Comment Response Summary to RR Program Guidance, RR-042 and RR-5474, Vapor Intrusion Continuing Obligations

Based on the 28 day public comment period held between May 15 and June 12, 2015

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July 2015

Thank you to the individuals who provided feedback on the Department of Natural Resources (DNR or Department) proposed guidance documents:

- RR-042, DNR Case Closure Obligations: Vapor Intrusion
- RR-5474, Vapor Intrusion Continuing Obligations Applied in DNR Closure Approvals

The following summarizes the comments received and the response to comments. Changes made to the documents are noted under the column **Revisions to Guidance Document**. Revisions apply to both documents unless specifically noted. Copies of the comments are attached following the comment response summary. Comments were received from We Energies and EnviroForensics.

We Energies comments:

#	Summary of Comment	Response to Comment	Revisions to Guidance Document
1	Guidance may impose obligations on We Energies	The guidance explains and tries to set consistent expectations for determining when continuing obligations are necessary as set out in NR 726.15 (2)(h) through (L) of Wisconsin Administrative Code. Continuing obligations are imposed through the authority of administrative code to ensure that public health is protected at properties where residual contamination remains at the time of site closure.	
2	This guidance should be considered in light of the U.S. EPA vapor intrusion guidance issued on June 11, 2015.	The DNR documents provide guidance on specific portions of Wisconsin Administrative code related to closure of contaminated sites where vapor intrusion	

		may be a risk post-closure. The DNR guidance reflects current processes used by the Department in applying continuing obligations at sites requesting closure. The U.S. EPA guidance provides recommendations for addressing the risk of vapor intrusion at contaminated properties under the federal authorities of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the corrective action provisions of the Resource Conservation and Recovery Act (RCRA) and EPA's brownfield grantees. The EPA guidance is "is not intended to alter existing requirements, guidance, or practices" (p. xiii).	
3	The guidance is highly proscriptive in terms of conditions that "trigger" the application of VI continuing obligations	Additional language has been added throughout the guidance to emphasize that site-specific conditions and professional judgment are the controlling factors for determining when a conditional obligation is applied to a contaminated property. In addition, a new paragraph has been added to Sec. V.A. in both guidance documents. The guidance specifically states that site-specific conditions, including geology, soil moisture, air permeability of soils, groundwater concentrations, etc., must be considered in assessing whether VI may present a risk in the future at a particular site.	**Sec. V.A. (RR-042)** Site specific conditions and professional judgment will determine whether a continuing obligation for future vapor risk is selected for a property. Submit data and include a specific discussion of the potential for future vapor risk, particularly if the conditions discussed below are present at a property. Data from multiple-lines of evidence can be used to establish the magnitude (high to low) for risk of vapor intrusion to future buildings. **Sec. V.A (RR-5474)** Site specific conditions and professional judgment will

			determine whether a continuing obligation for future vapor risk is selected for a property. If the conditions discussed below are present at a property and an RP feels a CO for future vapor risk should NOT be applied, the RP/consultant should submit data and include a specific discussion of the potential for future vapor risk. That data may include multiple-lines of evidence to establish the magnitude (high to low) for risk of vapor intrusion to future buildings.
4	The guidance is broad in describing "any building" and "anywhere on the property"	The phrase has been modified to include, "near any location where a building can be placed on the property". The Department rarely knows where on a contaminated property development will take place prior to closure. The continuing obligation is applied assuming development can take place anywhere on the property. Once specific plans are available, the continuing obligation allows the owner/developer to determine that a vapor risk does NOT exist based on location of the building relative to the residual contamination. The continuing obligation for future VI risk acts as a "place holder" to ensure that developers take into consideration the risk of VI when constructing new buildings.	**Sec. V. B.4.b.i.** *Petroleum NAPL* exists near any location where a building can be placed on the property (including the "smear zone").

5	Include some guidance that a CO can be removed from the GIS based upon demonstrated improvements in site conditions	The guidance has been revised to add a reference to NR 727.09(4), Removal from the department database and NR 727.09(5), Modification of the department database.	**Introduction (RR-042 only)** Section NR 727.09(4) and (5), Wis. Adm. Code, set out criteria for removal or modification of continuing obligations when all applicable standards have been met and all requirements imposed have been satisfied or nullified.
6	Marginal concentrations of PVOCs and VI COs	One of the intents of the RR-042 and RR-5474 is to avoid placing continuing obligations on properties with low level or "marginal" PVOC contamination. This is why non-aqueous phase liquid (NAPL) levels are referred to in the guidance. Even in cases with levels exceeding NAPL concentration, future buildings placed 15 feet or more from the contamination will not require vapor control technologies. The Department intends to revise RR-800, Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin, to reflect the distances to be considered in vapor risk assessment of petroleum contaminants.	
7	Guidance should acknowledge that new building designs and operations are adequate to address VI	The guidance documents are revised to reflect that building designs, other than sub-slab vapor control systems, can be effective in controlling vapor intrusion.	**Sec. V.A. (RR-042)** Where this continuing obligation is required, the Department expects that vapor control technologies will be designed into the new building prior to construction unless the risk of vapor intrusion is assessed and the Department agrees that vapor control technologies are not

