reimburse EPA for its costs hereunder.

XVII. DISPUTE RESOLUTION

67. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes regarding this Settlement Agreement. However, the procedures set forth in this Section shall not apply to actions by, or on behalf of, EPA to enforce obligations of Respondents that have not been timely disputed in accordance with this Section.

68. Any dispute regarding this Settlement Agreement shall in the first instance be the subject of informal negotiations between the Parties. The period for informal negotiations shall not exceed twenty (20) days from the time the dispute arises, unless it is modified by written agreement of the Parties. The dispute shall be considered to have arisen when one Party sends the other Party a written Notice of Dispute.

69. Statements of Position.

a. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by EPA shall be considered binding unless, within twenty (20) days after the conclusion of the informal negotiation period, Respondents invoke the formal dispute resolution procedures of this Section by submitting to EPA a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by Respondents. The Statement of Position shall specify Respondents' position as to whether formal dispute resolution should proceed under Paragraph 70 (Record Review) or Paragraph 71.

b. Within twenty (20) days after receipt of Respondents' Statement of Position, EPA will submit to Respondents its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by EPA. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under Paragraph 70 (Record Review) or Paragraph 71. Within twenty (20) days after receipt of EPA's Statement of Position, Respondents may submit a Reply.

c. If there is disagreement between EPA and Respondents as to whether dispute resolution should proceed under Paragraph 70 (Record Review) or Paragraph 71, the Parties shall follow the procedures set forth in the Paragraph determined by EPA to be applicable. However, if Respondents ultimately appeals to Region 7's Regional Judicial Officer (RJO) to resolve the dispute, the RJO shall determine which Paragraph is applicable in accordance with the standards of applicability set forth in Paragraphs 70 (Record Review) and 71.

70. Record Review. Formal dispute resolution for disputes pertaining to EPA's selection or the adequacy of any response action shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation, the adequacy, or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this Settlement Agreement, and the adequacy of the performance of response actions taken pursuant to this S.

a. An administrative record of the dispute shall be maintained by EPA and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, EPA may allow submission of supplemental statements of position by the Parties.

b. The Director of EPA Region 7's Superfund Division, or his or her designee ("Division Director"), will issue a final administrative decision resolving the dispute based on the administrative record described in Paragraph 70(a). This decision shall be binding upon Respondents, subject only to the right to seek RJO review pursuant to Paragraphs 70(c) and 70(d).

c. Any administrative decision made by EPA pursuant to Paragraph 70(b) shall be reviewable by the RJO, provided that a request for RJO review of the decision is submitted to EPA by Respondents within ten (10) days after receipt of the Division Director's decision. This submittal shall include a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Settlement Agreement. EPA may submit a response to Respondents' submittal.

d. In proceedings on any dispute governed by this Paragraph, Respondents shall have the burden of demonstrating that the Division Director's decision is arbitrary and capricious or otherwise is not in accordance with law. RJO review of the Division Director's decision shall be on the administrative record compiled pursuant to Paragraph 70(a). Stipulated penalties may be waived at the discretion of the RJO.

71. Formal dispute resolution for disputes that do not pertain to EPA's selection or adequacy of any response action shall be governed by this Paragraph. Following receipt of Respondents' Statement of Position submitted pursuant to Paragraph 69, the Division Director will issue a final decision resolving the dispute. The Division Director's decision shall be binding on Respondents.

72. The invocation of formal dispute resolution procedures under this Section shall not extend, postpone, or affect in any way any obligation of Respondents under this Settlement Agreement, not directly in dispute, unless EPA or the RJO agrees otherwise. Stipulated penalties with respect to the disputed matter shall continue to accrue but payment shall be stayed pending resolution of the dispute as provided in Paragraph 82. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this Settlement Agreement. In the event that Respondents do not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XIX (Stipulated Penalties). In this context, stipulated penalties may be waived at the discretion of the Division Director.

XVIII. FORCE MAJEURE

73. Respondents agree to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a *force* majeure. For purposes of this Settlement Agreement, a *force majeure* is defined as any event arising from causes beyond the control of Respondents, or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondents' best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work or increased cost of performance.

74. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a force *majeure* event, Respondents shall notify EPA orally within 7 days of when Respondents first knew that the event might cause a delay. Within 7 days thereafter, Respondents shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondents' rationale for attributing such delay to a *force majeure* event if they intend to assert such a claim; and a statement as to whether, in the opinion of Respondents, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondents from asserting any claim of *force majeure* for that event for the period of time of such failure to comply and for any additional delay caused by such failure.

75. If EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Settlement Agreement that are affected by the *force majeure* event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, EPA will notify Respondents in writing of its decision. If EPA agrees that the delay is attributable to a *force majeure* event, EPA will notify Respondents in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XIX. STIPULATED PENALTIES

76. Respondents shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 79 and 80 for failure to comply with the requirements of this Settlement Agreement specified below, unless excused under Section XVIII (*Force Majeure*). "Compliance" by Respondents shall include completion of the activities under this Settlement Agreement or any work plan or other plan approved under this Settlement Agreement identified below in accordance with all applicable requirements of law, this Settlement Agreement, and any

plans or other documents approved by EPA pursuant to this Settlement Agreement and within the specified time schedules established by and approved under this Settlement Agreement.

77. Stipulated Penalty Amounts – Work (Excluding Payments, Plans, Reports, and Other Deliverables). The following stipulated penalties shall accrue per violation per day for any noncompliance with this Settlement Agreement, or failure to perform the Work, except as provided in Paragraph 76:

Penalty Per Violation Per Day	Period of Noncompliance
$500	1st through 30th day
$1000	31st day and beyond

78. Stipulated Penalty Amounts – Payments, Plans, Reports, and other Deliverables. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate payment, reports or other plans or deliverables pursuant to this Settlement Agreement or a work plan:

Penalty Per Violation Per Day	Period of Noncompliance
$250	1st through 30th day
$500	31st day and beyond

79. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 88 of Section XXI, Respondents shall be liable for a stipulated penalty in the amount of $100,000.

80. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under Section VIII (Work to be Performed), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Respondents of any deficiency; and (b) with respect to a decision by the Superfund Division Director, or his/her delegate, under Paragraph 74 of Section XVII (Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period begins until the date that the EPA management official issues a final decision regarding such dispute. Nothing in this Settlement Agreement shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

81. Following EPA's determination that Respondents have failed to comply with a requirement of this Settlement Agreement, EPA will provide Respondents written notification of the failure and describe the noncompliance. Upon receipt of such notification, Respondents will have seven calendar days to cure such noncompliance. Upon Respondents' timely cure of the noncompliance, EPA will waive stipulated penalties that have accrued. Upon failure to timely cure, EPA will send Respondents a written demand for the payment of penalties.

82. All penalties accruing under this Section shall be due and payable to EPA within 30 days of Respondents' receipt from EPA of a demand for payment of the penalties, unless Respondents invoke the dispute resolution procedures under Section XVII (Dispute Resolution). All payments to EPA under this Section shall be paid by certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," shall be submitted to:

US Environmental Protection Agency
Superfund Payments
Cincinnati Finance Center
P.O. Box 979076
St. Louis, MO 63197-9000

83. Any payment made pursuant to this Section shall indicate that the payment is for stipulated penalties, and shall reference the EPA Region and Site/Spill ID Number B792, the EPA Docket Number CERCLA-07-2015-0006 and the name and address of the party(ies) making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to EPA as provided in Paragraph 62.

84. The payment of penalties shall not alter in any way Respondents' obligation to complete performance of the Work required under this Settlement Agreement.

85. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until 15 days after the dispute is resolved by agreement or by receipt of EPA's decision.

86. If Respondents fail to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondents shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to Paragraph 83. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondents' violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Sections 106(b) and 122(*l*) of CERCLA, 42 U.S.C. §§ 9606(b) and 9622(*l*), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3). Provided, however, that EPA wall not seek civil penalties pursuant to Section 106(b) or 122(*l*) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided in this Section, except in the case of a willful violation of this Settlement Agreement. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XX. COVENANT NOT TO SUE BY EPA

87. In consideration of the actions that will be performed and the payments that will be made by Respondents under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, EPA covenants not to sue or to take administrative action against Respondents pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for the Work, Past Response Costs, and Future Response Costs. This covenant not to sue shall take effect upon the Effective Date. This covenant not to sue is conditioned upon the complete and satisfactory performance by Respondents of their obligations under this Settlement Agreement, including, but not limited to, payment of Future Response Costs pursuant to Section XVI. This covenant not to sue extends only to Respondents and does not extend to any other person.

XXI. RESERVATIONS OF RIGHTS BY EPA

88. Except as specifically provided in this Settlement Agreement, nothing in this Settlement Agreement shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing in this Settlement Agreement shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law.

89. The covenant not to sue set forth in Section XX above does not pertain to any matters other than those expressly identified therein. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondents with respect to all other matters, including, but not limited to:

a. claims based on a failure by Respondents to meet a requirement of this Settlement Agreement;

b. liability for costs not included within the definitions of Past Response Costs or Future Response Costs;

c. liability for performance of response action other than the Work;

d. criminal liability;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and

g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the Site.

90. Work Takeover. Subject to Paragraph 40, in the event EPA determines that Respondents have ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may assume the performance of all or any portion of the Work as EPA determines necessary. Respondents may invoke the procedures set forth in Section XVII (Dispute Resolution) to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. Costs incurred by the United States in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Respondents shall pay pursuant to Section XVI (Payment of Response Costs). Notwithstanding any other provision of this Settlement Agreement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXII. COVENANT NOT TO SUE BY RESPONDENTS

91. Respondents covenant not to sue and agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Past Response Costs, Future Response Costs, or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Missouri Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. §§ 9607 and 9613, relating to the Work, Past Response Costs, or Future Response Costs.

92. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

XXIII. OTHER CLAIMS

93. By issuance of this Settlement Agreement, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or EPA shall not be deemed a party to any contract entered into by Respondents or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement Agreement.

94. Except as expressly provided in Section XX (Covenant Not to Sue by EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

95. No action or decision by EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXIV. CONTRIBUTION

96. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement pursuant to which each Respondent has, as of the Effective Date, resolved liability to the United States within the meaning of Sections 113(f)(2) and 112(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), and that Respondents are entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§ 9613(f)(2) and 9622(h)(4), for "matters addressed" in this Settlement Agreement. The "matters addressed" in this Settlement Agreement are the Work, Past Response Costs, and Future Response Costs.

b. The Parties further agree that this Settlement Agreement constitutes an administrative settlement, pursuant to which each Respondent has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

c. Nothing in this Settlement Agreement precludes the United States or Respondents from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not parties to this Settlement Agreement. Nothing in this Settlement Agreement diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any

such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

XXV. INDEMNIFICATION

97. Respondents shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondents agree to pay the United States all costs incurred by the United States, including but not limited to attorneys' fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, subcontractors and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondents in carrying out activities pursuant to this Settlement Agreement. Neither Respondents nor any such contractor shall be considered an agent of the United States.

98. The United States will give Respondents notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondents prior to settling such claim.

99. Respondents waive all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Respondents shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXVI. INSURANCE

100. At least 7 days prior to commencing any on-Site work under this Settlement Agreement, Respondents shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance and automobile insurance with limits of $3,000,000 million dollars, combined single limit, naming EPA as an additional insured. Within the same time period, Respondents shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondents shall submit such certificates and copies of policies

each year on the anniversary of the Effective Date. In addition, for the duration of the Settlement Agreement, Respondents shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Respondents in furtherance of this Settlement Agreement. If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondents need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVII. FINANCIAL ASSURANCE

101. Within 60 days of the Effective Date, Respondent Compton (and if Respondent Compton is unable or unwilling to do so, then Respondent Spectrum Brands within 90 days) shall establish and maintain financial assurance for the benefit of EPA in the amount of $500,000. Any work plan detailing Work shall include a detailed written estimate, in current dollars, of the cost of hiring a third party to perform that portion of the Work detailed in such work plan. Respondents shall maintain financial assurance in that amount and will have in one or more of the following forms, in order to secure the full and final completion of Work by Respondents:

a. a surety bond unconditionally guaranteeing payment and/or performance of the Work;

b. one or more irrevocable letters of credit, payable to or at the direction of EPA, issued by financial institution(s) acceptable in all respects to EPA;

c. a trust fund administered by a trustee acceptable in all respects to EPA;

d. a policy of insurance issued by an insurance carrier acceptable in all respects to EPA, which ensures the payment and/or performance of the Work;

e. a written guarantee to pay for or perform the Work provided by one or more parent companies of Respondents, or by one or more unrelated companies that have a substantial business relationship with at least one of Respondents; including a demonstration that any such guarantor company satisfies the financial test requirements of 40 C.F.R. § 264.143(f); and/or

f. a demonstration of sufficient financial resources to pay for the Work made by one or more of Respondents, which shall consist of a demonstration that any such Respondent satisfies the requirements of 40 C.F.R. § 264.143(f).

102. Any and all financial assurance instruments provided pursuant to this Section shall be in form and substance satisfactory to EPA, determined in EPA's sole discretion. In the event that EPA determines at any time that the financial assurances provided pursuant to this Section (including, without limitation, the instrument(s) evidencing such assurances) are inadequate, Respondents shall, within 30 days of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 103 above. In addition, if at any time EPA notifies Respondents that the anticipated cost of completing the Work has increased, then, within 30 days of such notification, Respondents shall obtain and present to EPA for approval a revised form of financial assurance (otherwise acceptable under this Section) that reflects such cost increase. Respondents' inability to demonstrate financial ability to complete the Work shall in no way excuse performance of any activities required under this Settlement Agreement.

103. If Respondents seek to ensure completion of the Work through a guarantee pursuant to Subparagraph 101(e) or 101(f) of this Settlement Agreement, Respondents shall: (a) demonstrate to EPA's satisfaction that the guarantor satisfies the requirements of 40 C.F.R. § 264.143(f); and (b) resubmit sworn statements conveying the information required by 40 C.F.R. § 264.143(f) annually, on the anniversary of the Effective Date or such other date as agreed by EPA, to EPA. For the purposes of this Settlement Agreement, wherever 40 C.F.R. § 264.143(f) references "sum of current closure and post-closure costs estimates and the current plugging and abandonment costs estimates," the dollar amount to be used in the relevant financial test calculations shall be the current cost estimate of $486,700 for the Work at the Site plus any other RCRA, CERCLA, TSCA, or other federal environmental obligations financially assured by the relevant Respondent or guarantor to EPA by means of passing a financial test.

104. If, after the Effective Date, Respondents can show that the estimated cost to complete the remaining Work has diminished below the amount set forth in Paragraph 103 of this Section, Respondents may, on any anniversary date of the Effective Date, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining Work to be performed. Respondents shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security after receiving written approval from EPA. In the event of a dispute, Respondents may seek dispute resolution pursuant to Section XVII (Dispute Resolution). Respondents may reduce the amount of security in accordance with EPA's written decision resolving the dispute. Following EPA's issuance of a notice of completion of work pursuant to Section XXIX, upon the request of Respondents, EPA will notify Respondents in writing that they have been released from the financial assurance obligations under this Settlement Agreement.

105. Respondents may change the form of financial assurance provided under this Section at any time, upon notice to and prior written approval by EPA, provided that EPA determines that the new form of assurance meets the requirements of this Section. In the event of a dispute, Respondents may change the form of the financial assurance only in accordance with the written decision resolving the dispute.

XXVIII. MODIFICATIONS

106. EPA's OSC may make modifications to any plan or schedule in writing or by oral direction. Any oral modification will be memorialized in writing by EPA promptly, but shall have as its effective date the date of the OSC's oral direction. Any other requirements of this Settlement Agreement may be modified in writing by mutual agreement of the parties.

107. If Respondents seek permission to deviate from any approved work plan or schedule, Respondents' Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondents may not proceed with the requested deviation until receiving oral or written approval from the OSC pursuant to Paragraph 106.

108. No informal advice, guidance, suggestion, or comment by EPA's OSC or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXIX. NOTICE OF COMPLETION OF WORK

109. When EPA determines, after EPA's review of the Final Report, that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including record retention, EPA will provide written notice to Respondents. If EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondents, provide a list of the deficiencies, and require that Respondents modify the Work Plan if appropriate in order to correct such deficiencies. Respondents shall implement the modified and approved Work Plan and shall submit a modified Final Report in accordance with the EPA notice. Failure by Respondents to implement the approved modified Work Plan shall be a violation of this Settlement Agreement.

XXX. INTEGRATION/APPENDICES

110. This Settlement Agreement and its appendices constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following appendices are attached to and incorporated into this Settlement Agreement: Appendix I, RAWP.

XXXI. EFFECTIVE DATE

111. This Settlement Agreement shall be effective upon signature by the EPA.

112. Each undersigned representative of a Respondent certifies that he/she is fully authorized to enter into this Settlement Agreement and to bind such Respondent to this Settlement Agreement.

113. Respondents' obligation to perform the Work will begin on the Effective Date of this Settlement Agreement.

For Respondent

COMPTON'S LLC

September 29, 2015
Date

Signature: _____

Print Name: Richard Compton

Title: Sole member

For Respondent

SPECTRUM BRANDS, INC.

11/12/15
Date

Signature: Nathan F. Fagre

Print Name: Nathan F. Fagre

Title: Sr. Vice President & General Counsel

U.S. Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

11/20/2015
Date

Mary P. Peterson
Director
United States Environmental Protection Agency
Region 7
Superfund Division

11/19/2015
Date

Kristen Nazar
Attorney
United States Environmental Protection Agency
Region 7
Office of Regional Counsel

Facility Vapor Intrusion Mitigation System Design & Implementation/Residential Investigation Work Plan

Compton's Auction & Liquidation
Former Toastmaster Facility
Macon, Missouri

Prepared for
Compton's Auction & Liquidation

February 2015

Revised May 2015

Facility Vapor Intrusion Mitigation System Design & Implementation/Residential Investigation Work Plan

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Revised May 2015

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Facility Vapor Intrusion Mitigation System Design & Implementation/Residential Investigation Work Plan

February 2015
Revised May 2015

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1.0 Background and Objectives

1.1 Background

The Former Toastmaster Facility (Facility), now owned by Compton's Auction & Liquidation (Compton's), is in the process of conducting a vapor intrusion investigation associated with historic industrial practices at the Facility located at 704 South Missouri Street (U.S. Highway 63) in Macon, Missouri. The Facility had stored trichloroethylene (TCE) in a 5,000-gallon aboveground storage tank (AST) outside the western wall of the warehouse. TCE was piped from the AST through an aboveground pipe into the Facility degreasing area just inside the western wall of the warehouse. Due to historic operations using the degreasing solvent, the shallow groundwater became contaminated with TCE and other related volatile organic compounds (VOCs). Contamination in the shallow groundwater led to the assessment of the potential for vapors migrating from groundwater impacted with TCE upward into the soil. The Missouri Department of Natural Resources (MDNR) conducted separate indoor air investigations for area residences and the interior of the Facility warehouse during 2014.

In May 2014, MDNR sampled sub-slab soil vapor at seven locations and indoor air at seven locations inside the warehouse (MDNR, 2014). The vapor intrusion investigation results identified four sub-slab soil vapor and six indoor air locations that had concentrations of TCE exceeding vapor intrusion screening levels (VISLs).

In July 2014, MDNR performed sub-slab and indoor testing at homes around the north, south, and west sides of the Facility. Two homes located north of the current warehouse exceeded action levels for TCE. The United States Environmental Protection Agency (EPA) hired St. Louis Radon Company to install vapor mitigation systems in both of these houses (USEPA, 2014).

As a result of the indoor air and sub-slab vapor testing, EPA entered into a Draft Administrative Order on Consent with Compton's, requiring Compton's to submit a work plan to address additional indoor air testing at area residences and install a vapor mitigation system inside the Facility in the area operated by Toastmaster as part of their manufacturing processes.

1.2 Objectives

The overall objectives of this *Facility Vapor Intrusion Mitigation System Design & Implementation/ Residential Investigation Work Plan* (Work Plan) are twofold:

- To install a sub-slab depressurization system (SDS) in a portion of the Facility building.
- To outline and provide detail on collecting sub-slab soil gas samples and indoor air samples, as well as outdoor ambient air samples, at selected occupied residences to assess whether mitigation systems are needed to prevent potential vapor intrusion.

