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December 5, 2025

Greg Braun

Massachusetts Department of Environmental Protection (MassDEP)

Office of Research & Standards

100 Cambridge Street

Suite 900

Boston, MA 02114

Subject: LSPA Comments on MassDEP's *Risk Characterization Guidance—Chapters 14 and 17, Public Review Drafts*

Dear Mr. Braun:

The [LSP Association \(LSPA\)](https://www.lspa.org), a professional non-profit association of 800 LSPs and other environmental professionals, appreciates the opportunity to provide comments on MassDEP's *Risk Characterization Guidance—Chapters 14 and 17, Public Review Drafts*. The LSPA solicited comments from its membership at large, including from its Regulations Committee and Risk Assessors Subcommittee.

A detailed set of comments for each chapter is enclosed with this letter, but our key areas of concern and recommendations are summarized as follows:

1. **Provide Clearer Terminology and Consistent Use of MCP-aligned Definitions:** In several places, the intent of terms like “permissive,” descriptions of “biologically significant effects,” references to “all areas subject to flooding,” or distinctions between current and future exposures is not fully clear or may conflict with other guidance. Improving consistency and clarifying key terms will help practitioners apply the guidance reliably and reduce the potential for inconsistent interpretation.
2. **Confirm Alignment with the MCP's Existing Performance Standards and Decision-making Framework:** In some instances, the chapters blend explanatory narrative with policy interpretation, which blurs the distinction between regulatory requirements and recommended practices. Clearly delineating the elements of risk characterization that are required as part the MCP—such as the role of Conceptual Site Models, evaluation of exposure pathways, critical exposure pathways, and the treatment of downgradient properties—will strengthen the clarity and utility of the document.

3. **Expand on Recommended Analytical Approaches:** Practitioners would benefit from more context explaining why specific evaluations are required, how new or expanded concepts should be interpreted, and what constitutes sufficient documentation—particularly regarding uncertainty analysis, exposure scenario justification, and considerations related to changing site conditions such as flooding.
4. **Check for Technical Accuracy and Precision:** We have identified places to improve technical accuracy and precision, including clarifying distinctions within the weight-of-evidence framework, ensuring scientifically accurate descriptions of hazard and dose-response relationships, and strengthening explanations of how dynamic site conditions influence potential exposures.

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 and welcome ongoing dialogue.

Respectfully,
The LSP Association, Inc.



Katie Kudzma LSP, President



Mariellen Morris, Executive Director

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

Attachments:

- LSPA Detailed Comments on *MassDEP Risk Characterization Guidance—Chapters 14 Public Review Draft*
- LSPA Detailed Comments on *MassDEP Risk Characterization Guidance—Chapters 17 Public Review Draft*

LSPA Comments on MassDEP Risk Characterization Guidance--Chapter 14

Chapter 14: <https://www.mass.gov/doc/risk-characterization-guidance-chapter-14-public-review-draft/download>

Provided below are the LSP Association's detailed comments on the MassDEP Risk Characterization Guidance--Chapter 14.

****"Page No." refers to the pages in the MassDEP Risk Characterization Guidance--Chapter 14 Public review Draft.*

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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 No.	LSPA Comment
General	General	Please do a general/global search to correct verb tense for data: e.g., "data is", as the word "DATA" is the plural form of the word "DATUM" and requires appropriate verb tense: 'data are' vs. 'datum is'; data require, etc.
3	14.1.4	Last bullet on this page: Is "permissive" the correct term here? If the goal is to preclude more extensive assessments where effects are unlikely, wouldn't that be restrictive? It is suggested that DEP say more exactly what they mean by this statement.
4-5	14.1.4	There are two boxes labeled 14.1, one on page 14-4 (local conditions) and another on page 14-5 (key terms). Re-label the second one as 14-2.
5	14.1.4	Box 14.1 Key Terms: "Evidence of biologically significant harm means past or current exposures have degraded an area of habitat, are impairing a community or are exerting stress on a population". There are no examples or at least references to where the examples are provided in Box 14.1 Perhaps they could note that more detail and examples are provided later in the document? Additional detail about MassDEP preferences in this guidance would also be helpful (see Page 14-29). They provide this detail in some of their technical updates – for example, emphasizing chronic over acute toxicity tests, toxicity over community, etc. In cases where a benchmark is required, could they provide preferred sources? For example, Army Corps ERED database for tissue concentrations? Could they incorporate references to the Tech Updates where relevant?
5	14.1.4	Box 14.1 Key Terms: "Both current and future site conditions should be considered." Provider further description of what MassDEP means by 'future site conditions' – 10, 20, 50 years? Does it parallel the climate modeling time frames in Resilient MA Models?
7	14.1.7	Last sentence: ";it should not incorporate exposure reduction....". While in general this is true, there could be instances where consideration of response actions (e.g., as a result of human health-related risk or planned development activities) could be used to justify not evaluating ecological risk for a portion of a disposal site.

