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October 20, 2025

John Fitzgerald, PE
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, MA 01801

Subject: LSPA Comments on MassDEP's *Guidance on the Use, Design, Construction, Monitoring and Maintenance of Engineered Barriers* dated September 9, 2025

Dear Mr. Fitzgerald:

The [LSP Association \(LSPA\)](http://www.lspa.org), a professional non-profit association of 800 LSPs and other environmental professionals, appreciates the opportunity to provide comments on the draft *Guidance on the Use, Design, Construction, Monitoring and Maintenance of Engineered Barriers*. The LSPA solicited comments from its membership at large, including from its Regulations, Technical Practices, and Loss Prevention Committees.

A detailed list of comments is included with this letter, but the LSPA's key concerns and recommendations are summarized as follows:

1. **Flexibility in Applicability and Implementation:** The LSPA has identified examples when design modifications are commonly sought and would request that MassDEP consider noting these examples in the guidance, provided they are acceptable solutions.
2. **Technical and Scientific Refinement:** The LSPA recommends revisiting several technical specifications and criteria, including:
 - The thickness of the "clean soil" separation layer, which may be overly conservative relative to other regulatory standards.
 - The criteria for exclusion of low-permeability or gas vent layers, which may not have considered certain common situations identified by LSPA commenters.
 - The scientific basis for classifying "highly toxic hazardous materials," including questions about specific chemicals listed and the use of LD50 thresholds, which lack consistency.
3. **Integration of Environmental and Practical Considerations:** The LSPA supports expanding feasibility evaluations to explicitly include ecological and environmental factors, such as wetland and floodplain impacts. We also recommend more flexibility in design features (e.g., placement of defining/demarcation layers) to accommodate existing structures or unique site constraints.

4. **Consistency, Clarity, and Usability:** Multiple edits are suggested to improve readability and reduce ambiguity—such as defining subjective terms (“high concentrations,” “recent,” “severe storms”), clarifying when “should” denotes recommendations vs. requirements, and improving figures and references.

Thank you once again for providing this opportunity to comment and for considering our feedback. The LSPA is available at your convenience to discuss any of our comments.

Respectfully,
The LSP Association, Inc.



Katie Kudzma LSP, President



Mariellen Morris, Executive Director

CC: Millie Garcia-Serrano, Assistant Commissioner, BWSC, MassDEP

Attachment: LSPA Detailed Comments on the MassDEP *Guidance on the Use, Design, Construction, Monitoring and Maintenance of Engineered Barriers*

LSPA Comments on MassDEP Guidance on the Use, Design, Construction, Monitoring and Maintenance of Engineered Barriers

Guidance: <https://www.mass.gov/doc/draft-guidance-on-the-use-design-construction-and-monitoring-of-engineered-barriers-december-2002/download>

Provided below are the LSP Association's detailed comments on the MassDEP Guidance on the Use, Design, Construction, Monitoring and Maintenance of Engineered Barriers.

***"Page No." refers to the pages in the MassDEP Guidance on the Use, Design, Construction, Monitoring and Maintenance of Engineered Barriers.

***"Section/Subsection" refers to the Sections in the MassDEP Guidance on the Use, Design, Construction, Monitoring and Maintenance of Engineered Barriers, unless otherwise noted.

The LSPA has made every effort to state the issue of concern, provide a specific example wherever possible, and propose suggested language changes (in red font color), where appropriate.

Page No.	Section/Subsection Number	LSPA Comment
N/A	N/A	It would be helpful to include an acronym list with defined acronyms at the beginning of the document.
N/A	N/A	General Comment: I wonder if MassDEP has any guidance/suggestions on what should happen with a FAM if a property with an EB transfers ownership. Does the new owner have to establish their own FAM? Does MassDEP verify that FAMs are enacted throughout the 30-year lifecycle?
2	2.0	The document states, " <i>However, parties choosing to use these specifications will have certainty on the acceptability of their design, construction, monitoring, and maintenance proposals and efforts.</i> " Can this be made more specific to indicate that referenced elements would be acceptable to MassDEP in this scenario?
2	4.0	In first paragraph, third sentence of this section, "coat" should be "coal".
2	4.0	At the end of the second bullet at the bottom of the page, there is a typo in the provided citation to the MCP. There is a "9" immediately before 40.0997(4).
2	4.0	Typo in the first paragraph in this section, extra comma after "deposits."
3-4	5.1	Consider expanding feasibility evaluations to account for other environmental and ecological impacts (e.g., disturbance to ecological receptors and/or floodplain considerations as a result of clearing/capping). In many cases, these are significant concerns as sites that are potential candidates for "EBs" tend to be adjacent/near waterways and wetlands.
4	5.1	Second to last sub-bullet, "high concentrations..." is subjective.
5	5.2.1	A better quality version of Figure 1 would be appreciated (flagged multiple times)
6	5.4	Please fix typo at the end of the last sub-bullet, it says "te" and should be "the"
7	5.5	Second sub-bullet, consider further qualification of "severe storms"..
6	5.5	In the sub-bullets under the second main bullet, the use of the word, "should," indicates a recommended course of action or policy that is desirable, but not obligatory, with the choice of following it left to the individual or entity. Looking to clarify that the related actions are not mandatory.
8	6	Recommend that additional flexibility be incorporated into the FAM process for EBs for certain types of facilities/sites, consistent with the language added to the Massachusetts Contingency Plan (MCP) in 2023 for state agencies, authorities and municipalities. For example, a simple maintenance agreement would be adequate for public utility sites, which have substantial infrastructure maintenance requirements and are subject to other regulatory programs, for most types of EBs. The formal FAM process outlined in the guidance is not warranted at many of these sites.