For the Facility warehouse, this process includes mitigation system construction, sub-slab pressure testing beneath the warehouse floor, and post-installation indoor air testing inside a portion of the Facility building. For the residential properties, this process includes access coordination, at least three rounds of

sub-slab sampling, and indoor air testing and mitigation if necessary. The prescribed, step-wise approach described in this document will allow for project efficiency and keep property owners and stakeholders informed during this process. Barr Engineering Co. (Barr) and Compton's consider this approach as the first step in an ongoing process to abate potential human health concerns associated with the historical groundwater contamination in the area. The general project approach, stakeholder communications, and continuing evaluation of the Work Plan are described in the following sections.

1.2.1 General Project Approach

Mitigation of vapors under the Facility floor will be performed in steps, if necessary, with the first step designed to mitigate vapors in the former degreasing area where TCE was used. The building mitigation process for the Facility warehouse is described in Section 5.

A general overview of the process for obtaining residential home access, collecting sub-slab soil vapor samples, collecting indoor air samples, and mitigating properties at the selected homes is shown on the figures in Appendix A. There may be deviations from this process for unique situations (e.g., access restrictions, non-traditional basement construction, etc.) as described further in other sections of this Work Plan. Work will be conducted consistent with EPA guidance.

Access to the selected buildings must be obtained from property owners and potentially coordinated with occupants/tenants, as described in Section 2, to collect sub-slab soil vapor/indoor air samples and install mitigation systems, if appropriate, based on the results of the sub-slab soil vapor/indoor air sampling. The purpose of conducting sub-slab sampling is to measure the TCE concentration in the soil vapor beneath the lowest floor of the building. The details of sub-slab soil vapor and indoor air sampling in a building are described in Section 3.

Knowing the TCE concentration beneath the floor slab will allow for the evaluation of the vapor intrusion risk on a building-specific basis. The evaluation of sub-slab sampling results and how the results will inform a decision as to the need to install a mitigation system is described in Section 4. If the TCE concentration in sub-slab vapor exceeds EPA screening criteria, a mitigation system will be installed, assuming the building owner provides access for system installation.

The purpose of installing and operating a mitigation system is to create a negative pressure gradient beneath the floor slab in a building at risk for vapor intrusion. The negative pressure gradient (i.e., lower pressure beneath the floor than above) serves to interrupt the vapor intrusion pathway and prevents vapors from entering occupied portions of the building.

Project schedule and reporting is described in Section 6 and document references are in Section 7. A monitoring and maintenance plan for mitigation will be submitted separately.

1.2.2 Work Plan Flexibility and Re-Evaluation

Due to the data-driven nature of the project and the accelerated schedule, Compton's expects that the scope of work may be adjusted as the project progresses. Compton's and EPA will continually evaluate the extent to which the sampling program is warranted, based on data gathered. This work plan is written

to address selected residential properties ringing the warehouse and a portion of the Facility warehouse; however, it is also applicable to offsite commercial properties, although they are not explicitly referenced.

Figure 1-1 shows the properties where sub-slab vapor sampling will be conducted, and, if appropriate based on sampling results, building mitigation systems will be installed. Additionally, Barr will perform step-out sampling to delineate the extent of vapor intrusion potential. If a sampled property has sub-slab TCE concentrations exceeding EPA screening values, sampling will extend to the nearest building within a 150 feet (ft) radius down and side gradient (in the direction away from the source) of the selected buildings shown on Figure 1-1.

2.0 Property Access Coordination

On behalf of Compton's, Barr will request permission from the homeowners to obtain access to properties that are planned for testing. Entry into the buildings will be coordinated with owners and as needed occupants or property managers, as shown on Figure 1-1, to conduct indoor air and sub-slab soil vapor sampling and, if appropriate based on sampling results, install building mitigation systems. Additionally, Barr will perform step-out sampling to delineate the extent of vapor intrusion potential. When applicable, sampling will extend to the nearest building within a 150 ft radius down and side gradient of the selected buildings shown on Figure 1-1.

2.1 Obtaining Access Agreements

Access to collect sub-slab soil vapor and/or indoor air samples and to install a mitigation system, if necessary, will be obtained through the use of separate access agreements. These separate access agreements will be utilized for sampling and, where appropriate, mitigation.

To collect indoor air/sub-slab soil vapor samples from an occupied building, the property owner must sign an access agreement for a Compton's representative to enter the building, install a sampling port, and collect the initially proposed five samples (three sub-slab vapor, two indoor air). The sampling access agreement and mitigation access agreement templates are in Appendix B.

Through an agreement with property owners, Barr will request access to specific properties. At least two of the following communication methods will be utilized:

- United States Postal Service (USPS) first class mail correspondence.
- Email correspondence.
- Telephone call.
- Door knocking with fact sheet and access agreement template left behind.

Barr will refer properties that fall into the following categories to EPA:

- Property owner cannot be reached after attempting two communication methods to obtain an access agreement signed as described above.
- Property owner declines to sign an access agreement.
- Property owner or occupant does not permit access after three communication method attempts.

If neither Barr nor EPA is able to obtain an access agreement or to gain entry after an agreement has been signed, sampling or mitigation will not occur on the property.

2.2 Scheduling and Coordination

Sample collection or mitigation activities will be scheduled and coordinated with property owners and/or occupants once signed access agreements are obtained.

2.3 Records

As described in this section, Barr will maintain records to track specific contact information and project implementation at the selected properties.

2.3.1 Structure of Recordkeeping

The following property-specific information will be recorded as the project is implemented:

- Contact information for owners and/or occupants.
- Contacts with and attempts to contact owners and/or occupants (e.g., phone calls, door visits, emails, etc.)
- Sampling access agreements.
- Building-specific information provided by owners and/or occupants (e.g., basement, radon mitigation system currently installed/operational, etc.) and building information obtained by Barr or the mitigation contractor in constructing the mitigation system.
- Sampling port installation and sampling date(s).
- Sample analytical results and laboratory reports.
- Mitigation system installation access agreements.
- Mitigation system installation completion date.
- Mitigation system diagnostic results.
- Sampling port removal date.

The records will be used to provide status updates to EPA on a regular basis as the project is implemented.

2.3.2 Privacy and Confidentiality

Each selected property will be assigned a unique, random numeric 3-digit (150 to 200) identifier to correlate each property to the project in a confidential manner for public record. This unique identifier will be included on sampling chain-of-custody forms and used to track sampling results and to track mitigation system installations. All properties within the residential testing area will be assigned a unique identifier whether or not the property owner has signed a sampling access agreement and/or a mitigation system installation access agreement. Due to the confidential nature of the project, only authorized

parties implementing the project including EPA, MDNR, Compton's, and Barr will have access to the unique numeric identifier assigned to each property.

3.0 Scope of Residential Sub-Slab Soil Vapor/Indoor Air Sampling

The purpose of collecting sub-slab soil vapor samples is to provide data that accurately represents conditions beneath the lowest floors of the occupied residences identified in Figure 1-1. In addition, indoor air samples may be collected on the basement floor, if present, and on the main floor, dependent upon sub-slab sampling results.

The applicable indoor air screening value for TCE at residential properties is 2 micrograms per cubic meter ($\mu g/m^3$), and the applicable indoor air screening value for TCE at the Facility is 8.8 $\mu g/m^3$. Using an assumed attenuation factor of 0.03 as per EPA guidance, the applicable sub-slab screening value for TCE at residential properties is 66 $\mu g/m^3$and the sub-slab commercial screening value applicable at the Facility is 293 $\mu g/m^3$. Properties will be compared against these screening values.

3.1 Interior Building Inspection

Prior to collection of the indoor air samples at each house, Barr will perform a visual survey in the basement (or lowest level) and main floor of each residence to collect information about building use, construction, floor condition, occupancy, potential vapor entry locations, and other features that can influence the potential for vapor intrusion risk. An indoor air quality survey that includes a complete chemical inventory of products and potential background sources will be performed. Barr will request that residents move or isolate potential background sources during the indoor air sampling event. The information recorded during the building survey will include consideration of the information in the Vapor Intrusion Interior Building Survey Form in Appendix C.

If the building survey shows that the basement has a dirt floor, sub-slab soil vapor sampling will not be attempted. In this case, only indoor air sampling will be performed. Due to shallow groundwater known to exist in the area, it also may not be possible to sample sub-slab soil vapors due to the presence of groundwater directly beneath the slab floor. In this case, indoor air sampling will be performed, and if present, groundwater will be collected from the residence sump pump (if the residence has one installed) and analyzed. Additionally, the property would be a potential target for a future soil gas investigation.

3.2 Sub-Slab Sampling Frequency

Barr will collect one sub-slab soil vapor sample using a sampling port (vapor pin) for every 1,000 square feet of building footprint or for every section of the building that is separated by footings or with foundations at different levels. The size of the building footprint will be approximated based on the dimensions of the basement (or lowest level) floor. Barr anticipates that most buildings will have a building footprint less than 1,000 square feet; therefore, three sub-slab soil vapor samples will be collected from each building, unless the building has vapor concentrations exceeding 66 $\mu g/m^3$. If the sub-slab concentrations exceed 66 $\mu g/m^3$, then a vapor mitigation system will be installed with the resident's permission. Sampling ports, when able, will be installed near the center of the home in the

basement (or lowest level) floor. Discrete sub-slab soil vapor samples will be collected in a 1-liter summa canister.

3.3 Indoor Air Sampling

If applicable, Barr will collect one indoor air sample from the basement (lower floor) of each residence. Upon review of the sampling results, a second and third round of indoor air sampling will be performed if it is agreed that the sampling results are not representative of the risk posed to the indoor air within the residence. In the event that the residence has only one floor (i.e., a trailer home), only one indoor air sample is proposed.

Samples will be collected using 6-liter summa canisters fitted with 24-hour flow controllers. Both the canisters and flow controllers will be individually certified by the laboratory. A maximum of two indoor air samples are proposed at locations that are co-located with sub-slab sampling locations. The indoor air sample location is proposed in a living area on the lower level, if possible.

The exact location may vary depending on coordination with the property owner and/or tenants. If access is not available to a living space, then the sample may be collected in a common area. Indoor air samples may also be biased toward potential preferential pathways or other routes of entry, if identified, or as determined in the field.

For each sampling location, the following information will be recorded: the initial and final dates and times of sample collection, canister serial number and flow controller serial number, canister field vacuum prior to and immediately following sample collection, a building layout sketch with depiction of the sample location and measurement ties to prominent building features, and potential external sources of VOCs. Photoionization detector (PID) readings may be included as determined by field conditions.

In order to minimize influencing indoor air concentrations from sub-slab sampling, a phased approach is planned. Specifically, once the indoor air sampling is completed, the investigator will collect the sub-slab soil gas samples from the existing permanent soil gas monitoring points. Using this sampling process, the indoor air sample collection would be started on Day 1 and 24 hours later (Day 2), the indoor air canisters are closed and the investigator will collect the sub-slab soil gas samples.

3.4 Outdoor Air Sampling

As part of the residential testing, Barr will collect three outdoor air samples to evaluate ambient air quality; one sample will be collected in the northern-central portion of the initial 10-house area, one on the western side of this area, and one within the eastern area. These samples will be collected in a 6-liter summa canister that draws ambient air over an approximately 24-hour period and will be collected at the same time as the residential testing. The coordinates of each of the outdoor sampling locations will be recorded using a Trimble GPS unit.

3.5 Quality Assurance and Data Quality Objectives

The overall quality assurance (QA) objective for this work is to develop and implement procedures for sub-slab soil vapor sampling, indoor air sampling, sample custody, laboratory analysis, and reporting that will support decisions made for the need to install a mitigation system.

3.6 Monitoring Point Construction

Based on access provided by the property owner, Barr will select the location(s) for the sub-slab soil vapor monitoring point(s) (if a basement or crawlspace exists) with one placed in each occupied building. A schematic of a sub-slab soil vapor monitoring point is shown in Figure 3-1. Barr will coordinate monitoring point installation activities with the building property owner and/or their representative (e.g., property manager, tenant). Barr anticipates that the location of the monitoring point will be near the approximate center of the concrete floor slab and that the location will be adjusted based on the presence of obstructions, utilities, or other hindrances. When possible, Barr will select the monitoring point location to be in an area with an unfinished floor (i.e., bare concrete with no tile, carpet, or other coverings) and not in areas where disturbances may occur to potentially hazardous materials such as asbestos-containing materials (ACM) or lead based paint. Barr will document the sample location with photographs and by measuring from nearby walls, stairs, support beams or other permanent structures in the building. These measurements will be noted on the Vapor Intrusion Interior Building Survey Form (Appendix C).

Barr will conduct a visual interior utility screen prior to installing the monitoring points to minimize the risk of damage to utilities buried under the floor. In situations where a visual screening is insufficient, a private utility locator will be used to verify proposed monitoring point locations are not directly above floor utilities. Barr will install the monitoring point in general conformance with Barr Standard Operating Procedure (SOP) Installation and Extraction of the Vapor Pin™ (Appendix D). Barr will complete leak testing at each monitoring point using potable water as described in Appendix D. After the monitoring point passes the leak test, a sub-slab soil vapor sample will be collected following the procedures described in Section 3.6 and Appendix E.

3.7 Sampling Procedures

3.7.1 Sub-Slab Soil Vapor

A Barr team of two will collect sub-slab soil vapor samples using the methods described in the Barr SOP titled Air Sample Collection from a Sub-Slab Soil Vapor Monitoring Point (Appendix E). Barr will document the quality control measures (e.g., vacuum testing of the manifold and leak testing) on the Field Sampling Quality Control Checklist (Appendix E). Barr will collect sub-slab soil vapor samples in laboratory-supplied, individually certified 1-liter summa canisters and submit the samples to Pace Analytical Services, Inc. (Pace) in Minneapolis, Minnesota. A chain-of-custody form will accompany the sub-slab soil vapor samples to the laboratory to document proper handling of the sample.

When indoor air testing is performed, the indoor air testing will be completed prior to installation of the vapor pin and subsequent discrete sampling of sub-slab soil vapor. Vapor pins will remain in the floor to

allow for additional testing of sub-slab soil vapor and mitigation diagnostic testing, if required. For sub-slab soil vapor results below the screening criteria, Barr will request the property owner's approval to have the sampling port remain in place for one year to assist with potential additional rounds of sampling. After a year, Barr will remove the sub-slab soil vapor monitoring point(s) and seal the opening(s) in the floor. The borehole used to place the sampling point will be filled with fast-setting vinyl cement grout until the top of the grout is smooth and level with the surrounding floor slab.

3.7.2 Indoor Air

A Barr team of two will perform the interior building survey to identify potential TCE-containing products and then subsequently collect indoor air samples inside each residence. Where possible these materials will be removed from the building or isolated prior to testing. Barr will collect indoor air samples in laboratory-supplied, individually certified 6-liter summa canisters and submit the samples to Pace in Minneapolis, Minnesota. A chain-of-custody form will accompany the indoor air samples to the laboratory to document proper handling of the sample.

Normal practice will include starting the testing with the summa canisters and then return the following day (approximately 24 hours later) to collect the canister. Barr will return to each home within approximately 23 to 25 hours of initiating the sample collection to complete the indoor air sample. After collecting the indoor air sample, sub-slab soil vapor monitoring points will be installed.

3.8 Analytical Methods

Pace will analyze the sub-slab soil vapor, indoor air, and outdoor ambient air samples using EPA Compendium Method TO-15 (TO-15). Pace will conduct the TO-15 analysis and report the results for TCE at or below their maximum reporting limit of 1.1 $\mu g/m^3$ for an undiluted sample. Pace will be instructed to also report all VOC compounds, including 1,2-dichloroethylene (1,2-DCE), 1,1-DCE, and vinyl chloride (VC).

4.0 Evaluation of Sampling Results

Results from the indoor air and sub-slab soil vapor sampling will be used to inform property-specific decisions (i.e., no further action, re-sampling, or installing a mitigation system) and will also determine when sampling is complete and when sampling at additional area properties is necessary. Additionally, multiple lines of evidence will be considered in assessment of vapor intrusion sampling results and data. These might include review of spatial and temporal data trends, information obtained during interior building surveys, background contaminant sources, consistent ratios in or between sub-slab and indoor air sample results, and other information.

Sampling results will be reported to Barr with a standard turnaround. The laboratory QA/QC data furnished with the initial laboratory report will be reviewed to determine if the data is fit for the intended purpose. The property-specific decisions described in Section 4.1 and the sampling progression decisions described in Section 4.2 will be made based on that data. Systemic problems identified with the data, including false negatives and false positives relative to the threshold values, will be evaluated and addressed at the time they are discovered.

The access, sampling, and building mitigation decision process for residential buildings is shown in the figures in Appendix A. As shown in Figure A-2, the first step in the sampling process is to assess the condition of the basement floor slab and to identify a sampling location or locations as described in Section 3.1 of this Work Plan.

After installing the sampling port through the floor, a sample of the sub-slab soil vapor below the floor will be collected and analyzed for VOCs. As shown in Figure A-2 (Appendix A):

- If the TCE concentration in the first sub-slab vapor sample is equal to or greater than 66 $\mu g/m^3$, a mitigation system will be offered to the property owner. An indoor air sample will be collected the day prior to the sub-slab sample collection.
- If the TCE concentration in the first sub-slab vapor sample is equal to or less than 2 $\mu g/m^3$, an appointment will be made with the property owner to perform 2 additional rounds of follow-up sub-slab soil vapor testing to confirm the results. TCE concentrations of each follow-up sample will be assessed to determine the next step.
- If the TCE concentration in the first sub-slab sample is less than 66 $\mu g/m^3$ but greater than 2 $\mu g/m^3$, follow up testing including for both sub-slab soil vapor and indoor air will be collected and analyzed as described in Section 3.0 of this Work Plan. TCE concentrations of the sub-slab and indoor air samples will be compared to EPA screening values and assessed to determine the next step.
    - If the sub-slab TCE concentration is equal to or greater than 66 $\mu g/m^3$, or the indoor air TCE concentration is equal to or greater than 2 $\mu g/m^3$, a mitigation system will be offered for installation in the building, and an indoor air sample will be collected approximately one month after the mitigation system is installed.

- If the TCE concentration in the second sub-slab sample is less than 66 µg/m^3, and the indoor air TCE concentration is less than 2 µg/m^3, a third round of sub-slab and indoor air follow-up testing will be performed to confirm the results. If the TCE concentrations in the third sub-slab and indoor air sampling event exceed applicable EPA screening values, a mitigation system will be offered for installation in the building, and an indoor air sample will be collected approximately one month after the mitigation system is installed.

- Upon approval of the property owner, the sampling port will remain in place for one year to assist with potential additional rounds of sampling. If additional sampling results indicate that more rounds of sampling are warranted (beyond one year), then approval from the property owner will be requested to allow the sampling port to remain in place. If no additional sampling is required, an appointment will be made with the property owner to remove the sampling port as described in Section 3.6 of this Work Plan.

The above decision process and threshold values will apply to all residential buildings. The same process will be followed for commercial buildings; however, the commercial intrusion screening values (ISV) rather than the residential screening values will be used as the threshold values in the process. The applicable commercial and industrial indoor air screening value for TCE is 8.8 µg/m^3. Using an assumed attenuation factor of 0.03, the sub-slab commercial and industrial screening value applicable at the Facility is 293 µg/m^3. These values will be used to determine the decision to install a mitigation system.

In the unlikely event sub-slab vapor testing reveals TCE concentrations below 2 µg/m^3 but the indoor air testing reveals TCE concentrations above 2 µg/m^3, Barr will evaluate from the building interior survey if other sources of TCE contamination might be present. If the source is determined to be likely from the Facility release, a mitigation system will be offered to the property owner. If a sub-slab soil vapor sample was not able to be collected from the residence, and the indoor air sample revealed TCE concentrations above 2 µg/m^3, Barr will evaluate from the interior building survey if other sources of TCE contamination might be present. If the source is determined to be likely from the Facility, a mitigation system will be offered to the property owner.

4.1 Transmittal of Sampling Results to EPA

Sampling results for each building will be provided to EPA following Barr's QA/QC of the results. Recommendations for additional indoor air/sub-slab soil vapor testing will be provided in the report, along with a schedule for testing during two more sampling events.

