**From:** Hnat, John J - DNR
**To:** DOT Hazmat Unit
**Subject:** RE: Notice of Contamination
**Date:** Wednesday, July 29, 2020 7:17:00 AM
**Attachments:** 20200720_11_Closure_Final_OHM108.pdf

---

Hi Sharlene,

Sorry about that. Here's the final closure letter to Mr. Cass. The soil and groundwater maps are on Page 6 & 7. Have a great day and stay safe.

---

**From:** DOT Hazmat Unit <DOTHazmatUnit@dot.wi.gov>
**Sent:** Tuesday, July 28, 2020 4:37 PM
**To:** Hnat, John J - DNR <John.Hnat@wisconsin.gov>
**Subject:** RE: Notice of Contamination

Hi John,
Where in the documentation will I find the plume maps for soil and GW contamination extending into the R/W? (Which document?) We typically attach that information to our Real Estate records for future reference.

Sharlene Te Beest
Hazardous Materials Specialist
WI Dept of Transportation
Bureau of Technical Services, Environmental Services Section

Phone 608-266-1476; Cell 608-381-4789
Street Address:
4822 Madison Yards Way
Room 5 South S513.12
Madison, WI 53705

Mailing Address:
PO Box 7965
Room 5 South S513.12
Madison, WI 53707-7965

---

**From:** Hnat, John J - DNR <John.Hnat@wisconsin.gov>
**Sent:** Wednesday, July 22, 2020 1:01 PM
**To:** DOT Hazmat Unit <DOTHazmatUnit@dot.wi.gov>
**Cc:** Hnat, John J - DNR <John.Hnat@wisconsin.gov>
**Subject:** Notice of Contamination

The purpose of this email is to provide notification that residual soil and groundwater contamination exists under South 108th Street, West Allis, WI right-of-way west of the following properties:

One Hour Martinizing
2262 South 108th Street

West Allis, WI 53227

Please refer to the Wisconsin Department of Natural Resources (DNR) web site (dnr.wi.gov) BRRTS Case #: 02-41-246246 for detailed information regarding the site or contact me at the phone or email address below.

*J. Hnat, C.P.G, P.G.,*

Project Manager/Hydrogeologist
Remediation and Redevelopment Program
Southeast Region Headquarters
Wisconsin Department of Natural Resources
(☎) **phone:** (414) 263-8644, temporary cell: (414) 881-0523
(☎) **fax:** (414) 263-8550
(✉) **e-mail:** John.Hnat@wisconsin.gov

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dnr.wi.gov

**State of Wisconsin**
**DEPARTMENT OF NATURAL RESOURCES**
**2300 N. Dr. Martin Luther King, Jr. Drive**
**Milwaukee WI 53212-3128**

**Tony Evers, Governor**
**Preston D. Cole, Secretary**
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

July 20, 2020

Mr. Brian Cass
c/o OHM Holdings, Inc.
W229 N2494 Highway F
Waukesha, WI 53186

**KEEP THIS DOCUMENT WITH YOUR PROPERTY RECORDS**

Subject: Final Case Closure with Continuing Obligations
One Hour Martinizing, 2262 South 108th Street, Milwaukee, WI
BRRTS: 02-41-246246, FID: 241287530

Dear Mr. Cass:

The Department of Natural Resources (DNR) considers the One Hour Martinizing site closed, with continuing obligations. No further investigation or remediation is required at this time. However, you, future property owners, and occupants of the property must comply with the continuing obligations as explained in the conditions of closure in this letter. Please read over this letter closely to ensure that you comply with all conditions and other on-going requirements. Provide this letter and any attachments listed at the end of this letter to anyone who purchases, rents or leases this property from you. Certain continuing obligations also apply to affected property owners or rights-of-way holders. These are identified within each continuing obligation.

This final closure decision is based on the correspondence and data provided and is issued under chs. NR 726 and 727, Wis. Adm. Code. The DNR reviewed the request for closure on May 2, 2019. The DNR reviewed this environmental remediation case for compliance with state laws and standards to maintain consistency in the closure of these cases. A request for remaining actions needed was issued by the DNR on June 24, 2019, and documentation that the conditions in that letter were met was received on May 21, 2020.

The One Hour Martinizing site was investigated for a discharge of hazardous substances from a dry cleaner located in the area of an underground storage tank next to and in the northwest corner of the onsite building. Case closure is granted for the chlorinated solvent contaminants analyzed during the site investigation, as documented in the case file. The site investigation and/or remedial action addressed the soil, groundwater and vapor intrusion issues. The remedial action and vapor intrusion source control consisted of enhanced biodegradation and natural attenuation of groundwater. Mitigation actions taken for vapor intrusion included installation of a sub-slab depressurization system. The conditions of closure and continuing obligations required were based on the property being used for commercial purposes.

## Continuing Obligations

The continuing obligations for this site are summarized below. Further details on actions required are found in the section Closure Conditions.

- Groundwater contamination is present at or above ch. NR 140, Wis. Adm. Code enforcement standards.

- Residual soil contamination exists that must be properly managed should it be excavated or removed.
- Pavement and building foundation must be maintained over contaminated soil and the DNR must be notified and approve any changes to this barrier.
- A vapor mitigation system must be operated and maintained, and inspections must be documented.
- Remaining contamination could result in vapor intrusion if future construction activities occur. Future construction includes expansion or partial removal of current buildings as well as construction of new buildings. Vapor control technologies will be required for occupied buildings, unless the property owner assesses the potential for vapor intrusion, and the DNR agrees that vapor control technologies are not needed.

The DNR fact sheet "Continuing Obligations for Environmental Protection," RR-819, helps to explain a property owner's responsibility for continuing obligations on their property. The fact sheet may be obtained online at dnr.wi.gov and search "RR-819".

## DNR Database

This site will be included on the Bureau for Remediation and Redevelopment Tracking System (BRRTS) on the Web (BOTW) online at dnr.wi.gov and search "BOTW", to provide public notice of residual contamination and of any continuing obligations. The site can also be viewed on the Remediation and Redevelopment Sites Map (RRSM), a map view, at dnr.wi.gov and search "RRSM".

The DNR's approval prior to well construction or reconstruction is required in accordance with s. NR 812.09 (4) (w), Wis. Adm. Code. This requirement applies to private drinking water wells and high capacity wells. To obtain approval, complete and submit Form 3300-254 to the DNR Drinking and Groundwater program's regional water supply specialist. This form can be obtained on-line at dnr.wi.gov and search "3300-254".

All site information is also on file at the Southeast Regional DNR office, located at 2300 Dr. M. L. King Drive, Milwaukee, Wisconsin. This letter and information that was submitted with your closure request application, including any maintenance plan and maps, can be found as a Portable Document Format (PDF) in BOTW.

## Prohibited Activities

Certain activities are prohibited at closed sites because maintenance of a barrier is intended to prevent contact with any remaining contamination. When a barrier is required, the condition of closure requires notification of the DNR before making a change, in order to determine if further action is needed to maintain the protectiveness of the remedy employed. The following activities are prohibited on any portion of the property where the pavement, a building foundation, or a vapor mitigation system is required, as shown on the **attached map Engineered Cap, Figure D.2, dated 5/19/20**, unless prior written approval has been obtained from the DNR:

- removal of the existing barrier or cover;
- replacement with another barrier or cover;
- excavating or grading of the land surface;
- filling on covered or paved areas;
- plowing for agricultural cultivation;
- construction or placement of a building or other structure;
- changing the use or occupancy of the property to a residential exposure setting, which may include certain uses, such as single or multiple family residences, a school, day care, senior center, hospital, or similar residential exposure settings;
- changing the construction of a building that has a vapor mitigation system in place.

## Closure Conditions

Compliance with the requirements of this letter is a responsibility to which the current property owner of 2262 South 108th Street, Milwaukee, Wisconsin, and any subsequent property owners must adhere. DNR staff will conduct periodic prearranged inspections to ensure that the conditions included in this letter and the attached maintenance plan are met. If these requirements are not followed, the DNR may take enforcement action under s. 292.11, Wis. Stats. to ensure compliance with the specified requirements, limitations or other conditions related to the property.

Please send written notifications in accordance with the following requirements to:

Department of Natural Resources
Attn: Remediation and Redevelopment Program Environmental Program Associate
2300 Dr. M. L. King Drive
Milwaukee, WI 53212

Residual Groundwater Contamination (ch. NR 140, 812, Wis. Adm. Code)

Groundwater contamination greater than enforcement standards is present both on this contaminated property and off this contaminated property, as shown on the **attached map Groundwater Isoconcentration Map, Figure B.3.b, dated 4/11/19**. If you intend to construct a new well, or reconstruct an existing well, you'll need prior DNR approval. Affected property owners and right-of-way holders were notified of the presence of groundwater contamination. This continuing obligation also applies to the owners of 2230 South 108th Street, Milwaukee, Wisconsin, 2248 South 108th Street, Milwaukee, Wisconsin, and the WisDOT 108th Street ROW owners.

Residual Soil Contamination (ch. NR 718, chs. 500 to 536, Wis. Adm. Code or ch. 289, Wis. Stats.)

Soil contamination remains at the locations as indicated on the **attached map Residual Soil Contamination Map, Figure B.2.b, dated 5/19/20**. If soil in the specific locations described above is excavated in the future, the property owner or right-of-way holder at the time of excavation must sample and analyze the excavated soil to determine if contamination remains. If sampling confirms that contamination is present, the property owner or right-of-way holder at the time of excavation will need to determine whether the material is considered solid or hazardous waste and ensure that any storage, treatment or disposal is in compliance with applicable standards and rules. Contaminated soil may be managed in accordance with ch. NR 718, Wis. Adm. Code, with prior DNR approval. This continuing obligation also applies to the owner of 2230 South 108th Street, Milwaukee, Wisconsin, 2248 South 108th Street, Milwaukee, Wisconsin, the City of West Allis Right-of-Way, and WisDOT 108th Street Right-of-Way.

In addition, all current and future owners and occupants of the property and right-of-way holders need to be aware that excavation of the contaminated soil may pose an inhalation or other direct contact hazard and as a result special precautions may need to be taken to prevent a direct contact health threat to humans.

Cover or Barrier (s. 292.12 (2) (a), Wis. Stats., s. NR 726.15, s. NR 727.07 Wis. Adm. Code)

The pavement and building foundation that exists in the location shown on the **attached map Engineered Cap, Figure D.2, dated 5/19/20,** shall be maintained in compliance with the **attached maintenance plan** in order to minimize the infiltration of water and prevent additional groundwater contamination that would violate the groundwater quality standards in ch. NR140, Wis. Adm. Code.

The cover approved for this closure was designed to be protective for a commercial or industrial use setting. Before using the property for residential purposes, you must notify the DNR at least 45 days before taking an action, to determine if additional response actions are warranted.

A request may be made to modify or replace a cover or barrier. Before removing or replacing the cover, you must notify the DNR at least 45 days before taking an action. The replacement or modified cover or barrier must be protective of the revised use of the property and must be approved in writing by the DNR prior to implementation.

A cover or barrier for industrial land uses, or certain types of commercial land uses may not be protective if the use of the property were to change such that a residential exposure would apply. This may include, but is not limited to, single or multiple family residences, a school, day care, senior center, hospital or similar settings. In addition, a cover or barrier for multi-family residential housing use may not be appropriate for use at a single-family residence.

The **attached maintenance plan and inspection log (DNR form 4400-305)** are to be kept up-to-date and onsite. Inspections shall be conducted annually, in accordance with the attached maintenance plan. Submit the inspection log to the DNR only on request.

Vapor Mitigation or Evaluation (s. 292.12 (2), Wis. Stats., s. NR 726.15, s. NR 727.07, Wis. Adm. Code)

Vapor intrusion is the movement of vapors coming from volatile chemicals in the soil or groundwater, into buildings where people may breathe air contaminated by the vapors. Vapor mitigation systems are used to interrupt the pathway, thereby reducing or preventing vapors from moving into the building.

Vapor Mitigation System: Soil vapor beneath the building contains chlorinated VOCs at levels that would pose a long-term risk to human health, if allowed to migrate into an occupied building on the property. The vapor mitigation system, installed in September 2015, must be operated, maintained and inspected in accordance with the **attached** maintenance plan. System components must be repaired or replaced immediately upon discovery of a malfunction. Annual inspections and any system repairs must be documented in the inspection log (DNR form 4400-305). The inspection log shall be kept up-to-date and on-site. Inspections shall be conducted annually, in accordance with the attached maintenance plan. Submit the inspection log to the DNR only upon request.

If a decision is made to no longer use the vapor mitigation system, or to make a change to the vapor mitigation system, the property owner must notify the DNR at least 45 days before shutting the mitigation system off, or before making any other change to the system, and evaluate whether conditions are protective of public health and safety. Additional response actions may be necessary. This continuing obligation also applies to the owner of 2248 South 108th Street, Milwaukee, Wisconsin.

The integrity of the building floor that exists on the property, shown on the **attached map Engineered Cap, Figure D.2, dated 5/19/20**, must be maintained in compliance with the **attached maintenance plan**. This will help ensure proper functioning of the vapor mitigation system, limiting vapor intrusion to indoor air spaces.

Future Concern: Chlorinated VOCs remain in soil and groundwater at the locations shown on **attached maps Residual Soil Contamination Map, Figure B.2.b, dated 5/19/20, and Groundwater Isoconcentration Map, Figure B.3.b, dated 4/11/19**, at levels that may be of concern for vapor intrusion in the future, depending on construction and occupancy of a building. The building is currently used as a commercial drop-off and pick-up point for dry cleaning clothes. Therefore, before a building is constructed and/or an existing building is modified, the property owner must notify the DNR at least 45 days before the change. Vapor control technologies are required for construction of occupied buildings unless the property owner assesses the vapor pathway and the DNR agrees that vapor control technologies are not needed. This continuing obligation also applies to the owner at the 2248 South 108th Street, Milwaukee, Wisconsin.

## In Closing

Please be aware that the case may be reopened pursuant to s. NR 727.13, Wis. Adm. Code, for any of the following situations:

- if additional information regarding site conditions indicates that contamination on or from the site poses a threat to public health, safety, or welfare or to the environment,
- if the property owner does not comply with the conditions of closure, with any deed restrictions applied to the property, or with a certificate of completion issued under s. 292.15, Wis. Stats., or
- a property owner fails to maintain or comply with a continuing obligation (imposed under this closure approval letter).

The DNR appreciates your efforts to restore the environment at this site. If you have any questions regarding this closure decision or anything outlined in this letter, please contact John J. Hnat at 414-263-8644, or at his email: John.Hnat@wisconsin.gov.

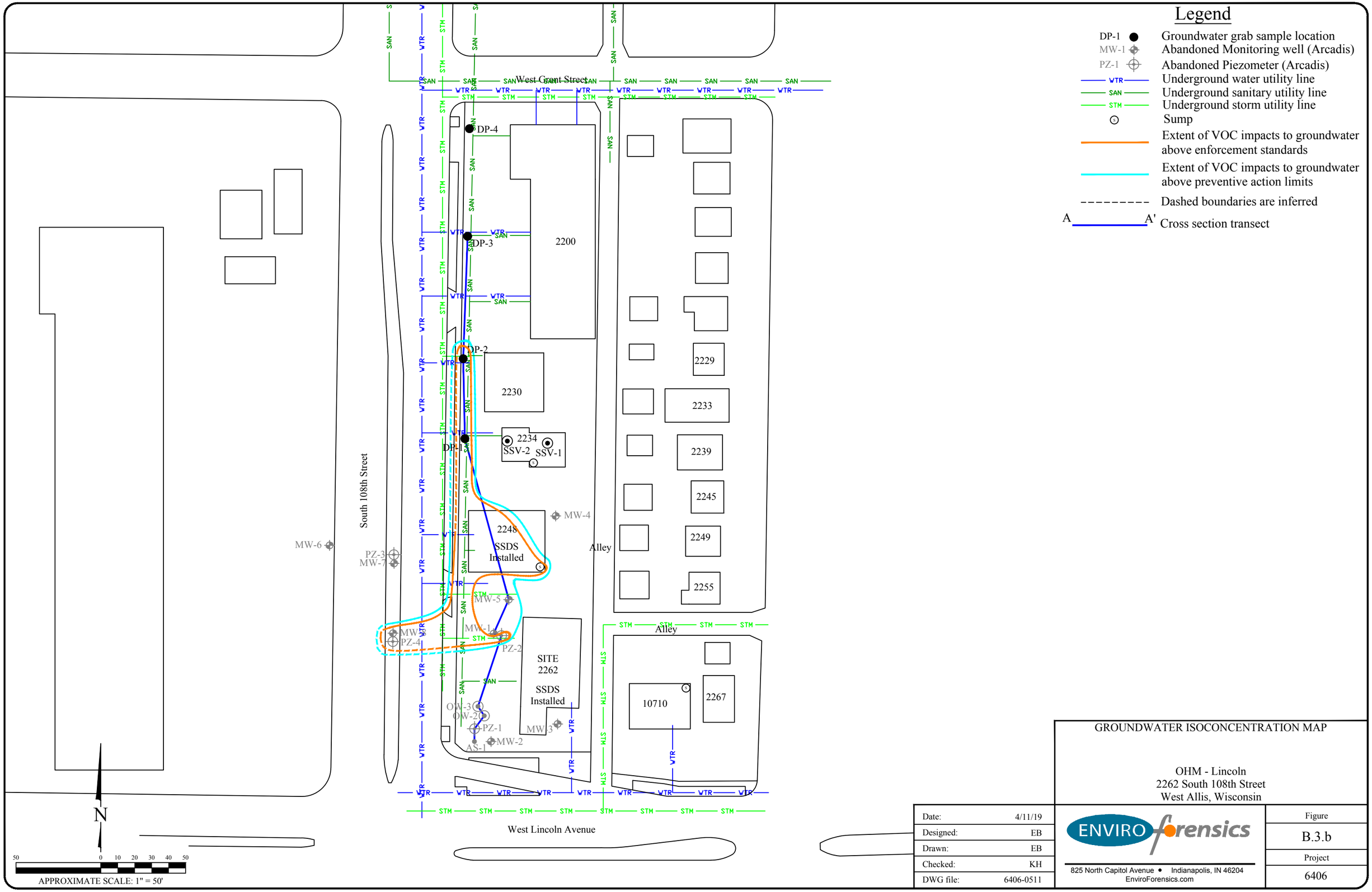
Sincerely,

Pamela A. Mylotta
Southeast Region Team Supervisor
Remediation & Redevelopment Program