9	7.1	In the first bullet regarding isolate, consider replacing the word "activity" with "interaction" to be more consistent with language throughout Section 7.2.
10	7.2	Figure 2 - consider adding another arrow to depict the "Low Permeability Barrier" that is comprised of the Flexible Membrane Liner and Low Hydraulic Conductivity Layer, similar to the arrows that depict the components of the containment and isolation layers.
10	7.2.2	The guidance requires that the Defining (demarcation) Layer be placed below the Separation Layer for an EB. That may not be the appropriate location for this layer in all cases and it clearly makes the scenario where an existing structure is incorporated into an EB unworkable. For many EBs, this "notice" layer that is intended to provide some form of warning to those who might be disturbing the barrier is more appropriately placed at or near the top of the barrier. In that scenario, the "warning" layer is encountered before a significant portion of the barrier is disrupted. The guidance should leave the selection of the appropriate location for the Defining Layer to the judgment of the LSP.
12	7.2.3.3	In the 6th line down, it states "(as detailed in Section 8.0, Reference 5)". Since there is no actual description presented itself in Section 8.0 (the references section), this would read better if it said "(as detailed in Reference 5 listed in Section 8.0)."
13	7.2.5	In the last bullet of this section, would "allowed" be more appropriate than "suitable"?
13	7.2.7	In the 6th line down, it states that the geotechnical analysis of the barrier should be included in the Remedial Action Plan. This information seems better suited and/or relevant to be presented in a Phase IV Remedy Implementation Plan (RIP). Suggest adding "and/or Remedy Implementation" after Remedial Action Plan.
14	7.3	We recommend that the Department reconsider the details of the "clean soil" separation layer in the guidance. The 48-inch default thickness appears to be excessive. A 3-foot thickness is sufficient for a soil EB and would be consistent with other guidance and regulation regarding potential soil exposures and definitions of "surficial" soil. Additionally, the design option modifications for soil barriers (substitution of geofabrics or geomembranes for soil thickness) should be reconsidered. It is not appropriate to measure the thickness of geofabrics and geomembranes in inches, so an inch-for-inch substitution formula is not relevant. Additionally, a membrane or fabric offers considerably more exposure and disturbance protection than an inch of soil, so should be considered as a more effective barrier than soil, allowing for a reduced soil thickness in cases where a membrane or geofabric is used. As an alternative, inclusion of a geofabric and/or geomembrane of some minimum specification/thickness in the EB design could serve as a substitute for up to 1 foot of soil thickness. Finally, for the "soil" barrier, the guidance should specifically acknowledge that it could include gravel/rock.
15	7.3.2	For this section, I would suggest making it clearer and more apparent as to what considerations apply under what conditions. In both cases, the conditions are buried within the text, so it is unclear that section (a) specifically applies for 1-4 unit residential sites, and that (b) applies to ALL sites. My suggestion would be to make these entirely separate subsections (i.e., 7.3.2 for 1-4 unit residences and 7.3.3 for severe/lethal health effects. Alternatively, specifically state the conditions in the header of each of section (a) and (b) what their applicability is.
15-16	7.3.2	Section 7.3.2 states that such chemicals as listed in parts (a) and (b) *may* be left in place pursuant to section (c), which seems to contravene everything that was said in (a) and (b). Recommend moving this qualification to the beginning of section 7.3.2 or mentioning it in both (a) and (b) that such chemicals can be addressed by installing a barrier as described in section (c).
15	7.3.2 (a)	Delete errant "mg/kg/day" at the end of this section/bullet