4.2 Transmittal of Sampling Results to Property Owners

Sampling results will be shared and explained to each property owner concurrently with transmitting the results to the EPA. A results table will be prepared including the TCE concentration measured in the sample(s), the screening value, and the laboratory reporting limit with a simple explanation of each and a cover letter with a simple explanation of the results. If a mitigation system was installed, operational information will be provided to the property owner, including methods to determine that the mitigation system is operating properly. This information will be sent via USPS first class mail along with calling the

property owner. If the property owner cannot be reached via phone after the third attempt, the mailed sampling results, cover letter, and mitigation system information will be the sole form of communicating the results to the owner.

For properties that have 66 $\mu g/m^3$ or greater TCE in the sub-slab sample, Barr will attempt to contact property owners via telephone to confirm receipt of results and attempt to coordinate an appointment for a mitigation system design meeting and obtain a mitigation system access agreement.

5.0 Scope of the Warehouse Building Mitigation

Previous sub-slab and indoor air sampling results conducted by the MDNR inside the Compton's warehouse indicated that concentrations of TCE in both media exceed the screening criteria. As such, EPA requested that a vapor intrusion mitigation system be installed. The initial steps for performing the building mitigation include the construction of a pilot system focused within the area of highest sub-slab soil vapor/indoor air contaminant results, installation of vapor pins to evaluate system performance, and a one-month follow-up to monitor indoor air and evaluate the effects of removing sub-slab soil vapors over the assumed area of highest groundwater contamination beneath the building. Barr will coordinate the construction of the mitigation system on behalf of Compton's, utilizing the expertise and construction personnel of St. Louis Radon Company. Additionally, local roofing contractors and licensed electricians will be used to complete the mitigation system.

5.1 Mitigation System Construction

The most common and cost-effective sub-slab soil vapor intrusion mitigation strategy involves installation of a sub-slab depressurization (SSD) system that is similar to a typical radon mitigation system. SSD systems are considered one of the most effective vapor intrusion mitigation strategies for existing or new buildings. St. Louis Radon will use Radon Away ™ fans to reduce building occupant exposure to VOCs in vapors resulting from potential soil and groundwater contamination. The mitigation system will, at a minimum, comply with the American Society for Testing and Materials (ASTM) E2121-13 Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings (ASTM, 2013).

A typical SSD system consists of suction points extending through the slab floor. Each suction point is fitted with a pipe with the annulus sealed between the floor and the pipe. The pipe is generally routed through the upper floors of the building and fitted with a fan in the attic. In special cases, the pipe may be routed to the outside of the building and up the outside wall to above the roof. The fan provides suction that serves to depressurize the soil layer beneath the slab floor and directs soil vapor to the atmosphere.

5.1.1 Preparation

To prepare for mitigation system installation, the building will be inspected and photographed to document the pre-installation conditions. This initial inspection is referred to as the mitigation design meeting. A pre-mitigation system construction checklist will be completed by the mitigation contractor during the mitigation design meeting to record the observed building construction, discuss the plan for the layout of the mitigation system (e.g., where will the suction point(s) be located, where will the piping be routed, etc.), and record the warehouse owner-agreed layout (subject to field installation changes) and date for installing the mitigation system. Building design and construction aspects that will be considered include crawl spaces, floor and wall construction and integrity, likely footings, floor protuberances, utilities, and materials that may need special handling and disposal (potentially contaminated soils).

5.1.2 Mitigation System Construction

St. Louis Radon will install SSD systems at the Facility warehouse with an initial focus on the previous degreasing area located in the northwest quarter of the warehouse as shown on Figure 5-1. The floor slab will be cored and hammer chipped, and a small extraction pit will be excavated below the slab. A 3-inch inside diameter (ID) poly-vinyl chloride (PVC) riser pipe will begin at the extraction pit, exit the building above grade, and extend vertically to an exhaust point above the roof. An in-line fan will be installed in a serviceable location along the riser pipe on the inside of the building above the beam.

The initial system will consist of 10-18 pits spaced near every second structural column leading from the sub-slab to the roof, and two pits located near both ends of a roof water drainage downspout pipe leading under the warehouse floor. These two downspouts were the only apparent underground utilities located during the initial warehouse inspection. Each location will be proportionally spaced and have the opportunity for a secondary penetration (also proportionally spaced) stemming from the original fan system into the slab, as deemed necessary. Should the initial pits not meet sub-slab soil vapor/indoor air concentration reduction requirements, the choice between a secondary point of penetration from an initial fan system and/or a larger fan will be determined based on soil density and pressure field extension measurements.

Diagnostic testing used for SSD systems, described in Section 5.2 and Appendix F, will be used to demonstrate the effectiveness of the SSD system.

5.1.3 Permits and Inspections

5.1.3.1 Contractor Certification

Since an SSD system is similar to a radon system, the mitigation systems for this project will be installed by a mitigation contractor that has received voluntary certification through the National Radon Proficiency Program (NRPP).

5.1.3.2 Electrical

Electrical permits will likely be required at locations where mitigation systems are installed. Electrical work will be performed by a Missouri-licensed electrician that meets all licensing and/or permitting requirements of the City of Macon. This work will be coordinated through St. Louis Radon and the owner.

5.1.3.3 Other Permits

There may be other project-specific permits required by the City of Macon. Certain types of finishing work may require a building permit or another type of permit. Building permits may be required for work such as constructing concrete slabs, modifying plumbing, or other major finishing work. All contractors that work on the construction of the mitigation systems will meet licensing and/or permitting requirements of Macon County and/or the City of Macon.

5.2 Mitigation System Diagnostics

Mitigation system diagnostics are tests that will be performed to show that the mitigation system is functioning properly and is meeting the performance criteria described in this Work Plan.

5.2.1 Diagnostic Objectives

5.2.1.1 Performance

An SSD system prevents vapor intrusion into a building by lowering the air pressure in the soil directly beneath the lowest building floor slab relative to the indoor air pressure. The performance of SSD systems can be assessed by measuring the magnitude and extent of the low pressure zone created by the installed system. If the extent of the low pressure zone extends over or beyond the building footprint, and if the magnitude of the low pressure zone exceeds the ambient pressure differential created by barometric pressure variations, wind, HVAC operation, etc., then the system will be sufficient to prevent vapor intrusion.

To measure the extent of the low pressure zone, monitoring points will initially be installed at up to 20 locations, spaced evenly between the suction points. If there is evidence of a building feature that may inhibit the propagation of a low pressure zone (e.g., interior building footings, multiple slabs, slabs at different elevations, etc.), monitoring points will be installed in locations that will allow for an assessment of these features.

The magnitude of the low pressure zone will be assessed at the monitoring points by measuring the differential pressure between indoor air and sub-slab soil vapor. Differential pressure measurements will be made with a digital micro-manometer. The pressure differential between sub-slab soil vapor and indoor air that will be achieved by the SSD system will range from 0.012 to 0.02 inch of water, which is equivalent to 3 to 5 Pascals.

5.2.1.2 Data Quality Objectives

In order for diagnostic testing to demonstrate the effectiveness of an SSD, the data collected during testing must be sufficiently precise, accurate, reproducible, and representative. The necessary precision and accuracy will be attained by selecting a micro-manometer with a precision of at least 0.001 inch of water or less and an accuracy reading of +/-10% or less.

5.2.2 Diagnostic Procedures

Detailed diagnostic procedures including equipment, methods, field data forms, and checklists are described in Appendix F.

5.3 Documentation of Installation and Diagnostics

The installation of the mitigation systems will be performed by St. Louis Radon. Barr will oversee the installation of the mitigation system and the diagnostic testing and record measurements from the diagnostic testing. Installation records will be maintained by Barr.

5.3.1 Documents and Forms

Diagnostic testing forms and checklists are included in the diagnostic testing SOP in Appendix F.

5.3.2 Photographic Documentation

The area or system installation and the diagnostic testing will be photographed prior to, during, and after completion of the installation and diagnostic work.

5.4 Post-Installation Indoor Air Testing

One month following operation of the initial SSD system inside the Facility warehouse, Barr will perform indoor air testing to evaluate the effect of the installation of the pilot system. Barr field technicians will sample at six locations inside the Facility warehouse, approximately replicating the sampling performed by MDNR during the summer of 2014. These six locations have been indicated on Figure 5-1, but will not include AS-3, which is inside the store showroom and was not an area of the Facility warehouse having contaminated indoor air or sub-slab soil vapor samples. Barr will also collect an outdoor ambient air sample on the west side of the warehouse. Indoor and outdoor air samples will be collected over an approximately 24-hour period in summa canisters in the same manner as described for the residences in Section 3.4 of this Work Plan.

6.0 Reporting and Schedule

6.1 Schedule

Barr will begin implementing the Work Plan immediately upon EPA approval of the Work Plan. Assuming at most 20 pits will be installed as part of the initial SSD system in the Facility warehouse, it is expected that completion of the mitigation system installation and performance evaluation activities described in this Work Plan will take two to three weeks. EPA will be provided notice two weeks prior to implementing the Work Plan. Follow-up indoor air testing inside the warehouse will occur approximately one month following system startup.

Barr will also initiate residence access agreements immediately upon EPA approval of the Work Plan and will plan to visit with each homeowner while the SSD system is being installed in the Facility warehouse. If access agreements are received, the residential indoor air and sub-slab vapor testing will occur at the same time that the indoor air monitoring will be performed following installation of the Facility warehouse SSD system (one month). Residential testing is anticipated to take a team of two up to one week.

This schedule relies on the cooperation and responsiveness of the individual property owners. If Barr encounters difficulties securing access to one or more properties, we will inform EPA and request assistance.

6.2 Facility Vapor Mitigation Response Action Report

At the conclusion of implementation of the Work Plan, Barr will submit a Vapor Mitigation Response Action Report to EPA summarizing the work completed for the project including the status of each of the selected properties and all laboratory data collected for the project organized by 3-digit property identifier. The report will be submitted within 60 days of receipt of the final analytical results from the home testing and post mitigation installation testing inside the warehouse. Reporting as required by the AOC will be implemented for the project.

The report will contain the recommended schedule for continued sampling of the residential homes and the homes that are recommended for mitigation systems. Additional properties may be recommended for testing based on the results of the initial ten homes, if necessary.

The report will contain an evaluation of the effectiveness of the pilot SSD system operation inside the Facility warehouse based on diagnostic pressure testing and one-month indoor air testing results. If the indoor air testing reveals TCE concentrations above the commercial action level of 8.8 $\mu g/m^3$, Barr will coordinate additional sub-slab soil vapor testing inside the warehouse and plan for the build out of the initial SSD pilot mitigation system. The report will contain details of recommended testing and expansion of the mitigation system.

7.0 References

American Society for Testing and Materials (ASTM), 2013. ASTM E2121-13 Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings. 2013.

MDNR, 2014. May 2014 Sampling Results: Toastmaster-Macon Site. Missouri Department of Natural Resources Hazardous Waste Program Superfund Section. June 2014.

United States Environmental Protection Agency (USEPA), 2014. Draft Administrative Settlement Agreement and Order on Consent for Removal Action. November 2014.

Figures

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Base
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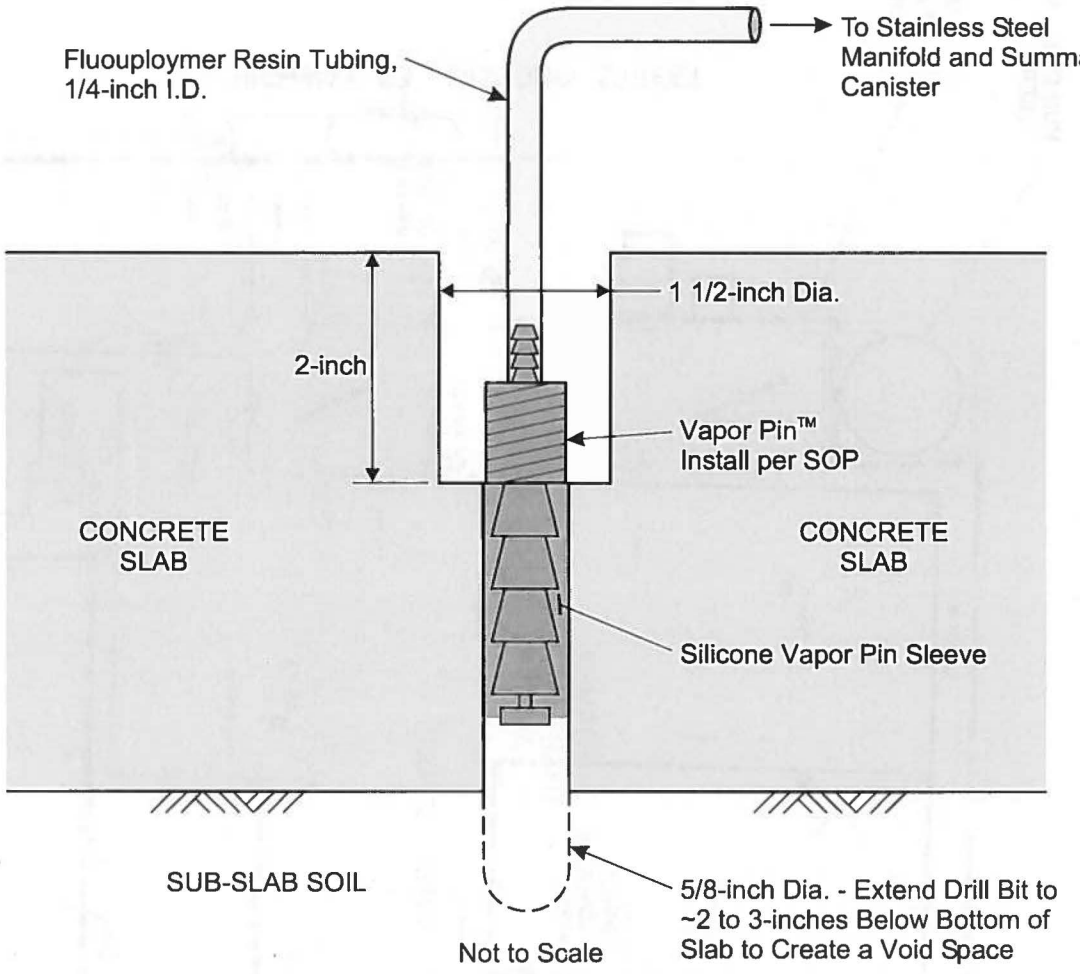
DAMERO
6TH ST
7TH ST
RUTHERFORD ST
TIN ST



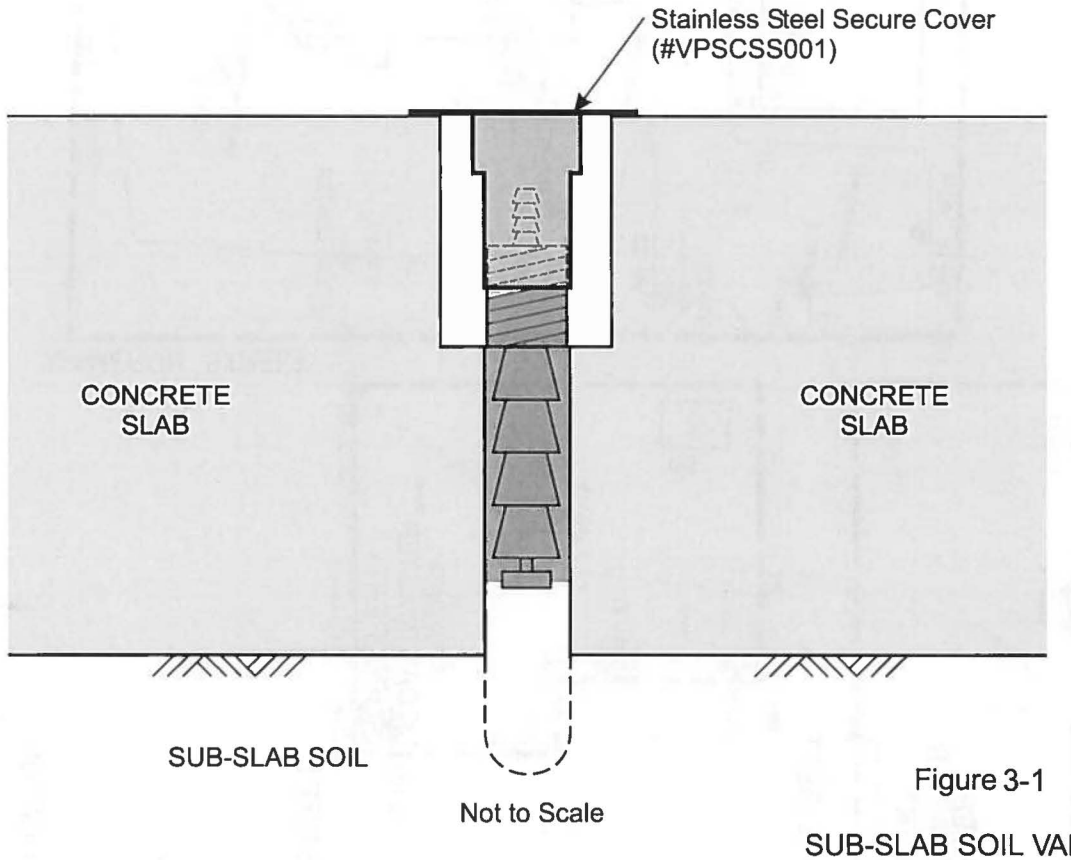


Figure 3-1

SUB-SLAB SOIL VAPOR MONITORING POINT SCHEMATIC

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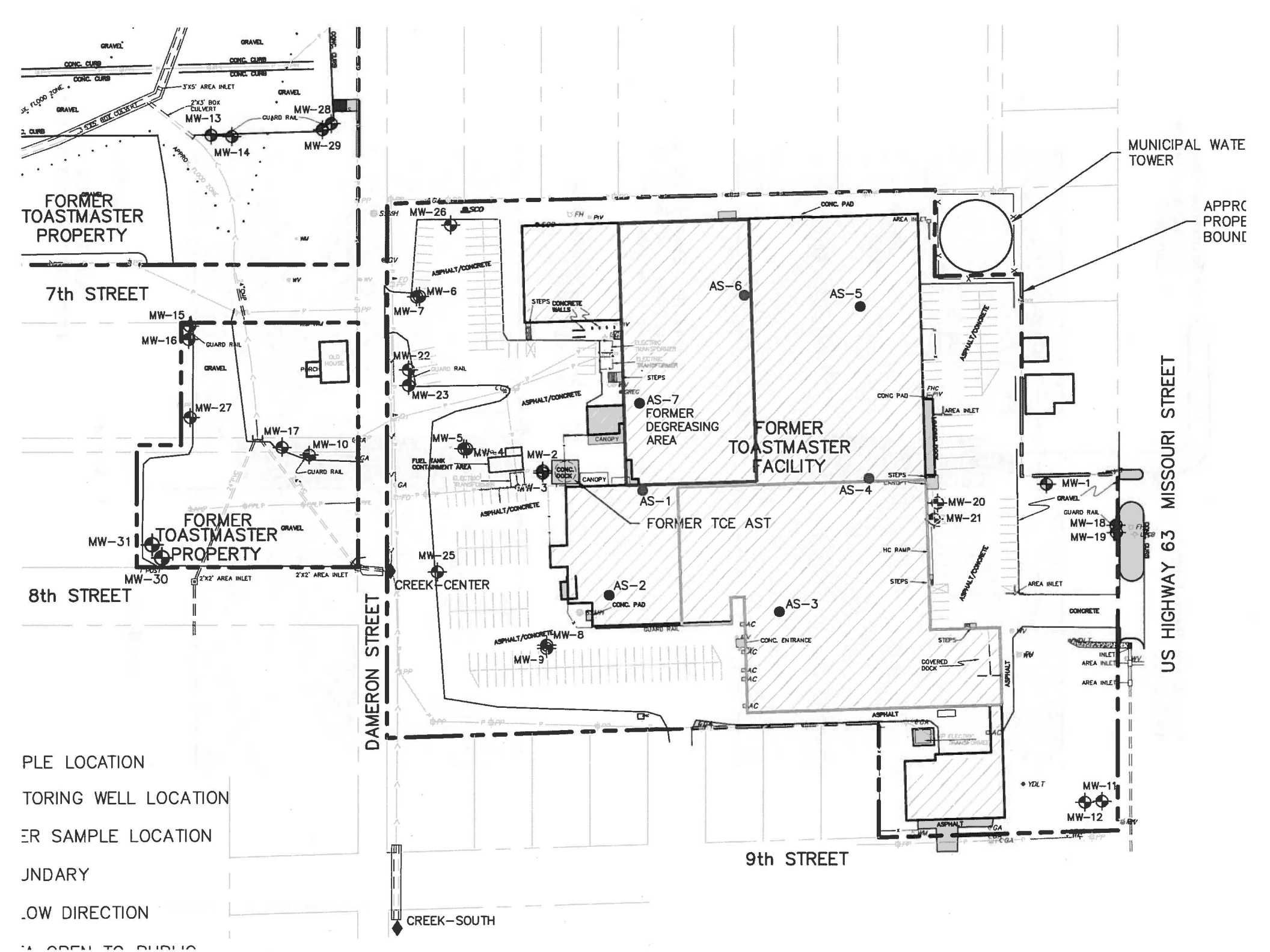
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7th STREET
8th STREET
9th STREET
DAMERON STREET
US HIGHWAY 63 MISSOURI STREET
MUNICIPAL WATE TOWER
APPRC PROPE BOUNI
FORMER TOASTMASTER FACILITY
FORMER TOASTMASTER PROPERTY
AS-1 FORMER TCE AST
AS-2
AS-3
AS-4
AS-5
AS-6
AS-7 FORMER DEGREASING AREA
CREEK-CENTER
CREEK-SOUTH
MW-1
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Appendix A

