

**A Summary of Major Stakeholder Comments Regarding
*Vapor Intrusion Mitigation Systems (VIMS) Design Submittal Requirements.***

February 2024

- 1) **Preamble - Comments regarding that the Document does not mention policy related to engineered ventilation VIMS (aka “sweep” systems) as opposed to depressurization VIMS.**

The BRS does recognize the difference and that pressure differential is not necessarily a performance measurement for ventilation systems. BRS will incorporate more information/policy clarity about these systems as being active systems without pressure differential requirements. We will consult with appropriate stakeholders on this matter.

- 2) **Preamble - A comment in support of consideration for developing EMC Rules for the program so that such guidelines can be vetted through the rules making process.** It is important to note that the function of these guidelines is not to establish enforceable standards, but, rather, to both encourage consistency across the Section when negotiating Brownfields Agreements, and to provide transparency to our stakeholders regarding the considerations employed by the Section during these negotiations. The statute states that negotiation is the central basis for its operation:

§ 130A-310.32(b). In negotiating a brownfields agreement, parties may rely on land-use restrictions that will be included in a Notice of Brownfields Property required under G.S. 130A-310.35.

In fact, the stakeholders and the BRS have been, and are, engaged in meaningful conversation and input on both site-by-site and programmatic bases without such formal rulemaking. In fact, we have engaged in developing these guidelines because the stakeholders have been interested in having them to encourage a consistent approach among different project managers across the Section. But it has also been the stakeholders which have consistently eschewed rules for one very good reason: it would cut into the flexibility and innovation in decisionmaking. The BRS ultimately recognizes that rules would not benefit the stakeholders (nor DEQ) in the negotiation process that is conceived by the brownfields statute. We are consistently engaged by developers from outside the state who have projects here and comment that they wish their state programs operated as we do in North Carolina. The statute is clear that a brownfields agreement is meant to be a negotiated agreement, and consistent with such an approach, the statute does not direct DEQ to promulgate Rules for the Brownfields Program (again, for good reason, as the lack of formal rules has long been the source of

its strength, innovation, and popularity). Furthermore, when rules are in place it stymies the nimbleness and ability of the program to continue to adapt in response to ongoing stakeholder issues as the rules will be in place and changing them is a long arduous process. We believe this to be important because we are aware of other states that find their rules actually hinder their program, sometimes deterring development in the state.

3) Preamble - A comment about the meaning of minimal turnaround time and the need to integrate this into construction schedule.

The BRS is committed to meeting construction schedules where possible and wants to know about them in advance as much as is practical. We do prioritize sites with imminent construction as well as preoccupation decisions. We hope many of you have experienced this commitment firsthand. Many sites vary in technical complexity as well as risk, which includes consideration for the presence and level of TCE, the nature of the end use, and many other variables. This checklist is an effort to develop a process that will take the minimum amount of review time. For sites of high risk, especially with TCE and residential use, Kelly Johnson may need to get involved in the review which, as a sole source, can be more time consuming. For sites of lower risk or without TCE considerations our internal PM staff training is allowing them to review sites at a faster pace with fewer inherent time sinks. The Property Management Branch is still not fully staffed as positions could not be created, even with EPA grant funds, without a budget being passed and administratively settled. We hope to create those positions now that this has been accomplished.

4) Preamble - Comments on the preamble where the PD team is asked to notify the BRS of the construction schedule in advance and changes in construction schedule or design modifications regarding VIMS systems. The commenter stated that changes in construction schedules occur for many reasons that cannot be anticipated.

BRS recognizes this and is not asking for anticipation of changes, but for notification of changes as soon as possible after they occur. The “in advance” statement only applies to schedule itself, not changes to that schedule.

5) Section 1 - Comments on the need for clarifying the required documentation of the building foundation design.

The BRS believes the important point here is to have a statement which provides information about special circumstances that can affect designs. We do not intend to require drawings unless the consultant/engineer feels it is needed or important to show the nature of the design features being described (waffled construction, post-tension cabling, extra floor layers, etc.). The structural plans are commonly submitted, but not required.

- 6) **Section 1 – A comment relating to the risk-based justification for reducing the number of buildings that require VIMS systems and asks if the consultant can rely on DEQ using its risk calculator output as the basis for its decisionmaking.** Assuming the commenter means the risk calculator output run by BRS, yes, they can, and we do use it for decisionmaking, provided the risk is based on data from a proper assessment. The BRS has always incorporated this into our decisionmaking. The risk calculator serves as a basis for the matrix tables approach. The approach and purpose of the matrix tables is to find the endpoint for sampling based on the risk calculator output rather than having no decision points with limitless or undefined sampling endpoints.
- 7) **Section 1 - Comments relating to concerns regarding the effects of engineering certification language.**

For reference, here is the certification language: “The vapor intrusion mitigation system (VIMS) detailed herein is designed to mitigate the intrusion of subsurface vapors into building features in accordance with the most recent and applicable DWM Vapor Intrusion Guidance, Interstate Technology & Regulatory Council (ITRC) guidance, and American National Standards Institute (ANSI)/American Association of Radon Scientists and Technologists (AARST) standards, ~~including, but not limited to,~~ or alternative standards approved in writing in advance by DEQ, and that a professional engineer licensed in North Carolina, as evidenced by said engineer’s professional seal, is satisfied that the design is fully protective of public health from known Brownfields Property contaminants.”