Attachments:

- Engineered Cap Area, Figure D.2, OHM – Lincoln, 2262 South 108th Street, West Allis, Wisconsin, Enviroforensics, dated 5/19/20
- Groundwater Isoconcentration Map, Figure B.3.b, OHM – Lincoln, 2262 South 108th Street, West Allis, Wisconsin, Enviroforensics, dated 4/11/19
- Residual Soil Contamination, Figure B.2.b, OHM – Lincoln, 2262 South 108th Street, West Allis, Wisconsin, Enviroforensics, dated 5/19/20
- Cap Maintenance Plan, 2262 South 108th Street, West Allis, Wisconsin, February 25, 2020
- Continuing Obligations Inspection and Maintenance Log, DNR Form 4400-305
- Vapor Mitigation System Operation, Maintenance & Monitoring Plan, Success, Inc, One Hour Martinizing, 2262 South 108th Street, West Allis, Wisconsin, July 29, 2019
- Sub Slab Depressurization System Operations Maintenance & Monitoring Plan, 2248 South 108th Street, West Allis, Wisconsin, February 25, 2020

cc: Brian Kappen – email, bkappen@enviroforensics.com
Thomas Wilkoski – 12294 West Black Oak Drive, Greenfield, WI – email, twilkoski@sbcglobal.net
Mike Cunningham – 483 South Washington Street, Elmhurst, IL – email, cunningham.mike@gmail.com
City of West Allis, Dave Wepking – 6300 West McGeoch Avenue, West Allis, WI – email, dwepking@westalliswi.gov
WisDOT-BTS-ESS, Sharlee Te Beest, PO Box 7965 5 South S513.12, Madison, WI -email: sharlene.tebeest@dot.wi.gov




## Legend

- DP-1 — Groundwater grab sample location
- MW-1 — Abandoned Monitoring well (Arcadis)
- PZ-1 — Abandoned Piezometer (Arcadis)
- WTR — Underground water utility line
- SAN — Underground sanitary utility line
- STM — Underground storm utility line
- Sump
- Extent of VOC impacts to groundwater above enforcement standards
- Extent of VOC impacts to groundwater above preventive action limits
- Dashed boundaries are inferred
- A — A' Cross section transect

# GROUNDWATER ISOCONCENTRATION MAP

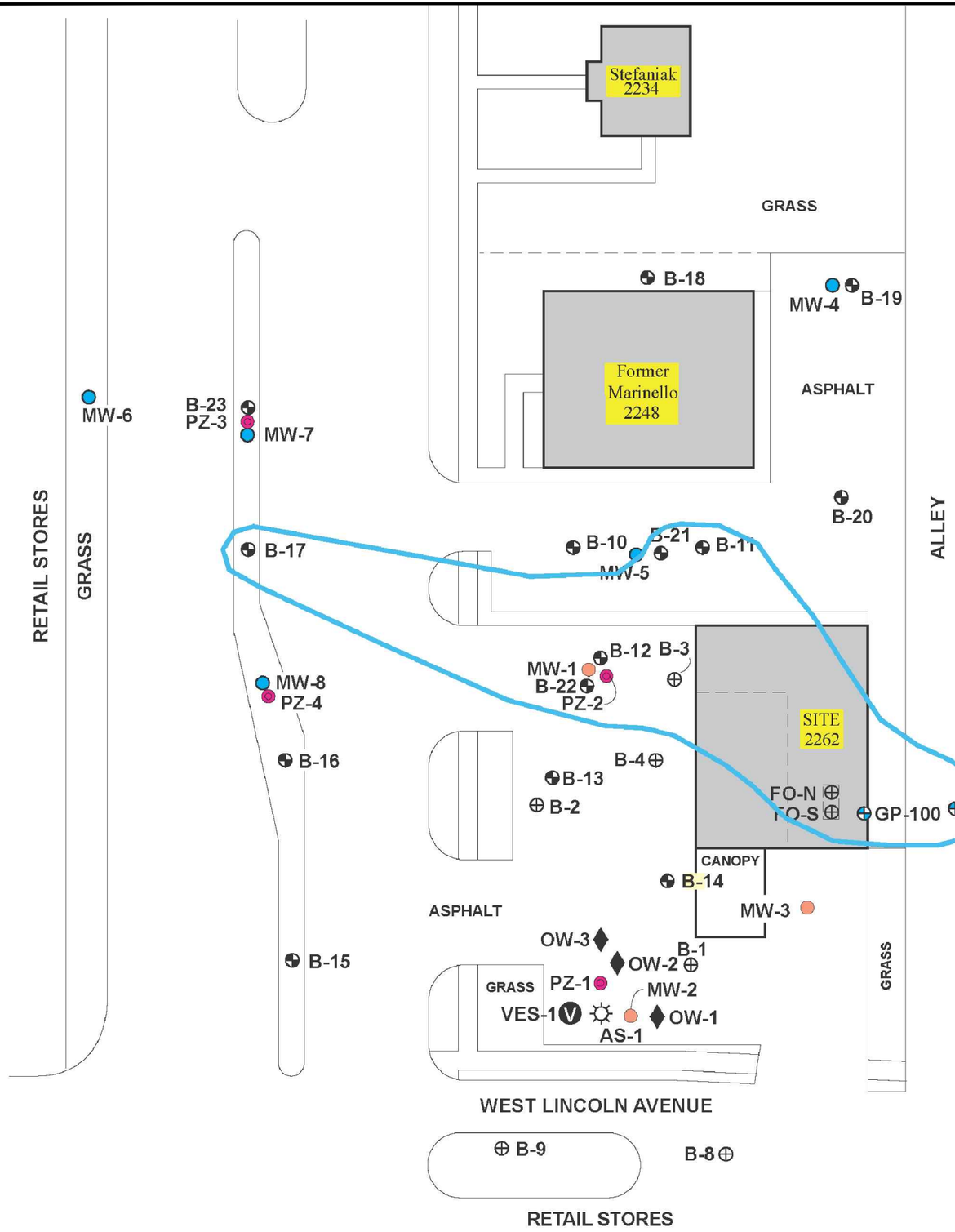
OHM - Lincoln
2262 South 108th Street
West Allis, Wisconsin

| | |
|---|---|
| Date: | 4/11/19 |
| Designed: | EB |
| Drawn: | EB |
| Checked: | KH |
| DWG file: | 6406-0511 |

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure
B.3.b

Project
6406




BASE MAP PREPARED BY ARCADIS US, INC.

N

0 20 40 80

APPROXIMATE SCALE IN FEET

## LEGEND

- MONITORING WELL LOCATION (MW-1 to MW-3)
  (Installed by Giles Engineering Associates 4/94)
- SOIL BORING LOCATION (B-1 TO B-9)
  (Drilled by Giles Engineering Associates 4/94)
- GEOPROBE LOCATION (B-10 TO B-22)
  (Drilled by Geraghty & Miller, Inc. 1995-1996)
- MONITORING WELL LOCATION (MW-4 to MW-8)
  (Installed by Geraghty & Miller, Inc. 1995-1996)
- PIEZOMETER LOCATION (PZ-1 to PZ-4)
  (Installed by Geraghty & Miller, Inc. 1995-1996)
- VAPOR EXTRACTION WELL LOCATION (VES-1)
  (Installed by Geraghty & Miller, Inc. 1996)
- VAPOR MONITORING PROBE LOCATION (OW-1 to OW-3)
  (Installed by Geraghty & Miller, Inc. 1996)
- AIR SPARGING WELL LOCATION (AS-1)
  (Installed by Geraghty & Miller, Inc. 1996)
- GEOPROBE LOCATION (GP-100 to GP-101)
  (Installed by ARCADIS 2012)
- EXTENT OF CVOCs IN SOIL EXCEEDING THE GROUNDWATER PROTECTION RCL

THERE ARE NO DIRECT-CONTACT RCL EXCEEDENCES OF CVOCs FROM 0-4 FEET

CVOCs = Chlorinated Volatile Organic Compounds

# RESIDUAL SOIL CONTAMINATION

OHM - Lincoln
2262 South 108th Street
West Allis, Wisconsin

| | |
|---|---|
| Date: | 5/19/20 |
| Designed: | EB |
| Drawn: | EB |
| Checked: | BK |
| DWG file: | 6406-0890 |

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EnviroForensics.com

Figure
B.2.b

Project
6406

# CAP MAINTENANCE PLAN

February 25, 2020

Property located at:

**2262 South 108th Street**
**West Allis, Wisconsin 53227**
**BRRTS# 02-41-246246**

**LEGAL DESCRIPTION: LOTS FIFTEEN (15), SIXTEEN (16), AND SEVENTEEN (17) IN BLOCK THREE (3) IN LINCOLN MANOR, A SUBDIVISION OF THE SOUTHWEST ONE-QUARTER (1/4) OF SECTION FIVE (5) IN TOWNSHIP SIX (6) NORTH, RANGE TWENTY-ONE (21) EAST, IN THE CITY OF WEST ALLIS, MILWAUKEE COUNTY, WISCONSIN**

**TAX ID#: 4800273000**

## INTRODUCTION

This document is the Maintenance Plan for the asphalt/concrete surface material (the "Cap") covering soil and groundwater contaminated with chlorinated volatile organic compounds (CVOCs) at 2262 South 108th Street in West Allis, Wisconsin in accordance with the requirements of s. NR 724.13(2), Wis. Adm. Code. The contamination originated from the former dry cleaning operations performed at the property. The maintenance activities relate to the existing asphalt/concrete parking lot and building foundation which occupies the area over the residual soil and groundwater contamination.

More site-specific information about source property/site may be obtained from:

- The case file in the Wisconsin Department of Natural Resources (WDNR) Regional office;
- BRRTS on the Web (WDNR's internet based data base of contaminated sites)for the link to a PDF for site-specific information at the time of closure and on continuing obligations;
- RR Sites Map/GIS Registry layer for a map view of the site, and
- The WDNR project manager.

## DESCRIPTION OF CONTAMINATION

Soil contaminated by the chlorinated volatile organic compound (CVOC) tetrachloroethene (PCE) and various petroleum-related compounds including ethylbenzene, naphthalene, toluene, and xylene is located at a depth of approximately 2 to 8 feet below ground surface (bgs) in the area under the existing building and the northern two-thirds of the asphalt parking lot. The extent of residual CVOC contamination in soil is shown on the attached **Figure D.1**. The concentrations of soil impacts are below the non-industrial direct contact residual contaminant levels (RCLs) within four feet of the ground surface, but are above the soil to groundwater RCLs.

## DESCRIPTION OF CAP

The cap consists of the concrete building foundation and the asphalt parking area on the west and south sides of the building. This comprises the entire surface area of the property with the exception of the unpaved landscaped areas. The location and extent of the cap is depicted on **Figure D.2**. The concrete/asphalt cap is anticipated to be 4 to 6 inches thick across the area.

The existing cap is intended to be a barrier to infiltration of precipitation, which will minimize soil-to-groundwater contaminant migration. In addition, proper maintenance of the concrete floor inside the building is required for the sub-slab depressurization system (SSDS) to operate as designed. If a crack in the floor permits short-circuiting of indoor air to the sub-slab space, the SSDS may not protect against vapor intrusion.

## ANNUAL INSPECTION

The asphalt/concrete parking lot cap will be visually inspected once per year for deterioration, cracks and other potential problems that would allow a direct conduit for infiltration of precipitation. This is typically performed in the early spring after all snow and ice has melted and before the seasonal rains begin. The entire perimeter of the building foundation, and the entire asphalt surface shall be inspected. The inspections will be performed by the property owner or their designated representative (i.e. tenant, property manager, etc.). The inspections will be performed to evaluate damage due to settling, exposure to the weather, wear from traffic, increasing age, and other factors. Any area where large cracks or other openings have occurred or are likely to occur will be documented.

A log of the inspections and any repairs will be maintained by the property owner on WDNR Form 4400-305 (Continuing Obligations Inspection and Maintenance Log), included as **Attachment A**. The log will include recommendations for necessary repair of any areas where underlying soils are exposed. Once repairs are completed, they will be documented in the

Inspection Log. A copy of this Cap Maintenance Plan and the Inspection Log will be kept at the property and available for submittal or review by WDNR representatives upon their request.

## MAINTENANCE ACTIVITIES

If problems are noted during the annual inspections or at any other time during the year, repairs will be scheduled as soon as practical. Repairs can include patching, filling, asphalt resurfacing, or construction operations. In the event that maintenance activities involve soil removal and disposal is necessary, the property owner must sample any soil excavated from the site prior to disposal to ascertain if contamination is present. The soil must be stored, disposed, or treated by the owner in accordance with applicable local, state and federal law.

In the event the cap overlying the contaminated soil is removed or replaced, the replacement barrier must be equally impermeable. Any replacement barrier will be subject to the same maintenance and inspection guidelines as outlined in this Cap Maintenance Plan unless indicated otherwise by the WDNR or its successor. The property owner, in order to maintain the integrity of the asphalt/concrete parking lot and building foundation cap, will maintain a copy of this Maintenance Plan on-site and make it available to all interested parties (i.e. on-site employees, contractors, future property owners, etc.) for viewing.

## PROHIBITION OF ACTIVITIES AND NOTIFICATION

The following activities are prohibited on any portion of the property where an asphalt/concrete parking lot and building foundation cap is required as depicted on the attached **Figure D.2**, unless prior written approval has been obtained from the WDNR: 1) removal of the existing barrier; 2) replacement with another barrier; 3) excavating or grading of the land surface; 4) filling on capped or paved areas; 5) plowing for agricultural cultivation; or 6) construction or placement of a building or other structure.

If removal, replacement or other changes to the asphalt/concrete parking lot and building foundation cap are considered, the property owner will contact WDNR at least 45 days before taking such an action, to determine whether further action may be necessary to protect human health, safety, or welfare or the environment, in accordance with s. NR 727.07, Wis. Adm. Code.

## AMENDMENT OR WITHDRAWAL OF MAINTENANCE PLAN

This Maintenance Plan can be amended or withdrawn by the property owner and its successors with the written approval of the WDNR.

## CONTACT INFORMATION

Property Owner: OHM Holdings, Inc.
W229 N2494 County Rd F
Waukesha, WI 53186

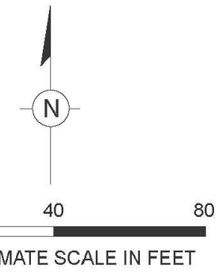
Signature: _____

Consultant: EnviroForensics, LLC.
Wayne Fassbender, PG, PMP
N16 W23390 Stone Ridge Dr., Suite G
Waukesha, WI 53188
(262) 290-4001

WDNR Project Manager: John Hnat
Wisconsin Dept. of Natural Resources
2300 Dr. Martin Luther King Jr. Dr.
Milwaukee, WI 53212
(414) 263-8644

# FIGURES


BASE MAP PREPARED BY ARCADIS US, INC




## LEGEND

- MONITORING WELL LOCATION (MW-1 to MW-3)
  (Installed by Giles Engineering Associates 4/94)
- SOIL BORING LOCATION (B-1 TO B-9)
  (Drilled by Giles Engineering Associates 4/94)
- GEOPROBE LOCATION (B-10 TO B-22)
  (Drilled by Geraghty & Miller, Inc. 1995-1996)
- MONITORING WELL LOCATION (MW-4 to MW-8)
  (Installed by Geraghty & Miller, Inc. 1995-1996)
- PIEZOMETER LOCATION (PZ-1 to PZ-4)
  (Installed by Geraghty & Miller, Inc. 1995-1996)
- VAPOR EXTRACTION WELL LOCATION (VES-1)
  (Installed by Geraghty & Miller, Inc. 1996)
- VAPOR MONITORING PROBE LOCATION (OW-1 to OW-3)
  (Installed by Geraghty & Miller, Inc. 1996)
- AIR SPARGING WELL LOCATION (AS-1)
  (Installed by Geraghty & Miller, Inc. 1996)
- GEOPROBE LOCATION (GP-100 to GP-101)
  (Installed by ARCADIS 2012)
- EXTENT OF CVOCs IN SOIL EXCEEDING THE GROUNDWATER PROTECTION RCL