General Project Approach

Figure A-1
Pre-Sampling Process

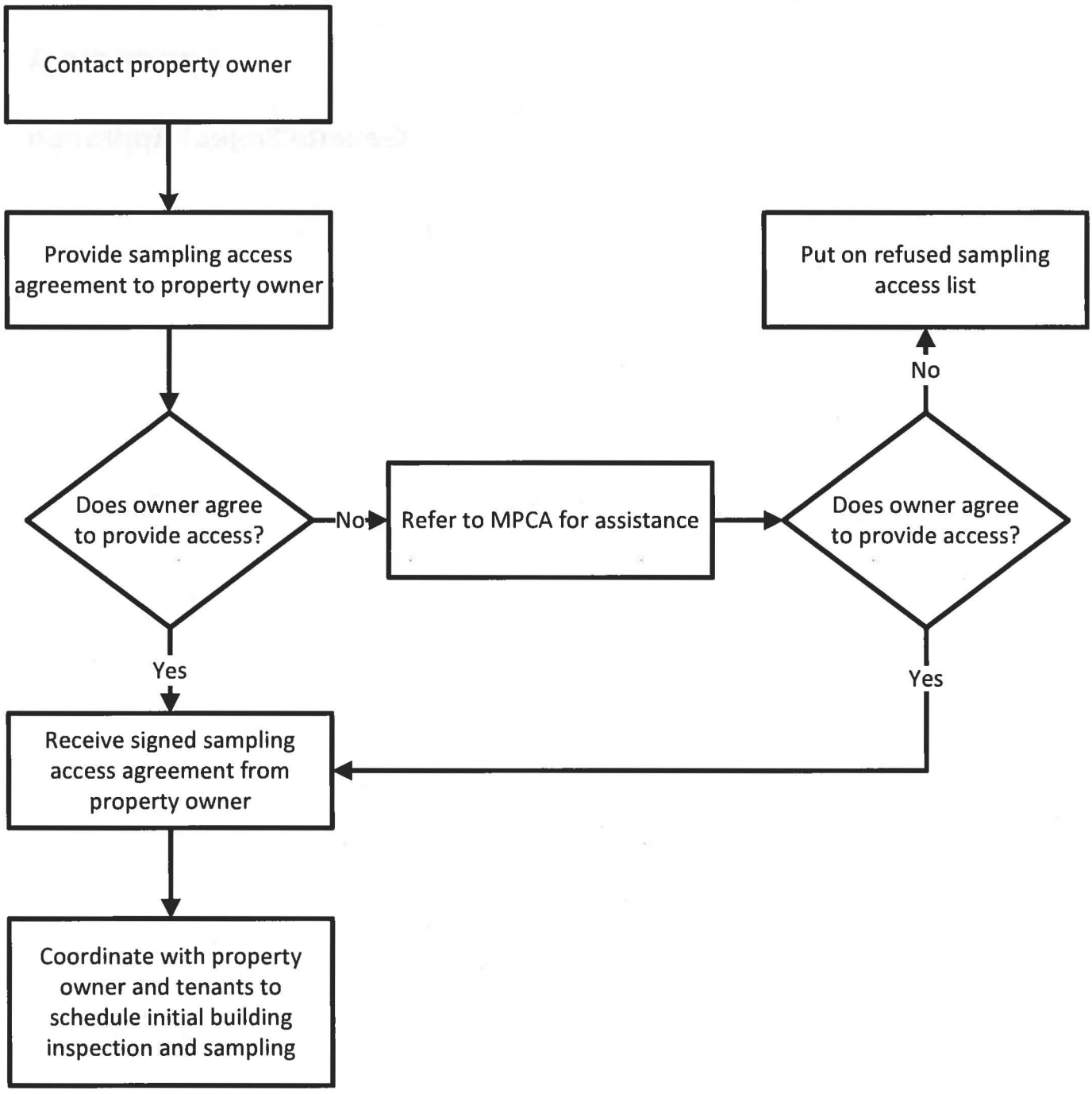
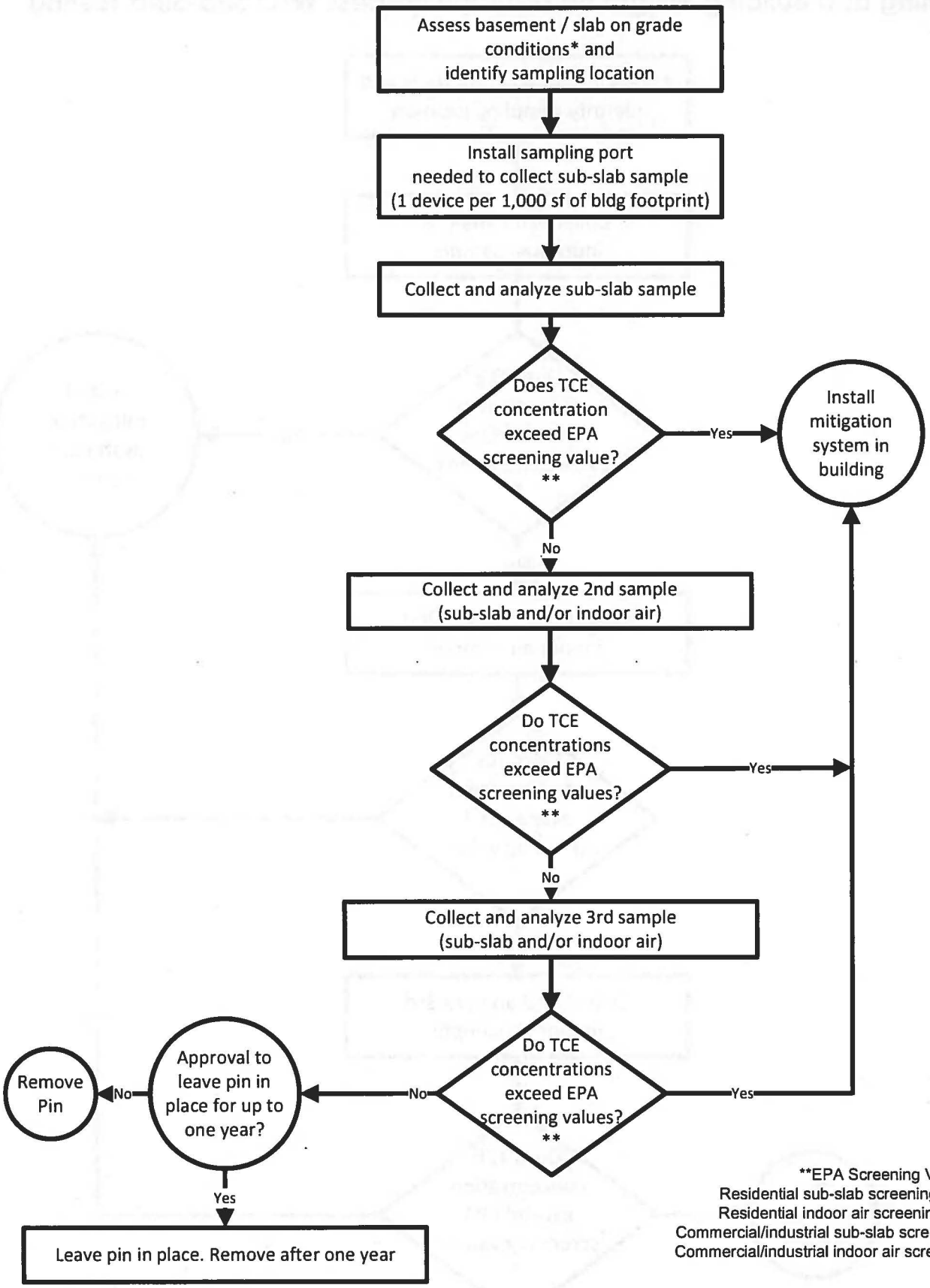


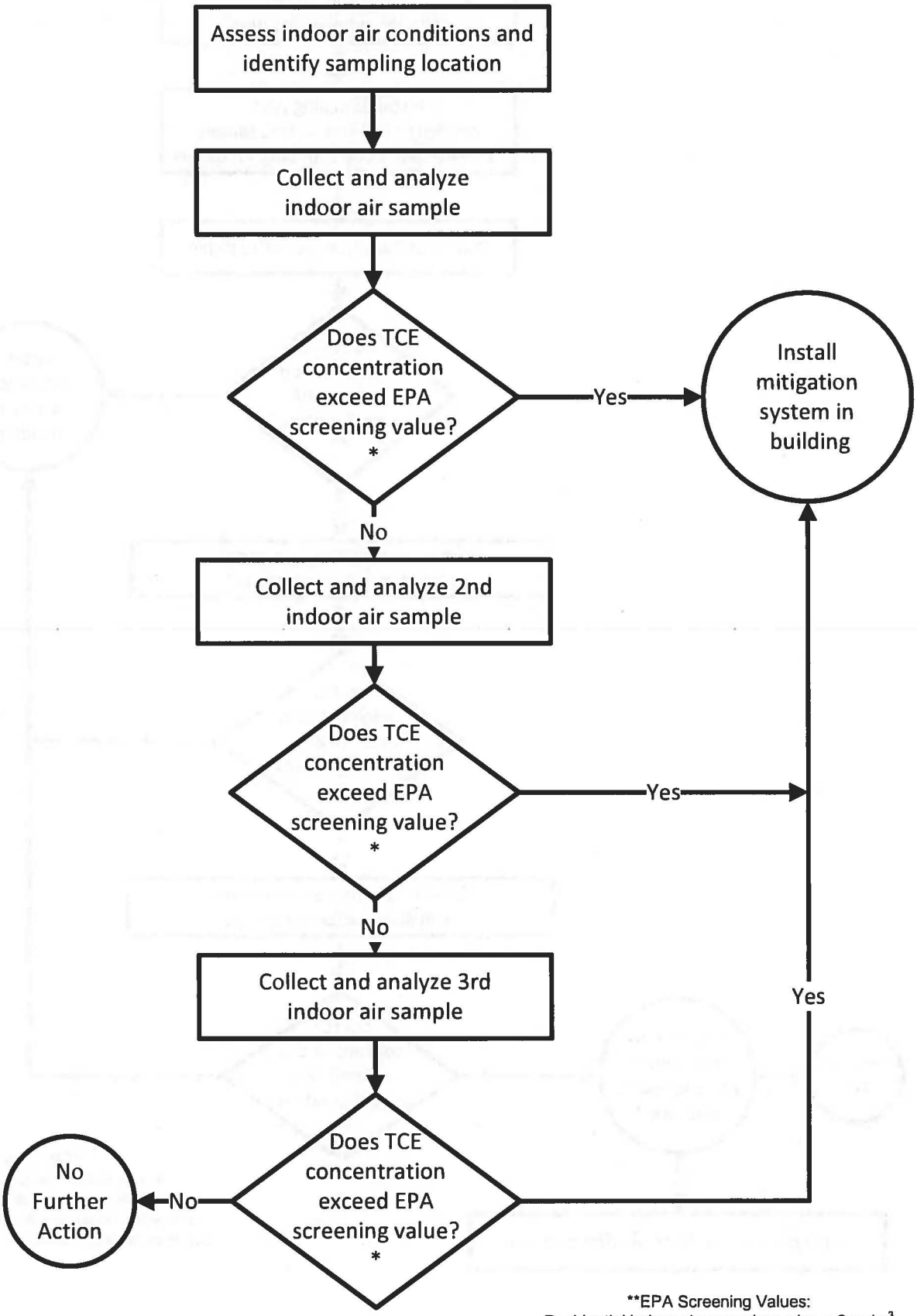
Figure A-2
Sampling and Building Mitigation Decision Process



**EPA Screening Values:
Residential sub-slab screening value = 66 µg/m^3
Residential indoor air screening value = 2 µg/m^3
Commercial/industrial sub-slab screening value = 293 µg/m^3
Commercial/industrial indoor air screening value = 8.8 µg/m^3

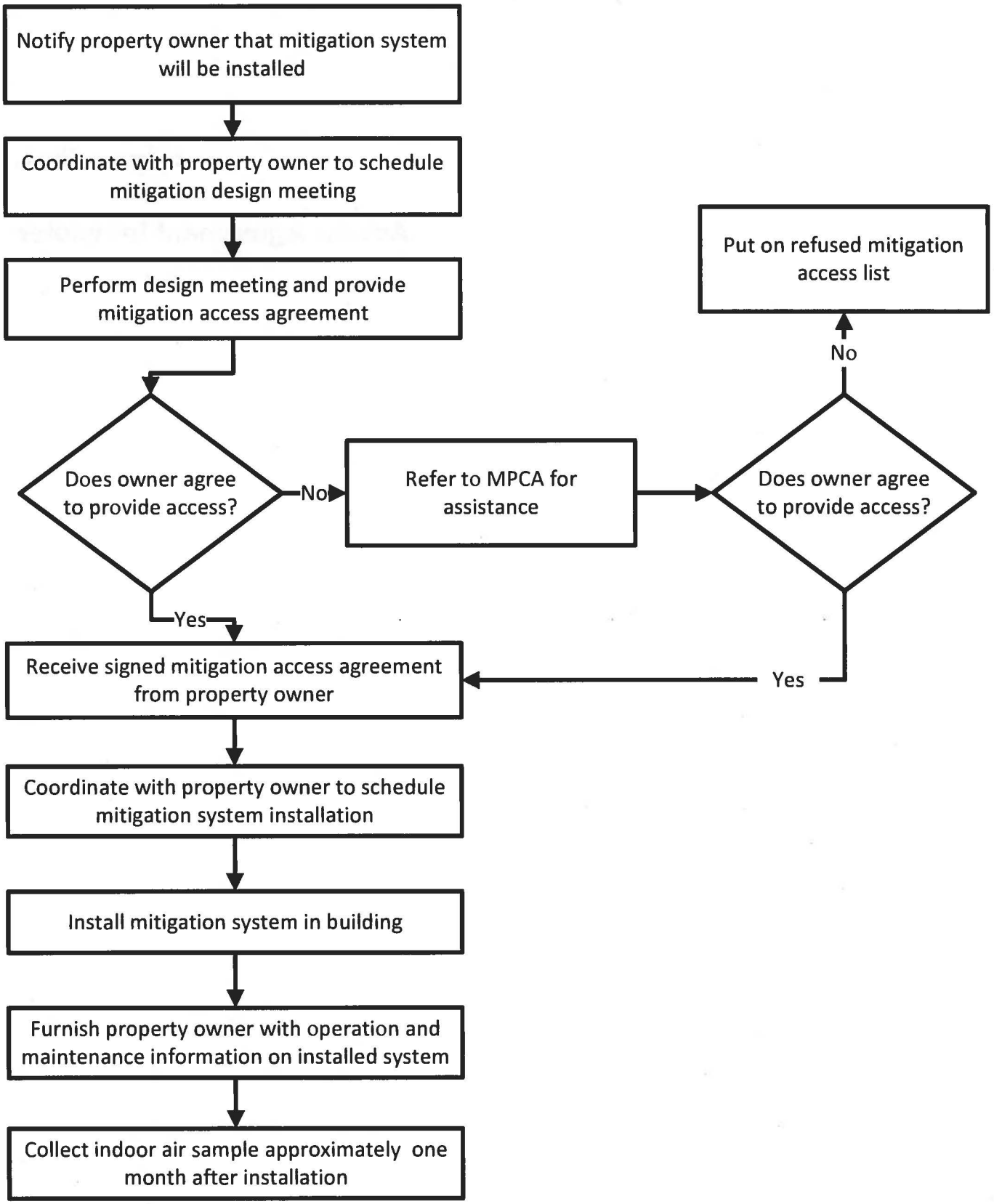
*Basements with dirt floors will be a special case requiring either placing a membrane or concrete floor prior to implementing the next step in the decision process or indoor air sampling in the basement.

Figure A-3
Sampling and Building Mitigation Decision Process W/O Sub-Slab Testing



**EPA Screening Values:
Residential indoor air screening value = 2 µg/m^3
Commercial/industrial indoor air screening value = 8.8 µg/m^3

Figure A-4
Building Mitigation Process



Appendix B

Access Agreement Templates

Soil Vapor Sampling Study - Access Agreement

This section to be completed by OWNER OR TENANT of property to be sampled:

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PH. (Day): _____ PH. (Evening): _____ EMAIL: _____

PLEASE CHECK: HOMEOWNER ❑ TENANT ❑

PREFERRED TIME OF DAY TO CONTACT:

_____

IF TENANT, PROVIDE NAME, ADDRESS AND PHONE NUMBER OF HOMEOWNER:

_____

_____

This section to be completed by OWNER of property to be sampled:

Check the box below as applicable:

- ❑ It is my desire to have vapor sampling conducted in the soil beneath my home. I understand that in order to collect samples, those contractors necessary to perform these functions will have to enter my property for the purpose of identifying the appropriate sampling location in the basement of lowest level of my home. In addition, I agree to assist the sampling team in answering a few questions about my home. I understand Barr Engineering, acting on behalf of Compton's Auction and Liquidation, will restore my property to its original condition to the extent possible following completion of its sampling activity. I have read the materials made available regarding the soil vapor sampling study. By signing below, I hereby authorize Barr Engineering and their representatives the right to access my property for the purpose of performing their respective tasks.
- ❑ I have been offered to have the soil beneath my home sampled for soil vapor and have reviewed the materials made available regarding the soil vapor sampling study and **DECLINE** to have my property sampled.

_____ _____

Property Owner Signature **Date**

Please complete this form with the information requested above and return it to the attention of:

Tony Schroer at Barr Engineering Co.
1001 Diamond Ridge, Suite 1100
Jefferson City, MO 65109
phone: 573-638-5021 fax: 573-638-5001 email: tschroer@barr.com

Ventilation System Program Access Agreement

This section to be completed by OWNER or TENANT of property eligible to receive ventilation system:

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PHONE (Day): _____ (Evening): _____ EMAIL: _____

PREFERRED TIME OF DAY FOR CONTACT PURPOSES:_____

PLEASE CHECK: HOMEOWNER _____ TENANT _____

IF TENANT, PROVIDE NAME, ADDRESS AND PHONE NUMBER OF HOMEOWNER:

_____

This section to be completed by property OWNER:

Check one box:

☐ It is my desire to have a ventilation system installed in my home/building. I understand that in order to allow the system to be installed, contractors retained by Compton's Auction and Liquidation to perform these functions will have to enter my property for the purpose of installing the ventilation system. I have read the materials provided regarding installation of the system. I understand Compton's Auction and Liquidation's contractors will restore my property to its original condition to the extent possible following completion of their work. By signing below, I hereby authorize those contractors and their representatives the right to access my property for the purpose of performing their respective tasks.

☐ I have been offered installation of a ventilation system and reviewed the materials provided regarding installation of the system, and **DECLINE** to have a ventilation system installed in my home/building.