			needed. When this continuing obligation is imposed, the Department will usually expect that the VMS will be designed and installed at future buildings. Regardless of the approach to vapor intrusion control, information must be provided showing the risk of vapor intrusion has been addressed through the proposed building design, in accordance with NR 727.07(6), Wis. Adm. Code. **Sec. V.A. (RR-5474)** Redevelopment of contaminated properties requires that vapor control technologies be designed into the building prior to construction unless the risk of vapor intrusion is assessed and the department agrees that vapor control technologies are not needed. Regardless of the approach to vapor intrusion control, information must be provided showing the risk of vapor intrusion has been addressed through the proposed building design, in accordance with NR 727.07(6), Wis. Adm. Code.

8	Use the term “flag” instead of “trigger”	“Considerations” replaces trigger in addition to minor wording revisions throughout the documents.	The term “**considerations**” replaces “triggers” throughout the documents
9	Formal definitions of VAL, VRSL	A footnote has been added to refer to the definitions for VAL and VRSL in NR 700.03.	**Sec. I.A. (RR-042 only)** Footnote #1: Vapor risk screening level is defined in NR 700.03(66w). The VRSL is the vapor action level divided by the appropriate attenuation factor. The vapor action level is defined in NR 700.03(66p). The vapor action level is the concentration of a contaminant in indoor air at or above the 1-in-100,000 excess lifetime cancer risk or at or above a hazard index of 1 for non-carcinogens.
10	Multiple guidance documents	While there are multiple DNR guidance documents, they are intended to work together. The Department has chosen not to create one, very long document. Document RR-800, Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin, is the primary VI guidance. Documents RR-042 and RR-5474 provide detailed information on continuing obligations that is not contained in RR-800.	
11	Section 1, Revise first paragraph in Section 1A to read: “ . . .and the **completed** vapor **exposure** pathway has been interrupted or mitigated.”	The text has been revised to include the word “exposure”. Significantly more monitoring cost and time would be incurred by Responsible Parties in order to establish that a “completed” pathway exists. Requiring proof of a completed VI pathway results in allowing building occupants to be exposed to	**Sec. 1.A.** “. . .and the vapor **exposure** pathway has been interrupted or mitigated.”

		contaminants. The Department's goal is to protect occupants from vapor migration into buildings at the point that contaminants (in the form of vapors) have migrated to the building foundation, but not necessarily entered the building.	
12	Is it necessary to require COs on a GIS for marginal cases with precautionary interim VMS?	A continuing obligation is NOT required if a VMS is NOT necessary to interrupt the vapor migration pathway. If the system is installed and subsequent remedial action removes the vapor risk, then the Department will not require a CO on the property. The RP must show that the VMS is no longer necessary prior to the closure request. The Department expects to prepare guidance on the steps necessary to show that a VMS is not needed after one has been installed. At minimum, the VMS would need to be turned off, allowing equilibration of the sub-slab vapors, and seasonal (including winter season) sub-slab vapor testing (indoor air and other sampling may also be needed) in order to establish that vapors no longer present a risk to the building occupants. RR-042 and RR-5474 address the situations where VMS are required post-closure. These documents are not technical documents. They do not address site investigation, remediation, operation, maintenance and monitoring, testing of VMS, or any other aspect of vapor intrusion besides continuing obligations applied at the time closure is requested.	
13	Revise the second paragraph of Section 1A: "Option 7A is applied to ~~any~~ buildings where sub-slab vapor risk screening levels (VRSL) are exceeded and **the certifying professional deems that a long-term ~~an~~** engineered vapor mitigation	The word "any" has been removed from the sentence. The Department has established criteria to determine when contaminated vapors present a risk	**Sec.1.A (RR-5474 only)** "Option 7A is applied to buildings where sub-slab vapor risk screening levels . . ."

	system (VMS) is needed to protect occupants."	to building occupants. Professional engineering consultants usually collect groundwater, soil gas, sub-slab vapor, and indoor air samples and make recommendations on the need for mitigation systems, using the criteria established by the Department. If cleanup has effectively removed the threat of vapor migration, then the professional engineering consultant can collect data (see the discussion above) and present that information to the Department. If a VMS is not needed to protect the VI pathway, a continuing obligation will not be imposed on the property.	
14	Section 1A fails to mention the operation of ventilated underground or first floor parking garages as effective VMS. Suggest the addition of ventilated, unoccupied parking garages and other engineered VMS.	The documents have been revised to reflect that properly ventilated underground and first floor parking garages as well as other engineered systems that protect building occupants can be used to protect the vapor pathway. In the case where these systems are necessary to protect the VI pathway, a continuing obligation under NR 726.15(2)(h) will be imposed on the property.	**Section 1.A.** 6. *Ventilated unoccupied parking garages*. Underground or first floor parking garages that meet the building codes and separate the occupied floor levels from the ground surface may be used to control vapor migration into the occupied space above. 7. *Other engineered VMS.* Any other engineered system, which may include building design, operations and existing engineering controls or HVAC systems that can be shown to protect the building occupants from vapor intrusion.
15	Section III – Delete entire closure letter condition #3 (compounds of concern are being used at a site	NR 726.15(2)(i), WI Adm. Code, specifically addresses vapor risk at sites where compounds of	