THERE ARE NO DIRECT-CONTACT RCL EXCEEDENCES OF CVOCs FROM 0-4 FEET

CVOCs = Chlorinated Volatile Organic Compounds

# EXTENT OF RESIDUAL SOIL CONTAMINATION

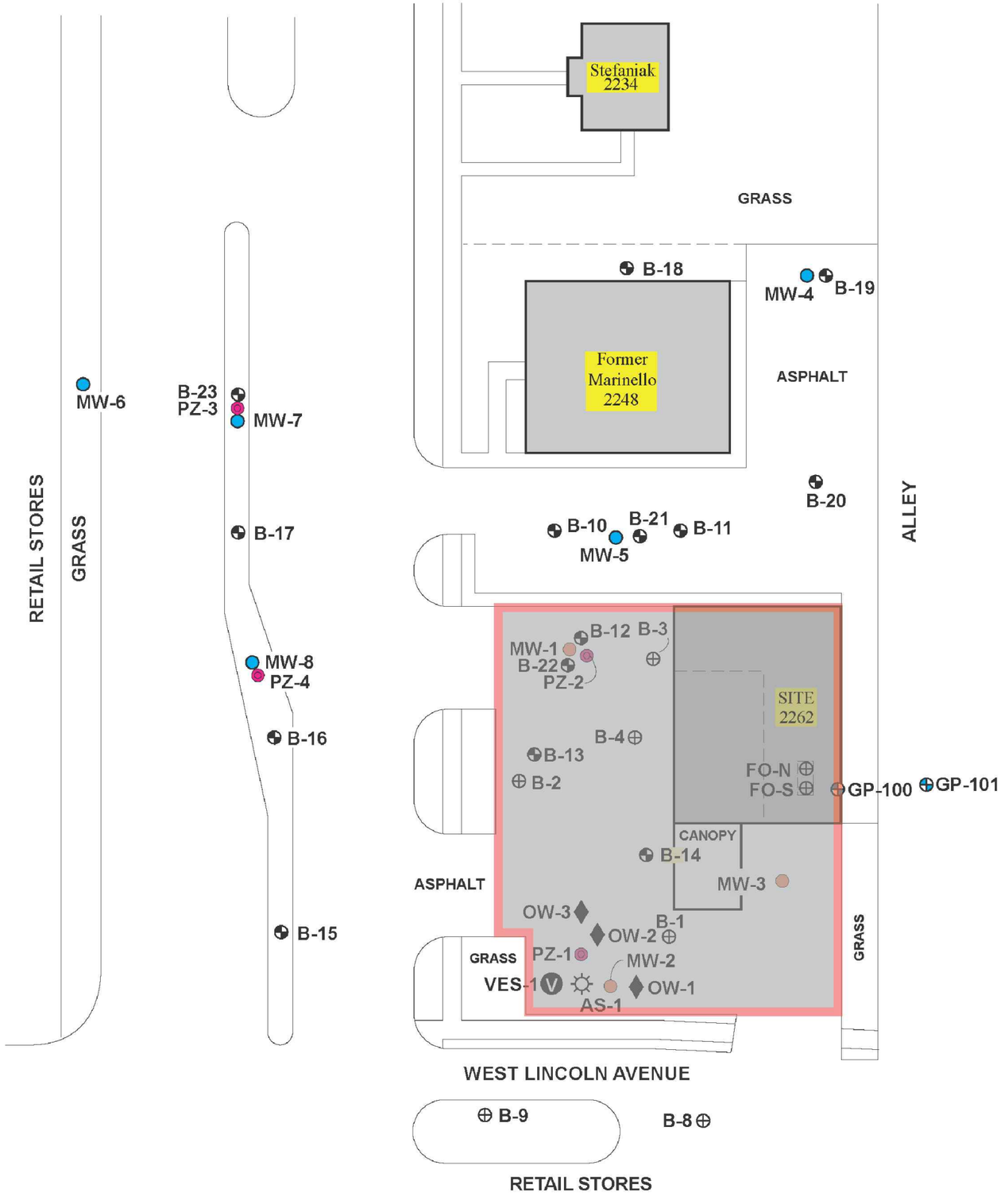
OHM - Lincoln
2262 South 108th Street
West Allis, Wisconsin

| | |
|---|---|
| Date: | 5/19/20 |
| Designed: | EB |
| Drawn: | EB |
| Checked: | BK |
| DWG file: | 6406-0890 |

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure
D.1

Project
6406




BASE MAP PREPARED BY ARCADIS US, INC

N

0 20 40 80

APPROXIMATE SCALE IN FEET

## LEGEND

- MONITORING WELL LOCATION (MW-1 to MW-3)
  (Installed by Giles Engineering Associates 4/94)
- SOIL BORING LOCATION (B-1 TO B-9)
  (Drilled by Giles Engineering Associates 4/94)
- GEOPROBE LOCATION (B-10 TO B-22)
  (Drilled by Geraghty & Miller, Inc. 1995-1996)
- MONITORING WELL LOCATION (MW-4 to MW-8)
  (Installed by Geraghty & Miller, Inc. 1995-1996)
- PIEZOMETER LOCATION (PZ-1 to PZ-4)
  (Installed by Geraghty & Miller, Inc. 1995-1996)
- VAPOR EXTRACTION WELL LOCATION (VES-1)
  (Installed by Geraghty & Miller, Inc. 1996)
- VAPOR MONITORING PROBE LOCATION (OW-1 to OW-3)
  (Installed by Geraghty & Miller, Inc. 1996)
- AIR SPARGING WELL LOCATION (AS-1)
  (Installed by Geraghty & Miller, Inc. 1996)
- GEOPROBE LOCATION (GP-100 to GP-101)
  (Installed by ARCADIS 2012)

EXTENT OF THE ENGINEERED CAP TO BE MAINTAINED

ENGINEERED CAP AREA

OHM - Lincoln
2262 South 108th Street
West Allis, Wisconsin

| | |
|---|---|
| Date: | 5/19/20 |
| Designed: | EB |
| Drawn: | EB |
| Checked: | BK |
| DWG file: | 6406-0890 |

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure
D.2

Project
6406

# PHOTOGRAPHS

## October 26, 2018

Overview of asphalt/concrete cap – facing south

Asphalt condition in northern part of site – facing south

Asphalt condition in southern part of site – facing southeast


Overview of cap in drive-through area – facing east

# APPENDIX A

## Continuing Obligations Inspection and Maintenance Log

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

# Continuing Obligations Inspection and Maintenance Log

Form 4400-305 (2/14)



**Directions:** In accordance with s. NR 727.05 (1) (b) 3., Wis. Adm. Code, use of this form for documenting the inspections and maintenance of certain continuing obligations is required. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.]. When using this form, identify the condition that is being inspected. See the closure approval letter for this site for requirements regarding the submittal of this form to the Department of Natural Resources. A copy of this inspection log is required to be maintained either on the property, or at a location specified in the closure approval letter. Do NOT delete previous inspection results. This form was developed to provide a continuous history of site inspection results. The Department of Natural Resources project manager is identified in the closure letter. The project manager may also be identified from the database, BRRTS on the Web, at http://dnr.wi.gov/botw/SetUpBasicSearchForm.do, by searching for the site using the BRRTS ID number, and then looking in the "Who" section.

| Activity (Site) Name | BRRTS No. |
|---|---|
| One Hour Martinizing | 02-41-246246 |

Inspections are required to be conducted (see closure approval letter):

- (●) annually
- ( ) semi-annually
- ( ) other – specify _____

When submittal of this form is required, submit the form electronically to the DNR project manager. An electronic version of this filled out form, or a scanned version may be sent to the following email address (see closure approval letter):

| Inspection Date | Inspector Name | Item | Describe the condition of the item that is being inspected | Recommendations for repair or maintenance | Previous recommendations implemented? | Photographs taken and attached? |
|---|---|---|---|---|---|---|
| | | ☐ monitoring well<br>☒ cover/barrier<br>☐ vapor mitigation system<br>☐ other: | | | ○ Y ○ N | ○ Y ○ N |
| | | ☐ monitoring well<br>☐ cover/barrier<br>☒ vapor mitigation system<br>☐ other: | | | ○ Y ○ N | ○ Y ○ N |
| | | ☐ monitoring well<br>☐ cover/barrier<br>☐ vapor mitigation system<br>☐ other: | | | ○ Y ○ N | ○ Y ○ N |
| | | ☐ monitoring well<br>☐ cover/barrier<br>☐ vapor mitigation system<br>☐ other: | | | ○ Y ○ N | ○ Y ○ N |
| | | ☐ monitoring well<br>☐ cover/barrier<br>☐ vapor mitigation system<br>☐ other: | | | ○ Y ○ N | ○ Y ○ N |
| | | ☐ monitoring well<br>☐ cover/barrier<br>☐ vapor mitigation system<br>☐ other: | | | ○ Y ○ N | ○ Y ○ N |

# Continuing Obligations Inspection and Maintenance Log



{Click to Add/Edit Image}

Date added:

Title:

{Click to Add/Edit Image}

Date added:

Title:

# VAPOR MITIGATION SYSTEM
# OPERATION, MAINTENANCE & MONITORING PLAN

**Success, Inc. One Hour Martinizing**
**2262 South 108th Street**
**West Allis, Wisconsin**
**BRRTS# 02-54-246246**

July 29, 2019

*Prepared For:*

OHM Holdings, LLC
W229N2494 Hwy F
Waukesha, WI 53186

*Prepared By:*

EnviroForensics, LLC
N16 W23390 Stone Ridge Drive, Suite G
Waukesha, WI 53188
Phone: (262) 290-4001
www.enviroforensics.com

*Document: 6406-0212*

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### FIGURES



### ATTACHMENTS

## 1.0 BACKGROUND

A sub-slab depressurization system (SSDS) was installed at 2262 South 108th Street in West Allis, Wisconsin (Site) to mitigate vapor intrusion risk associated with a tetrachloroethene (PCE) release at the Site. EnviroForensics, LLC (EnviroForensics) has prepared this Operation, Maintenance, and Monitoring Plan (OM&M Plan) as a reference for current and future owners of the Site. At the time of installation, the property was occupied by a One Hour Martinizing drop-off store and owned by OHM Properties 4 LLC.

The SSDS is designed to depressurize the sub-slab space and prevent vapors from migrating into the building and affecting indoor air quality. The Wisconsin Department of Natural Resources (WDNR) requires that vapor mitigation systems be monitored and maintained to ensure ongoing effectiveness. Proper operation of the SSDS is necessary to prevent exposure to the chemicals of concern via vapor intrusion.

### 1.1 Site History

The Site building consists of single story construction with slab on grade (no basement). The Site was occupied by a Texaco gasoline service station over the period from 1952 to 1968. In 1969, the service station was converted to a dry cleaner; however, several underground storage tanks (USTs) were left in-place. The building was remodeled in 1993, and expanded to include a drive-through window and canopy on the south side of the building. The USTs were discovered during the remodeling activities. Two areas of impacted soils and groundwater were identified at the Site during the subsequent investigation. One area was located at the southern portion of the site, in the vicinity of the former USTs. The constituents of concern at this location were petroleum volatile organic compounds (PVOCs) such as benzene, toluene, ethylbenzene, and xylenes. The second area of concern was located at the northern portion of the site, in the vicinity of a former waste oil UST. The constituents of concern at this location were chlorinated volatile organic compounds (CVOCs), particularly tetrachloroethene, trichloroethene, and cis-1,2-dichloroethene.

Remedation in exterior areas was completed; however, sub-slab vapor sampling indicated a vapor intrusion risk associated with residual CVOC contamination beneath the building. Sub-slab depressurization was selected as the best option for mitigating the vapor intrusion risk.

## 2.0 SYSTEM DESIGN AND CONSTRUCTION

EnviroForensics contracted Vapor Protection Services (VPS) of Indianapolis, Indiana to design and install the SSDS. VPS is a subcontractor certified by the National Environmental Health Association/National Radon Proficiency Program for radon mitigation and by the Center for Environmental Research and Technology for radon mitigation technology. VPS was subsequently acquired by EnviroForensics.

Pressure field extension testing was conducted during installation of the SSDS in order to determine the number and position of extraction points needed to depressurize the entire sub-slab space. A total of four (4) sub-slab pressure test ports were drilled within the building at the locations depicted on **Figure 1**. During testing, vacuum was applied at a selected extraction point while a manometer was used to measure sub-slab pressure at the test ports. The pressure test results are illustrated on a figure in the attached VPS installation report in **Attachment 1**.

The SSDS was designed based on the pressure field extension test results. The system consists of one (1) fan mounted to the east side of the building and three (3) extraction points designated EP-1, -2, and -3. The extraction points and conveyance piping are constructed of 4-inch diameter, schedule 40 polyvinyl chloride (PVC). The extraction points were installed by cutting away a section of the concrete floor slab at each location, and then removing a portion of the sub-slab materials to create a sump (hole in the soil below the slab) for inserting the extraction points. The extraction points are connected by to a RadonAway Model GP501 fan to create negative pressure below the floor slab and induce flow of vapor to the extraction points. A short stack above the fan discharges vapor above the roofline. A figure depicting the layout of the SSDS, including piping runs, extraction points, and fan location, is provided on **Figure 1**.

## 3.0 SYSTEM OPERATION, MAINTENANCE, AND MONITORING

The Wisconsin Department of Natural Resources (WDNR) has issued guidelines for long-term OM&M of vapor mitigation systems in Appendices D and E of Publication RR-800: *Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin.* The guidelines have been adopted and incorporated into this OM&M Plan.

OHM Holdings LLC will be responsible for operation, maintenance, and monitoring (OM&M) of the SSDS until the Site is sold to a new owner, or until the WDNR grants approval for system decommissioning. Any new owner of the Site assumes the responsibility for OM&M of the system.

## 3.1 System Operation

The one (1) RadonAway GP501 fan is hardwired to a dedicated circuit breaker in the electrical panel and an on/off switch is located next to the fan on the exterior of the building. Operation of the SSDS can be confirmed by inspecting the fan (i.e., checking for noise and vibration) or confirming vacuum in the u-tube manometers. The system is designed and intended to operate continuously. Fans specifications and warranty information are included in **Attachment 1**.

## 3.2 System Monitoring

The long-term monitoring procedures are described in the system inspection and maintenance log provided in **Attachment 2**. The recommended monitoring includes an annual inspection of the system fans and discharge points, piping and connections, and floor slab/suction point seals, as well as observing the negative pressure indicated by the u-tube manometers mounted on the piping above each suction point. These activities are required to be conducted annually during the heating season. A summary of acceptable observations is provided in the table below.

| Parameter | Location | Equipment | Acceptable Result |
|---|---|---|---|
| Pressure | Suction Points EP-1, EP-2, and EP-3 | U-tube manometers | 0.3 to 3 in $H_2O$ |
| System condition | Multiple | Visual inspection | No cracks, gaps, leaks in piping or floor slab |

Note: in $H_2O$ = inches of water

The inspection and maintenance log shall be completed by the person or group responsible for OM&M of the SSDS. The logs shall be kept on file by the environmental consultant and/or the property owner and made available to WDNR upon request.

## 3.3 System Maintenance

The SSDS fan is factory sealed and requires no maintenance. In the event that the fan stops operating due to mechanical failure, the fan shall be replaced with an identical model or a fan with the same performance specifications. Replacement of fans should be handled by a mitigation contractor and/or an electrician. Maintenance and repair activities on other components, including piping and floor seals, can be performed by the environmental consultant or building maintenance personnel.

## 3.4 Notifications

The WDNR shall be notified at least 45 days before any actions are taken which would terminate or interrupt operation of the SSDS for more than one week.

## 4.0 CONTINUING OBLIGATIONS AND DECOMMISSIONING

If the SSDS is necessary to mitigate vapor movement into the building at the time of case closure, there will be a continuing obligation for any owner of the Site to operate and maintain the SSDS post-closure. Post-closure OM&M reporting shall be done using the Continuing Obligations Inspection and Maintenance Log (WDNR Form 4400-305) and **Attachment 2**.

The SSDS will be operated until it is no longer needed to prevent vapor intrusion. The WDNR has issued guidelines for SSDS decommissioning in Appendix F of Publication RR-800. A Decommissioning Plan will be prepared, if appropriate. In general, decommissioning will be performed according to the following procedure:

- Provide WDNR a 45-day notice of intent to begin the decommissioning process.
- Re-assess the vapor intrusion pathway in the building:
    - Turn the fan off and wait 2 to 4 weeks;
    - Collect three (3) rounds of sub-slab vapor samples within one (1) year, with two (2) sampling events during the heating season; and
    - Re-start the fan if a vapor risk screening level is exceeded.
- Submit the sampling data to WDNR with a request for approval to permanently leave the fan off and/or remove the system components from the building.

If the sub-slab vapor sampling data demonstrates that the vapor intrusion risk no longer exists, the owner can submit a Post-Closure Modification to WDNR (with fee) to remove the continuing obligation.