_____ _____

Property Owner Signature **Date**

Please complete this form with the information requested above and return it to:

Tony Schroer at Barr Engineering Co.
1001 Diamond Ridge, Suite 1100
Jefferson City, MO 65109
phone: 573-638-5021 fax: 573-638-5001 email: tschroer@barr.com

Appendix C

Vapor Intrusion Interior Building Survey Form

Vapor Intrusion Interior Building Survey Form

Part 1: Physical Building Inspection

Preparer's name: _____ Date/Time prepared: _____

Affiliation: _____ Phone number: _____

1. Occupant information

Occupant name(s): _____ Interviewed: ☐ Yes ☐ No

Mailing address: _____

City: _____ State: _____ Zip code: _____

Phone: _____ Fax: _____ E-mail: _____

Number of occupants at this location: _____ Age range of occupants: _____

2. Owner/Landlord information (Check if same as occupant: ☐)

Occupant name(s): _____ Interviewed: ☐ Yes ☐ No

Mailing address: _____

City: _____ State: _____ Zip code: _____

Home phone: _____ Office phone: _____

3. Building type (Check appropriate response)

☐ Residential ☐ Industrial ☐ School ☐ Church ☐ Commercial/Multi-use

☐ Other (specify): _____

If the property is residential, what type? (Check appropriate response)

☐ Ranch rambler ☐ Raised rambler ☐ Townhouses/Condos ☐ Duplex ☐ Modular ☐ 2-Family

☐ Split level ☐ Contemporary ☐ Apartment house ☐ Cape cod ☐ Log home ☐ 3-Family

☐ Colonial ☐ Mobile home ☐ Other (specify): _____

4. Building description

If the property is commercial or industrial, describe the business use(s):

_____

_____

_____

Indicate the number of floors and general use of each floor of the building beginning with lowest level:

_____

_____

_____

If there are multiple residential units, indicate how many units: _____ When was building constructed: _____

Type of insulation used in building: _____ Elevators or lifts: ☐ Yes ☐ No

Basement/Lowest level depth below grade: _____ (feet)

Observed basement characteristics (Check all that apply)

Is basement/lowest level occupied:	☐ Full time	☐ Occasionally	☐ Almost never		
Basement type:	☐ Full	☐ Crawlspace	☐ Slab	☐ Other:	
Floor materials:	☐ Concrete	☐ Dirt	☐ Stone	☐ Other:	
Floor covering:	☐ Uncovered	☐ Covered	☐ Covered with:		
Concrete floor:	☐ Unsealed	☐ Sealed	☐ Sealed with:		
Foundation walls:	☐ Poured	☐ Block	☐ Stone	☐ Other:	
Basement finished:	☐ Unfinished	☐ Finished	☐ Partially finished		
Basement wetness:	☐ Wet	☐ Damp	☐ Seldom	☐ Moldy	
Sump pump present:	☐ Yes ☐ No	If yes, was water present: ☐ Yes ☐ No			

Indicate sources of water supply sources (i.e., drinking, irrigation, etc.) and type of sewage disposal (Check all that apply)

Water supply:	☐ Public water	☐ Drilled well	☐ Driven well	☐ Dug well
Sewage disposal:	☐ Public sewer	☐ Septic tank	☐ Leach field	☐ Dry well:

5. Heating, venting, air conditioning, or other building controls (Check all that apply)

Type of heating system(s) used in this building (Check all that apply)

☐ Hot air circulation ☐ Space heaters ☐ Electric baseboard ☐ In-floor heating ☐ Heat pump

☐ Steam radiation ☐ Wood stove ☐ Hot water baseboard ☐ Radiant floor ☐ Outdoor wood boiler

☐ Other (specify): _____ **Primary type:** _____

Primary type of fuel used (Check appropriate response)

☐ Natural gas ☐ Fuel oil ☐ Kerosene ☐ Electric ☐ Propane

☐ Solar ☐ Wood ☐ Coal

If hot water tank present, indicate fuel source: _____

Boiler/furnace is located in:	☐ Basement	☐ Outdoors	☐ Main floor	☐ Other:
Type of air conditioning:	☐ Central air	☐ Window units	☐ Open windows	☐ No mechanical system

Are there air distribution ducts present: ☐ Yes ☐ No

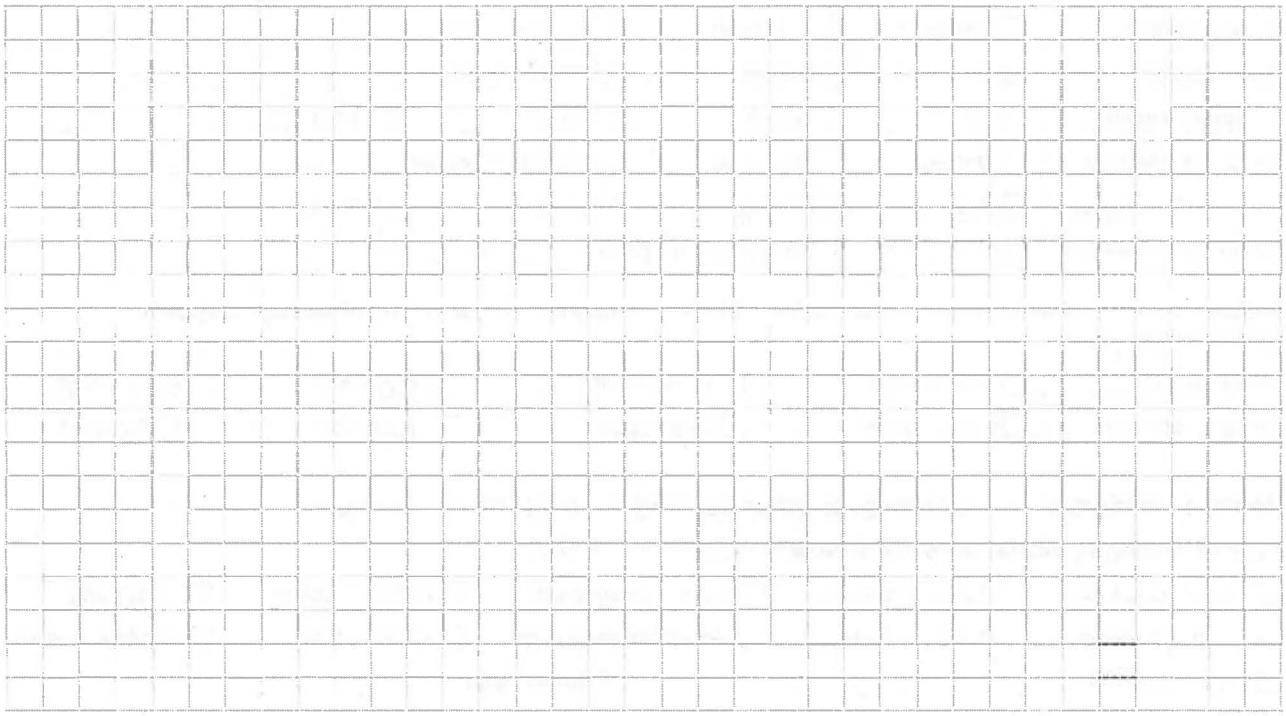
Describe the supply and cold air return ductwork and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

Describe the type of mechanical ventilation systems used within or for the building (e.g., air-to-air exchangers, HVAC, etc.). Indicate whether the interior spaces of the building use separate ventilation systems and/or controls. Provide information on any existing building mitigation system (e.g., radon mitigation, passive venting systems, etc.). If available, provide information on air exchange rates for any existing mechanical ventilation systems currently in use.

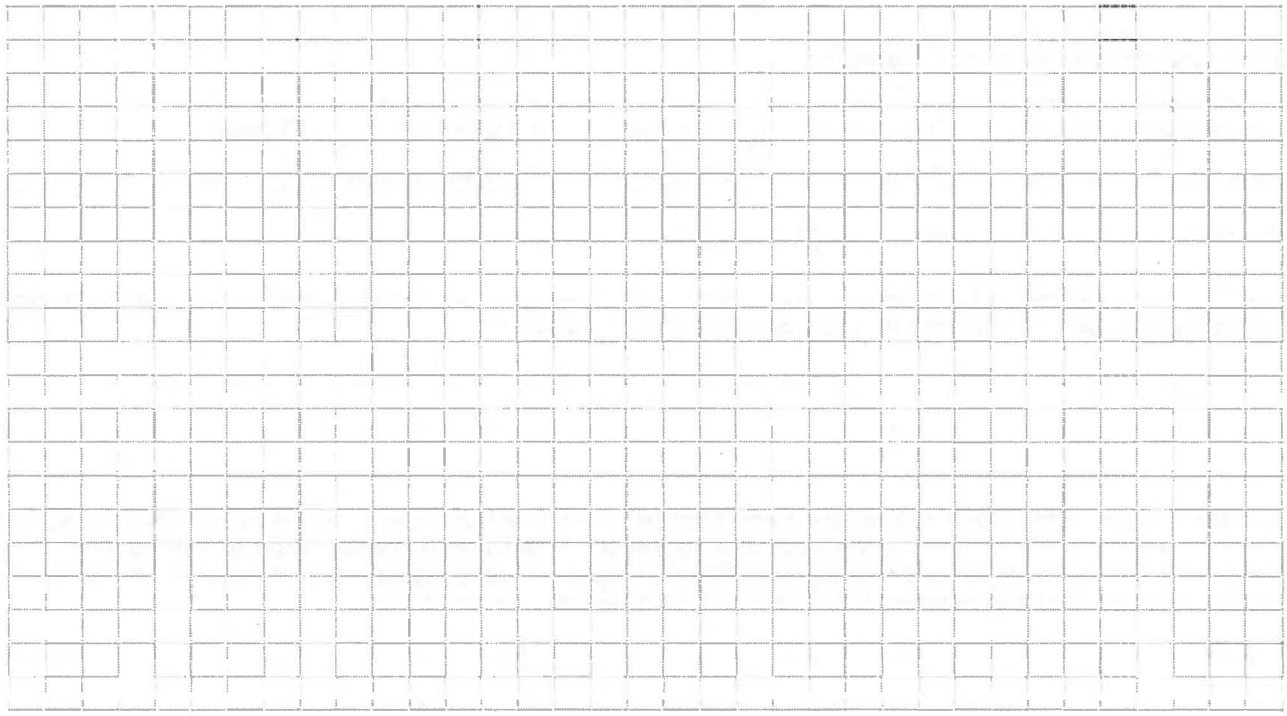
6. Grid plans

Use grid plans to describe floor plans, locate potential soil vapor entry points (e.g., cracks, utility ports, drains); and if applicable, identify sample locations (sub-slab, indoor air, outdoor air sampling).

Floor plan for basement or lowest level:

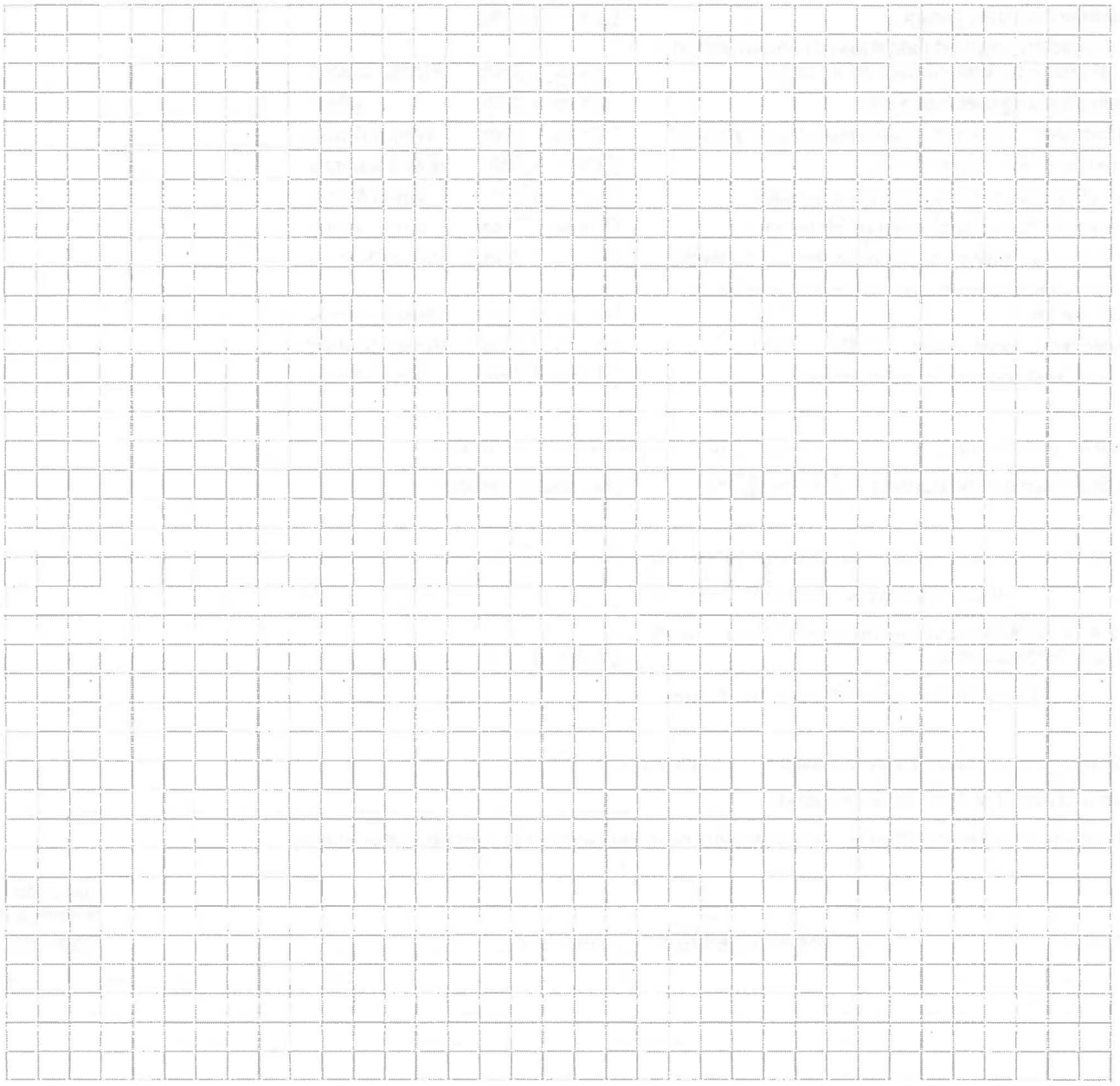


Floor above lowest level:



Outdoor grid plot (Include if outdoor ambient air samples collected):

Insert sketch (or attach separate document) of the area outside the building and locate outdoor air sample locations.
If applicable, provide information on spill locations, potential air contamination sources, locations of wells, septic system, etc., and PID meter readings. Indicate wind direction and speed during sampling.



Part 2: Indoor Air Quality Survey

Complete if indoor air sampling is conducted (use grids in Part 1 for labeling sampling locations).

Factors that may influence indoor air quality:

Is there an attached garage:	☐ Yes ☐ No		
Are petroleum-powered machines or vehicles stored in the garage (e.g., lawn mower, ATV, car):	☐ Yes ☐ No	Please specify:	_____
Has the building ever had a fire:	☐ Yes ☐ No	When:	_____
Is a kerosene or unvented gas space heater present:	☐ Yes ☐ No	Where & type:	_____
Is there smoking in the building:	☐ Yes ☐ No	How frequently:	_____
Have cleaning products been used recently:	☐ Yes ☐ No	When & type:	_____
Have cosmetic products been used recently:	☐ Yes ☐ No	When & type:	_____
Has painting/staining been done in the last 6 months:	☐ Yes ☐ No	Where & when:	_____
Has any remodeling or construction occurred in the last 6 months:	☐ Yes ☐ No	Where & when:	_____
Is there new carpet, drapes, or other textiles:	☐ Yes ☐ No	Where & when:	_____
Have air fresheners been used recently:	☐ Yes ☐ No	When & type:	_____

Is there a clothes dryer: ☐ Yes ☐ No If yes, is it vented outside: _____

Are there odors in the building: ☐ Yes ☐ No If yes, please describe: _____

Do any of the building occupants use solvents at work: ☐ Yes ☐ No

If yes, what types of solvents are used: _____

Do any of the building occupants regularly use or work at a dry-cleaning service: ☐ Yes ☐ No

If yes, indicate approximately how frequent: _____

Product inventory form (Add additional rows if needed)

Make and model of field instrument used: _____

List specific products identified in the building that have the potential to affect indoor air quality:

Location	Product description*	Comments	Instrument readings if taken and units

* Describe the condition of the product containers as Unopened (UO), Used (U), or Deteriorated (D). Include photographs of product containers as appropriate to document products and ingredients.

Appendix D

Installation and Extraction of the Vapor Pin SOP

Cox-Colvin & Associates, Inc. Environmental Services

Standard Operating Procedure Use of the Vapor Pin™ Drilling Guide and Secure Cover

July 16, 2012

Scope:

This standard operating procedure (SOP) describes the methodology to use the Vapor Pin™ Drilling Guide and Secure Cover to install and secure a Vapor Pin™ in a flush mount configuration.

Purpose:

The purpose of this SOP is to detail the methodology for installing a Vapor Pin™ and Secure Cover in a flush mount configuration. The flush mount configuration reduces the risk of damage to the Vapor Pin™ by foot and vehicular traffic, keeps dust and debris from falling into the flush mount hole, and reduces the opportunity for tampering. This SOP is an optional process performed in conjunction with the SOP entitled "Installation and Extraction of the Vapor Pin™". However, portions of this SOP should be performed prior to installing the Vapor Pin™.

Equipment Needed:

- Vapor Pin™ Secure Cover (Figure 1);
- Vapor Pin™ Drilling Guide (Figure 2);
- Hammer drill;
- 1½-inch diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent);
- 5/8-inch diameter hammer bit (Hilti™ TE-YX 5/8" x 22" #00226514 or equivalent);
- assembled Vapor Pin™;
- #14 spanner wrench;
- Wet/Dry vacuum with HEPA filter (optional); and
- personal protective equipment (PPE).

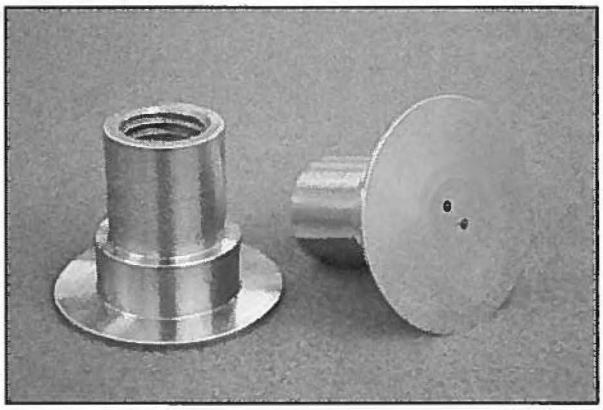


Figure 1. Vapor Pin™ Secure Cover.

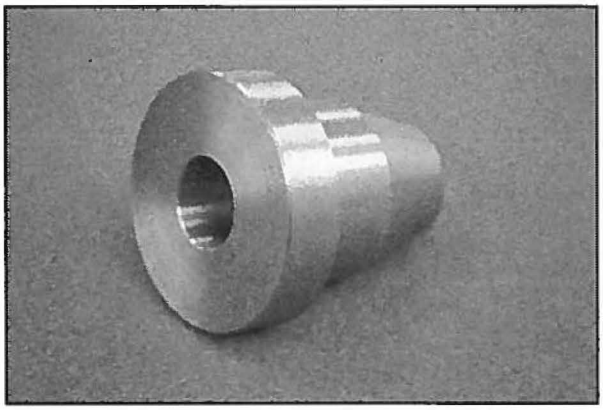


Figure 2. Vapor Pin™ Drilling Guide.

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) While wearing PPE, drill a 1½-inch diameter hole into the concrete slab to a

depth of approximately 1 3/4 inches. Pre-marking the desired depth on the drill bit with tape will assist in this process.

4) Remove cuttings from the hole and place the Drilling Guide in the hole with the conical end down (Figure 3). The hole is sufficiently deep if the flange of the Drilling Guide lies flush with the surface of the slab. Deepen the hole as necessary, but avoid drilling more than 2 inches into the slab, as the threads on the Secure Cover may not engage properly with the threads on the Vapor Pin™.

Figure 3. Installing the Drilling Guide.

5) When the 1½-inch diameter hole is drilled to the proper depth, replace the drill bit with a $^{5}/_{8}$-inch diameter bit, insert the bit through the Drilling Guide (Figure 4), and drill through the slab. The Drilling Guide will help to center the hole for the Vapor Pin™, and keep the hole perpendicular to the slab.

6) Remove the bit and drilling guide, clean the hole, and install the Vapor Pin™ in accordance with the SOP "Installation and Extraction of the Vapor Pin™.