	or facility)	concern are in use. "Compound of concern" does not include documentation of every chemical currently in use in the building. This provision focuses only on the chemical(s) that is of concern for vapor intrusion at that building. For example, the use of perchloroethylene at a dry cleaner establishment. Even though dry cleaners may use many other chemicals, only the use or storage of perchloroethylene is of interest for this continuing obligation.	
16	Section V. B (1) Discussion notes: 1) sub-slab sampling not always needed; 2) When is VMS needed? 3) Depth and nature of phase separated NAPL; 4) allowance for professional judgment	The items included in this discussion are beyond the scope these two guidance documents. The Department will be revising RR-800, Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin, in the near future. The NR 700 Technical Advisory Group will serve as an external advisory group to provide input for the revisions of RR-800. We Energies Corp. participates in that group and will have input to the topics addressed in the revision.	
17	Section V. B (1) Add "However, professional judgment should be used to determine when site-specific conditions require the application of Option 7E.	See response to comment #3 above. In addition, "professional judgment" has been added in other sections of the guidance.	**Introduction (RR-5474)** All decisions for applying continuing obligations are made on a site-by-site basis using professional judgment. **Sec. V.B.4 (RR-5474)** The following situations should be considered when selecting a continuing obligation for future exposure to vapors. Decisions to apply Option 7E are based on site-specific conditions and

			professional judgment. **Sec. V.B.4 (RR-042)** Site specific conditions and professional judgment will determine the potential for a risk of vapor intrusion to future buildings
18	Section V. B (3) Revision: "Calculated groundwater VRSLs should not be used to rule out vapor intrusion at future development sites but **may be used for selection and design of a VMS**."	When a continuing obligation is placed on a property under the authority of NR 726.15(2)(L), Wis. Adm. Code, design of a future building must include vapor controls UNLESS data is provided to the Department that shows vapor control technology is NOT necessary. If a VMS is designed into the new building, no additional environmental data is necessary. That is, a property owner is not obligated to collect groundwater, soil gas, or any other data post-closure in order to select and design a VMS into the new building.	
19	Section V. B (4)(b) Restrict continuing obligation to the developable area of the property to acknowledge that not all areas are **developable** due to setbacks, easements, wetlands, etc.	See response to comment #4 above. Guidance has been changed to acknowledge the restriction applies to locations where buildings can be placed on the property. Because development plans are rarely known at the time of closure, it is difficult for the Department to specify which areas of a contaminated property will be "developable" and which are not, particularly as this relates to setbacks, easements, etc. At the time of development, an evaluation of the need for vapor mitigation measures should be conducted for new buildings based on where the building is placed with respect to the residual contamination.	See #4 above for revised text.
20	Section V. B(4)(b) Basis for the indicators of	The indicators of NAPL are based on the ITRC	

	petroleum NAPL should be clearly presented and discussed. Decisions on the need for VI related CO should be made on a case-specific basis.	petroleum vapor intrusion guidance, which is referenced in the guidance documents. The discussion of the basis for NAPL is beyond the scope of this guidance. The guidance repeatedly states that professional judgment and site-specific circumstances must be taken into account prior to deciding which conditional obligations apply at a property with residual contamination remaining at the time of closure. The ITRC exclusion distance between a building and NAPL is 15 feet. When RR-800 is revised, set back distances in the ITRC document will be incorporated into RR-800. For petroleum contaminants, a building separation distance of only 15 feet from residual concentrations exceeding petroleum NAPL will avoid the need to install a vapor mitigation system. For significant petroleum concentrations that are less than NAPL concentrations, as little as 5 feet of separation is needed to avoid installation of a vapor control system at a new building.	
21	Guidance may result in complications and delays in sales and redevelopment of remediated brownfields or former industrial properties. Request an advisory group to more thoroughly discuss concerns.	The guidance documents reflect the approach the Department currently takes to imposing continuing obligations at properties with residual contamination. Generally, site closures have encouraged sales and redevelopment of properties. We have no reason to believe that continuing our current course will affect property redevelopment or sales. The guidance is intended to reduce the number of properties with petroleum contamination that receive continuing obligations due to future vapor risk. The NR 700 Technical Advisory group will help with	

		revisions to the Department's main vapor intrusion guidance. We Energies is part of that advisory group.	