11	14.3.1	Last paragraph on page states "If some but not all sediment contaminants are present below the screening criteria, then all of the contaminants are carried into Stage II." Comment 1: We disagree with this statement; this approach is inconsistent with USEPA ecological risk assessment guidelines, which the MassDEP methodology generally follows (see The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments, June, 2001, which states: "The screening-level ERA also allows contaminants that do not pose a substantial ecological risk to be removed from the list of COPCs prior to conducting the baseline ERA." (page 5). The MassDEP sediment screening levels are conservative and reflect low potential for ecological risk, as most of the screening levels are based on threshold effects concentrations. While some of the benchmarks for metals are based on probable effects concentrations, MassDEP's sediment screening levels guidance indicates "Based on ten years of experience with lower screening levels, it has become apparent that Stage II site-specific risk assessments generally find a condition of "no significant risk of harm" to the environment for sediment contaminated with metals at levels below the PECs." In practice, OHM at levels below screening levels would be ruled out as COPCs in a Stage II ERA in the refinement step anyway: In short, there is limited utility for most sites in carrying forward OHM that are at concentrations below Stage I screening levels into a Stage II ERA. We thus recommend revising the guidance to allow for screening out of OHM as COPCs, with the goal of creating a more efficient and focused Stage II ERA when needed. Comment 2: The requirement to assess all OHM as part of a Stage II if any OHM exceeds screening levels is not well-justified and is inconsistent with other risk assessment guidance (see USEPA's 1997 Ecological Risk Assessment Guidance for Superfund, Section 3.2 and elsewhere). Screening levels are conservative, and OHM with concentrations below screening levels are very likely to not pose a site risk in later stages of the risk assessment. Effort and resources in latter stages of the risk assessment process (data collection and analysis) should be focused on OHM with a reasonable probability of risk. It is also not clear why this logic is different than the logic presented in Section 14.3.2 (Background Evaluation). We recommend that OHM constituents that are screened out as part of a State I screening not be carried forward as part of further analysis. Comment 3: Re: "To rule out the need to further assess any contaminant present in a medium using screening benchmarks, DEP-published screening values must be available for all contaminants." For media for which DEP-publishes screening values (sediment and surface water) then, all chemicals need to be carried forward for that medium even if the concentrations of all chemicals with DEP-published criteria are less than the criteria, but there are one or more chemicals lacking DEP-published criteria in that group? For DEP-published screening values, it would seem to be reasonable to allow for those chemicals to be ruled out for further assessment while those without published values are carried forward to Stage II where the assessor can develop specific screening values?
11	14.3.1	Text box at bottom of page indicates "DEP-published screening values must be available for all contaminants". However, to date, DEP has published screening values for only sediment, and only for a relatively small number of constituents. Thus, any site with OHM lacking a MassDEP sediment screening level, or with OHM in other media would require evaluation via a Stage II. This requirement is onerous as well as unnecessary, especially given that ecological screening-level benchmarks (for example, USEPA Soil Screening Levels and USEPA Region 4 Ecological Screening Values) have been published and are routinely used in SLERA/screening level assessments at CERCLA, RCRA, and many state-led sites. We recommend instead that MassDEP allow for use of benchmarks available from these other sources (with justification) to address OHM lacking Mass-DEP published values. This comment relates to the previous comment about allowing for more flexibility in Stage I instead of requiring the PRP to automatically be forced to conduct a Stage II.
16	14.5.1	Re: "Both current and foreseeable future contaminant conditions must be considered to meet the requirements of the MCP. Current conditions must be characterized in all cases. Future conditions must be evaluated if exposures may change due to fate and transport processes, particularly if contaminant concentrations could increase at one or more exposure points. When the potential for future migration or bioaccumulation of contaminants exists, the risk assessor should estimate the maximum future contaminant level and assume that this level will occur under foreseeable future conditions." The addition of requiring climate change considerations in risk estimates and resiliency in decisions with the lack of specificity requires LSPs to consider the lifespan of remedial solutions. The Guidance should recognize the value of resiliency work to capture the climate change requirements in the MCP. Particularly with coastal sites but increasingly for inland sites too, there are resiliency plans in place or developed that would be a benefit to MCP Sites. Drawing from resiliency work underway, LSPs should be able to gain more confidence in their remedial plans and the need to consider future conditions.