## 5.0 CONTACTS

Property Owner: OHM Holdings, Inc.
W229 N2494 County Rd F
Waukesha, WI 53186

Name: Brian Cass

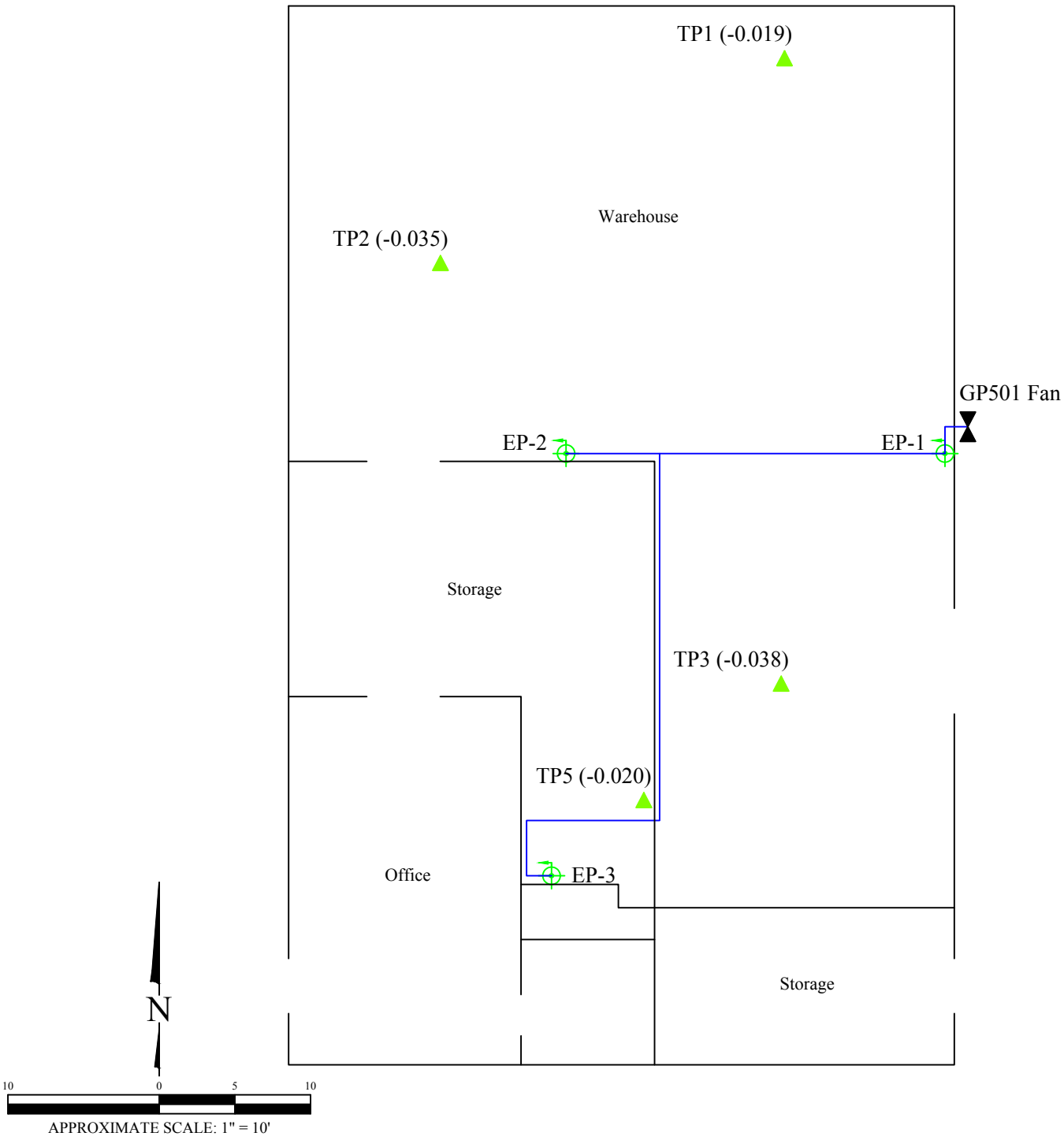
Signature:

Consultant: EnviroForensics, LLC.
Wayne Fassbender, PG, PMP
N16 W23390 Stone Ridge Dr., Suite G
Waukesha, WI 53188
(262) 290-4001

WDNR Project Manager: John Hnat
Wisconsin Dept. of Natural Resources
2300 Dr. Martin Luther King Jr. Dr.
Milwaukee, WI 53212
(414) 263-8644

**Figure 1**

**Sub Slab Depressurization System Layout**




APPROXIMATE SCALE: 1" = 10'

## Legend

EP-1 Extraction point and manometer location

Mitigation Fan

Piping

TP1 Sub-slab vacuum monitoring point (in $H_2O$)

(-0.038) Vacuum reading in inches of water (in $H_2O$)

| No. | Date | Revision | Approved |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

ENVIRO forensics

825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

| | |
|---|---|
| Date: | 8/1/16 |
| Designed: | EB |
| Drawn: | EB |
| Checked: | KH |
| DWG file: | 6406-0173 |

SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT
OHM Property
2262 South 108th Street
West Allis, Wisconsin

Figure 1

Project 6406

**ATTACHMENT 1**

**Vapor Protection Services Installation Report**

VAPOR PROTECTION SERVICES

# TABLE OF CONTENTS

Prepared for: **Kyle Heimstead and**
**Wayne Fassbender**
**EnviroForensics**

Site: **2248 & 2262 South 108th St.**
**West Allis, WI 53227**

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VAPOR PROTECTION SERVICES

# INSTALLATION REPORT

September 30, 2015

VPS Proposal No. 201504186
Sub-Slab Depressurization System (SSDS)
2248 & 2262 South 108th St.
West Allis, WI 53227

Mr. Kyle Heimstead
Mr. Wayne Fassbender
EnviroForensics
N16 W23390 Stone Ridge Drive, Suite G
Waukesha, WI 53188
(612) 210-3374

**Vapor Mitigation System Installation Report**
2262 South 108th St.
West Allis, WI 53227

**Date of SSDS Installation: September 8-11, 2015**

Vapor Protection Services (VPS) is pleased to provide a Vapor Mitigation System Installation Report that summarizes the scope of services performed at 2262 South 108th St. West Allis, WI 53227 (Site). The scope of services performed at the Sites is detailed in VPS Proposal No. 201504186 and is noted below:

**Scope of Service at 2262 South 108th St:**

- VPS utilized a sub-slab depressurization system (SSDS) and RadonAway Models GP501 Fan to depressurize the soil beneath approximately 3100 square foot concrete slab to meet performance criteria.
- The SSDS utilizes (3) Extraction points, approximately 110' of 4 inch schedule 40 PVC piping, and (1) model GP501 with u-tube manometers.
- The fan was hardwired to a dedicated circuit breaker in an existing electrical panel with dedicated on/off switches located next to the mitigation fan.
- Run Time meter was installed.

**Please Note:**

- A figure depicting the SSDS layout is included as **Figure 2**.
- Photos taken during the installation have been included as **Attachment 1**.
- VPS's radon mitigation certification is included as **Attachment 2**.
- VI Mitigation Installation Checklist is included as **Attachment 3**.
- O & M manual is included as **Attachment 4**.
- Annual Operating Costs is included as **Attachment 5**.
- RadonAway fan 5 year warranty is included as **Attachment 6.**
- MSDS sheet is included as **Attachment 7**.

**Conclusion:**

VPS submits this report as written and visual documentation that the contracted work scope for vapor mitigation as detailed in Proposal No. 201504186 was successfully completed to the approval of EnviroForensics at Site. Please do not hesitate to contact me with any questions you might have regarding this report.

Respectfully Submitted,

Nick Martinez
Director of Technical Services
nick@vaporprotection.com
Vapor Protection Services®
6544 Ferguson Street
Indianapolis, IN 46220
317.252.5295
www.vaporprotection.com
NRPP Certification #106792 RMT
Indiana Mitigator License #RTM 00633
Indianapolis Contractor License #0555673

**Figure 2**
**System Layout**

VAPOR PROTECTION SERVICES®

**Prepared for:** EnviroForensics
Kyle Heimstead & Wayne Fassbender
**Site:** 2262 S. 108th St.
West Allis, WI 53227
VPS # 201504186

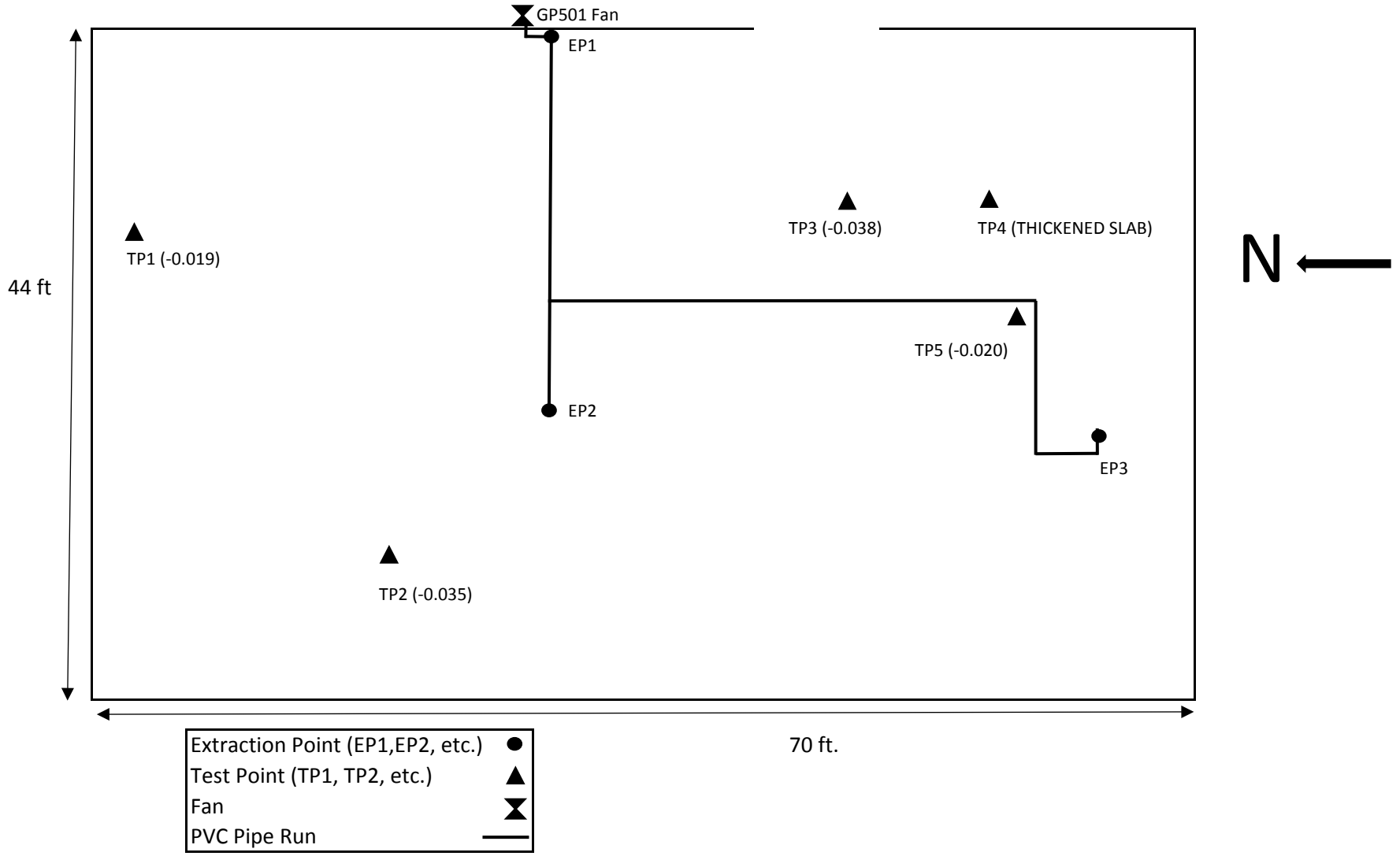


**Figure 2**
**Pre-Install PFE Readings**

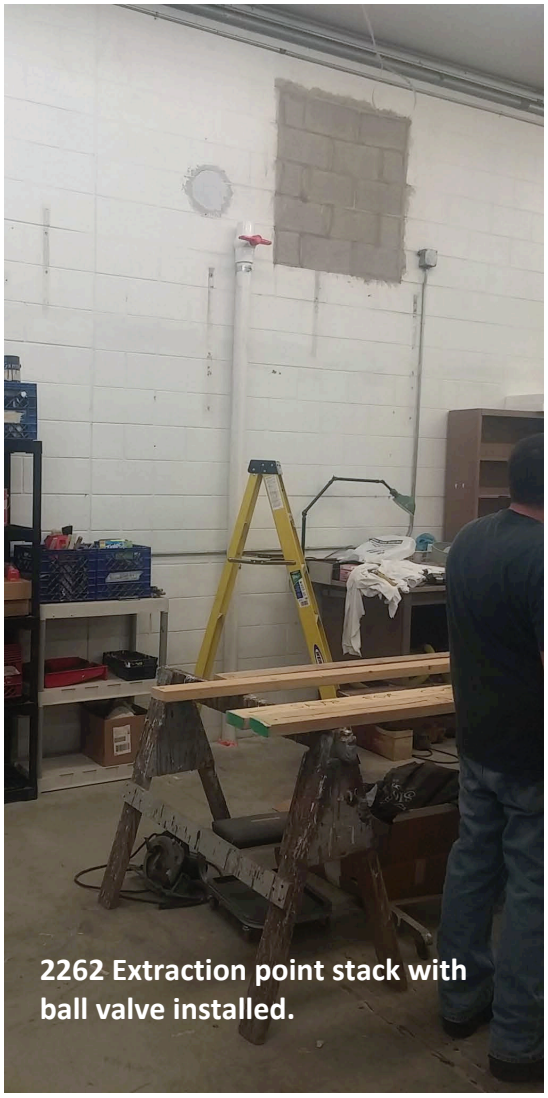
**Company:** EnviroForensics
**Contact Name:** Kyle Heimstead/ Wayne Fassbender
**Proposal #:** 201504186

## Pre-Install PFE Readings

**Site Address:** 2262 South 108th St., W. Allis, WI 53227

| Test Point | Ext. Point 1 | Ext. Point 2 | Ext. Point 3 | Ext. Point 4 |
|---|---|---|---|---|
| TP 1 | -0.012 | -0.015 | | -0.008 |
| TP 2 | -0.003 | -0.016 | -0.001 | -0.037 |
| TP 3 | -0.028 | -0.004 | -0.002 | -0.010 |
| TP 4 | Thickened slab | Thickened slab | Thickened slab | Thickened slab |
| TP 5 | -0.002 | -0.001 | -0.140 | -0.003 |

**Attachment 1 cont d**
**Installation Photos**



**2262 Extraction point stack with ball valve installed.**

**2262 Exit Point with TP501 fan installed on exterior wall with run time meter.**

## Attachment 2
## Mitigation Certifications

AARST

*Nicolas Martinez*

Has satisfactorily fulfilled the requirements set forth by the
National Radon Proficiency Program and is therefore certified as a:

*Residential Measurement Provider*

*NRPP ID 107225 RT Expires 08/31/2017*

NATIONAL RADON PROFICIENCY PROGRAM
AARST

Valid for specific activities or measurement devices, which can be verified with NRPP.
State and local agencies may have additional requirements.

In witness Whereof,
I have subscribed my name as a
Representative of NRPP

Janna M. Sinclair
NRPP Credentialing Coordinator

National Radon Proficiency Program

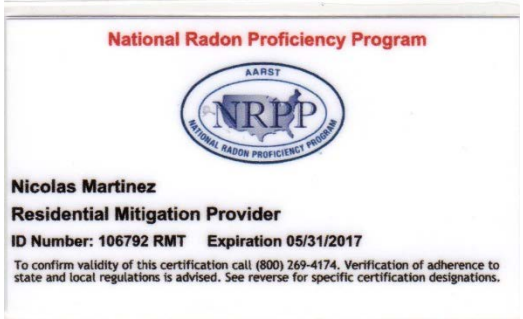
AARST NRPP NATIONAL RADON PROFICIENCY PROGRAM

**Nicolas Martinez**

**Residential Measurement Provider**

**ID Number: 107225 RT Expiration 08/31/2017**

To confirm validity of this certification call (800) 269-4174. Verification of adherence to state and local regulations is advised. See reverse for specific certification designations.



National Radon Proficiency Program

AARST NRPP NATIONAL RADON PROFICIENCY PROGRAM

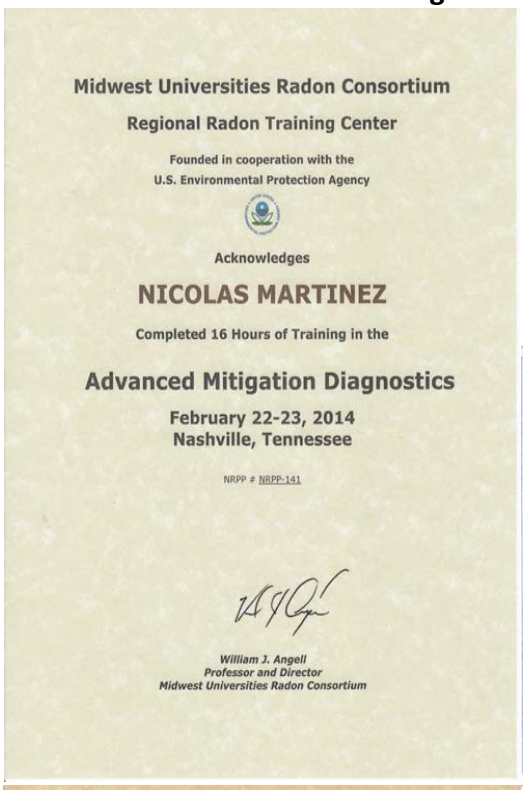
**Nicolas Martinez**

**Residential Mitigation Provider**

**ID Number: 106792 RMT Expiration 05/31/2017**

To confirm validity of this certification call (800) 269-4174. Verification of adherence to state and local regulations is advised. See reverse for specific certification designations.