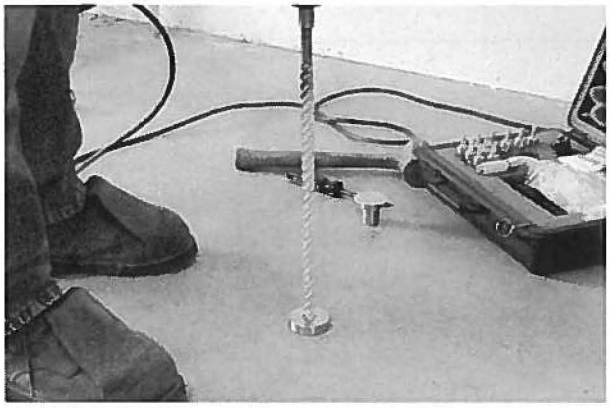


Figure 4. Using the Drilling Guide.

7) Screw the Secure Cover onto the Vapor Pin™ and tighten using a #14 spanner wrench by rotating it clockwise (Figure 5). Rotate the cover counter clockwise to remove it for subsequent access.

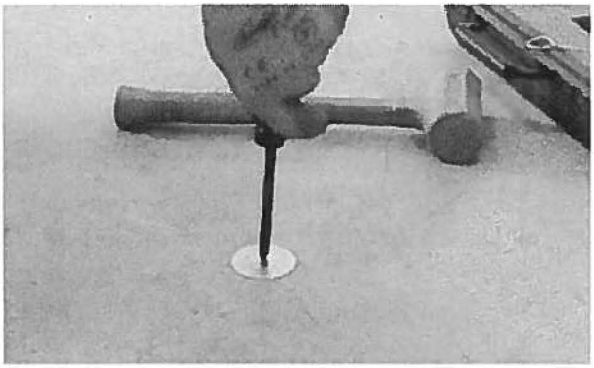


Figure 5. Tightening the Secured Cover.

Limitations:

On slabs less than 3 inches thick, it may be difficult to obtain a good seal in a flush mount configuration with the Vapor Pin™.

Cox-Colvin & Associates, Inc. Environmental Services

Standard Operating Procedure Installation and Extraction of the Vapor Pin™

December 3, 2013

Scope:

This standard operating procedure describes the installation and extraction of the Vapor Pin™ for use in sub-slab soil-gas sampling.

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Vapor Pin™ for the collection of sub-slab soil-gas samples.

Equipment Needed:

- Assembled Vapor Pin™ [Vapor Pin™ and silicone sleeve (Figure 1)];
- Hammer drill;
- 5/8-inch diameter hammer bit (Hilti™ TE-YX 5/8" x 22" #00206514 or equivalent);
- 1½-inch diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch diameter bottle brush;
- Wet/dry vacuum with HEPA filter (optional);
- Vapor Pin™ installation/extraction tool;
- Dead blow hammer;
- Vapor Pin™ flush mount cover, if desired;
- Vapor Pin™ protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel.

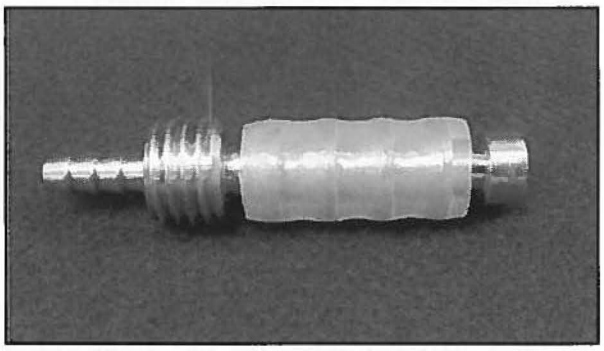


Figure 1. Assembled Vapor Pin™.

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) If a flush mount installation is required, drill a 1½-inch diameter hole at least 1¾-inches into the slab.

4) Drill a 5/8-inch diameter hole through the slab and approximately 1-inch into the underlying soil to form a void.

5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.

6) Place the lower end of Vapor Pin™ assembly into the drilled hole. Place the small hole located in the handle of the extraction/installation tool over the Vapor Pin™ to protect the barb fitting and cap, and tap the Vapor Pin™ into place using a dead blow hammer (Figure 2). Make sure

the extraction/installation tool is aligned parallel to the Vapor Pin™ to avoid damaging the barb fitting.

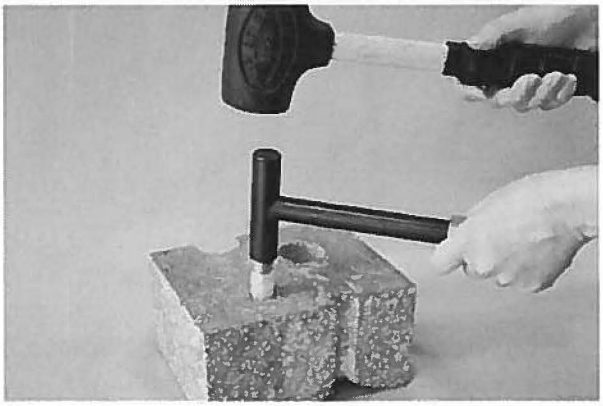


Figure 2. Installing the Vapor Pin™.

For flush mount installations, unscrew the threaded coupling from the installation/extraction handle and use the hole in the end of the tool to assist with the installation (Figure 3).

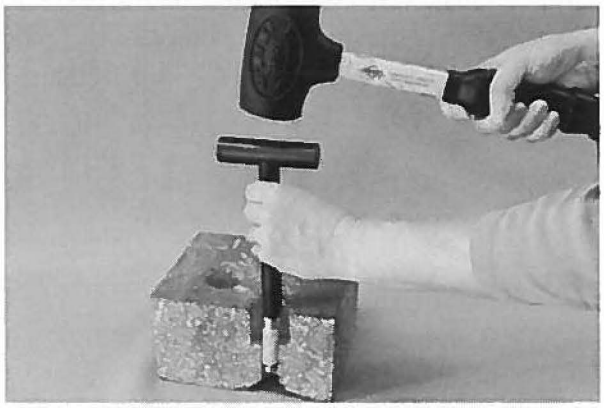


Figure 3. Flush-mount installation.

During installation, the silicone sleeve will form a slight bulge between the slab and the Vapor Pin™ shoulder. Place the protective cap on Vapor Pin™ to prevent vapor loss prior to sampling (Figure 4).

Figure 4. Installed Vapor Pin™.

7) For flush mount installations, cover the Vapor Pin™ with a flush mount cover, using either the plastic cover or the optional stainless-steel Secure Cover.

8) Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to equilibrate prior to sampling.

9) Remove protective cap and connect sample tubing to the barb fitting of the Vapor Pin™ (Figure 5).

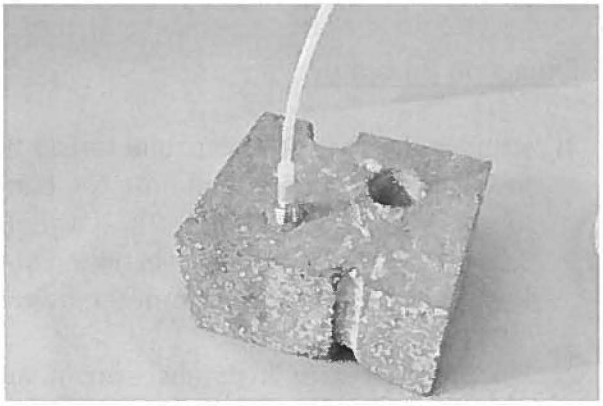


Figure 5. Vapor Pin™ sample connection.

10) Conduct leak tests in accordance with applicable guidance. If the method of leak testing is not specified, an attractive alternative can be the use of a water dam and vacuum pump, as described in SOP Leak Testing the Vapor Pin™ via Mechanical Means (Figure 6).

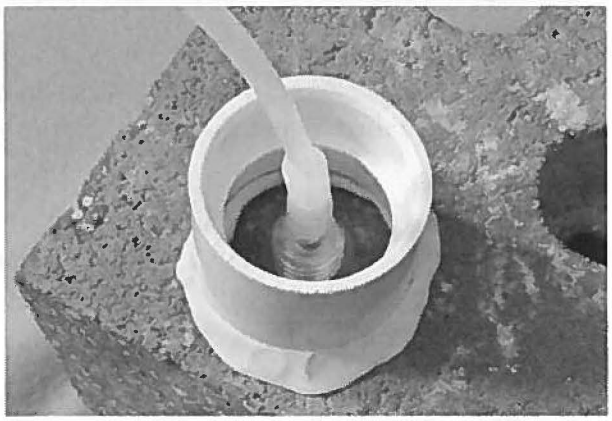


Figure 6. Water dam used for leak detection.

11) Collect sub-slab soil gas sample. When finished sampling, replace the protective cap and flush mount cover until the next sampling event. If the sampling is complete, extract the Vapor Pin™.

Extraction Procedure:

1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the Vapor Pin™ (Figure 7). Continue turning the tool to assist in extraction, then pull the Vapor Pin™ from the hole.

2) Fill the void with hydraulic cement and smooth with the trowel or putty knife. Urethane caulk is widely recommended for installing radon systems and can provide a tight seal, but it could also be a source of VOCs during subsequent sampling.

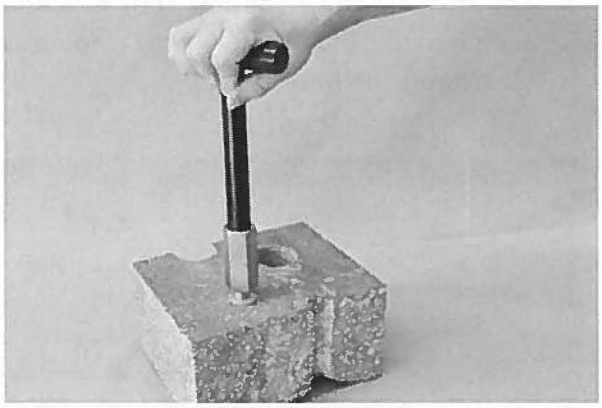


Figure 7. Removing the Vapor Pin™.

3) Prior to reuse, remove the silicone sleeve and discard. Decontaminate the Vapor Pin™ in a hot water and Alconox® wash, then heat in an oven to a temperature of 130° C.

The Vapor Pin™ to designed be used repeatedly; however, replacement parts and supplies will be required periodically. These parts are available on-line at www.CoxColvin.com.

Replacement Parts:

Vapor Pin™ Kit Case - VPC001
Vapor Pins™ - VPIN0522
Silicone Sleeves - VPTS077
Installation/Extraction Tool - VPIE023
Protective Caps - VPPC010
Flush Mount Covers - VPFM050
Water Dam - VPWD004
Brush - VPB026
Secure Cover - VPSCSS001
Spanner Wrench - VPSPAN001

Appendix E

Sample Collection SOPs

STANDARD OPERATING PROCEDURE

Air Sample Collection from a Sub-Slab Soil Vapor Monitoring Point

Revision 0

May 27, 2014

Approved By:	Terri A. Olson	Terri A. Olson	05/27/14
	Print QA Manager(s)	Signature	Date
	Kevin McGilp	Kevin McGilp	05/27/14
	Print Field Technician(s)	Signature	Date

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Review of the SOP has been performed and the SOP still reflects current practice.

Initials:	_____	Date:	_____
Initials:	_____	Date:	_____
Initials:	_____	Date:	_____
Initials:	_____	Date:	_____
Initials:	_____	Date:	_____

Standard Operating Procedures for the Air Sample Collection from a Sub-Slab Soil Vapor Monitoring Point

Purpose

To describe the procedure for collecting an active air sample for laboratory analysis using Summa canisters from sub-slab soil vapor monitoring points.

Applicability

The procedure applies to collection of an air sample in a Summa canister from a sub-slab soil vapor monitoring point. The term "Summa" Canister is a generalized trademark that refers to electropolished, passivated stainless steel vacuum sampling devices, such as TO canisters, SilcoCans, MiniCans, etc., which are cleaned, evacuated, and used to collect whole-air samples for laboratory analysis.

Equipment

a. Summa canister with a male quick connect fitting (provided by laboratory).

b. 7 micron particulate filter (provided by laboratory)

c. Pressure Gauge (provided by laboratory)

d. Flow controlling device (provided by the laboratory)

e. Male and female quick connect fittings

f. Small diameter Teflon tubing with a compression fitting/nut on one end

g. Surgical grade silicone tubing

h. Small diameter plug valve and associated ferrules, nuts and fittings

i. 9/16-inch wrench

j. Surgical grade graduated syringe with female Luer lock type connection, 60 mL

k. Surgical grade Luer lock valve

l. Cable tie

m. Photo-Ionization Detector (PID) equipped with a 10.6 eV bulb

n. Chain of custody, and dedicated field logbook and/or sampling forms as required

References

Cox-Colvin & Associates, Inc., Standard Operating Procedure Installation and Extraction of the Vapor Pin™. May 20, 2011

Cox-Colvin & Associates, Inc., Standard Operating Procedure Use of the Vapor Pin™ Drilling Guide and Secure Cover. July 16, 2012

Air Toxics Ltd, Guide to Air Sampling and Analysis, Canisters and Tedlar Bags Fifth Edition

Responsibilities

The Field Technician(s) are responsible for collection of the air sample using a Summa canister.

Procedure

The following procedure includes purging a sub-slab soil vapor monitoring point, conducting a vacuum based leak test on the sampling train, collecting a single sub-slab soil vapor sample in a Summa canister, and collecting split/duplicate sub-slab soil vapor samples in two Summa canisters.

The sub-slab soil vapor monitoring point will be installed.

a. Advance a boring into the sub-slab material using a rotary hammer drill or other device.

b. Sub-slab soil vapor monitoring points should be fitted with Teflon tubing of the appropriate size. Insert a sub-slab soil vapor monitoring point into the material immediately below the slab.

c. Fine sand should be added to the space around and above the sub-slab soil vapor monitoring point to help prevent surface sealing materials from contacting and potentially plugging the sub-slab soil vapor monitoring points.

d. Once the sub-slab soil vapor monitoring points are installed, the boring is sealed at the surface with non-VOC-containing and non-shrinking products to prevent infiltration of ambient air from above the slab.

The Teflon tubing is attached to the sub-slab soil vapor monitoring point. A single or a series of brass or stainless steel valves and fittings is utilized to minimize the sub-slab soil vapor source's exposure to ambient atmosphere. The Teflon source tubing is then connected to the single or series of brass or stainless steel valves and fittings. After connection of the source Teflon tubing, proceed with operational procedures described below.

The Teflon tubing will be discarded upon completion of sample collection. The sampling train will be submitted to the laboratory or field office for decontamination following internal standard operating procedures.

If the construction of the sub-slab soil vapor monitoring point included the use of a Vapor Pin™ device then attachment to the sub-slab soil vapor monitoring points shall be completed in general accordance with Standard Operating Procedure Installation and Extraction of the

Vapor Pin™ and/or Standard Operating Procedure Use of the Vapor Pin™ Drilling Guide and Secure Cover. This method in general will incorporate the use of disposable small diameter PTFE (Teflon) tubing, a plug valve, and the pressure gauge assembly supplied by the analytical laboratory. Brass or stainless steel valves and/or fittings may also be used.

1. Performing the Vacuum-Based Leak Test

[Note: In this standard operating procedure if Vapor Pins™ are used, vacuum based leak testing should be performed in conjunction with water based leak testing described in Standard Operating Procedure Installation and Extraction of the Vapor Pin™ The analytical testing laboratories may supply the particulate filter, flow controlling device, vacuum gauge, and Teflon tubing with compression fitting as one assembly (Flow Control Assembly). In addition, the Summa canisters may be fitted with a quick connect which will connect directly to the Flow Control Assembly. Alternate configurations may need to be assembled for collection of Summa canister data and/or successful sample collection. Some states may require leak testing with a tracer gas. This SOP does not address tracer gas leak testing. Always check state and/or project requirements.]

a. Connect the Luer lock valve to the male threaded end of the quick connect fitting (or other fitting as appropriate) with a short section of Teflon tubing fit inside surgical grade silicone tubing. Secure the silicon tubing to both fittings with a cable tie.

b. Connect the Luer lock valve to the syringe to complete the assembly (Purge Assembly).

c. Disconnect the laboratory supplied Teflon tubing (if present) from the Flow Control Assembly and insert the plug valve between the tubing and particulate filter. Tighten the fittings on either side of the valve by turning approximately 1/8 turn past finger tight.

d. Connect one end of a short section (approximately 1 foot) of new Teflon tubing to the hose barb fitting (or other fitting as appropriate) of the sub-slab soil vapor monitoring point. Connect the other end to the Flow Control Assembly.

e. Connect the male quick connect fitting (or other fitting as appropriate) on the Purge Assembly to the female quick connect fitting (or other fitting as appropriate) on the Flow Control Assembly.

f. Close the plug valve(s).

g. Engage the Purge Assembly and draw back the syringe plunger until the pressure gauge indicates a vacuum of approximately 20-25 inches of Hg has developed in the sampling train.

h. While maintaining the syringe plunger position, quickly close the Luer lock valve and disconnect the quick connect fitting (or other fitting as appropriate).

i. Although the vacuum in the sampling train may drop slightly while disconnecting the quick connect fitting (or other fitting as appropriate), the vacuum should remain stable for a minimum of five minutes. If the vacuum, as indicated by the pressure gauge, drops then there is a leak in the sampling train.

j. If a leak is detected, tighten all fittings in the sampling train and repeat steps f through i.

2. Purging the Monitoring Point

a. Purging requirements may vary based on site conditions or project requirements, but will be a minimum of two times the volume of the sub-slab soil vapor monitoring point and the associated tubing and sampling train.

b. Connect all portions of the sampling train by following steps a through e in Part 1.

c. Connect the male quick connect fitting (or other fitting as appropriate) on the Purge Assembly to the female quick connect fitting (or other fitting as appropriate) on the Flow Control Assembly.

d. While the Luer lock valve and plug valve(s) are in the open position, slowly draw back the syringe plunger until the syringe plunger's indicator is to the 60 mL mark. Be sure to maintain the vacuum in the sampling train under 10 inches of Hg, as indicated by the pressure gauge, while drawing back the syringe plunger.

e. Close the Luer lock valve.

f. Disconnect the Luer lock valve from the syringe and purge the syringe contents to the atmosphere and away from other personnel.

g. Reconnect the Luer lock valve to the syringe and repeat steps d through f until the desired purge volume has been removed.

3. Single Sample Collection in One Summa Canister

a. After leak testing is complete and with the quick connect (or other fitting as appropriate) disconnected, open the plug valve connected to the Teflon source tubing to relieve the vacuum in the sampling train and complete the monitoring point purge procedure. If a Flow Control Assembly is used, record the unique identifier number assigned by the laboratory (if present) on the chain of custody form and in/on the dedicated field book or sampling form.

b. Close the plug valve.

c. Connect the Summa canister to the quick connect fitting (or other fitting as appropriate). Once connected the pressure gauge should indicate the initial vacuum in the Summa canister.

d. Record the initial vacuum on the chain of custody form and in/on a dedicated field logbook or sampling form.

e. When ready, open the plug valve to begin sample collection. Record the "start" time when the plug valve was opened. The canister filling rate must be limited to a maximum flow rate of 200 milliliter per minute using a flow controlling device.

f. Monitor the vacuum in the Summa canister by watching and periodically tapping the pressure gauge in case of a "sticky" pressure indicator needle.

g. When the pressure gauge indicates that there is approximately three inches of Hg of vacuum in the Summa canister close the plug valve.

h. Record the "stop" time and "final" vacuum on the chain of custody form and in/on a dedicated field book or sampling form.

i. Disconnect the quick connect fitting (or other fitting as appropriate).

j. Disconnect the Teflon tubing from the plug valve and quickly insert the tip of the PID.

k. Record the highest reading on the PID over a 30 second screening period.

l. Transfer the sample time (i.e. the stop time), the PID reading, the sample ID and the date to the Summa canister tag.

m. After sampling activities are completed, properly seal the sub-slab hole opening. For permanent monitoring points, close the monitoring point tight to allow for follow up sampling.