16	14.5.1	Re: "To justify eliminating a substance from the risk assessment, the risk assessment report must show that it is unlikely to have an adverse effect on valued habitat or receptor of concern. Such a determination should consider the concentration, extent of the contamination, transport potential and toxicity. The risk assessment report must make a strong case for the elimination of any COPC from further consideration." Please clarify when a risk assessor can eliminate a COPC from further consideration in a Stage II. As I understand the guidance, at the Stage I step, background concentrations can be used to eliminate individual chemicals. Additionally, a clear understanding of site-derived uses and the conceptual site model 'could' be used to justify removal of chemicals that might have initially been considered. Stage I Screening cannot be used to screen out individual chemicals. However, under the Stage II guidance in Section 14.5.2, further reduction of COPCs is described (and a high bar is set). Under EPA there is an opportunity to re-evaluate COPCs in a BERA using additional screening values (in the 'space' between a SLERA and BERA), but in the Guidance, MassDEP provides the following possible justifications: "To justify eliminating a substance from the risk assessment, the risk assessment report must show that it is unlikely to have an adverse effect on valued habitat or receptor of concern. Such a determination should consider the concentration, extent of the contamination, transport potential and toxicity. The risk assessment report must make a strong case for the elimination of any COPC from further consideration." The challenge is that some of these guidelines require completion of the Stage II before eliminating. Please add additional explanation to how to justify removal in the Problem Formulation of a Stage II (presumably the COPC concentrations exceed background and have some relation to Site History at that point). For example, could concentrations be compared to more probable effects concentrations instead of only the threshold concentrations in a Stage I. Could AVS-SEM be used to support lack of bioavailability? Could TOC be used to support lack of bioavailability? It is unclear how extent could be used to justify – though maybe a low detection frequency could be applied? As far as toxicity, would nutrients fall into this category possibly? Are there other examples?
17	14.5.3	Top Text Box – Exposure Pathway: Change 'person' to organism.
22	14.5.5	Section 'Susceptibility: Relative Sensitivity, 2nd para., last sentence. Please change "...reference samples would indicate..." to "reference samples may indicate...". Benthic community diversity, density are contingent upon many factors beyond levels of contaminants. The absence or reduction in number of taxa at a site relative to a reference area is not necessarily an indicator of an impaired community. Also recommend incorporating reference to <i>statistically significant</i> comparisons.
23	14.5.5 (3)	Re: "Ecologically relevant endpoints may be identified at any level of biological organization (e.g., individual, population, community ecosystem, landscape). The consequences of changes in these endpoints may be quantified alteration of community structure from the loss of a keystone species) or....." Unpaired parentheses. Since this is a quote from EPA, DEP should check to confirm that their quote is correct. There appears to be one unpaired parentheses, which could be an EPA mistake.
25	14.5.5	Regarding the discussion of Community and Population Levels – I agree these are important considerations and that organism-level effects are still the most direct/repeatable/comparable endpoints for MCP site. However, having worked on many MCP projects, I argue that there are still approaches to include community and population endpoints even though it is rare to have the resources or time to conduct field studies particularly for higher level organisms and those studies are subject to hard to characterize variability and uncertainty. One approach that we find valuable is a detailed/systematic habitat survey by ecologists and professional wetland scientists to determine if the habitat is functioning as expected. The problem with traditional biological field studies, is that they may pickup issues due to urbanization and the spread of invasives – both impacts that a well-trained and experienced ecologist can 'normalize' in the habitat assessment. Recognizing the value of habitat surveys in capturing Community and Population Level conditions thus allowing for community/population endpoints to be included. We want to be sure that ecosystem functionality can be an assessment endpoint and that habitat surveys are suitable measurement endpoints. Organism level analyses will remain key endpoints.
25	14.5.5	Box 14.4. The citation for Suter et al., 2005 is not included in the references section.