## Attachment 2 (cont'd)
## Mitigation Certification



Midwest Universities Radon Consortium

Regional Radon Training Center

Founded in cooperation with the
U.S. Environmental Protection Agency

Acknowledges

**NICOLAS MARTINEZ**

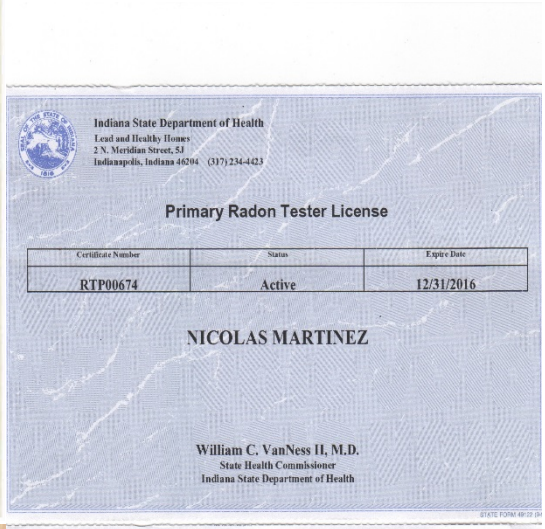
Completed 16 Hours of Training in the

**Advanced Mitigation Diagnostics**

February 22-23, 2014
Nashville, Tennessee

NRPP # NRPP-141

*William J. Angell*
*Professor and Director*
*Midwest Universities Radon Consortium*



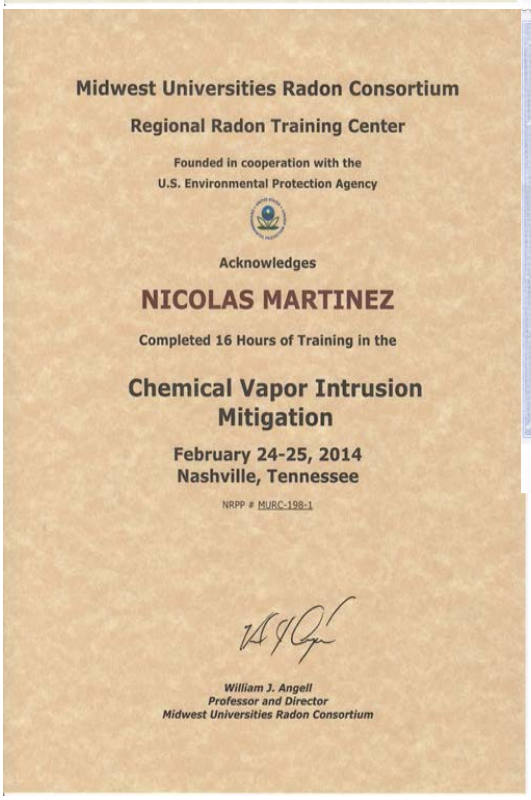
Indiana State Department of Health
Lead and Healthy Homes
2 N. Meridian Street, 5J
Indianapolis, Indiana 46204 (317) 234-1423

Primary Radon Tester License

| Certificate Number | Status | Expire Date |
|---|---|---|
| RTP00674 | Active | 12/31/2016 |

NICOLAS MARTINEZ

William C. VanNess II, M.D.
State Health Commissioner
Indiana State Department of Health



Midwest Universities Radon Consortium

Regional Radon Training Center

Founded in cooperation with the
U.S. Environmental Protection Agency

Acknowledges

**NICOLAS MARTINEZ**

Completed 16 Hours of Training in the

**Chemical Vapor Intrusion Mitigation**

February 24-25, 2014
Nashville, Tennessee

NRPP # MURC-198-1

*William J. Angell*
*Professor and Director*
*Midwest Universities Radon Consortium*

Indiana State Department of Health
Lead and Healthy Homes
2 N. Meridian Street, 5J
Indianapolis, Indiana 46204 (317) 234-1423

Radon Mitigator License

| Certificate Number | Status | Expire Date |
|---|---|---|
| RTM00633 | Active | 12/31/2015 |

NICOLAS MARTINEZ

*Gregory N. Larkin*
Gregory N. Larkin M.D. F.A.A.F.P.
State Health Commissioner
Indiana State Department of Health

**Attachment 3**
**Installation hec list**

VAPOR PROTECTION SERVICES®

| | |
|---|---|
| Company: | **EnviroForensics** |
| Name: | **Kyle Heimstead** |
| Address: | **2248/2262 S.108th St.** |
| | **West Allis, WI 53227** |
| Proposal Number: | **201504186** |
| Date: | **9/8/15-9/11/15** |
| Fan Make/Model: | **GP501 (2)** |

## VI Mitigation Installation Checklist

| **Piping** | **Yes** | **No** | **N/A** |
|---|---|---|---|
| Are all pipes solid schedule 40 PVC? | X | | |
| Are all pipe connections permanently sealed? | X | | |
| Are the system pipes supported by existing ductwork, piping, or any equipment? | | X | |
| Do any of the system pipes obstruct windows, doors or service access points? | | X | |
| Are horizontal pipe supports installed at 6- 4 foot increments? | X | | |
| Are vertical pipe runs supported properly in accordance to building code? | X | | |
| Extraction point vertical pipes supported and sealed permanently? | X | | |
| Do Horizontal pipes slope toward extraction pits for condensate drainage? | X | | |
| Are permanent test ports installed on extraction point suction pipes? | | X | |
| ***Fans*** | | | |
| Is the fan level and properly supported to prevent unnecessary vibration? | X | | |
| Does the fan have a condensate by-pass installed? | X | | |
| Has the fan been mounted to piping using flexible connections? | X | | |
| Is the exhaust vent pipe at least 10 feet above grade, 10 feet from any doors or windows, and 2 feet above the top of any opening into the conditioned space? | X | | |
| If vent pipe exits through a roof penetration, does it extend at least 12 inches above the surface? | | | X |
| If vent pipe runs along the exterior wall, is it supported by brackets placed at least every 8 feet? | X | | |
| Is the vent stack made of schedule 40 PVC piping? | X | | |
| ***Vapor Barrier*** | | | |
| I crawl space(s) free or debris and obstruction that may prevent proper installation of vapor retarder or sub-slab depressurization system? | | | X |
| Has sub-membrane depressurization system been installed? | | | X |
| Was 6mil or thicker reinforced skrim used as the vapor retarder? | | | X |
| Are heavy traffic areas and/or storage areas protected from tears and punctures by carpet or heavy felt padding? | | | X |
| Are all membrane seams overlapped at least 12 inches and sealed properly? | | | X |
| Has the membrane been secured to walls with tape, furring strips, and/or caulk? | | | X |
| Has a perforated/slotted pipe been installed under the membrane and above the soil for proper de-pressurization? | | | X |
| Does suction pipe have permanent test port installed? | | | X |
| Are all utility, foundation, or other penetrations sealed properly? | | | X |

**Attachment 3 cont d**
**Installation hec list**

| ***Electrical*** | **Yes** | **No** | **N/A** |
|---|---|---|---|
| Has electrical wiring/switching been performed by a licensed electrician? | X | | |
| Is the fan's power supply shutoff switch mounted in a weather tight enclosure? | X | | |
| Is the circuit breaker clearly labeled "Vapor Mitigation System"? | X | | |
| Has a run-time meter been installed, and is it in a weather tight enclosure? | X | | |
| Has a KW meter been installed? | | X | |

| ***Sump Pit*** | | | |
|---|---|---|---|
| Is there a sump pit(s) in the basement or crawl space? | X | | |
| Does sump pit have impermeable cover attached with proper sealant? | X | | |
| Are sump lid penetrations properly sealed? | X | | |
| Has sump pit been used as an extraction point? | | X | |
| Does sump lid have a clear view port for pump/pit observation and maintenance? | X | | |

| ***Labels and Monitors*** | | | |
|---|---|---|---|
| Does each suction pipe have a u-tube manometer or magnehelic gage to measure pressure? | X | | |
| Does each suction pipe have a permanent test port? | | X | |
| Has an audible alarm to inform of possible system malfunction been installed? | | X | |
| Are labels placed on pipes, membrane(s), and prominent locations to identify system components? | X | | |
| Does label include name and number of person(s) to contact in case of system emergency? | X | | |

| ***Testing and Sealing*** | | | |
|---|---|---|---|
| Has PFE testing been completed to verify system performance? | X | | |
| Has foundation been smoke tested after mitigation system installation? | | X | |
| Have leaks in slab, walls or membrane been sealed properly? | X | | |

| ***Report*** | | | |
|---|---|---|---|
| Has an as built drawing been completed depicting system installation? | X | | |
| Have all test point reading been recorded and inserted into the drawing? | X | | |
| Has the system installation been recorded with photographs? | X | | |

| **Notes:** |
|---|
| |

## Attachment 4
## Vapor Mitigation System Operation and Maintenance

We advise consultants, maintenance personnel or property owners to conduct routine visual inspections of all SSDS to verify that vapor mitigation system components are operating properly. The inspection should include but not be limited to the following:

- Observe the u tube or magnehelic gauges for pressure indication; a pressure of '0' indicates that there is a problem with system piping or fan operation.

- Observe the mitigation fan(s) and note any abnormal sounds or noises coming from the fan including buzzing, scraping, rattling, or et cetera. If any abnormal noises or sounds are audible, contact VPS.

- Most mitigation fans are factory sealed and designed to be maintenance free for the life of the fan. Should the fan's casing be opened or the factory seal broken, any service warranty may be voided. Factory maintenance documentation has been provided to consultant with recommended schedule for maintenance of fans if required.

- Inspect the PVC piping of the system for damage or cracks. If any damage occurs to the PVC piping, contact VPS Piping supports and Hangers should also be inspected for wear and integrity.

- Roof penetrations for system exhaust piping should be inspected to assure no moisture or other intrusion is apparent.

- Sub-membrane depressurization system (SMDS) components should also be periodically inspected to assure proper performance. Should a vapor barrier or membrane become damaged, loss of system pressure can occur affecting overall system performance. Tears should be repaired properly using approved methods.

- Any significant changes to building or structure can and may affect system performance. VPS should be advised of planned changes beforehand to avoid any possible performance issues or system failure.

*Contact VPS for Additional Service & Maintenance should any occasion arise that may causes concern that the SMDS is not functioning properly as vapor intrusion may no longer be mitigated to meet performance criteria provided to VPS by consultant.*

**Attachment 5**
**ANNUAL OPERATING COSTS**

| RADONAWAY FANS | AVERAGE KWH | AVERAGE COST PER YEAR |
|---|---|---|
| RP140 | $0.0894 | $13.31 |
| RP145 | $0.0894 | $42.29 |
| RP260 | $0.0894 | $48.55 |
| RP265 | $0.0894 | $88.50 |
| RP380 | $0.0894 | $101.03 |
| | | |
| SF180 | $0.0894 | $42.29 |
| | | |
| GP201 | $0.0894 | $39.16 |
| GP301 | $0.0894 | $56.39 |
| GP401 | $0.0894 | $66.57 |
| GP500 | $0.0894 | $78.31 |
| GP501 | $0.0894 | $82.23 |
| | | |
| XP151 | $0.0894 | $40.72 |
| XP201 | $0.0894 | $43.07 |
| XP261 | $0.0894 | $66.57 |
| | | |
| HS2000 | $0.0894 | $164.46 |
| HS3000 | $0.0894 | $117.47 |
| HS5000 | $0.0894 | $250.61 |
| | | |
| **FANTECH FANS** | | |
| HP2133 | $0.0894 | $13.31 |
| HP2190 | $0.0894 | $56.78 |
| HP175 | $0.0894 | $42.68 |
| HP190 | $0.0894 | $56.78 |
| HP220 | $0.0894 | $92.80 |
| | | |
| **PLASTEC VENTILATION** | | |
| STORM 12 | | $250.00 |
| PLASTEC 20 | | $250.00 |

RadonAway™

The World's Leading Radon Fan Manufaturer



# GP/XP/XR Series Installation & Operating Instructions

## *Please Read And Save These Instructions*

**DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.**

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible of flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
   **See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion**
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
   **Do NOT attempt to open.** Return unit to the factory for service.
6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.
7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
8. **WARNING - TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:**
   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

RadonAway
3 Saber Way | Ward Hill, MA 01835
www.radonaway.com

RadonAway™

**Installation & Operating Instructions IN014 Rev J**

| XP/XR Series | | GP Series | |
|---|---|---|---|
| XP101 | p/n 23008-1 | GP201 | p/n 23007-1 |
| XP151 | p/n 23010-1 | GP301 | p/n 23006-1 |
| XP201 | p/n 23011-1 | GP401 | p/n 23009-1 |
| XR261 | p/n 23019-1 | GP501 | p/n 23005-1 |

## 1.0 SYSTEM DESIGN CONSIDERATIONS

### 1.1 INTRODUCTION

The GP/XP/XR Series Radon Fans are intended for use by trained, professional, certified/licensed Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a fan. This instruction should be considered as a supplement to EPA/radon industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

### 1.2 ENVIRONMENTALS

The GP/XP/XR Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

### 1.3 ACOUSTICS

The GP/XP/XR Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

### 1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the GP/XP/XR Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

### 1.5 SLAB COVERAGE

The GP/XP/XR Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the GP/XP/XR Series Fan best suited for the sub-slab material can improve the slab coverage. The GP & XP Series have a wide range of models to choose from to cover a wide range of subslab material. The higher static suction fans are generally used for tighter subslab materials. The XR Series is specifically designed for high flow applications such as stone/gravel and drain tile. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

## 1.6 CONDENSATION & DRAINAGE

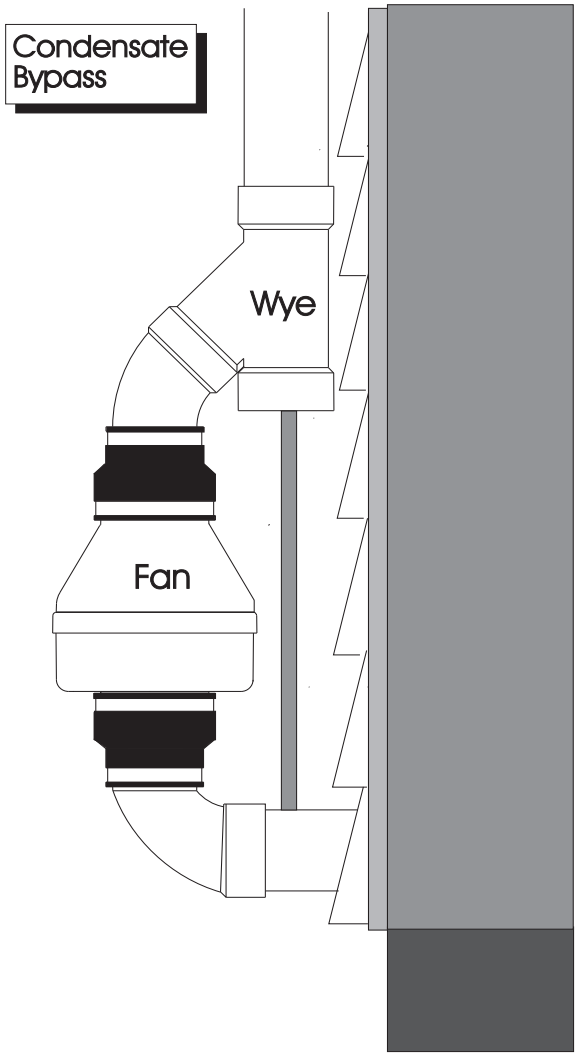
Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The GP/XP/XR Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GP/XP/XR Series Fans are **NOT** suitable for underground burial.

For GP/XP/XR Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

| Pipe Dia. | Minimum Rise per Foot of Run* @25 CFM | @50 CFM | @100 CFM |
|---|---|---|---|
| 4″ | 1/8″ | 1/4″ | 3/8″ |
| 3" | 1/4" | 3/8" | 1 1/2" |


*Typical GP/XP/XR Series Fan operational flow rate is 25 - 90 CFM. (For more precision, determine flow rate by using the chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.




The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

## 1.7 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50006-1) or audible alarm (P/N 28001-2) is required to notify the occupants of a fan system malfunction. A System Label (P/N 15022) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.

1.8 ELECTRICAL WIRING

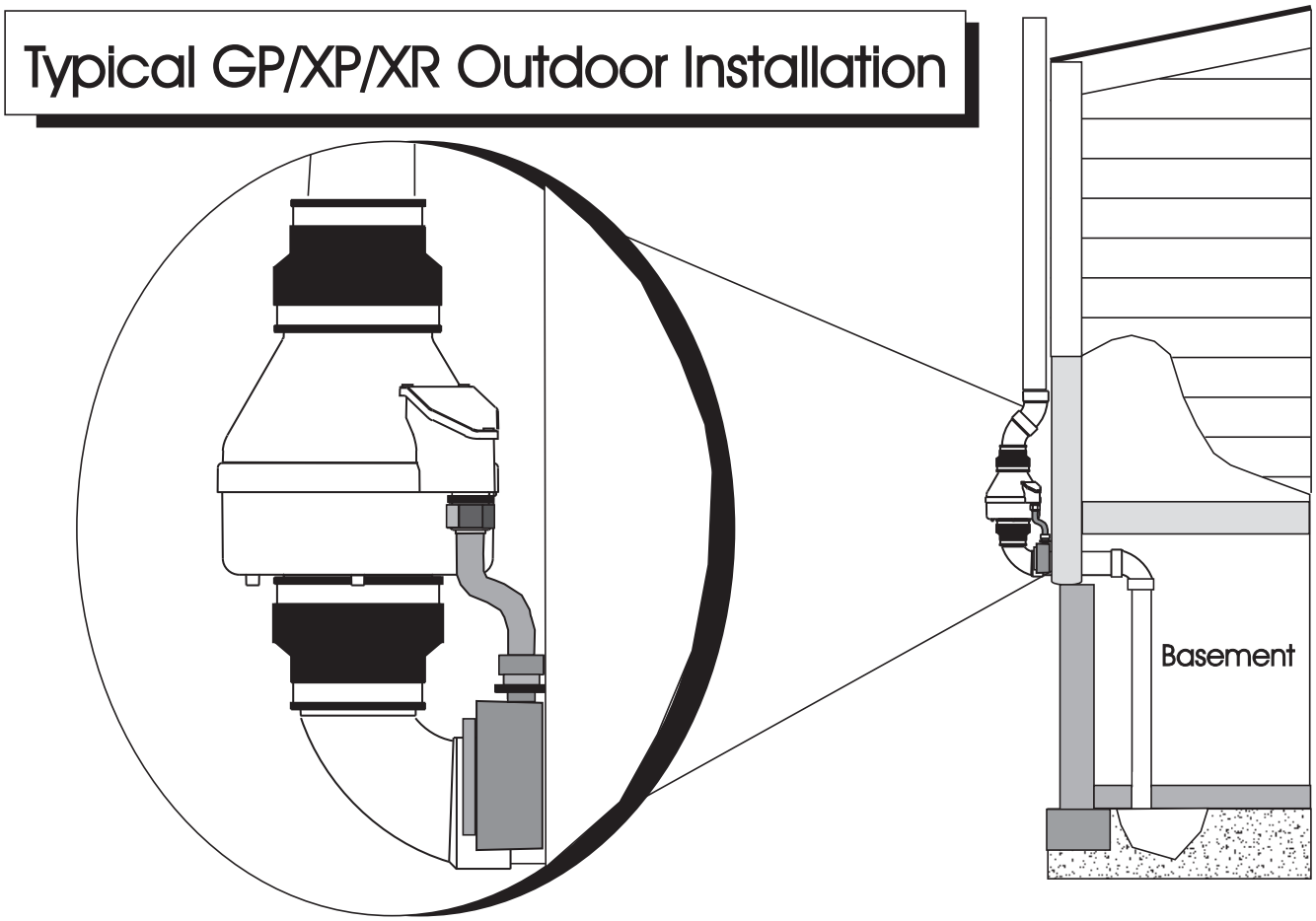
The GP/XP/XR Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The GP/XP/XR Series Fans are rated for use with electronic speed controls, however, they are generally not recommended. If used, the speed control recommended is Pass & Seymour Solid State Speed Control Cat. No. 94601-I.