EnviroForensics comments:

22	Clarify fees due for post-closure review/approval of O&M submittals or change in status requests for continuing obligations in any form.	In accordance with NR 749, Table 1, (d) 5, post-closure modification fees are equal to closure fees ($1050) plus applicable GIS fees ($300 or $350).	
23	RR-042, Section 1.B.2. Detailed guidance on operation & maintenance of vapor mitigation systems would be helpful in addition to this guidance.	The Department plans to write a guidance document addressing operation, maintenance and monitoring of vapor mitigation systems in the near future.	
24	RR-042, Section III. A VMS may not be necessary at a commercial property where compounds of concern are used (e.g., at dry cleaners). Closure may be protective at these properties by notifying DNR when land uses changes and re-evaluating the vapor pathway at that time.	Section III quotes NR 726.15(2)(i), WI Adm. Code: "The agency may require installation and operation of a vapor mitigation system for sites or facilities where the site is using the compounds of concern in their daily operations". An environmental consultant or RP can discuss with the Department the benefits and drawbacks of installing a VMS at an active dry cleaner and a site-specific decision can be made to not install a system while dry cleaning active operations are on-going. However, there are good reasons for installing systems even when a dry cleaner is operating. For instance, a large percentage of dry cleaners are located in strip malls. A VMS can restrict the migration of sub-slab vapors to adjacent bays in those settings.	
25	RR-042, Section IV. A. Regardless of sub-slab concentrations, if post VMS installation verification indoor air sample results at a commercial/industrial property are below the residential VAL, then a property use restriction should not be needed in addition to the VMS restriction.	Indoor air sampling is not necessarily conducted at commercial/industrial properties. Conducting indoor air testing at commercial/industrial facilities is a site-specific decision. However, the Department's vapor intrusion guidance, RR-800, Addressing Vapor Intrusion at Remediation &	

		Redevelopment Sites in Wisconsin, strongly recommends indoor air samples be collected at residential settings. It is likely that a commercial/industrial building would be significantly remodeled prior to residential use. Remodeling could significantly change air exchange rates, routes for vapor intrusion, etc. Testing of indoor air within the commercial/industrial building may or may not be reflective of indoor air quality within the remodeled, residential space. The continuing obligation requires that the Department be notified of the change in use – at that point, decisions can be made regarding indoor air testing given the new configuration of the building and the building use.	
26	RR-042, Section V. Use of Enforcement Standard (ES) is overly conservative and may impose unnecessary costs onto the RP and/or property owners by requiring a VMS in new construction where it may not be needed. Better to use multiple lines of evidence as a way to confidently rule out potential VI at undeveloped properties.	See response to comment #3. The guidance has been revised to add more emphasis to the role of site-specific conditions and the use of professional judgment to determine whether a risk of vapor intrusion exists for a future building. The guidance has been revised to state that the RP can provide data <u>prior to closure</u> to show that vapor risk is low for future buildings constructed on the property and therefore this continuing obligation is not needed. The Department agrees that multiple lines of evidence (groundwater concentrations, soil gas samples, flux chambers, etc.) can provide a basis to determine that a future risk of vapor intrusion is low. A Responsible Party should provide the necessary data and explanation to demonstrate that	

		the continuing obligation regarding future vapor risk does not apply. Even when the continuing obligation for a future vapor risk is applied, the guidance states: "Where this continuing obligation is required, the Department expects that vapor control technologies will be designed into the new building prior to construction unless the risk of vapor intrusion is assessed and the Department agrees that vapor control technologies are not needed." Therefore, the imposition of this CO does not mean that vapor mitigation technologies must be used at new construction. The owner/developer can show that vapors will not be a risk due to building design, geologic conditions, placement of the building relative to the residual contamination, etc.	

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June 12, 2015

Submitted Electronically
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Subject: **Comments on Draft "*Vapor Intrusion Continuing Obligations Applied in DNR Closure Approvals (RR-5474)*" and Draft *"Case Closure Continuing Obligations: Vapor Intrusion (RR-042)."***

Dear Ms. Evanson:

Wisconsin Electric Power Company and Wisconsin Gas LLC (d.b.a. We Energies) are pleased to submit for Wisconsin Department of Natural Resources (WDNR) consideration the following comments on the two above-referenced draft guidance documents (Guidance). We appreciate WDNR's ongoing efforts to solicit and incorporate feedback from interested parties on this issue.

We Energies is an investor-owned electric and gas utility that serves more than 1.1 million electric customers in Wisconsin and Michigan's Upper Peninsula and 1.1 million natural gas customers in Wisconsin. We Energies has 27 generating facilities, 353 electric substations, 25 service centers, about 46,000 miles of electric distribution lines and 21,000 miles of gas main, some of which may be subject to this Guidance. We Energies has open cases in the DNR's Bureau for Remediation and Redevelopment Tracking System (BRRTS) from current operations and from predecessor operations dating back to the late 1800's, and many of these cases will likely require continuing obligations for closure. Many of these BRRTS sites are large MGP sites that have multiple parcels and property owners. Some of these sites are in densely populated areas, and consequently, the sites have numerous adjacent off-site property owners. The proposed Guidance may impose obligations on We Energies regarding closure of these cases and create additional continuing obligations for potentially dozens of adjacent or affected property owners.