15	7.3.2 (a)	The genesis of the list of "highly toxic" hazardous materials is unclear and does not appear to be consistent with the criteria as identified below the table for identifying "other" highly toxic hazardous materials. The following chemicals are listed in the table but do not meet the criteria as listed for the RfD/CSF: carbon tetrachloride, beryllium, chromium (VI), and ethylene dibromide. In particular, carbon tetrachloride does not appear to belong on this list, as its M3CL is 10,000 mg/kg, which is equivalent to the ceiling concentration for soil M3CLs, indicating that it is not "highly toxic." Please consider whether the other three chemicals also belong on this list, and provide a rationale should any of them be retained.
15	7.3.2 (a)	For the text below the table, suggest revising as follows, " For other hazardous materials not already listed in the table above, Highly Toxic Hazardous Materials are defined as ". In particular, the "in general" should be deleted from the phrase - either these are how these materials should be defined or they are not.
16	7.3.2 (b)	Fix typo, third bullet should be " value less than " not "value less ten"
16	7.3.2 (b)	Please clarify that the chemicals as listed in item (b) are intended to be chemicals that are present at concentrations above the M3CL and that are severely/lethally toxic. The section does not specify, so it appears to indicate that the presence of these chemicals in general would not be allowed. However, such chemicals (e.g., cyanide) are often detected at MCP sites at concentrations that are well below levels that would be considered severely/lethally toxic, and their presence can be considered consistent with a conclusion of No Significant Risk as assessed in a risk assessment.
16	7.3.2 (b)	It would be useful for MassDEP to consider providing a list of chemicals that would be considered to fit in these categories. There are many chemicals that can cause an severe/lethal effect at a high enough dose; however, the concentrations at which these effects may occur are not typically relevant to environmental conditions. It is also unclear how this would apply in practice. Is the presence of the chemical (presumably above the M3CL) sufficient to trigger this provision, as would be suggested by this guidance? In that instance, it would still be a question as to whether the concentrations in question present a potential short-term hazard, based on the toxicity of the chemical.
16	7.3.2 (b)	No basis is provided for the use of an LD50 value of 50 mg/kg-bw as indicative of severe/lethal toxicity. In addition, there can be substantial variability in LD50 values depending on study conditions and exposed subjects. I would suggest removing this criterion from the section for the following reasons: there is not any scientific basis used for identifying this criterion, LD50 values are widely varied (so it is unclear by what basis one should identify an LD50 to be used to evaluate this criterion), and no resource is provided for determining an appropriate value.
16	7.3.2(b)	For current item (c), recommend not making this a letter-bulleted item, striking "Design of Separation Layer", and aligning the remainder of text with with first text under this section.
16	7.4	In the last line of the second paragraph, it states that all other modifications must be fully discussed and defended in the Remedial Action Plan. This information seems better suited and/or also relevant to be presented in a Phase IV Remedy Implementation Plan (RIP). Suggest adding "and/or Remedy Implementation" after Remedial Action Plan.
16	7.4.1	Add "310 CMR" before 40.0998 in the last line of the first paragraph.

17	7.4.2	For EBs that are being implemented almost exclusively as exposure barriers, particularly in the case of visible coal tar waste deposits (VCTWDs), we do not agree with the default assumption that a low-permeability barrier needs to be a component of the EB absent a rigorous demonstration that it is not necessary. We recommend that strict language in the guidance under Section 7.4.2(a) be modified to allow for a more site-specific evaluation by the LSP based on actual groundwater data and site conditions. As currently worded, we expect that the guidance would result in the inclusion of a low-permeability layer in virtually all EBs but that addition would not provide significant environmental benefits. Incorporation of the low-permeability layer in some scenarios would require the design and implementation specific drainage structures to manage the surface flows at the barrier limits and potentially within the barrier footprint. These considerations further impact the design and construction costs for this remedial option and may not provide a benefit to risk-reduction in certain cases. Based on these considerations, we believe that some flexibility should be provided in the guidance to consider alternate options to the strict use of a low-permeability layer
17	7.4.2 (a)	For the last bullet under this section, can you define "recent"?
18	7.4.3	Under the second bullet, if the 0.5 mm Hg restriction is meant to apply to both items (i) and (ii), then would recommend clarification. As currently written, there appears to be conflict between item (i) of the second bullet and the third bullet.
18	7.4.3	Under the third bullet, "None" should be "Non".
18	7.4.3	The current language would result in the conclusion that a gas vent layer would be required at any site where volatile organic compounds are present, even if they are only present at trace levels and vapor migration has already been ruled out as an exposure pathway. This would add unnecessary costs and complexity to EBs at most sites as well as complicating the subsequent barrier maintenance and monitoring program. We recommend wording in the guidance that allows for a site-specific evaluation of the need for a gas vent layer in place of the prescriptive language in the draft
18	7.5.1	In the first bullet, it states that the geotechnical evaluation regarding the placement of a building over an engineered barrier should be included in the Remedial Action Plan. This information seems better suited and/or relevant to be presented in a Phase IV Remedy Implementation Plan (RIP). Suggest adding "and/or Remedy Implementation" after Remedial Action Plan.
18	7.5.2	The most common scenario for an EB with an existing building is a structure that has a concrete slab which complies with the requirements of 7.3.1 of the guidance (at least 5 inches of reinforced concrete constructed in accordance with appropriate technical standards). In these situations, the "Defining Layer" can consist of a warning notice stenciled or printed onto the top of the slab and then protected by a clear coating. This warning sign approach is more effective at providing the appropriate notice to building occupants regarding the barrier than an additional thin layer of concrete over a separate defining layer. This also avoids the structural and logistical complexities associated with trying to add an additional layer to an existing building slab.
19	7.5.2	For the last sentence of second paragraph, suggest defining which part of the structure would be covered by the defining layer.
19	7.5.3	In the second paragraph, 5th line down, there is a typo. Remove the "r" after waste before deposits.