26	14.5.6	One interesting point about timing of steps in an Environmental Risk Assessment that is worth noting is the sequencing of sampling. Typically, a collection of chemical concentration data from the primary media has been completed and is the basis for a Stage I Screening. If a Stage II is required, additional sampling is planned. It is really important to update the CSM and develop the Assessment and Measurement Endpoints in coordination with the additional sampling to ensure there are data for each measurement endpoint. Sometimes the additional sampling precedes the completion of the preliminary Stage II steps. The problem formulation step, <i>“the first phase in a quantitative MCP environmental risk assessment (Stage II Environmental Risk Characterization) is problem formulation. This phase involves gathering existing site information determining the appropriate scope and focus of the risk assess”,</i> can/should be iterative. There is not always sufficient information from a Stage I to adequately complete a Stage II Problem Formulation without additional data. While data collection as a goal may come out of the Problem Formulation, those data may in fact result in modifying the conceptual model.
33	14.5.8	Screening benchmarks, 3rd bullet on page: Suggest changing from "risk-based concentrations identified at other waste sites..." to reference eco benchmark documents published by state and federal regulatory agencies, such as USEPA Region IV and LANL, both of which provide no- and low-effects levels.
34	14.5.8	2nd paragraph on page: Consider adding reference to other readily-available published sources of TRVs (e.g., LANL).
37	14.5.8	Problem Formulation: Effects Thresholds Based on Body Burdens, 3rd sentence of 1st paragraph: Suggest changing "tissue concentrations measured in..." to "...concentrations measured or modeled in".
43	14.6.2	Risk Analysis: Benchmark Comparison. Last paragraph of section. It would be helpful to the reader/risk assessor to expand discussion on use of number/magnitude of exceedances relative to interpreting risk.
43	14.6.2	Risk Analysis: Food Chain Analysis. Last paragraph/sentence on page indicates one should avoid estimating prey concentrations via bioconcentration factors. While we agree there is more uncertainty with modeling tissue concentrations compared to collection of tissue data, we disagree that modeling should be avoided. Collection of tissue samples can oftentimes be challenging for a number of reasons. The level of effort (and hence, cost) to obtain biological samples therefore should be weighed against this uncertainty and the potential for risk within the context of the Stage II scope. Modeling often can serve as a useful first step in evaluating food chain exposure and risk. Consider also discussing other options for assessing tissue concentrations, such as conducting site-specific bioaccumulation tests.
43	14.6.2	Regarding estimation of prey concentrations for food chain modeling using bioconcentration factors, this section indicates "...this approach is more uncertain and should be avoided." Recommend softening this language given the challenges of collecting sufficient tissue for analysis in certain situations. In fact, those challenges are acknowledged in the box on page 14-38 which reads: "Assessing toxicity based on body burdens is not typically used due to the difficulty of obtaining and analyzing tissue samples and the resources required to use this approach, and the limited data available to assess effects based on tissue samples." Consider indicating that direct analysis of prey tissue analysis is <i>preferred</i> to modeling.
43	14.6.2	While measured prey data are always preferred, there are situations and projects that are limited and cannot measure prey data. lookup bioconcentration factor may not be ideal, but it can provide some insights. Uncertainty must be acknowledged, but using a range of inputs can help to define that uncertainty. There are also models that include additional Site-Specific inputs providing an estimate with less uncertainty. Consider changing 'avoided' to 'should be used only when other data are not available and require sensitivity analyses' PAGE: 14-43: For birds and small mammals, dietary exposure concentrations should be based on measured prey concentrations if possible. The exposure concentration should be a conservative estimate of the average prey concentration within the exposure area(s). (Invertebrate prey samples for an area of concern may be composited.) The alternative is to estimate the prey concentration from soil levels by applying a bioconcentration factor. <u>However, this approach is more uncertain and should be avoided.</u>
44	14.6.2	1st paragraph on page: While we agree prey concentrations should not be diluted, home range of a receptor should be considered when estimating exposure, and accounted for when needed through use of an area use factor. Suggest adding this discussion into the text.