A commenter is concerned that this appears to establish binding requirements for participants in both the Brownfields Program and DWM’s other cleanup programs.

This design checklist is strictly a brownfields program document and is only applicable to the BRS, not the cleanup programs in DWM. This certification language was not developed to establish requirements for participants in the Brownfields Program, but, rather, to ensure that the Agreement is clear regarding the responsibilities which apply to professional engineers engaged in designing VIM systems for Brownfields Properties. Brownfields redevelopment is a risk-based program and brownfields agreements must rely on engineers to protect public health in their VIMS designs. This is required by the language in the Brownfields statute which states that, as a result of the Brownfields Agreement, the property may be reused in the specified manner while being “fully protective of public health.”

The certification language is consistent not only with the Brownfields statute but also the statutes covering the practice of engineering (Chapter 89C, aka North Carolina Engineering and Land Surveying Act). Those statutes define the practice of engineering as follows:

“Practice of engineering. – a. Any service or creative work, the adequate performance of which requires engineering education, training, and experience, in the application of special knowledge of the mathematical, physical, and engineering sciences to such

services or creative work as consultation, investigation, evaluation, planning, and design of engineering works and systems, planning the use of land and water, engineering surveys, and the observation of construction for the purposes of assuring compliance with drawings and specifications, including the consultation, investigation, evaluation, planning, and design for either private or public use, in connection with any utilities, structures, buildings, machines, equipment, processes, work systems, projects, and industrial or consumer products or equipment of a mechanical, electrical, hydraulic, pneumatic or thermal nature, insofar as they involve safeguarding life, health or property...”

Accordingly, PEs are tasked with performing tasks defined as the practice of engineering in a manner that safeguards life and health. Our counsel has had discussions with the PE Board’s counsel with respect to this language in order to ensure that the language adopted by the program was consistent with the professional responsibility of PEs when designing such systems. The certification language is clear in that it applies only to the criteria employed by a PE in designing such a system. It merely specifies the statutorily required goal for system design, as well as providing a partial, non-exclusive list of applicable design criteria.

Again, the BRS is tasked with negotiating Brownfields Agreements which protect public health because it is DEQ’s statutory responsibility to seek to do so. The BRS has adopted an approach of allowing the PD take advantage of the flexibility of a Professional Engineer to create and implement systems designed to protect public health rather than adopting an inflexible rules-based set of requirements with detailed specifications, requirements, or codes.

A commenter is concerned that the phrase “but not limited to” in the language setting forth the guidelines used in the design raises the possibility that their clients could be held to additional unnamed standards or requirements. It is definitely not the intent of the BRS to use this to bring in other unnamed guidelines to bear. We do not think that there is a record of the BRS ever having done so. The intent of this language is the opposite...to maximize flexibility by recognizing that there may be other guidance known to the engineer that could be applicable and usable in such a situation. In fact, to make this clear, the BRS is in the process of modifying this language by removing “but not limited to” and replacing it with the phrase indicated in the strikethrough and underline edit to the reference language above, “or alternative standards approved in writing in advance by DEQ”.

Commenters concerned the term “fully protective of public health” is not defined and/or may imply no risk. The program notes, as does the commenter, that the origin of this term is statutory as being the purpose behind any brownfields agreement. The program intended this language to align with the statute in this manner. The term in the statute is “fully protective of public health and the environment instead of being

remediated to unrestricted use standards". This statutory construction clearly implies that there is a level of acceptable risk above the level of unrestricted use. Furthermore, in the reopener section of the statute § 130A-310.33(c) it states reasons for reopeners include risks that "exceed levels beyond the acceptable range" and changes that cause "unacceptable risk". These terms of art are consistent in their lawful meaning and interpretation for all risk-based programs and is no different for the brownfields program. In short, fully protective means to acceptable risk levels.

A commenter was concerned that the American Association of Radon Scientists and Technologists (AARST) standards are not authored by any professional engineers and yet are on the list of standards, and this may be inconsistent with the requirement that PEs design said VIMS systems.

The BRS is considering this comment, but in no way believes the solution is to open VIMS designs to non-engineers as was implied by the commenter. The program will continue to rely on and respect the lawful public health protection that is offered by the PE seal.

8) Section 2 - Comment that the document is not specific enough with respect to allowances in lower pressure differential for continuous monitoring/telemetry systems.

The BRS recognizes such systems and the checklist states a 1 to 2 pascal difference may be acceptable for them if employed during varying HVAC situations, weather events, and winter and summer situations. The program is considering changing the "1 to 2" to "1" and the word "may" to "will" in the next version of the guidance as suggested by the commenter.