We Energies is involved with the WDNR's External Advisory Groups established for both the draft Soils Management and Sediment Assessment Guidance documents, and we have also actively participated in the Brownfield Study Group (BSG) since its establishment. Due to the complexity of the proposed Guidance, and EPA issuance of related guidance just yesterday, we request more thorough discussion and revision of the proposed Guidance through either the BSG or a new External Advisory Group. We believe that this is important in order to create clear and consistent direction for encouraging, and ultimately accomplishing statewide remediation actions.

General Comments

We understand that vapor intrusion (VI) is an important pathway that must be addressed for closing sites that are impacted by volatile constituents of concern. We recognize that there are numerous ways to assess the risk of VI and there are numerous means to mitigate the risk though engineered controls, vapor mitigation systems (VMS), and institutional controls. The Guidance recognizes some of these controls but does not offer the option for other engineered controls or other natural mitigating factors that may be present at the site.

In general, the draft guidance appears to be highly prescriptive in terms of the conditions that "trigger" the application of VI continuing obligations (COs). In our experience, the closure letters for GIS registry cases already appear alarming and are of great concern for many on-site and off-site property owners and lenders, especially those having limited experience with environmental issues or redevelopment of impacted brownfield parcels. In these cases, numerous requirements for materials handling and cap maintenance plans are already imposed. We also have concerns with areas of the Guidance that are very broad with terms such as "any building" and "anywhere on the property."

We appreciate WDNR's efforts to standardize these letters. The legacy of these closure letters can be decades, and if not properly crafted, may adversely stigmatize a property. The closure letters should have a statement that provides some guidance to the property owner that the CO can be removed from the GIS based upon demonstrated improvements to site conditions. Particularly for cases where VI related COs are imposed due to dissolved phase PVOC residual in surficial groundwater, it is recognized that natural attenuation and degradation processes will serve to reduce the mass of source material and attendant soil vapor concentrations over time. If a property owner can demonstrate that residual dissolved phase concentrations of PVOCs and/or soil vapor concentrations have declined to acceptable levels, the Guidance should make it clear that VI related COs can be rescinded for the property.

We suggest that the Guidance be modified to state that the closure letters with VI related COs include the following note:

> "The continuing obligations for vapor intrusion can be rescinded if the property owner can demonstrate that residual dissolved phase concentrations of PVOCs and/or soil vapor concentrations have declined to acceptable levels."

Indoor air quality is a concern for any occupied space, not just from vapor intrusion from releases to soil and groundwater, but from other sources that include off-gassing of building products, parking garages, household products, cooking, occupant respiration, pet dander, mold and pollen, and natural sources of methane and radon gas. Concerns of these sources should trump marginal concentrations of petroleum based VOCs. Recent building codes, builders and architects recognize these common sources of impaired air quality and require outdoor makeup air and greater air exchanges. Rather than the responsible party (RP) incurring additional costs for installing and operating a dedicated, separate VMS, the Guidance should acknowledge that in some cases that new building designs and operations are adequate to address VI provided it can be demonstrated by a certifying professional.

The term "trigger" is problematic. While it is stated that the Guidance is intended to only provide recommendations, we are concerned that in practice, it will become de facto regulation and be applied with little discretion, particularly by regional project managers (RPM) who may have less experience with decision-making for large and complex sites. In that light, we request that the WDNR consider an alternative term to "trigger" when describing conditions that may necessitate added COs. "Trigger" implies a very clear "if – then" situation which is the opposite of the stated intent in the Guidance introduction that "…all decisions for applying continuing obligations are made on a site-by-site basis." In lieu of the term "trigger," we suggest using the term "flag" throughout the documents.

It would be helpful to present in the introductory section of page 1 the formal definitions of "vapor action level (VAL)" and "vapor risk screening level (VRSL)", and reference the WDNR PUB-RR-800 *Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin.* We assume that a constituent-specific VAL is the lesser of the indoor air concentration equal to a lifetime incremental cancer risk (LICR) of 10^{-5} or a hazard index (HI) of 1.0 as presented in the USEPA Regional Screening Level (RSL) web calculator for "worker ambient air" or "resident ambient air." Likewise, we assume that a VRSL is the VAL divided by the applicable attenuation factor (AF). This information should be a footnote in Section V.

We appreciate the WDNR's agreement to extend the comment deadline, however this guidance warrants a longer comment period than what was given, even with the one-week extension. This is especially true in light of yesterday's EPA issuance of its Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. We Energies and other stakeholders have yet to even assess how the Guidance aligns with the EPA Technical Guide. See the following link to the new Technical Guide:
http://www.epa.gov/oswer/vaporintrusion/

With the release of this Guidance, WDNR will now have at least five SVI-related guidance documents in the public domain. These are in addition to nine VI related guidance documents published by USEPA and the three VI related guidance documents published by ITRC. Any one or all of these documents could potentially be applicable and presumably relied upon by responsible parties (RPs), consultants and regulatory agencies in arriving at technical and management decisions at remediation sites in Wisconsin where VI is a potential issue of concern. It would be helpful for the Department to characterize how this growing library of information and guidance is to be applied and reconciled, and which document(s) would take precedence in the event that there is inconsistent and/or contradictory information presented that may apply to a specific case or situation.