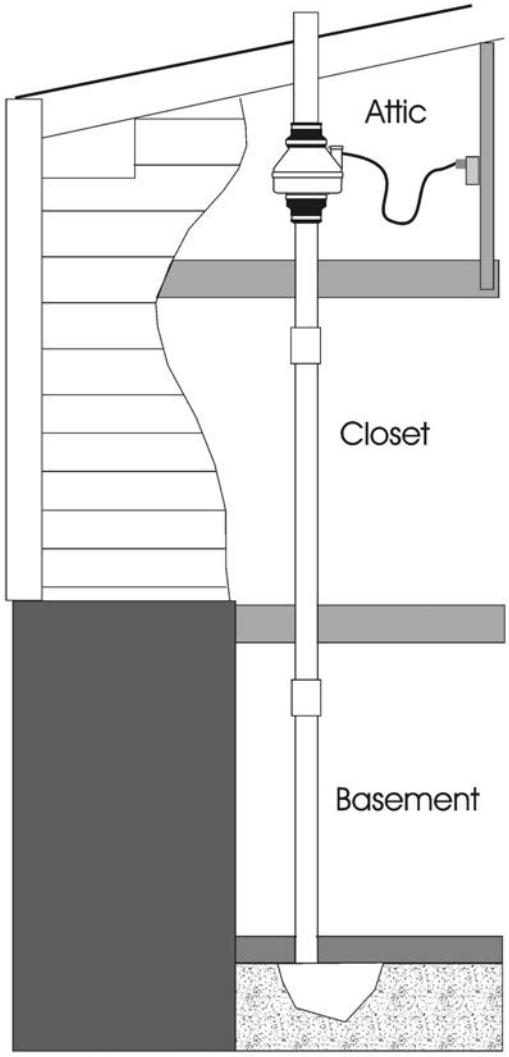
2.0 INSTALLATION

The GP/XP/XR Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The GP/XP/XR Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the GP/XP/XR Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.




2.2 MOUNTING BRACKET (optional)

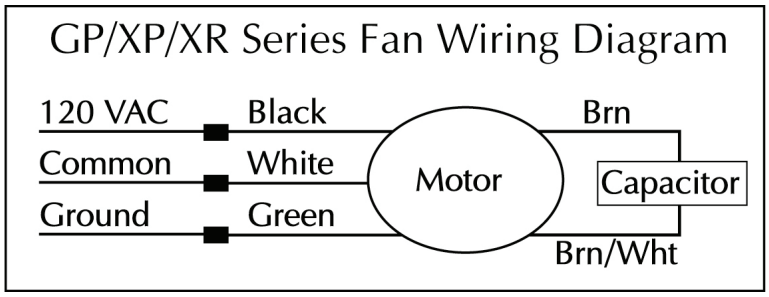
The GP/XP/XR Series Fan may be optionally secured with the integral mounting bracket on the GP Series fan or with RadonAway P/N 25007-2 mounting bracket for an XP/XR Series Fan. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.8):




2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS AND ANNUAL SYSTEM MAINTENANCE

_____ **Verify** all connections are tight and **leak-free**.

_____ **Insure** the GP/XP/XR Series Fan and all ducting is secure and vibration-free.

_____ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

*(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)*
*(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)*
*See Product Specifications. If this is exceeded, increase the number of suction points.*

_____ **Verify Radon levels by testing to EPA protocol.**

# XP/XR SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the XP & XR Series Fan:

| Typical CFM Vs Static Suction "WC | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0" | .25" | .5" | .75" | 1.0" | 1.25" | 1.5" | 1.75" | 2.0" |
| XP101 | 125 | 118 | 90 | 56 | 5 | - | - | - | - |
| XP151 | 180 | 162 | 140 | 117 | 78 | 46 | 10 | - | - |
| XP201 | 150 | 130 | 110 | 93 | 74 | 57 | 38 | 20 | - |
| XR261 | 250 | 215 | 185 | 150 | 115 | 80 | 50 | 20 | - |

| Maximum Recommended Operating Pressure* | | |
|---|---|---|
| XP101 | 0.9" W.C. | (Sea Level Operation)** |
| XP151 | 1.3" W.C. | (Sea Level Operation)** |
| XP201 | 1.7" W.C. | (Sea Level Operation)** |
| XR261 | 1.6" W.C. | (Sea Level Operation)** |

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

| Power Consumption @ 120 VAC | |
|---|---|
| XP101 | 40 - 49 watts |
| XP151 | 45 - 60 watts |
| XP201 | 45 - 66 watts |
| XR261 | 65 - 105 watts |

**XP Series Inlet/Outlet**: 4.5" OD (4.0" PVC Sched 40 size compatible)
**XR Series Inlet/Outlet**: 5.875" OD
**Mounting**: Mount on the duct pipe or with optional mounting bracket.
**Recommended ducting**: 3" or 4" Schedule 20/40 PVC Pipe
**Storage temperature range**: 32 - 100 degrees F.
**Normal operating temperature range:** -20 - 120 degrees F.
**Maximum inlet air temperature:** 80 degrees F.
**Size**: 9.5H" x 8.5" Dia.
**Weight**: 6 lbs. (XR261 - 7 lbs)

**Continuous Duty**
**Thermally Protected**
**Class B Insulation**
**3000 RPM**
**Rated for Indoor or Outdoor Use**

LISTED Electric Fan ETL® 77728 Tested to UL Std. 507

# GP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the GP Series Fan:

| Typical CFM Vs Static Suction "WC | 1.0" | 1.5" | 2.0" | 2.5" | 3.0" | 3.5" | 4.0" |
|---|---|---|---|---|---|---|---|
| GP501 | 95 | 87 | 80 | 70 | 57 | 30 | 5 |
| GP401 | 93 | 82 | 60 | 38 | 12 | - | - |
| GP301 | 92 | 77 | 45 | 10 | - | - | - |
| GP201 | 82 | 58 | 5 | - | - | - | - |

| Maximum Recommended Operating Pressure* | | |
|---|---|---|
| GP501 | 3.8" W.C. | (Sea Level Operation)** |
| GP401 | 3.0" W.C. | (Sea Level Operation)** |
| GP301 | 2.4" W.C. | (Sea Level Operation)** |
| GP201 | 1.8" W.C. | (Sea Level Operation)** |

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

| Power Consumption @ 120 VAC | |
|---|---|
| GP501 | 70 - 140 watts |
| GP401 | 60 - 110 watts |
| GP301 | 55 - 90 watts |
| GP201 | 40 - 60 watts |

**Inlet/Outlet**: 3.5" OD (3.0" PVC Sched 40 size compatible)

**Mounting**: Fan may be mounted on the duct pipe or with integral flanges.

**Weight**: 12 lbs.

**Size**: 13H" x 12.5" x 12.5"

**Recommended ducting**: 3″ or 4" Schedule 20/40 PVC Pipe

**Storage temperature range**: 32 - 100 degrees F.

**Normal operating temperature range:** -20 - 120 degrees F.

**Maximum inlet air temperature:** 80 degrees F.

**Continuous Duty**
**Class B Insulation**
**3000 RPM**
**Thermally Protected**
**Rated for Indoor or Outdoor Use**

LISTED Electric Fan ETL® 77728 Tested to UL Std. 507

**Attachment 6 cont d**
**Fan Warranty**
**IMPORTANT INSTRUCTIONS TO INSTALLER**

Inspect the GPx01/XP/XR Series Fan for shipping damage within 15 days of receipt. Notify RadonAway of any damages immediately. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

**Install the GPx01/XP/XR Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.**

**Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.**

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPx01/XP/XR Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

**EXCEPT AS STATED ABOVE, THE GPx01/XP/XR SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.**

**For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.**

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

**2 P501**

**2262 & 2248 S.108th St.**
**West Allis, WI.**

**Record the following information for your records:**

Serial No. **2262 170417 2248 170418**
Purchase Date **2262 9 8 15 2248 - 9 10 15**

# ATTACHMENT 2

## Vapor Mitigation System Inspection and Maintenance Log

**VAPOR MITIGATION SYSTEM INSPECTION AND MAINTENANCE LOG**
**2262 SOUTH 108TH STREET, WEST ALLIS, WISCONSIN**

| SYSTEM COMPONENT | | | | | | ANNUAL INSEPECTION | |
|---|---|---|---|---|---|---|---|
| **NAME** | **PHOTO** | **FUNCTION** | **CHECK** | **NORMAL OBSERVATION** | **POSSIBLE REPAIR** | **DATE** | **NOTES / REPAIR COMPLETED** |
| Fan |  | Fan creates a vacuum and lowers pressure below foundation.<br><br>The fan also removes soil gasses from below foundation for discharge to atmosphere. | Fan Operation<br>Fan Location<br>Motor Noise | Fan is on<br>Fan mounted outside and secure<br><br>Fan motor is quiet (loud motor may indicate a problem) | Fan may need to be replaced every 15 to 20 years.<br><br>Replacement fan to have similar specifications as original with respect to flow and vacuum.<br><br>**Fan Type = RadonAway GP501** | | |
| Suction Point with Vent Pipe |  | Suction Point : Soil gases are collected in a pit below the foundation, and tight seal prevents soil gas from entering the building.<br><br>Vent Pipe: Pipe conveys the vacuum from the fan, and collects soil gases for discharge to the atmosphere. | Suction Point Seal<br>Vent Pipe Condition | Seal is air tight around pipe penetration.<br><br>Vent pipe is connected to fan and has not cracked. | Suction point seal or vent pipe may need to be replaced in cracks or leaks appear.<br><br>Have professional test pressures if pipes are modified or cracks appear. | | |
| Manometer or Differential Pressure Gauge |  | Measures differential pressure between vacuum side of vent pipe and indoor space.<br><br>This measurement confirms the fan is creating a vacuum. | Liquid Level in Manometer | Liquid level in manometer is between 0.3 and 3 in $H_20$ | A change in liquid level indicates a change in the vacuum below the foundation. This could be caused by fan failure, vent pipe blockage, shallow water below foundation, or other conditions.<br><br>Troubleshoot or hire professional to identify the cause and repair if needed. | | |
| Outdoor Vent Pipe |  | Pipe carries soil gas outside and vents it to the atmosphere. | Vent Pipe Condition<br>Vent Pipe Location | Vent pipe remains connected to fan.<br><br>End of pipe free from obstructions.<br><br>The exhaust is more than 15 feet from windows and air intakes. | Vent pipe may require replacement, or cleaning to remove ice or debris.<br><br>Have professional test pressures if pipes are modified or cracks appear. | | |
| Foundation Floor |  | Foundation is a barrier that minimizes soil gas entry into building. | Foundation Condition<br>Foundation Footprint | No penetrating cracks or holes in foundation.<br><br>No alterations or additions to building foundation. | Seal cracks or other penetrations as you would to prevent water from entering.<br><br>If building floor plan has changed, contact a professional contractor or WDNR to evaluate if modifications to the mitigation system are necessary. | | |
| Vapor Pin |  | This is a sample port to measure vacuum or collect soil gas sample(s) if needed. | Pin Seal/Cap<br>Pin Condition | Pin is sealed and capped when not in use.<br><br>A manometer can be connected to the vapor pin to check sub-slab vacuum (not required). Vac should be less than -0.004 in $H_20$. | Repair or replace the seal and cover as needed.<br><br>Permanently seal hole if vapor pin is ever removed. | | |

# SUB SLAB DEPRESSURIZATION SYSTEM
# OPERATIONS MAINTENANCE & MONITORING PLAN

February 25, 2020

*Prepared For Property Located At:*

2248 South 108th Street
West Allis, WI 53227

*Prepared By:*

Environmental Forensic Investigations, Inc.
N16 W23390 Stone Ridge Drive, Suite G
Waukesha, WI 53188
Phone: (262) 290-4001
www.enviroforensics.com

*Document: 6406-0208*

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## 1.0 PURPOSE, LOCATION, AND DESCRIPTION

### 1.1 Purpose

A sub-slab depressurization system (SSDS) was installed at this location to mitigate potential vapor intrusion risk from chlorinated dry cleaning solvents. The solvents were released to the subsurface from the nearby One Hour Martinizing facility adjacent to the south. Previous sub-slab vapor samples have contained the chlorinated solvents tetrachloroethene (PCE) and trichloroethene (TCE) in concentrations that pose a risk for intrusion of vapors to indoor air. Groundwater contaminated with chlorinated solvents is in contact with the building foundation, which is the likely source of the vapors. Although solvent vapors were not detected during past indoor air sampling in concentrations that would pose a health risk, the Wisconisn Department of Natural resources (WDNR) requires that any continued risk of vapor intrusion be mitigated.

The SSDS is designed to depressurize the sub-slab space and prevent vapors from migrating into the buildings and affecting indoor air quality. The Wisconsin Department of Natural Resources (WDNR) requires that the SSDS be monitored and maintained to ensure ongoing effectiveness. Proper operation of the SSDS is necessary to prevent exposure to the chemicals of concern via vapor intrusion.

The purpose of this Operations Maintenance & Monitoring Plan (OM&MP) is to provide procedures that will ensure the ongoing effectiveness of the SSDS to mitigate sub-slab vapors.

### 1.2 Location and Description

The sub-slab depressurization system (SSDS) was installed at 2248 S. 108$^{th}$ Street, West Allis, Wisconsin during September 8-11, 2015. The building is two stories with basement and constructed of brick. The first floor is currently commercial, but unoccupied, and the second floor contains three (3) residential apartments. The current building owner is EE Acquisitions, LLC.

The SSDS consists of vapor extraction points installed below the floor slab, with interconnecting piping manifolded inside the building. The single pipe was relayed to the outside of the building and is connected to the system blower, which exhausts to a location above the roofline of the building. The SSDS is designed to operate continuously and there are u-tube manometers installed to allow a visual determination of whether the system is operating.

In order for the SSDS to function normally, there is a foundation dewatering sump in the basement that must be functional. Dewatering of the foundation is necessary to provide open pores in the base gravel beneath the basement slab to allow the collection of vapors using the

SSDS. The foundation dewatering sump and pump are considered integral components of the overall SSDS.

## 2.0 SYSTEM DESIGN AND CONSTRUCTION

The system consists of one (1) fan mounted to the north side of the building and three (3) extraction points cored through the subslab floor. Attached **Figure 1** depicts the layout of the SSDS, including piping runs, extraction points, fan location, and the location and connections of the foundation dewatering sump. Photographs of system components are provided in **Appendix A**.

The extraction points and connecting piping are made of 4-inch diameter, schedule 40 polyvinyl chloride (PVC). The extraction points were installed by cutting away a section of the concrete floor slab at each location, and then removing a portion of the sub-slab materials to create a sump (hole in the soil below the slab) for inserting the extraction points. This was done to prevent fine soil particles from being vacuumed into the system. The extraction lines were connected by schedule 40 PVC piping to a RadonAway Model GP 501 extraction fan to create negative pressure below the slab and draw vapors into the extraction piping. Extraction piping was routed outside the building where vapors are discharged above the roofline and away from the building (refer to picture of fan on outside wall of the building in **Appendix A**.

In January, 2020, modifications were made to the basement dewatering sump. The building foundation water contains concentrations of chlorinated solvents that exceed WDNR groundwater enforcement standards and is the most likely source of the solvent vapors that require mitigation via the SSDS. The water from the basement sump cannot be directly discharged to the storm sewer lateral because it is contaminated. Instead, the sump pump discharge was re-routed to the sanitary sewer system under permit from the Milwaukee Metropolitan Sewerage District (MMSD). The sump lid was replaced with grommeted openings for the sump pump discharge piping and a plug for periodic sampling of the sump water. Sealing of the sump lid was performed with silicone caulk to prevent vapors from escaping the sump and entering the breathing air of the building. In February, 2020, the sump discharge pipe was fitted with a flow volume totalizer (meter) per request of the MMSD. Photographs of sump modifications and components are contained in **Appendix A**.