4. Split Sample Collection into Two Summa Canisters

[Note: Information below represents one way to collect a split/duplicate sample. Other configurations may be required depending on equipment being used.]

a. Use a Flow Control Assembly fitted with a tee fitting and two female quick connects (or other fittings as appropriate) downstream of the flow controller/critical orifice/gauge assembly (Split/Duplicate Sample Assembly). The Split/Duplicate Sample Assembly will be supplied by the laboratory.

b. Disconnect the laboratory supplied Teflon tubing (if present) from the Split/Duplicate Sample Assembly and insert the plug valve between the tubing and particulate filter. Tighten the fittings on either side of the valve by turning approximately 1/8 turn past finger tight.

c. Connect one end of a short section (approximately 1 foot) of new Teflon tubing to the hose barb fitting (or other fitting as appropriate) of the sub-slab soil vapor monitoring point. Connect the other end to the Split/Duplicate Sample Assembly.

d. Connect the male quick connect fitting (or other fitting as appropriate) on the Purge Assembly to one of the two female quick connect fittings (or other fittings as appropriate) on the Split/Duplicate Sample Assembly.

e. Close the plug valve(s).

f. Engage the Purge Assembly and draw back the syringe plunger until the pressure gauge indicates a vacuum of approximately 20-25 inches of Hg has developed in the sampling train.

g. While maintaining the syringe plunger position, quickly close the Luer lock valve and disconnect the quick connect fitting (or other fitting as appropriate).

h. Although the vacuum in the sampling train may drop slightly while disconnecting the quick connect fitting (or other fitting as appropriate), the vacuum should remain stable for a minimum of five minutes. If the vacuum, as indicated by the pressure gauge, drops then there is a leak in the sampling train.

i. If a leak is detected, tighten all fittings in the sampling train and repeat steps E through h.

j. After leak testing is complete and with the quick connect (or other fitting as appropriate) disconnected, open the plug valve connected to the Teflon source tubing to relieve the vacuum in the sampling train and complete the monitoring point purge procedure. Record the unique identifier number of the Split/Duplicate Sample Assembly assigned by the laboratory (if present) on the chain of custody form and in/on the dedicated field book or sampling form.

k. Close the plug valve.

l. Connect the Summa canisters to the quick connect fittings (or other fittings as appropriate). Once connected, the pressure gauge should indicate the initial vacuum for both of the Summa canisters.

m. Record the initial vacuum on the chain of custody form and in/on a dedicated field logbook or sampling form.

n. When ready, open the plug valve to begin sample collection. Record the "start" time when the plug valve was opened. The canister filling rate must be limited to a maximum flow rate of 200 milliliter per minute using a flow controller or critical orifice.

o. Monitor the vacuum in the Summa canister by watching and periodically tapping the pressure gauge in case of a "sticky" pressure indicator needle.

p. When the pressure gauge indicates that there is approximately three inches of Hg of vacuum in the Summa canister close the plug valve.

q. Record the "stop" time and "final" vacuum on the chain of custody form and in/on a dedicated field book or sampling form.

r. Disconnect the quick connect fittings (or other fitting as appropriate).

s. Disconnect the Teflon tubing from the plug valve and quickly insert the tip of the PID.

t. Record the highest reading on the PID over a 30 second screening period.

u. Transfer the sample time (i.e. the stop time), the PID reading, the sample ID and the date to the Summa canister tags.

v. After sampling activities are completed, properly seal the sub-slab hole opening. For permanent monitoring points, close the monitoring point tight to allow for follow up sampling.

Sample Care and Documentation

1. Summa Canister Sample

The Environmental Technician should record on the Summa canister tag and in/on a dedicated field logbook or sampling form: the unique serial number of the Summa canister, the sample name, the time of sample collection, gauge pressure prior to collection, and gauge pressure following collection. The start and stop time of sample collection should also be recorded if using a flow controlling device. This information should also be reflected on the chain of custody when shipping samples to the laboratory.

Interferences/Discussion for Summa Canister

Samples collected in a Summa canister should be shipped or stored at ambient temperature and kept out of direct sunlight.

2. Sample Storage

The Summa canisters must be stored at ambient temperature until receipt at the laboratory. All samples will be kept secured to prevent tampering. If samples are left in a vehicle or field office for temporary storage, the area will be locked and secured. The samples may be packaged into cardboard boxes and must be delivered to the laboratory via hand or overnight delivery courier in accordance with all Federal, State and Local shipping regulations.

3. Documentation

The Environmental Technician should record the following on the Summa canister tag, dedicated field logbook or sampling form, and chain of custody form as required:

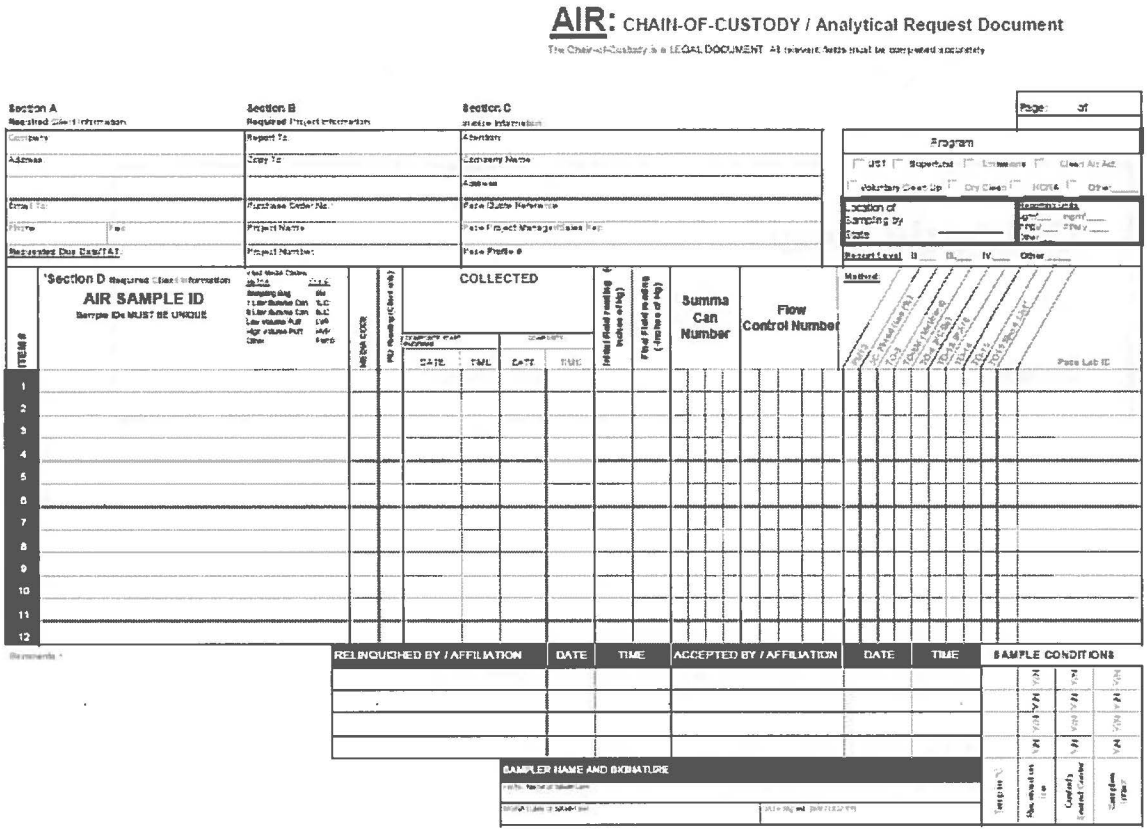
Summa canisters:

a. unique serial number or identifier of the Summa canister
b. unique serial number or identifier of the vacuum gauge and particulate filter
c. unique serial number or identifier of the flow controlling devise
d. date and time of sample collection
e. gauge pressure prior to collection
f. gauge pressure following collection
g. sample identification
h. start and stop time of sample collection if using a flow controlling devise
i. name of sample technician

Attachments

Attachment 1: Example Chain of Custody Form
Attachment 2: Custody Seal – if applicable
Attachment 3: Field Sampling Quality Control Check List

Attachment 1
Example Chain of Custody Form



AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information

Section B — Required Project Information

Section C — Invoice Information

Page: of

Program

Location of Sampling by

Report Level II III IV Other

'Section D Required Client Information

AIR SAMPLE ID

Sample IDs MUST BE UNIQUE

ITEM #	AIR SAMPLE ID	MEDIA CODE	PID Reading (if applicable)	COLLECTED DATE	COLLECTED TIME	COLLECTED DATE	COLLECTED TIME	Initial Field reading (inches of Hg)	Final Field reading (inches of Hg)	Summa Can Number	Flow Control Number	Method	Pace Lab ID
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

Attachment 2
Custody Seal – if applicable

Custody Seal

Date_____ Project _____

Signature _____ Container#_____ of_____

Attachment 3
Field Sampling Quality Control Check List

Project: _____

Sample Unique ID #: _____

☐ Sub-slab soil vapor monitoring point purging was completed. Volume purged:_____

☐ Vacuum based leak testing was performed. Vacuum:_____ Duration:_____

☐ Water based leak testing was performed (if Vapor Pin™ was used).

☐ Initial summa canister vacuum was greater than 25 in. of Hg. Initial vacuum:_____

☐ PID screening was performed. Reading:_____ Background: _____

☐ Sample information was added to the chain of custody form.

Chain of Custody Form #: _____

☐ Sample collection information added to summa canister tag

☐ Photo of monitoring point location taken before and after installation

Standard Operating Procedure

Collection of Indoor and Ambient Air Samples Using Evacuated Canisters

Revision 0

April 14, 2015

Approved By:

Kevin McGilp		04/09/15
Print Technical Reviewer	Signature	Date

Terri Olson		04/14/15
Print QA Manager	Signature	Date

Review of the SOP has been performed and the SOP still reflects current practice.

Initials: _____ Date: _____

Initials: _____ Date: _____

Initials: _____ Date: _____

Initials: _____ Date: _____

Collection of Indoor and Ambient Air Samples Using Evacuated Canisters

1.0 Scope and Applicability

The purpose of this Standard Operating Procedure (SOP) is to define the procedure to be followed when collecting an indoor or ambient air sample using an evacuated canister. This technique pulls air through a flow controller or flow restrictor into an evacuated canister over a chosen period of time, ranging from 5 minutes to 24 hours. Unlike active sampling, a pumping device is not required. The sampling period and the flow rate determine the canister volume required. Canister typically refers to an electropolished, passivated stainless steel vacuum sampling device such as Summa®, SilcoCan®, MiniCan™, etc. These canisters are cleaned, evacuated, and used to collect whole-air samples for laboratory analysis (e.g., EPA TO-15).

The recommended procedures in this SOP should be followed unless conditions make it impractical or inappropriate to do so. Modifications should be noted in the applicable documentation and communicated to appropriate personnel. Significant changes may result in a revision or newly created SOP.

2.0 Limitations

- Collection methods and parameters lists can vary from state to state. Consult with the appropriate regulatory agency for guidance.
- Samples collected in a canister should be shipped or stored at ambient temperature and kept out of direct sunlight.
- Determine if the regulatory agency requires individually certified clean canisters for the project. The laboratory will need to be notified when placing the canister order.
- Plugged sample inlet.

3.0 Responsibilities

Experienced Field Technician(s) are responsible for collection of the air sample using the appropriate equipment and procedure.

4.0 Safety

Barr staff is responsible for implementing the aspects of the job safely. Where available, refer to the appropriate Project Health and Safety Plan (PHASP) to determine the proper personal protection equipment (PPE) required when using this SOP.

5.0 Equipment, Reagents, and Supplies

- Canister *
- Particulate filter, 7 micron *
- Pressure gauge *
- Flow controller *
- Moisture trap *
- Wrenches, various sizes
- Photoionization Detector (PID) (ppb level)
- Materials to place or suspend canister for collection at 3-5' above the floor or ground surface
- Chain-of-custody (COC)

* - Provided by the laboratory

6.0 Procedure

This section describes the procedure(s) for the collection, handling, and delivery of indoor and ambient air samples in evacuated canisters.

6.1 Calibration

The ppb level PID is calibrated before use per the manufacturer's instructions. The flow controller is calibrated at the laboratory with the appropriate flow based on the size of the canister and sampling period needed.

6.2 Sampling

Prior to collecting an indoor air sample, it is advisable to conduct an interior building survey, chemical inventory, and owner/occupant interview. The collection of an outdoor air sample is also advised. It is used as a control sample that allows for the elimination of outdoor air contamination. Refer to applicable regulatory guidance for details and procedures regarding building surveys and the number/frequency of outdoor air sampling.

NOTE: Outdoor air samples may need to account for HVAC intake.

6.2.1 Collection

Identify a suitable location for the sample to be collected that is three to five feet from the floor or ground surface (e.g., small table/stand or rope for suspending). For indoor air samples select a location that is away from windows or other sources of exterior air leakage. If earthen floors, unsealed crawl spaces or sumps are identified the sample should be collected from that area.

If not supplied preassembled by the laboratory, connect the flow controller, pressure gauge, particulate filter, and moisture trap to the canister. Remove the brass cap and open the valve on the canister. Record the "initial" vacuum pressure and "start" time on the laboratory supplied label attached to the canister, the COC and in/on a dedicated field logbook or sampling form. It is recommended that a ppb level PID be used to measure the organic vapor concentrations in the ambient air near the sample containers at the time the sample collection is started. Record the PID measurement on the laboratory supplied label attached to the canister, the COC and in/on a dedicated field logbook or sampling form.

After the sampling period has ended, close the valve on the canister and record the "stop" time and "final" vacuum pressure on the laboratory supplied label attached to the canister, the COC and in/on a dedicated field book or sampling form.

Record the following on the COC and dedicated field logbook and/or sampling form as required:

- Canister serial #
- Flow controller serial #
- Sampler
- Sample ID *
- PID reading *
- Initial vacuum pressure
- Start time *
- Stop time (sample time) *
- Date(s) collected *
- Final vacuum pressure

NOTE: The items marked with an asterisk (*) should also be recorded on the canister tag.

6.2.2 Handling

Store the canisters at ambient temperature until receipt at the laboratory. Keep samples secure to prevent tampering. If samples are left in a vehicle or field office for temporary storage, the area will be locked and secured.

6.2.3 Shipment/Delivery

The samples should be packaged to minimize movement of the canisters and must be delivered to the laboratory via hand or overnight delivery courier in accordance with all Federal, State and Local shipping regulations.

6.3 Data Reduction/Calculations

No data reduction or calculations are associated with this procedure.

6.4 Disposal

No sample waste is associated with this procedure.

7.0 Quality Control and Quality Assurance (QA/QC)

The QC activities described below allow the self-verification of the quality and consistency of the work.

7.1 QA/QC Samples

Field duplicate samples, if required, will be collected in accordance with project specific plans or instructions. The laboratory must be notified, when ordering the canisters, that field duplicates are needed so the appropriate equipment is supplied.

7.2 Measurement Criteria

There should be a slight vacuum pressure left in the canister at the end of the sampling period. If the final vacuum pressure is at zero or higher than expected, inform the project team for determination on how to proceed with the sample and/or analysis.

8.0 Records

Examples of common field documentation are available in "Barr's Compendium of Field Documentation". Field documentation specific to this SOP are listed below. Other project specific or regulatory agency forms may also be used.

- Vapor Intrusion Interior Building Survey Form (MPCA)
- Interior Building Survey Inventory Form (Barr)
- Product Inventory Form (Barr)
- Indoor Air Building Survey and Sampling Form (MDEQ)

COCs and forms are provided to a Barr's Data Management Administrator for storage on the internal Barr network.

Additional records information can be found in Barr's "Records Management System Manual".

9.0 References

Minnesota Pollution Control Agency, *Vapor Intrusion Technical Support Document*, August 2010.

Minnesota Pollution Control Agency, Guidance Document 4-01a, *Vapor Intrusion Assessments Performed during Site Assessments*, October 2010.

Air Toxics Ltd, Guide to Air Sampling and Analysis, Canisters and Tedlar Bags, Fifth Edition.

Michigan Department of Environmental Quality, Guidance Document for the Vapor Intrusion Pathway. May 2013. Appendix F.4.

Appendix F

Mitigation System Diagnostic SOP

FORMER TOASTMASTER STUDY AREA
Vapor Intrusion Mitigation System Installation/Inspection Checklist

Property Address:	**Inspection Date and Time:**
Inspector (s) /Company:	**Date system installed:**
Make and model of fan:	**Mitigation system ID#:**

Minimum Recommendations	**Yes**	**No**
1.0 Interior Piping		
1.1 Are all manifold and suction point piping solid, rigid pipe with the required diameter for the designed air flow?		
1.2 Are all vent pipes and connections constructed of schedule 40 PVC and/or meeting all applicable codes?		
1.3 Are all pipe interior joints and connections in mitigation systems sealed permanently? (Exceptions include installation of fans and sump covers)		
1.4 Does the system piping avoid attachment to or support by existing pipes, ducts, conduits or any kind of equipment?		
1.5 Does the system piping avoid blocking window and doors or access to installed equipment?		
1.6 Are supports for system piping installed at least every four (4) feet on horizontal runs?		
1.7 Are pipe supports present at ends of branches and at changes in elevation or direction?		
1.8 Are vertical runs secured and within all applicable codes?		
1.9 Are suction point pipes supported and secured in a permanent manner that prevents their downward movement to the bottom of suction pits or sump pits, or into the soil beneath a soil-gas-retarder membrane?		
1.10 Are horizontal runs in system piping sloped to ensure that water from rain or condensation drains downward into the ground beneath the slab or soil-gas-retarder membrane?		
2.0 General Sealing		
2.1 Are openings around the suction point piping penetrations of the slab properly sealed using methods and materials that are permanent/durable and pass the smoke stick check?		
2.2 Are openings / cracks sealed where the slab meets the foundation wall (if appropriate)?		
2.3 At any point where vent pipe and electric conduit exits the building, is urethane caulk or equivalent material used, and when the joint is greater than ½ inch in width, is a foam backer rod or other comparable filler material inserted into the joint before the application of the sealant (principally from the outside)?		
2.4 Are all utility and other penetrations through a soil-gas-retarder membrane sealed?		
3.0 Labeling		
3.1 Does each suction point have a mechanism to measure vacuum?		
3.2 Is the pressure reading from the latest commissioning clearly marked on the vent pipe?		
3.3 Is a system description label noting "Vapor Mitigation System" placed on the system piping or other prominent location and legible?		

Minimum Recommendations	Yes	No
3.4 Does the label contain the name and phone number of the contact person in case the system isn't working?		
4.0 Fan Installation		
4.1 Is the fan installed in a configuration that avoids condensation buildup in the fan housing or is a condensate bypass system present?		
4.2 Is the fan mounted on the exterior of buildings rated for outdoor use or installed in a weatherproof protective housing? (leave blank for inside systems)		
4.3 Is the fan mounted and secured in a manner that minimizes transfer of vibration to the structural framing of the building? (leave blank for inside systems)		
4.4 Does the system operate without noise or vibration above normal conditions?		
4.5 If a fan is installed in the interior of a building, is the fan installed in an unoccupied attic or garage not beneath conditioned spaces?		
4.6 Is the fan installed in a vertical run of pipe?		
4.7 Is the fan mounted to the vent pipe with removable or flexible connections?		
5.0 Notes and Comments		
6.0 Required Corrective Actions		

VAPOR INTRUSION MITIGATION SYSTEM

PART 1 - GENERAL

1.1 SCOPE

A. This Section covers the requirements for the installation and performance of a Vapor Intrusion Mitigation System (System). The purpose of the System will be to prevent migration of vapors from the sub-surface into overlying buildings by lowering the air pressure in the soils directly below the building relative to the air pressure inside the building.

The System may be any of the variations, or combinations of the following variations defined in ASTM E2121 – 13 *Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings*: sub-slab depressurization (SSD), drain tile depressurization (DTD), and sub-membrane depressurization (SMD).

B. CONTRACTOR shall supply all labor, materials, equipment and services required for the proper installation of the System as described herein and shown on the Plans.

C. The installation and performance of the System shall meet ASTM E2121 – 13 *Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings,* and the diagnostics described in the Work Plan for this project, and shall generally conform to USEPA's technical guidance document, "*Radon Reduction Techniques for Existing Detached Houses*".

1.2 REFERENCES

A. American Society for Testing and Materials E2121 – 13, Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings.

B. USEPA - *Radon Reduction Techniques for Existing Detached Houses – Technical Guidance (Third Edition) for Active Soil Depressurization Systems*. EPA/625/R-93/011. October 1993.

1.3 SUBMITTALS

A. Manufacturers product specification sheets listing the materials to be supplied for the sealing materials and compounds, pipe, fittings, membrane material, and vent fan.