Vapor intrusion is a complex issue with widespread ramifications. We wish to provide extensive comments but due to the short allotted time we can only provide the following limited comments. As the language and content of both documents are so similar, we will confine our section-specific comments presented below to the RR-5474 document with the understanding that the same remarks would apply to the corresponding sections of both documents. Suggested revisions to the Guidance are noted in bold/underlined for additions and bold/strikeout for deletions.

Section I

Revise the first paragraph Section 1A to read as:

"... and the **completed** vapor **exposure** pathway has been interrupted or mitigated."

The broad phrase in Section 1A stating "...any building where sub-slab vapor risk screening levels (VRSL) are exceeded" seems to suggest that COs would be required even in cases of marginal concentrations of PVOCs that will degrade over time. It is our understanding that Option 7A is only imposed if the VRSL is exceeded *and* a certifying professional recommended that a VMS "...is *needed* to protect occupants." The imposition of a CO should not be based solely on an exceedance of a VRSL or the mere presence of a VMS, or at the sole discretion of the RPM. There are cases where the responsible party (RP) installs a VMS as an added precaution for an interim period while the marginal concentrations of PVOCs dissipate or there are other mitigating factors. Is it really necessary to require COs on a GIS for marginal cases with precautionary interim VMS? In the cases of marginal concentrations exceeding action levels or mitigating factors, we understand that a certifying professional may opt not to check off box 5 (ix) on Case Closure Form 4400-202 if they deem that a VMS is not required and they provide acceptable rationale in Section 4(M) on the closure form.

We suggest the following revisions to the second paragraph of Section 1A:

"Option 7A is applied to ~~any~~ buildings where sub-slab vapor risk screening levels (VRSL) are exceeded and **the certifying professional deems that a long-term** ~~an~~ engineered vapor mitigation system (VMS) is needed to protect occupants."

The five VMS examples described in this Section 1A fail to mention the existence and operation of ventilation systems for facilities with underground or first floor parking garages. Parking garages below occupied spaces are a very common feature for urban locations and new residential construction at brownfield sites. Recent building code revisions require a greater volume of air exchange for these facilities. Properly designed and operated, these systems would be fully protective of VMS (as well as any other petroleum VOCs associated with motor vehicle exhaust). Any vapor concentrations that could accumulate due to slab infiltration would be eliminated by the typical ventilation system which cycles for carbon monoxide levels that are a small fraction of the OSHA Permissible Exposure Limits (PEL). It would be helpful if the Guidance acknowledged that proper ventilation of underground parking structures can be an effective VMS.

Additionally, this Section should include "Other Engineered VMS and Institutional Controls" that may be suitable to address marginal concentrations of PVOCs. Examples would include durable vapor barriers, a post-tensioned concrete floor with sealed joints, raised building pads or changing grades around the building, or simply sealing and ventilating sump crocks.

We suggest the following additions to the second paragraph of Section 1A:

"6. *Ventilated Unoccupied Parking Garages* that meet the building codes and separate the occupied floor levels from the ground surface."

"7. *Other Engineered VMS* designed and certified by a professional engineer; and may include building designs, operations, and other existing engineering controls or HVAC systems that protect the building occupants from vapor intrusion."

Section III

It is unreasonable to require that a closure request must document chemical use within the building. The use of chemicals in the operations of a facility can change daily and any such list would be inherently ephemeral and incomplete. We recognize that this documentation is critical for evaluating sub-slab vapor and indoor air sampling but this requirement in Section II.B imposes an undue burden for many clean-up cases, especially for large industrial facilities, and stigmatizes the property with this documentation publically available on a GIS.
We suggest the following revision to Section II.C:

Delete entire closure letter condition #3.

Section V (B)

As noted above, the term "trigger" is objectionable and is not in line with the stated objectives of the Guidance. We recommend the WDNR consider an alternative term to "trigger" when describing conditions which may necessitate added COs. The trigger should be a *flag* to use professional judgment to determine whether an additional CO is warranted. It should not be a mandate. We suggest that all references to "trigger" and "triggers" be replaced with the term **"flag" or "flags."**

Section V B (1)

This section should recognize that sub-slab sampling may not be necessary at some sites based on a number of factors. The chemistry of the volatile organic chemicals (VOCs) that may be present should be considered, including their concentration and nature and extent in the subsurface (e.g., phase separated, adsorbed or dissolved phase), as well as their depth and proximity to the structure. The physical and biological makeup of the site geologic formations (e.g., oxygen and total organic carbon content, microbiological populations, etc.), the physical configuration of the structure and its foundation, and numerous other factors are also relevant.