## 3.0 OPERATION AND MAINTENANCE

### 3.1 SSDS Maintenance

System operation, maintenance, and monitoring (OM&M) of the SSDS is required to be performed until such time as case closure is reached for the dry cleaning solvent release. After that, the property owner is typically responsible for maintaining and operating the SSDS.

The SSDS fan is factory sealed and requires no maintenance. In the event that the fan stops operating due to mechanical failure, the fan shall be replaced with an identical model or a fan with the same performance specifications. Replacement of fans should be handled by a mitigation contractor and/or an electrician. Fan specifications are provided in **Appendix B**. Maintenance and repair activities on other components, including piping and floor seals, can be performed by the owner or building maintenance personnel.

As previously explained, the building foundation dewatering sump and pump must function properly to allow efficient operation of the SSDS. If the pump has stopped operating, it will need to be replaced and the sump lid will need to be re-sealed to the sump crock to eliminate the possibility of vapors within the sump crock entering the building breathing air. In addition, the MMSD has required annual sampling of the sump water with laboratory analysis and reporting back to them. This effort is more suited to trained environmental professionals.

### 3.2 Inspections

Complete system inspections shall be perfomed annually according to the operation and maintenance procedures outlined in documents contained in **Appendix C**. However, more routine inspections should be performed monthly to include visual inspection of u-tube manometers. If the fans and system are operating as intended, the U-tube manometers attached to the SSDS extraction piping at each extraction point will show off-set levels as indicated in the photograph of extraction point (EP) B, **Appendix A**. As long as the manometer levels are not equal, the SSDS fan is operating. However, decreasing negative pressure trends (where separation of liquids levels gets less over time) can indicate system problems such as pipe blockage, or fan motor problems. If significant changes in manometer levels are observed, then the system should be checked by an environmental professional to determine the cause.

The foundation dewatering sump and pump should be inspected to ensure that it is operating correctly and that the sump lid is sealed and in good condition. During the annual inspection, a sample of groundwater needs to be collected from the sump and analyzed for chlorinated volatile organic compounds. A copy of the laboratory report then needs to be submitted to the MMSD. A copy of the MMSD permit requirements and a sump analytical reporting form are included in

**Appendix D**. The MMSD also requires that yearly reporting of the totalized volume of water discharged from the sump be performed to determine continued permit requirments and potential costs to discharge if certain volume criteria are exceeded. This can be accomplished by recording the reading on the water meter located on the sump riser pipe. The meter records total gallons pumped.

All inspections and any equipment modifications shall be documented on the Continuing Obligations Inspection and Maintenance Log Form 4400-305 (**Appendix C**).

## 4.0 NOTIFICATIONS

### 4.1 WDNR Notification

In accordance with Wisconsin Administrative Code, NR 727.07, the WDNR will be notified at least 45 days before changes in land or property use or SSDS changes are required.

### 4.2 Contacts

Property Owner: EE Acquisitions LLC
483 S. Washington Street
Elmhurst, IL 60126

Name: Michael Cunningham

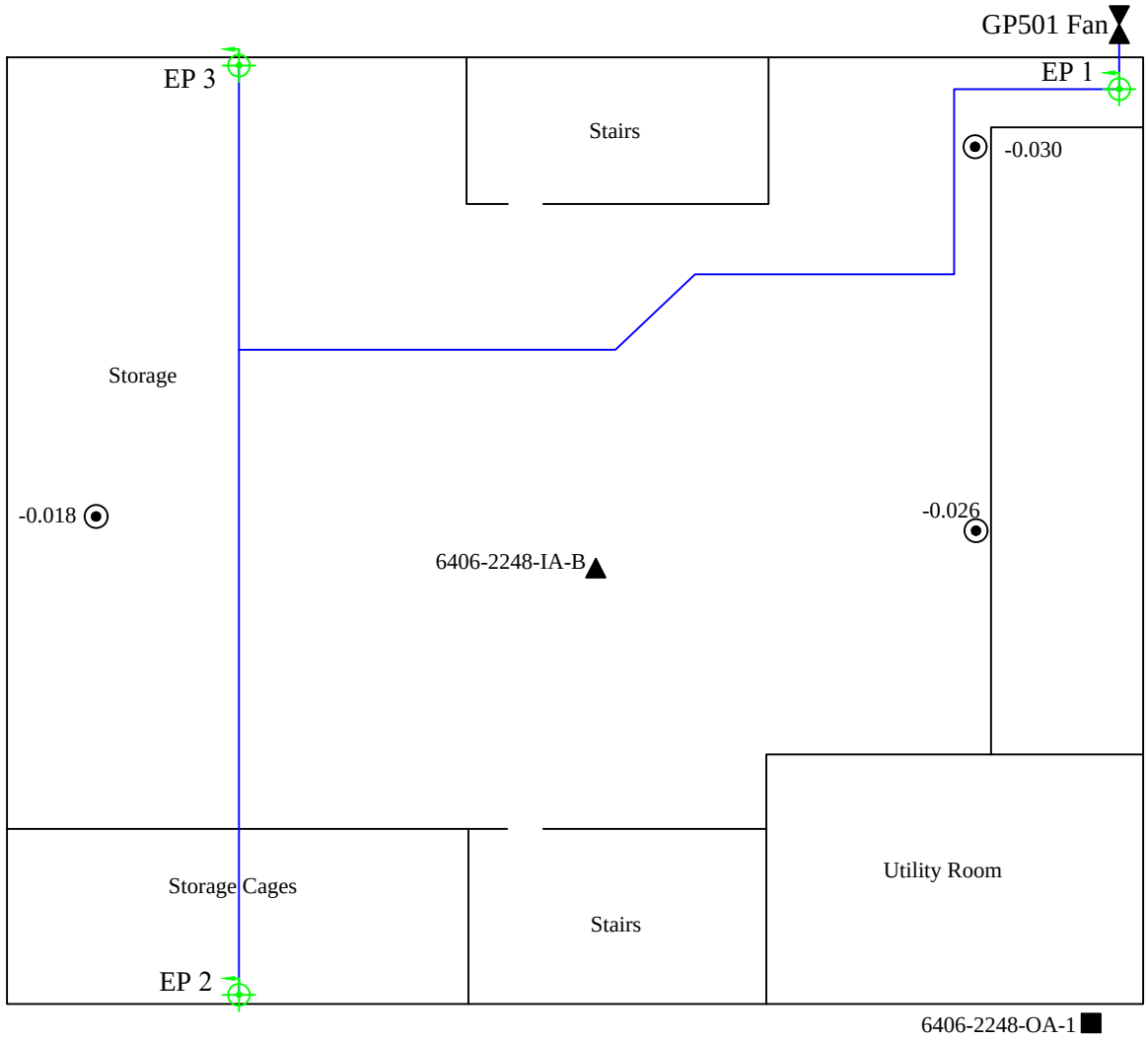
Signature: Michael Cunningham

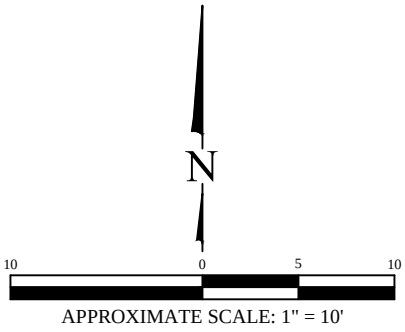
Consultant: Wayne Fassbender ( EnviroForensics)
Address: N16 W23390 Stone Ridge Dr., Suite G, Waukesha, WI 53188
Telephone #: 317-972-7870
Email: WFassbender@enviroforensics.com

Wisconsin DNR Contact: John Hnat
Address: 2300 N Martin Luther King, Jr Drive, Milwaukee, WI 53212
Telephone #: (414)-263-8644
Email: John.Hnat@Wisconsin.gov

**Figure 1**

Sub-slab Depressurization System Layout




APPROXIMATE SCALE: 1" = 10'

## Legend

EP-1 Vapor extraction point

Mitigation fan

Piping

Sub-slab negative pressure monitoring point (readings in $H_2O$)

OA-1 Outdoor air sample

IA-B Indoor air sample

| No. | Date | Revision | Approved |
|---|---|---|---|
| | | | |

ENVIRO forensics

ENVIRONMENTAL FORENSIC INVESTIGATIONS, INC.
602 N. Capitol Ave, Suite 210 • Indianapolis, IN 46204
EnviroForensics.com

| | |
|---|---|
| Date: | 5/12/16 |
| Designed: | EB |
| Drawn: | EB |
| Checked: | KH |
| DWG file: | 6406-0173 |

SUB SLAB DEPRESSURIZATION SYSTEM LAYOUT
Marinello Property
2248 South 108th Street
West Allis, Wisconsin

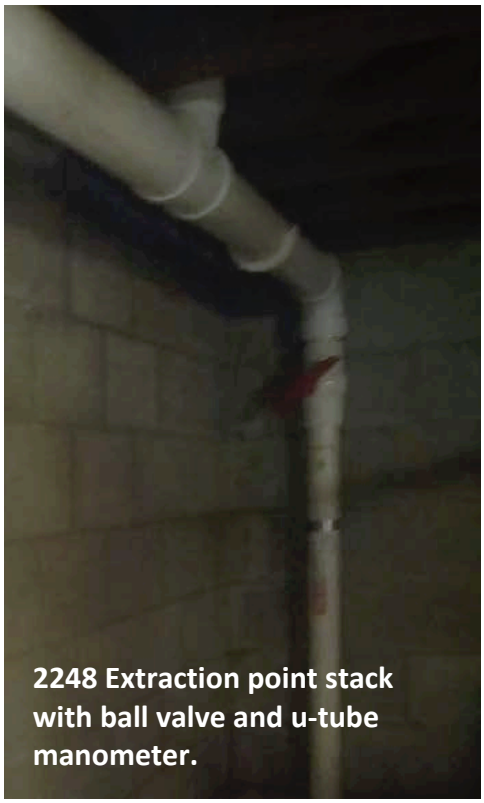
| Figure | |
|---|---|
| 1 | |
| Project | |
| 6406 | |

## Appendix A

Photographs of the SSDS System and Basement Sump Components

**Attachment 1**
**Installation Photos**

2248 S. Extraction Point
A location



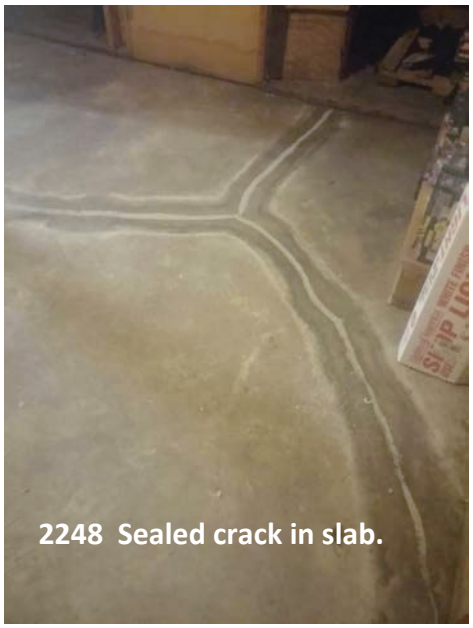
2248 Extraction point stack with ball valve and u-tube manometer.

2248 Extraction point stack with ball valve and u-tube manometer.

2248 Extraction point stack wth ball valve, u-tube manometer and horizontal pipe runs.

2248 Horizontal Pipe Runs

**Attachment 1 (cont'd)**
**Installation Photos**




2248 EP-B

**Photo #1**: New vapor-tight basement sump lid with threaded plug to allow access for collecting samples.

**Photo #2**: Basement sump and piping. Sump discharge has been disconnected from the storm sewer lateral seen adjacent right of the sump riser.

*Document: 6154-1xxx*

**Photo #3**: Close up showing that the sump discharge piping has been disconnected from the storm sewer lateral. The PVC elbow that formerly conveyed the sump discharge into the storm sewer lateral has been capped.

**Photo #4**: New sump discharge piping has been connected to a sanitary sewer lateral located just outside of the basement utility room.


**Photo #5**: Flow volume totalizer installed on sump riser pipe.

**Photo #6**: Flow volume totalizer installed on sump riser pipe approximately at same height as electrical outlet.

## Appendix B

SSDS Fan Specifications

**Attachment 5**
**ANNUAL OPERATING COSTS**

| RADONAWAY FANS | AVERAGE KWH | AVERAGE COST PER YEAR |
|---|---|---|
| RP140 | $0.0894 | $13.31 |
| RP145 | $0.0894 | $42.29 |
| RP260 | $0.0894 | $48.55 |
| RP265 | $0.0894 | $88.50 |
| RP380 | $0.0894 | $101.03 |
| | | |
| SF180 | $0.0894 | $42.29 |
| | | |
| GP201 | $0.0894 | $39.16 |
| GP301 | $0.0894 | $56.39 |
| GP401 | $0.0894 | $66.57 |
| GP500 | $0.0894 | $78.31 |
| GP501 | $0.0894 | $82.23 |
| | | |
| XP151 | $0.0894 | $40.72 |
| XP201 | $0.0894 | $43.07 |
| XP261 | $0.0894 | $66.57 |
| | | |
| HS2000 | $0.0894 | $164.46 |
| HS3000 | $0.0894 | $117.47 |
| HS5000 | $0.0894 | $250.61 |
| | | |
| **FANTECH FANS** | | |
| HP2133 | $0.0894 | $13.31 |
| HP2190 | $0.0894 | $56.78 |
| HP175 | $0.0894 | $42.68 |
| HP190 | $0.0894 | $56.78 |
| HP220 | $0.0894 | $92.80 |
| | | |
| **PLASTEC VENTILATION** | | |
| STORM 12 | | $250.00 |
| PLASTEC 20 | | $250.00 |

RadonAway™

The World's Leading Radon Fan Manufaturer



# GP/XP/XR Series Installation & Operating Instructions

## *Please Read And Save These Instructions*

**DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.**

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible of flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
   **See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion**
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
   **Do NOT attempt to open.** Return unit to the factory for service.
6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.
7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
8. **WARNING - TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:**
   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

RadonAway
3 Saber Way | Ward Hill, MA 01835
www.radonaway.com

RadonAway™

**Installation & Operating Instructions IN014 Rev J**

| XP/XR Series | | GP Series | |
|---|---|---|---|
| XP101 | p/n 23008-1 | GP201 | p/n 23007-1 |
| XP151 | p/n 23010-1 | GP301 | p/n 23006-1 |
| XP201 | p/n 23011-1 | GP401 | p/n 23009-1 |
| XR261 | p/n 23019-1 | GP501 | p/n 23005-1 |

## 1.0 SYSTEM DESIGN CONSIDERATIONS

### 1.1 INTRODUCTION

The GP/XP/XR Series Radon Fans are intended for use by trained, professional, certified/licensed Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a fan. This instruction should be considered as a supplement to EPA/radon industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

### 1.2 ENVIRONMENTALS

The GP/XP/XR Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

### 1.3 ACOUSTICS

The GP/XP/XR Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

### 1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the GP/XP/XR Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

### 1.5 SLAB COVERAGE

The GP/XP/XR Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the GP/XP/XR Series Fan best suited for the sub-slab material can improve the slab coverage. The GP & XP Series have a wide range of models to choose from to cover a wide range of subslab material. The higher static suction fans are generally used for tighter subslab materials. The XR Series is specifically designed for high flow applications such as stone/gravel and drain tile. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

## 1.6 CONDENSATION & DRAINAGE

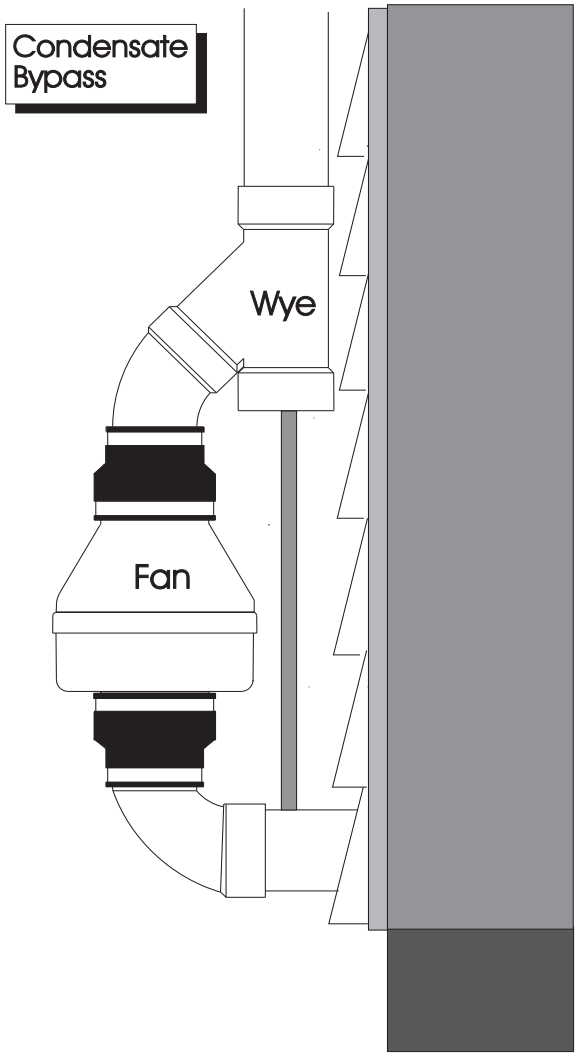
Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The GP/XP/XR Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GP/XP/XR Series Fans are **NOT** suitable for underground burial.