B. Diagnostic testing results in the format shown in the Work Plan for the project.

1.4 Quality Assurance

A. CONTRACTOR shall ensure that the vacuum produced by the System is sufficient in strength and distribution beneath the building floor by performing the diagnostic testing defined in the Work Plan for the project.

B. CONTRACTOR shall allow ENGINEER to be present and observe System planning, construction, and diagnostic testing.

C. CONTRACTOR shall ensure that any sections of Vent Riser located outside the building envelope are sufficiently insulated to prevent the formation of condensation inside the pipe when ambient outdoor temperatures are below 32 degrees Fahrenheit.

D. CONTRACTOR shall ensure that in SMD-type Systems the barrier membrane is overlapped and taped at least one foot in the event that more than one continuous sheet of membrane is required to completely cover earthen areas. CONTRACTOR shall ensure that the membrane is butted up and sealed with Butyl Seal tape along the foundation walls, and with Vapor Bond Tape around, pipes, conduits and other penetrations through the vapor barrier.

E. CONTRACTOR shall ensure that any sections of PVC pipe exposed to UV radiation are either properly rated for UV exposure or are coated with a UV resistant coating.

PART 2 – PRODUCTS

2.1 Materials

A. PVC Pipe and Fittings

   a. The PVC Riser Pipe and Vent Stack shall conform to the following: Schedule 40 PVC piping, elbows, end caps, and couplings

B. Vapor Barrier Membrane

   a. Raven Industries Vapor Block 15 – 15 mil thickness
   b. Vapor Bond Tape
   c. Raven Industries Vapor Bond Tape
   d. Butyl Seal Tape
   e. Raven Industries Butyl Seal Tape

C. Inline Fan

   a. Fantech HP Series or equal

PART 3 - EXECUTION

3.1 PROTECTION AND TAMPER-PROOFING

CONTRACTOR shall provide a lockable waterproof protective enclosure for vent fans and electrical components that are located outside.

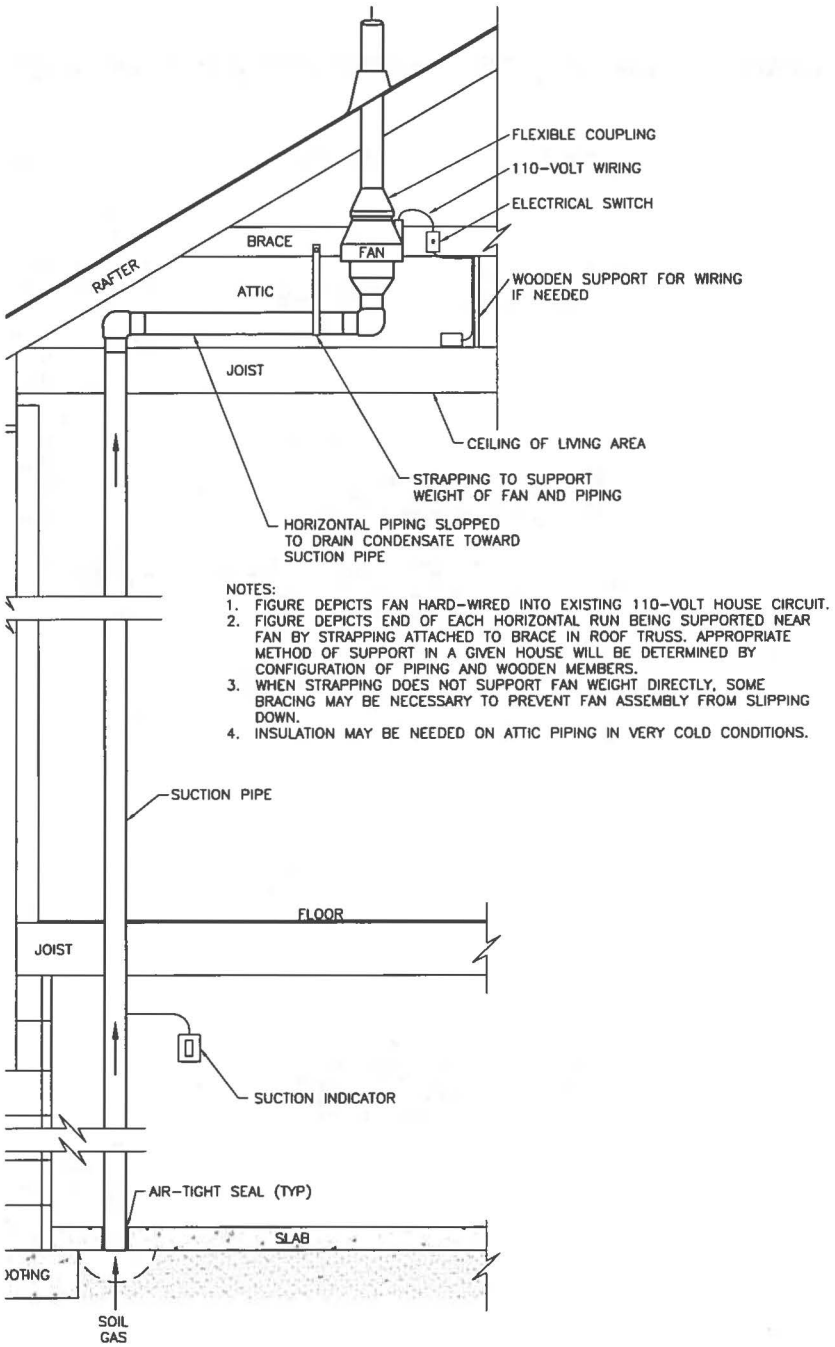
3.2 SUCTION PIT CONSTRUCTION

CONTRACTOR shall excavate a suction pit below the slab where the Vent Riser penetrates the slab. The dimensions of the suction pit shall be based on the experience of the Contractor.

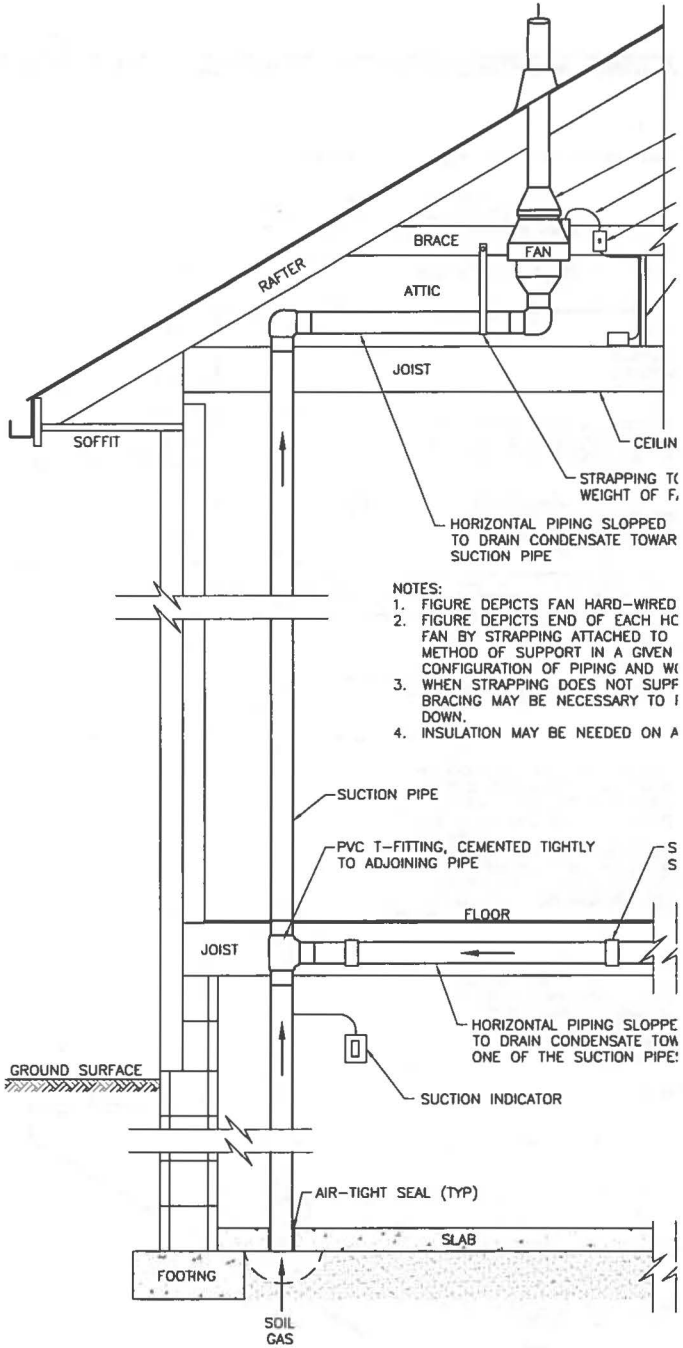
PART 4 - PAYMENT

[Section not used]

END OF SECTION



URCE: RADON REDUCTION TECHNIQUES FOR EXISTING DETACHED HOUSES, EPA, 1993

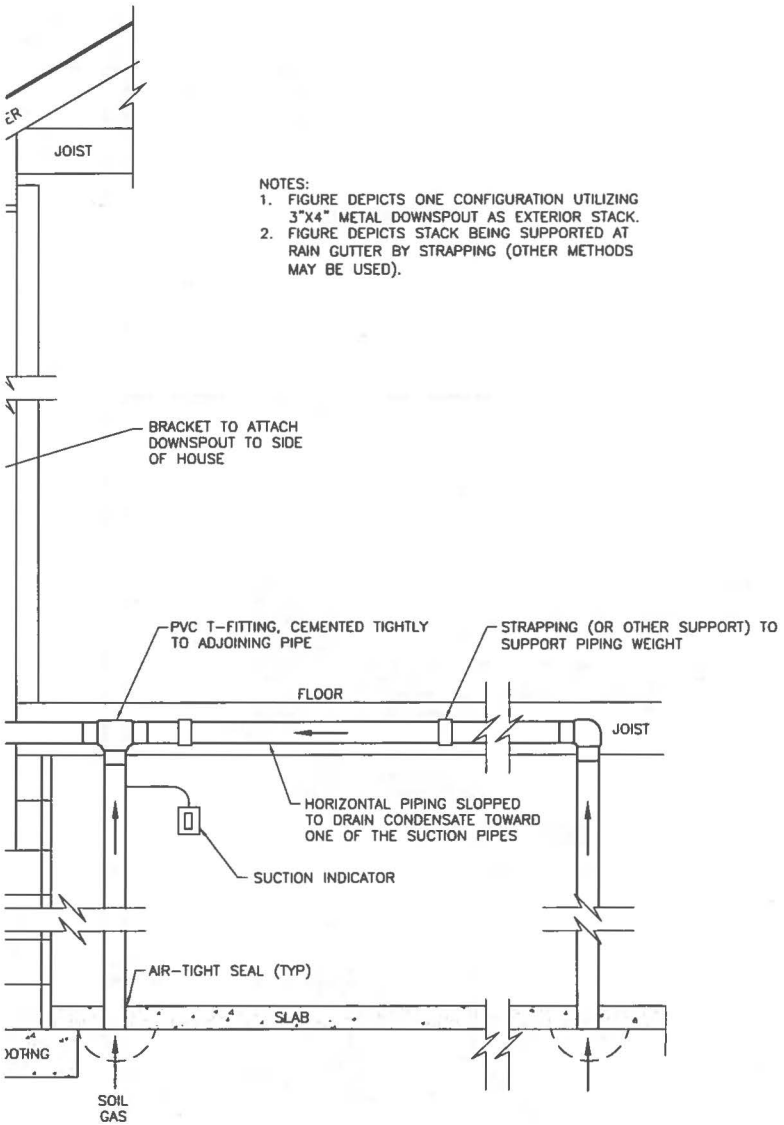


SOURCE: RADON REDUCTION TECHNIQUES FOR EXISTING DETACHED HO

RESSURIZATION (SSD) VAPOR ABATEMENT SYSTEM (INSIDE PIPING) – SINGLE EXTRACTION POINT

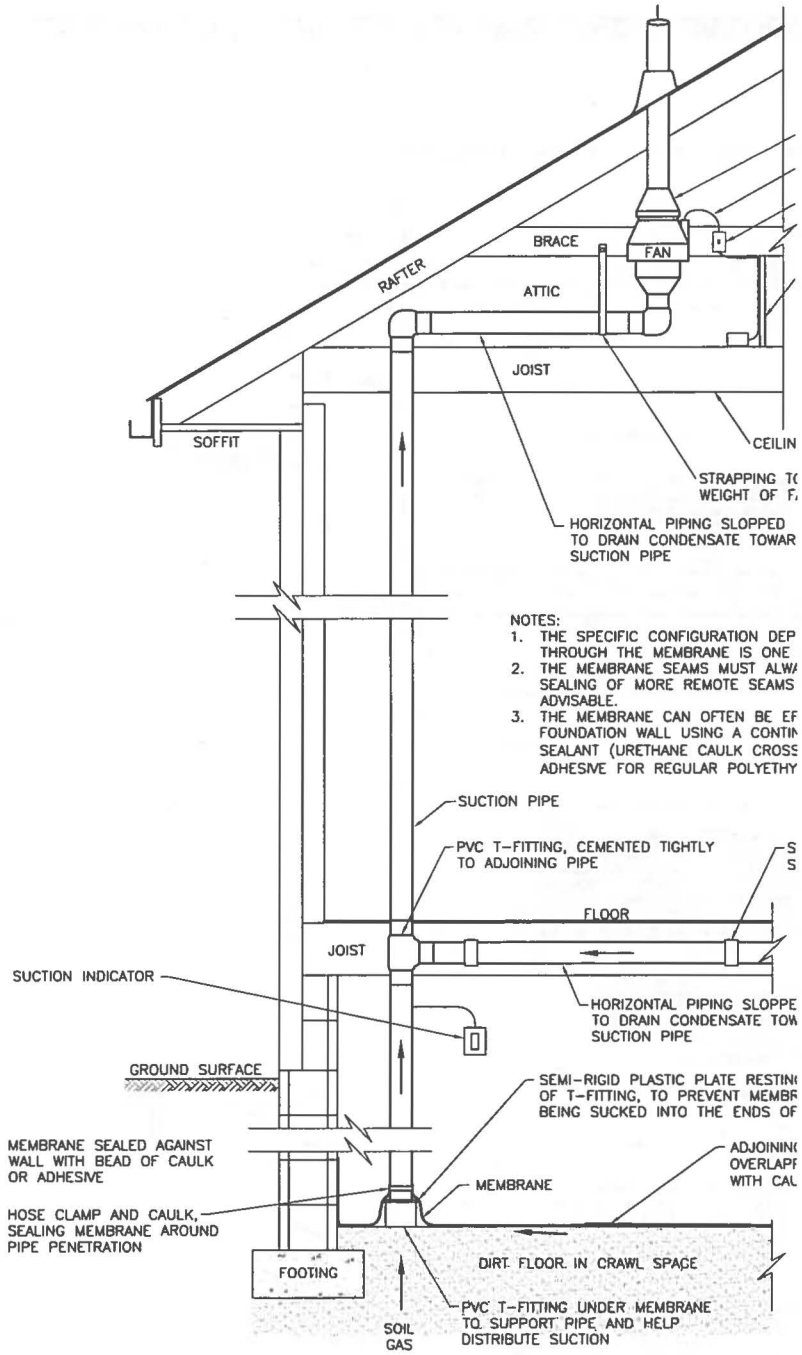
2 – SECTION: TYPICAL SUB-SLAB DEPRESSURIZATION (SSD) VAPOR ABATEMENT SYSTEM (

NOT TO SCALE



SOURCE: RADON REDUCTION TECHNIQUES FOR EXISTING DETACHED HOUSES, EPA, 1993

TYPICAL SUB-SLAB DEPRESSURIZATION (SSD) VAPOR ABATEMENT SYSTEM (OUTSIDE PIPING)



SOURCE: RADON REDUCTION TECHNIQUES FOR EXISTING DETACHED HOUSES, EPA,

4 SECTION: TYPICAL SUB-MEMBRANE DEPRESSURIZATION (SMD) V

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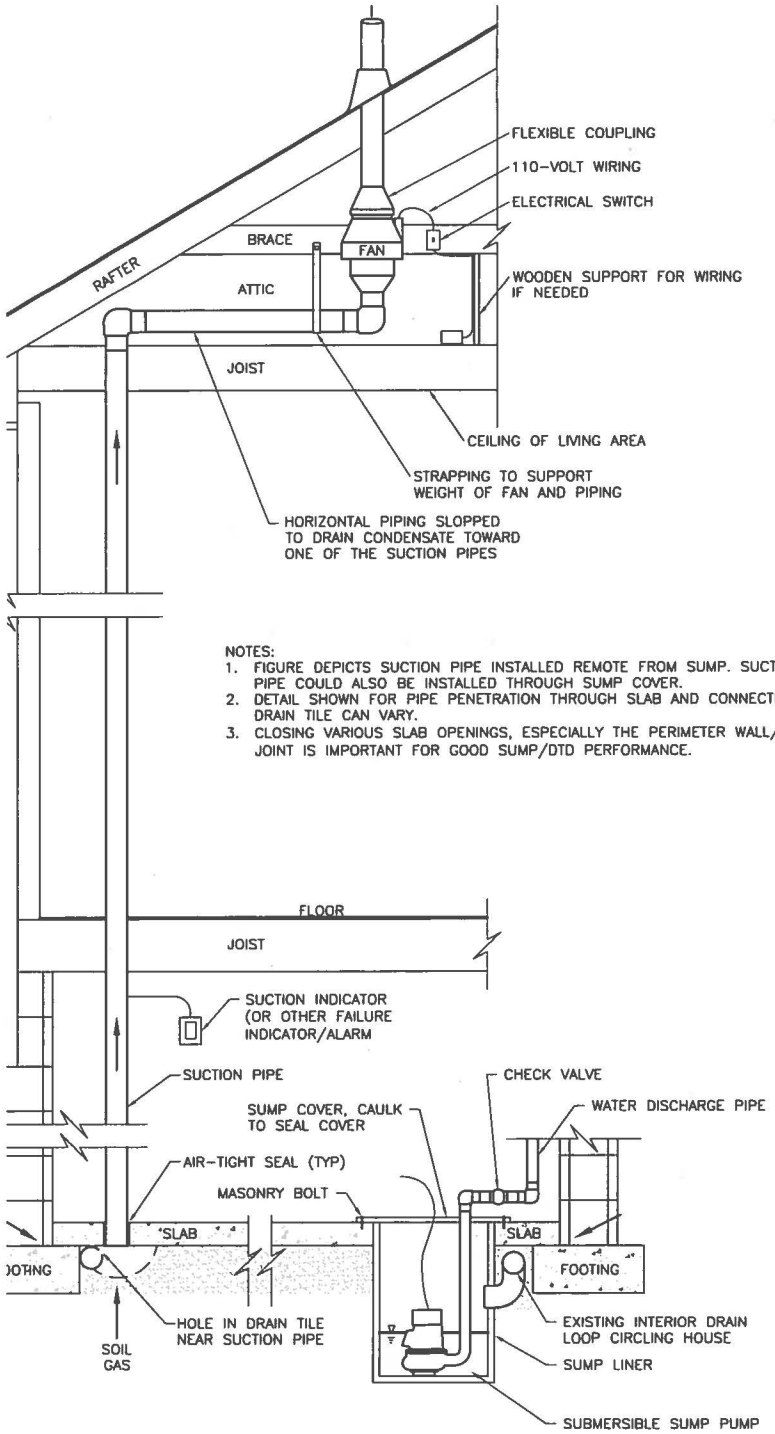

NOTES:
1. FIGURE DEPICTS SUCTION PIPE INSTALLED REMOTE FROM SUMP. SUCTION PIPE COULD ALSO BE INSTALLED THROUGH SUMP COVER.
2. DETAIL SHOWN FOR PIPE PENETRATION THROUGH SLAB AND CONNECTION TO DRAIN TILE CAN VARY.
3. CLOSING VARIOUS SLAB OPENINGS, ESPECIALLY THE PERIMETER WALL/FLOOR JOINT IS IMPORTANT FOR GOOD SUMP/DTD PERFORMANCE.

OURCE: RADON REDUCTION TECHNIQUES FOR EXISTING DETACHED HOUSES, EPA, 1993

TYPICAL DRAIN-TILE DEPRESSURIZATION (DTD) VAPOR ABATEMENT SYSTEM