In the event that other weight-of-evidence documentation cannot adequately discount the possibility for sub-slab impacts and sampling is undertaken, what then would be the methods for determining that a VMS is, in fact "needed?" Would this be simply an exceedance of the VRSL for any constituent in any one sub-slab sample? How might averaging or seasonal variations be factored into such a determination? These practical details are very important. Therefore we request that WDNR seek input from an External Advisory Group to answer these and other key questions prior to finalizing the Guidance.

The depth and the nature of the phase separated material (NAPL) should be considered in this scenario. For example, weathered heavy end coal tar NAPL occurring at depth (e.g., sitting atop a clay aquitard at 40 ft. below ground surface and 25 ft. below the water table elevation) would pose no appreciable potential for VI impacts, even to buildings directly over that location. This has been confirmed at numerous manufactured gas plant (MGP) sites in New York State through concurrent soil and indoor air sampling. (For more information refer to *New York State Manufactured Gas Plant (MGP) Soil Vapor Intrusion (SVI) Database by* Krista Anders, NY State Dept. of Health. Unpublished data. EPRI MGP Symposium, Savanah, GA, November 13, 2013; and *NGA – NYSEARCH MGP Tar Volatilization Study* by Ed Neuhauser, Ph.D., et al. EPRI MGP Symposium, Savanah, GA, November 13, 2013).

In summary, the mere presence of NAPL should not be an automatic "trigger" or "flag" for the inclusion of COs. There should be an allowance for professional judgment. The following qualification should be added to the end of the paragraph:

> **"However, professional judgment should be used to determine when site-specific conditions require the application of Option 7E."**

Section V B (3)

We suggest the following revisions:

> "Calculated groundwater VRSLs should not be used to rule out vapor intrusion at future development sites **but may be used for selection and design of a VMS**."

Section V B (4) (b)

See previous comment regarding petroleum NAPL regarding the need for COs if such material exists "...*anywhere* on the property..." It is essential that the Guidance provide leeway for professional judgment. Also the Guidance needs to acknowledge that not all areas of a site are developable due to setback requirements, easements, wetlands and other impediments or deed restricted institutional controls. We suggest the following revision:

> "Petroleum NAPL exists ~~**anywhere**~~ on the **developable areas of the** property (including the smear zone). Indicators of NAPL **may** include any of the following:"

The basis for the soil and groundwater concentrations listed as "...indicators of Petroleum NAPL" should be clearly presented and discussed. In our experience, adsorbed and dissolved phase impacts at these levels have never been shown to be associated with NAPL at over 20 MGP sites investigated or closed throughout the state. Moreover, laser induced fluorescence (LIF) results alone should not be used as a sole indicator of the presence or absence of NAPL. Many factors can influence the results of this technology. Analytical results from co-located geoprobe borings, field observations and boring logs, use of hydrophobic passive sampling sleeves and other methods should all be considered in making a conclusive determination of the presence and characteristics of any NAPL assumed to be present.

As a point of reference, comparative datasets from We Energies MGP sites have consistently shown that LIF readings (% RE) of at least 100 *and* adsorbed naphthalene concentrations of at least 100 mg/kg at co-located samples must be present to be indicative of phase separated coal tar. In addition, the basis and references for a "total PVOC" value of 250 mg/Kg should be presented and discussed. It would be helpful to acknowledge and reiterate that there may be cases when comparatively high levels of residual adsorbed PVOCs remain, decisions on the need for and form of VI related COs should be made on a case-specific basis. An example of how this may be applicable in this context is if a large fraction of the "total PVOC" mass was primarily made up of the less toxic or non-carcinogenic constituents (i.e., those having comparatively high VRSLs) such as toluene, xylenes or trimethylbenzenes. Also we believe that the locational criteria are too restrictive. Foundations for many building are typically four feet below the slabs of buildings and mere contact of marginal concentrations of VOC should not necessarily impose a VMA and VI related CO.

Again, we request that the WDNR seek input from an External Advisory Group to address the appropriate "flag" values and locational criteria prior to finalizing the Guidance.

Please revise the table "Triggers to Apply Vapor Intrusion Continuing Obligations" to reflect the previous comments and revise the Table's title to be:

"~~Triggers to Apply~~ **Flags for Applying** Vapor Intrusion Continuing Obligations."

In conclusion, the impacts of these Guidance documents are potentially widespread and may have a costly and lasting effect on properties being regulated under NR 700. As drafted, the Guidance may result in further complications and delays in the sales and redevelopment of remediated brownfields or former industrial properties. We request that issuance of final Guidance be delayed until the BSG or a new External Advisory Group can provide the opportunity for more thorough discussion and feedback. This is especially important given that EPA has issued its own related technical guidance just yesterday.

Thank you for the opportunity to comment on this important guidance and for the one-week extension to the comment period. We Energies is available to discuss these comments with you and others at WDNR. We would also be very interested in participating in further refinement of this Guidance and providing constructive input through either the BSG or a related External Advisory Group. If you should have any questions or require further information regarding these comments, please contact Frank Dombrowski, Sr. Environmental Consultant, by telephone at 414-221-2156 or by e-mail at frank.dombrowski@we-energies.com.