44	14.6.2	4th paragraph on page re: wet vs. dry weight. Suggest highlighting this important distinction in a text box.
44	14.6.2	While I agree that a calculation of exposure in the contaminated area exclusively is necessary, I strongly urge DEP to encourage the use of habitat suitability considerations in this estimation and use of spatially explicit exposure models in the uncertainty section. If the quality of the habitat in the contaminated area is lower than the quality in surrounding areas (of course the quality difference needs to be unrelated to the release) then it is difficult to claim that it could be a sustaining component. Some determination of suitability beyond the landscaped/paved/gravel determination would greatly benefit the analyses. There is an important balance between being realistically protective and unrealistically conservative.
44	14.6.2	MassDEP might consider providing a list of attributes/characteristics of TRVs that they would like to see – e.g. chronic versus acute studies, direct dosing with a range of doses, species types and extrapolations, safety factors. Some of these have been made in Technical Updates --- are Technical Update determinations integrated into this revised Guidance?
47	14.6.2	1st full paragraph, "Data sets from multiple reference areas should be collected..". Do you mean reference samples? It is often challenging to find one good reference area near a disposal site. Recommend changing language to state that collection of reference samples across multiple locations within a reference site or sites is necessary to characterize variability. Also consider expanding the discussion of selecting a reference area (e.g., finding areas with similar habitat, surroundings, substrate etc.)
47	14.6.2	Bullet 'Sampling Location Replicates' indicates collection of a minimum of 3 replicate samples per sample location. Given the typical cost of toxicity tests (up to several thousand dollars each), this recommendation would triple analytical costs. While field replicates are appropriate, an evaluation of toxicity relative to concentration can be conducted with fewer replicate samples (only at select locations) in conjunction with an adequate number of abiotic media chemistry samples to characterize contaminant variability.
47	14.6.2	Regarding toxicity test study design, it is unrealistic to assume that multiple replicates of toxicity tests can be run at each sample location. The risk of requiring a minimum of three replicates per location is that fewer site sampling locations maybe selected, site/reference comparisons may have less statistical power, and knowledge about larger-scale spatial heterogeneity may be sacrificed in favor of understanding small-scale heterogeneity. We recommend eliminating the requirement for multiple sample location replicates.
47-49	14.6.2	Observational studies are very challenging to plan and complete and with the limited budgets for most MCP projects, nearly impossible to complete sufficiently. At a large site we collected over 200 benthic samples and still did not meet the statistical power needed to capture the variability. I appreciate the care taken in the Technical Updates to express DEP preferences – while acknowledging that there are numerous lines of evidence that could be used. It might be helpful to include some comment about preferred lines of evidence for Analysis. A comment on reference areas – even with multiple reference areas, it is very difficult to find acceptable reference areas given the large footprint of chemicals in the environment – e.g. PFAS. Guidance is clear from MassDEP on criteria, but I am finding that very often finding suitable reference areas is a great challenge. Finally – regarding observations and as stated earlier – I hope the MassDEP sees the value of a habitat assessment (e.g. transects, random observation points and data collection on all types of habitat components – soils, wildlife, vegetation and the interaction of those). They can be efficient and cover larger areas and pickup important features that might be missed in a systematic and limited chemical sampling analysis.
50	14.6.3	1st bullet of 2nd paragraph: Suggest referencing Permanent Solution vs. RAO or, if this was updated in the REDUA guidance, replace this language with what is in that document.
52	14.7.1.1	2nd paragraph, penultimate sentence: Please provide additional discussion on magnitude of benchmark exceedances (small vs. moderate vs. large).
52	14.7.1.1	Box 14.7: Lines of evidence based on Benchmark Comparisons (i.e., changing the term quotient methods to benchmark comparison): By changing the term quotient methods to benchmark comparison, it adds a large degree of confusion as there is no differentiation between the term "benchmark comparison" used in this section as quotients and several other sections (see listed below); this will result in the potential for significant confusion in an ERA document. *Section 14.3.2 Stage I identifies a section screening benchmark comparison (page 14-12); *Section 14.5.8 Problem Formulation Selecting Measures of Effects identifies benchmark comparisons (page 14-32); *Callout box also identifying benchmark comparisons in Section 14.5.8 (page 14-33); *Page 14-37 2nd paragraph ..bioassessments are compared with benchmark comparisons (although it is not stated what benchmarks); *Section 14.6.2 Risk Analysis: Benchmark Comparison - identifying another section of comparisons (page 14-42)