For GP/XP/XR Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

| Pipe Dia. | Minimum Rise per Foot of Run* @25 CFM | @50 CFM | @100 CFM |
|---|---|---|---|
| 4″ | 1/8″ | 1/4″ | 3/8″ |
| 3" | 1/4" | 3/8" | 1 1/2" |


*Typical GP/XP/XR Series Fan operational flow rate is 25 - 90 CFM. (For more precision, determine flow rate by using the chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.




The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

## 1.7 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50006-1) or audible alarm (P/N 28001-2) is required to notify the occupants of a fan system malfunction. A System Label (P/N 15022) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.

1.8 ELECTRICAL WIRING

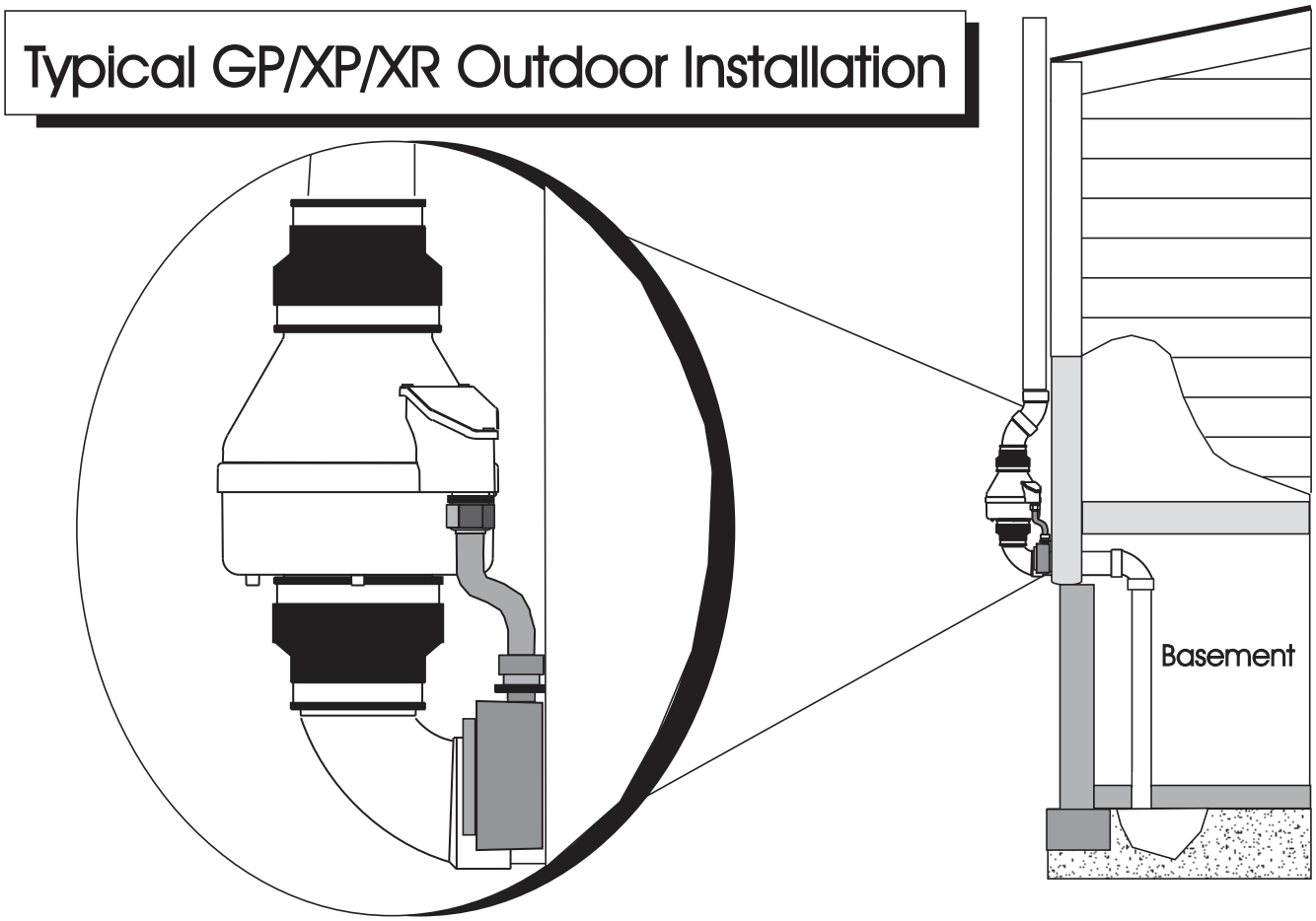
The GP/XP/XR Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The GP/XP/XR Series Fans are rated for use with electronic speed controls, however, they are generally not recommended. If used, the speed control recommended is Pass & Seymour Solid State Speed Control Cat. No. 94601-I.

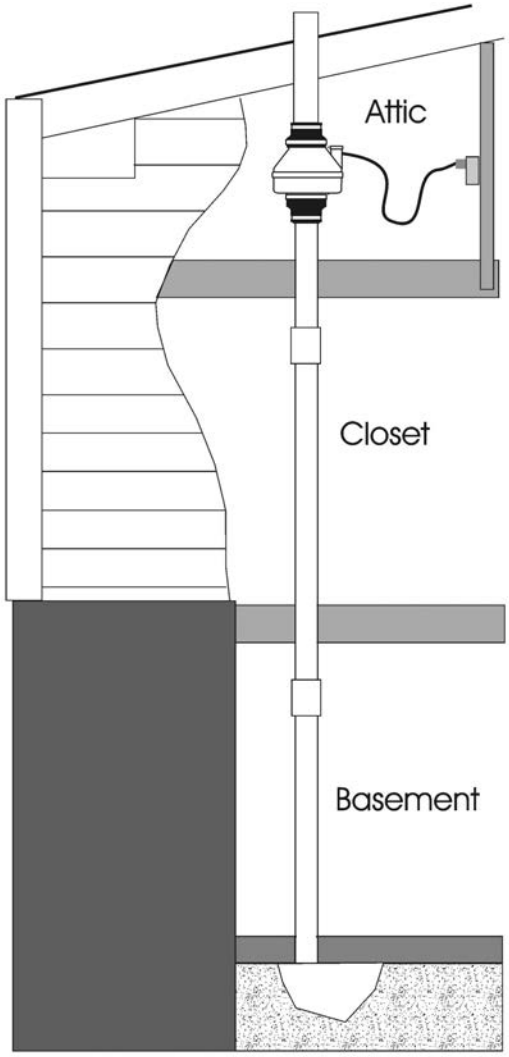
2.0 INSTALLATION

The GP/XP/XR Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The GP/XP/XR Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the GP/XP/XR Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.




2.2 MOUNTING BRACKET (optional)

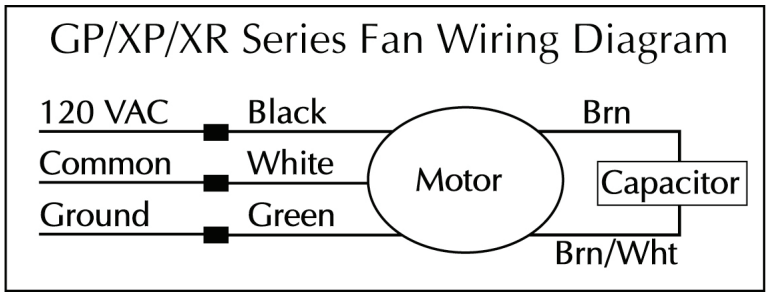
The GP/XP/XR Series Fan may be optionally secured with the integral mounting bracket on the GP Series fan or with RadonAway P/N 25007-2 mounting bracket for an XP/XR Series Fan. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.8):




2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS AND ANNUAL SYSTEM MAINTENANCE

_____ **Verify** all connections are tight and **leak-free**.

_____ **Insure** the GP/XP/XR Series Fan and all ducting is secure and vibration-free.

_____ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

*(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)*
*(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)*
*See Product Specifications. If this is exceeded, increase the number of suction points.*

_____ **Verify Radon levels by testing to EPA protocol.**

# XP/XR SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the XP & XR Series Fan:

| Typical CFM Vs Static Suction "WC | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0" | .25" | .5" | .75" | 1.0" | 1.25" | 1.5" | 1.75" | 2.0" |
| XP101 | 125 | 118 | 90 | 56 | 5 | - | - | - | - |
| XP151 | 180 | 162 | 140 | 117 | 78 | 46 | 10 | - | - |
| XP201 | 150 | 130 | 110 | 93 | 74 | 57 | 38 | 20 | - |
| XR261 | 250 | 215 | 185 | 150 | 115 | 80 | 50 | 20 | - |

| Maximum Recommended Operating Pressure* | | |
|---|---|---|
| XP101 | 0.9" W.C. | (Sea Level Operation)** |
| XP151 | 1.3" W.C. | (Sea Level Operation)** |
| XP201 | 1.7" W.C. | (Sea Level Operation)** |
| XR261 | 1.6" W.C. | (Sea Level Operation)** |

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

| Power Consumption @ 120 VAC | |
|---|---|
| XP101 | 40 - 49 watts |
| XP151 | 45 - 60 watts |
| XP201 | 45 - 66 watts |
| XR261 | 65 - 105 watts |

**XP Series Inlet/Outlet**: 4.5" OD (4.0" PVC Sched 40 size compatible)
**XR Series Inlet/Outlet**: 5.875" OD
**Mounting**: Mount on the duct pipe or with optional mounting bracket.
**Recommended ducting**: 3" or 4" Schedule 20/40 PVC Pipe
**Storage temperature range**: 32 - 100 degrees F.
**Normal operating temperature range:** -20 - 120 degrees F.
**Maximum inlet air temperature:** 80 degrees F.
**Size**: 9.5H" x 8.5" Dia.
**Weight**: 6 lbs. (XR261 - 7 lbs)

**Continuous Duty**
**Thermally Protected**
**Class B Insulation**
**3000 RPM**
**Rated for Indoor or Outdoor Use**

LISTED Electric Fan ETL® 77728 Tested to UL Std. 507

# GP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the GP Series Fan:

| Typical CFM Vs Static Suction "WC | 1.0" | 1.5" | 2.0" | 2.5" | 3.0" | 3.5" | 4.0" |
|---|---|---|---|---|---|---|---|
| GP501 | 95 | 87 | 80 | 70 | 57 | 30 | 5 |
| GP401 | 93 | 82 | 60 | 38 | 12 | - | - |
| GP301 | 92 | 77 | 45 | 10 | - | - | - |
| GP201 | 82 | 58 | 5 | - | - | - | - |

| Maximum Recommended Operating Pressure* | | |
|---|---|---|
| GP501 | 3.8" W.C. | (Sea Level Operation)** |
| GP401 | 3.0" W.C. | (Sea Level Operation)** |
| GP301 | 2.4" W.C. | (Sea Level Operation)** |
| GP201 | 1.8" W.C. | (Sea Level Operation)** |

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

| Power Consumption @ 120 VAC | |
|---|---|
| GP501 | 70 - 140 watts |
| GP401 | 60 - 110 watts |
| GP301 | 55 - 90 watts |
| GP201 | 40 - 60 watts |

**Inlet/Outlet**: 3.5" OD (3.0" PVC Sched 40 size compatible)

**Mounting**: Fan may be mounted on the duct pipe or with integral flanges.

**Weight**: 12 lbs.

**Size**: 13H" x 12.5" x 12.5"

**Recommended ducting**: 3″ or 4" Schedule 20/40 PVC Pipe

**Storage temperature range**: 32 - 100 degrees F.

**Normal operating temperature range:** -20 - 120 degrees F.

**Maximum inlet air temperature:** 80 degrees F.

**Continuous Duty**
**Class B Insulation**
**3000 RPM**
**Thermally Protected**
**Rated for Indoor or Outdoor Use**

LISTED Electric Fan ETL® 77728 Tested to UL Std. 507

**Attachment 6 cont d**
**Fan Warranty**
**IMPORTANT INSTRUCTIONS TO INSTALLER**

Inspect the GPx01/XP/XR Series Fan for shipping damage within 15 days of receipt. Notify RadonAway of any damages immediately. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

**Install the GPx01/XP/XR Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.**

**Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.**

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPx01/XP/XR Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

**EXCEPT AS STATED ABOVE, THE GPx01/XP/XR SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.**

**For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.**

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

**2 P501**

**2262 & 2248 S.108th St.**
**West Allis, WI.**

**Record the following information for your records:**

Serial No. **2262 170417 2248 170418**
Purchase Date **2262 9 8 15 2248 - 9 10 15**

## Appendix C

SSDS System Operation, Maintenance, and Monitoring Procedures and Forms

# Vapor Mitigation System Operation and Maintenance

Routine inspections should be performed to verify that the vapor mitigation system components are operating properly. Although complete inspections including collecting a basement sump sample and calculating annual sump volume discharge on an annual basis, more frequent simple inspections should be performed from time to time and include the following procedures:

- Observe the u-tube manometers attached to the riser pipes of the vapor extraction points. Even liquid levels, or nearly even liquid levels indicate that there is a problem with system piping or fan operation.
- Observe the mitigation fan and note any abnormal sounds or noises coming from the fan including buzzing, scraping, rattling, etc. If any abnormal noises or sounds are audible, contact a local radon mitigation contractor who can determine the problem.
- The mitigation fan is factory sealed and designed to be maintenance free for the life of the fan. Should the fan's casing be opened or the factory seal broken, any service warranty may be voided. Factory maintenance documentation has been provided in **Appendix B** of this Operation and Maintenance Plan with recommended schedule for maintenance of the fan, if required.
- Inspect the PVC piping of the system for damage or cracks. If any damage occurs to the PVC piping, contact a local radon mitigation contractor to perform repairs. Piping supports and hangers should also be inspected for wear and integrity.
- Effective operation of the sub-slab depressurization system is dependent on the integrity of the basement floor slab to ensure that short circuiting of air does not decrease system effectiveness. Inspect the basement floor slab and caulk shut any openings/cracks in the floor slab should they occur.
- A sample recording log is attached that should be used to record inspections.

**VAPOR MITIGATION SYSTEM INSPECTION AND MAINTENANCE LOG**
**2248 SOUTH 108TH STREET, WEST ALLIS, WISCONSIN**

| SYSTEM COMPONENT | | | | | | ANNUAL INSEPECTION | |
|---|---|---|---|---|---|---|---|
| **NAME** | **PHOTO** | **FUNCTION** | **CHECK** | **NORMAL OBSERVATION** | **POSSIBLE REPAIR** | **DATE** | **NOTES / REPAIR COMPLETED** |
| Fan |  | Fan creates a vacuum and lowers pressure below foundation.<br><br>The fan also removes soil gasses from below foundation for discharge to atmosphere. | Fan Operation<br>Fan Location<br>Motor Noise | Fan is on<br>Fan mounted outside and secure<br><br>Fan motor is quiet (loud motor may indicate a problem) | Fan may need to be replaced every 15 to 20 years.<br>Replacement fan to have similar specifications as original with respect to flow and vacuum.<br>**Fan Type = RadonAway GP501** | | |
| Suction Point with Vent Pipe |  | Suction Point : Soil gases are collected in a pit below the foundation, and tight seal prevents soil gas from entering the building.<br><br>Vent Pipe: Pipe conveys the vacuum from the fan, and collects soil gases for discharge to the atmosphere. | Suction Point Seal<br>Vent Pipe Condition | Seal is air tight around pipe penetration.<br><br>Vent pipe is connected to fan and has not cracked. | Suction point seal or vent pipe may need to be replaced in cracks or leaks appear.<br><br>Have professional test pressures if pipes are modified or cracks appear. | | |
| Manometer or Differential Pressure Gauge |  | Measures differential pressure between vacuum side of vent pipe and indoor space.<br><br>This measurement confirms the fan is creating a vacuum. | Liquid Level in Manometer | Liquid level in manometer is between 1 and 3 in $H_20$ | A change in liquid level indicates a change in the vacuum below the foundation. This could be caused by fan failure, vent pipe blockage, shallow water below foundation, or other conditions.<br>Troubleshoot or hire professional to identify the cause and repair if needed. | | |
| Outdoor Vent Pipe |  | Pipe carries soil gas outside and vents it to the atmosphere. | Vent Pipe Condition<br>Vent Pipe Location | Vent pipe remains connected to fan.<br>End of pipe free from obstructions.<br>The exhaust is more than 15 feet from windows and air intakes. | Vent pipe may require replacement, or cleaning to remove ice or debris.<br><br>Have professional test pressures if pipes are modified or cracks appear. | | |
| Foundation Floor |  | Foundation is a barrier that minimizes soil gas entry into building. | Foundation Condition<br>Foundation Footprint | No penetrating cracks or holes in foundation.<br><br>No alterations or additions to building foundation. | Seal cracks or other penetrations as you would to prevent water from entering.<br>If building floor plan has changed, contact a professional contractor or WDNR to evaluate if modifications to the mitigation system are necessary. | | |
| Sealed Sump |  | Sump Cover: Vapor is collected in sump and cover prevents vapor from getting inside building. | Sump Cover Seal | Sump seal is air tight around edge and at pipe penetrations. | Sump cover may need to be re-sealed or replaced if cracks or leaks appear, or if the sump pump needs to be maintained. | | |
| Vapor Pin |  | This is a sample port to measure vacuum or collect soil gas sample(s) if needed. | Pin Seal/Cap<br>Pin Condition | Pin is sealed and capped when not in use.<br>A manometer can be connected to the vapor pin to check sub-slab vacuum (not required). Vac should be less than -0.004 in $H_20$. | Repair or replace the seal and cover as needed.<br><br>Permanently seal hole if vapor pin is ever removed. | | |