Sincerely,

Bruce W. Ramme, Ph.D., P.E.
Vice President - Environmental

Copy: Judy Fassbender, Wisconsin DNR
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SUBJECT: Case Closure Continuing Obligations: Vapor Intrusion (RR-042)
Vapor Intrusion Continuing Obligations Applied DNR Closure Approvals Wisconsin (RR-5474)

Environmental Forensic Investigations, Inc. (EnviroForensics) respectfully submits the following comments to the Wisconsin Department of Natural Resources (WDNR) regarding the following proposed guidance documents:

- Case Closure Continuing Obligations: Vapor Intrusion (RR-042)
- Vapor Intrusion Continuing Obligations Applied DNR Closure Approvals Wisconsin (RR-5474)

1. Will the WDNR please clarify if it will assess technical assistance fees post closure to review/approve O&M submittals or change of status requests for the continuing obligations in any form?

2. In **Section I.B.2. of RR-042**, the WDNR states that an Operation and Maintenance (O&M) Plan, written in accordance with NR 724, will be required as a continuing obligation if a Vapor Mitigation System (VMS) is to be operated at structures after closure. Guidance detailing the suggested frequency of inspections and monitoring that will be expected by WDNR would be helpful additions to RR-042. It is assumed that periodic indoor air sampling will not be required as part of this continuing obligation, rather periodic negative pressure measurements from the subsurface would be considered "Long-Term Monitoring" for purposes of this requirement. This comment also applies to **Section I.B.2. of RR-5474**.

3. In **Section III of RR-042**, the WDNR states that the installation and operation of a VMS may be required as a post-closure, continuing obligation where a commercial site is using the compounds of concern in their daily operation. Further, the WDNR states that

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restrictions on the use or occupancy of the property may be required to ensure that closure will be protective. If a commercial site is using compounds of concern in their daily operation (e.g. drycleaning), the Occupational Safety and Health Administration (OSHA) standards would apply to the air quality. A VMS may not be necessary at this type of site during the duration of active operations due to the "background indoor air sources" already present, so long as the VI contribution to indoor air doesn't cause the indoor air standards to be exceeded. A post-closure restriction on the use of occupancy of the property may suffice in ensuring that closure will be protective. By eliminating the suggested requirement for a VMS at a commercial site using the compounds of concern in their daily operations, yet maintaining the requirement of Department notification and re-evaluation of the VI pathway when the property ceases to use the compounds of concern, the closure will be protective. This comment also applies to **Section II of RR-5474**.

4. In **Section IV.A. of RR-042**, the WDNR states that this continuing obligation restricts property to non-residential uses and is applied at buildings where commercial/industrial vapor risk levels are used to achieve site closure. The accompanying "Trigger Table" defines the trigger for this continuing obligation to be the commercial/industrial sub-slab vapor risk screening levels. However, the WDNR also states that this continuing obligation may be used in conjunction with implementation of a VMS (Continuing Obligation ix of RR-042).

   Regardless of the sub-slab concentrations, if post VMS installation verification indoor air sample results are below the residential Vapor Action Levels (VALs), then a property use restriction should not be needed in addition to the VMS restriction that will already apply to the property. Post VMS installation verification samples below the residential VAL can demonstrate that the VMS is mitigating the VI pathway to below health protective levels for residential scenarios. As long as indoor air concentrations remain protective of the residential scenario (below residential VALs), there should not be a need for a property use restriction, in addition to the VMS restriction. Please consider modifying this section to clarify this scenario. Also, please consider modifying the accompanying "Trigger Table" to reflect this scenario. This comment also applies to **Section IV.A. of RR-5474**.

5. In **Section V of RR-042**, the WDNR comments on continuing obligations that could be required to protect future on-site and off-site buildings.

   This restriction seems overly conservative and does not seem to consider all of the relevant lines of evidence available. Based on this specific language and the accompanying "Trigger Table", it seems that this restriction essentially will be required at any property where groundwater concentrations are equal to or exceed the enforcement standard (ES). If we are interpreting this correctly, this continuing obligation may impose unnecessary costs onto Responsible Parties (RP) and/or property owners by requiring the installation of VMSs in new construction where they may not be needed. Available

research and even federal guidance have demonstrated that the ES standards may not be a reliable measure of VI potential and may be needlessly, overly conservative in many cases.

Multiple lines of evidence used together may be a way to confidently rule out the potential for VI at undeveloped properties and ensure that future health risks from the VI pathway do not exist. For example, using calculated groundwater vapor risk screening levels (VRSLs) (that already take into account a very conservative generic attenuation factor), a plume stability demonstration, and soil gas sample results together can show with relative certainly that future VI is not a potential pathway. Please consider adding soil gas sample results from undeveloped properties and calculated groundwater VRSLs (using a conservative attenuation factor) as additional considerations to rule out the potential for a completed VI pathway in the future. This comment also applies to **Section V of RR-5474**.

Respectfully,

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