53	14.7.1.2	1st paragraph, last sentence: It is unclear if the text is discussing conversion of toxicity values from one species to another, or using toxicity reference values for one species as a surrogate for another species (i.e., no conversion).
53	14.7.1.2	2nd paragraph, last sentence: See prior comment above on utility of using bioaccumulation models.
56	14.7.2	I understand the distinction between the historic WOE approach and lines of evidence approach and appreciate the warning that the line of evidence approach is not less rigorous, there are elements of the WOE approach that should be included in the lines of evidence approach. In my view – MassDEP is warning against distilling lines of evidence down to a qualitative and seemingly arbitrary 'score' allowing lines to be added and compared. I agree that can be problematic, but I hope that in promoting the Lines of Evidence approach the real work of carefully describing the comparative strengths, magnitudes, ability to defend each line of evidence is not lost.
56	14.7.3	Re: "In other words, a positive answer to one risk question cannot be over-ruled by a negative answer to another. For example, a finding that sediment from the site is significantly more toxic to test organisms than sediment from a reference location should be considered conclusive; it cannot be "over-ruled" by a negative finding from an observational field study in which a quantitative relationship between contaminant levels and effect levels is not detected". MassDEP might provide clarification of this example. Two lines of evidence might lead to conflicting risk conclusions but that doesn't mean that there is necessarily a risk finding. It depends on the lines of evidence. The example provided is vague – what is the evidence for significantly more toxic? Given that identifying a dose-response relationship is very rare (based on over 100 MCP sites) – I would agree with this example. But a more informative example might be the case where risk is identified using a food chain model with measured prey items, but a wildlife survey reveals that wildlife are feeding and using the area determined to be posing a risk. In this case the lines of evidence require more evaluation and perhaps more data are needed.

LSPA Comments on MassDEP Risk Characterization Guidance--Chapter 17

Chapter 17: <https://www.mass.gov/doc/risk-characterization-guidance-chapter-17-public-review-draft/download>

Provided below are the LSP Association's detailed comments on the MassDEP Risk Characterization Guidance--Chapter 17.

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1	17	Are the media in "all areas subject to flooding during a hypothetical 100-year storm event" under the MCP definition wetland sediments or wetland soils or soil? I realize that linking the MCP to the Wetlands Protection Act is necessary, but this one category might confuse appropriate treatment of media under the MCP. I also realize that categorizing the medium at an MCP site based on probability of flooding is also challenging.
3-4	17.1.2	I appreciate the additional discussion about distinguishing wetland sediment from wetland soil. Use of the bank remains a challenge given that few sites have a true bank in my experience. I agree that use of the wetland vegetation as an indicator is valuable. Working with our wetland scientists and as a biologist, I find it useful to consider if aquatic and/or semi-aquatic biota could survive in a medium. This includes media that are saturated for long periods but may not have standing water. I also appreciate MassDEPs recognition that this will require professional judgement and input from a wide range of experts and benefits from multiple visits to a site. Defaulting to wetland sediment when there is too much uncertainty is an option I understand, but in terms of making risk decisions with as much information as possible, it could be worth a sensitivity analysis – i.e. treating the media as both soil and sediment to determine how the risk estimates differ.
5	17.2.3	This section provides valuable information, but it does not provide guidance on how to treat Vernal Pools within the MCP. They require special attention, but what are the expectations for assessment? Are they treated as wetland soil given the limited time they are flooded?
6	17.2.4	2nd paragraph: It is unclear what the objective is of the first sentence. Many wetlands historically have been filled in Massachusetts and would be considered 'altered'. Filled, developed lands would no longer be considered wetland and would not be evaluated in an ecological risk assessment as wetlands.
6	17.2.4	Please clarify the application of this investigation should it be determined that an area was historically a wetland that was altered. Is that not a Wetlands Protection Act concern rather than an issue under the MCP at a 21e Site? Many of the Sites we deal with have a long history of habitat alteration in addition to releases. It is not clear then if a historically altered wetland that is now a filled in area lacking wetland characteristics should be treated as a wetland under the MCP?
6	17.2.4	While wetland habitat that has been altered may represent a regulatory concern, it is not clear why this is relevant to an ecological risk assessment. The habitat is what it is, and the risks should be based on the receptors actually present, regardless of the Site history.
6	17.2.5	Thank you for the additional information – very clearly presented – iron floc is a very common issue at many Sites and this Section provides clarity on the analysis. Two remaining questions however, if the total areal extent of the floc exceeds the 1000 sq foot limit but the dissolved oxygen levels are measured to confirm that there is no decline in DO in the sediments/water, is that still considered readily apparent harm. Also, if sampling confirms the presence of aquatic biota beneath the floc – does that change the conclusion of readily apparent harm. Often the floc is not fully settle on the sediment surface, can be patchy and can be easily dispersed by natural disturbance all allowing for an aquatic community to survive.
7	17.2.5	1st full paragraph: Iron flocculants should be distinguished here, as they can be naturally-occurring and are not necessarily indicative of contamination.
7	17.3.1	To clarify – if a Site includes wetland soil or wetland sediment, a Stage I is not applicable and a Stage II is automatically required. Or is this only applicable to wetland sediment? Also – was background elimination of COCs allowed in a wetland or was this only an option in Stage II?