9) Section 2 - Comment regarding specific inclusion of a venting VIMS design which may or may not rely on depressurization under the slab, but is still protective. The BRS appreciates this comment and will do so. The language suggested by the commenter (or similar) will be added to the next version of the guidance... *"Mitigation systems that are not designed to induce target depressurization thresholds below a slab, such as sub-slab ventilation systems, may be allowable on a case-by-case basis following alternative monitoring strategies (e.g., air flow, sub slab chemical data) subject to review and approval from BRS.*

10) Section 2 - A commenter suggested adding the following: "For passive systems, performance testing shall be required by installing a temporary blower. The measured metrics should be the applied vacuum, air flow and pressure differential measurements from test port(s) located distant to the suction point. These values are to be included in the As-Built package provided to the DEQ, construction contractor and owner. If pressure ports are terminated at above ground panel, a drawing of the

sub slab pressure port locations shall remain within the enclosure of the panel.” The BRS believes this to be good practice and many designs we receive include provisions for this procedure for performance testing. We are not sure requiring such a procedure is necessary.

- 11) **Section 2 - A commenter suggested the BRS provide a minimum specification for vapor barriers such as 60-mil minimum with the appropriate ASTM (or equivalent) testing requirements because if not, PDs may assume that sub-slab low millage plastic sheeting (aka vapor barrier), is adequate for this application.** The VIMS system design includes a specification for specific barrier systems. We do not wish to impose a specific barrier thickness and infringe on the PE’s ability to spec the system.
- 12) **Section 2 - A commenter is concerned about the statements regarding chemical resistance data requirements for the contaminants of concern is unrealistic as the components are not usually tested for a select few chemicals.** The BRS believes this comment to be cogent and is open to discussion regarding improvements in the next version.
- 13) **Section 2 - Comments regarding trench dam requirements for penetrations and the need for further clarification on potential exceptions.** The BRS believes further clarification on this subject is warranted and will discuss with the commenters for inclusion if the next version.
- 14) **Section 4 - A comment regarding the BRS approach to smoke testing being “strongly recommended” is not adequate, and it should be required at a minimum on all penetrations and utility banks.** The BRS strongly recommends it without requiring it, but has the added note that systems that have chosen not to smoke test may have higher performance testing requirements as a result. We are inclined to maintain this stance, but are open to further discussion on the topic for the next version.
- 15) **Section 4 – A commenter regarding Pilot/Influence Testing recommended statement that influence testing should be performed as soon as practical after a slab pour and before vertical construction.** The BRS concurs with this comment and we will consider adding this to the next version.
- 16) **Section 4 - Comments related to pour back area communication testing that these requirements are in some cases onerous and not specific enough in others.** The BRS appreciates these comments and believes it can modify or replace the existing language with one commenter’s suggestion which may address all comments on this topic, *“Note, if concrete pour back areas for future tenants are included in the VIMS design or if slab modifications are made in the future, communication testing will be required after*

completion of the concrete slab pour. Further, if ongoing tenant upfit activities result in damage to the VI barrier, communication testing will be required following repair of the VI barrier and patching of the slab. Finally, in the instance TCE is present in subsurface soil gas above acceptable risk-based thresholds, temporary mitigation measures will be required to be conducted prior to performing tenant upfit activities as reviewed and approved by NC BRS.

- 17) **Section 4 - A commenter was concerned about the language near the end of Section 4 that soil gas and indoor air testing frequency and locations is subject to the sole discretion of the BRS.** The purpose of this language is not to open up an ad hoc sampling decision. It is to establish that this testing is not a PE specification in the design submittal, but instead is the point in the process where the sampling frequency matrix tables are used. The BRS will clarify this point in the next version.
- 18) **Section 5 - A commenter made several comments regarding inclusion of different requirements for telemetry systems.** The BRS acknowledges that telemetry systems need further clarification and will work with the commenter to make appropriate modifications, including determining what the minimum frequency of data logging would be to be defined as such as system.
- 19) **Section 6 – A commenter on notifying future users stated that this should be the responsibility of the owner not the engineer and that the inspection requirements for future slab modifications were overkill.** The BRS is simply saying the design document should contain a section in the design that provides a plan for the future owners to follow for communication with tenants about the VIMs and how to handle future slab modifications in order to protect the owners investment in it.
- 20) **Section 7 - A commenter made comments similar to those addressed in comment response No. 7 above regarding the engineering certification.** These were addressed above.
- 21) **Section 9 - Comments which state that the data requirements for retrofits are unrealistic as much of this information is not only unknown but can be unknowable.** The BRS acknowledges this and believes that language can be added to state certain structural details should be included to the extent feasible or to the extent they can be obtained. Including a section for a brief explanation of the situation and why certain information if not available may also help. We further remind the users of the document that it is meant to be a checklist of what should be considered if at all possible.

- 22) **Section 9 - A commenter asked why does it ask for details regarding radius of influence/communication testing when previously the document advised against drilling through the slab.** The BRS response is that, yes, drilling through a VIMS that is in place is not advisable, but this Section is about retrofits (which inherently do not have a VIMS in place).
- 23) **Multiple Locations - There was a commenter who, in places throughout the document, recommended including minimum specifications for 3", 4", and 6" pipe riser diameters in various situations and square footage of ground contact.** The BRS is not inclined to specify these in detail, as we do not wish to infringe on the PE's ability to spec the system.