8	17.3.1	3rd full paragraph, last sentence: Text recommends analyses of contaminants that are not site COCs. Please consider stating that at a minimum, the analyte list in reference areas should be matched with the site analyte list. Furthermore, please add that of equal importance is the evaluation of other parameters such as grain size/sediment characteristics, organic carbon content, dissolved oxygen, temperature etc. since these will influence toxicity and community metrics.
8	17.3.1	Re: "In addition to analyses for site COCs, ORS recommends conducting analyses for metals, EPH/VPH and PAHs as well as pesticides to ensure that levels of these chemicals are similar (except for site-related contamination) in the site and reference areas." This recommendation is unclear. If there is no evidence of these chemicals being site-related, why would they be assessed and given the likelihood of detecting some or all at urban sites as a local condition, what happens if any are detected on the Site? Proactive sampling for a fixed list of chemicals regardless of the Site history is concerning.
8	17.3.1	Minimally, additional sampling parameters that should be considered during a background evaluation are total organic carbon and grain size.
9	17.3.2	"Department considers ecological soil screening levels (EcoSSLs) from EPA as an appropriate Stage I screening measure for contaminants in wetland soils" Are EcoSSLs now official Stage I MCP soil screening criteria? The language isn't clear...
9	17.3.2	To clarify – wetland soils and wetland sediments can now go through the Stage I process using EcoSSLs and sediment screening values. There is no longer a requirement to move directly to Stage II for wetlands?
9	17.3.2	Suggest moving this section adjacent to the section on sediment screening levels.
9	17.3.2	Since EcoSSLs are available for only a limited number of contaminants, we suggest incorporating other published sources of soil screening values (e.g., LANL, Region 4) into this discussion.
9	17.3.4	Suggest incorporating other standard published sources of sediment benchmarks (Region 4, LANL etc.) into discussion.
9	17.3.2, 17.3.4	Language should be included to allow for use of additional published sources for contaminants that do not have screening values presented in the sources listed.
10	17.3.5	The discussion of reptile/amphibian toxicity, risk, and uncertainty seems like it would be better addressed under a Stage II ERA.
10	17.4	Last paragraph on page regarding buffer zone: The language in this paragraph is not clear--buffer zone is a regulatory term that does not necessarily reflect habitat. The focus of the Stage II should be on the habitats that have been impacted by a disposal site and the associated risk to receptors. The paragraph as written implies that buffer zone soils should be evaluated as wetland soils. Is the intent of the paragraph to recommend not applying the 2-acre areal exclusion criterion to undeveloped buffer zones? Suggest revising this paragraph to discuss the importance of evaluating habitats and complete or potentially complete exposure pathways within the buffer zone with respect to their potential impact on adjacent wetlands and waterways, and/or clarify use of the areal exclusion criterion within buffer zones.
11	17.4	"Because high productivity and chemical and mineral recycling processes normally occur in wetlands, impairment or loss of these functions over a substantial wetland area would represent a significant risk of harm to the environment in the vicinity of the site". We recommend describing what species focused endpoints MassDEP accepts as indicators or a reflection of the magnitude of productivity and mineral cycling process functioning. These two important ecological functions are not easy to evaluate independently without a large focused time-consuming and expense study.