Midwestern States Environmental Consultants Association

April 7, 2022

Mr. Michael Habeck
Indiana Department of Environmental Management
Office of Land Quality
Process Improvement Team
100 North Senate Avenue
Indiana Government Center North 1101
Indianapolis, Indiana 46204

Dear Mr. Habeck:

On behalf of the Midwestern States Environmental Consultants Association (MSECA) Response Group (RG), we would like to thank you for the opportunity to provide technical input to the Indiana Department of Environmental Management (IDEM) on the February 22, 2022 draft of the *Remediation Closure Guide-Revised* (*R2)*. This cover letter is accompanied by a spreadsheet of comments arranged to match the section order of the draft of the *R2*.

The MSECA RG has sought to include nearly all received comments and responses in their original form when possible so as to represent the full spectrum of our membership and not just of the MSECA RG.

We hope these responses and comments are helpful during your continued development of the *R2*. The MSECA RG is available to provide additional input and comments if requested by IDEM to assist in continuing to move the guidance forward. Additionally, members of the MSECA RG are willing to meet (in-person or virtually as safety dictates) to discuss any of these topics or to address any questions you or the IDEM staff may have.

Sincerely,

Jeremiah Armitage, LPG
MSECA President

Midwestern States Environmental Consultants Association
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#	Subsection	Page #	Line #	Comment
General				
1	*Subsection*	*Page No.*	*Line No.*	*Comment*
2				
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#	Subsection	Page #	Line #	Comment
Sec. 1				
1	*multiple*	*multiple*	*NA*	*The terms "release", "chemical release", and "release that requires characterization" are used (and the term "release that does not require characterization" may be inferred). Please provide definitions for these fundamental terms*

#	Subsection	Page #	Line #	Comment
Sec 2				
	Subsection			

#	Subsection	Page #	Line #	Comment
Sec. 2.1				
1	*2.1.2.3*	*17*		*Paragraph 6 states "Professional judgment and adequate sampling are necessary whenever it is important to establish the dimensions of source areas." It is not clear what this means or how it adds to the content of this section. Consider deleting*
2	*2.1.3*	*17*		*Repeated statements "Sampling data showing concentration gradients": Please clarify - is this a reference to spatial gradients around a source, temporal gradients or other? How are concentration gradients to be determined at a 'point' source?*

#	Subsection	Page #	Line #	Comment
Sec. 2.2				
1	*2.2.3*	*22*		*last para: reference is made to the SAP that IDEM has approved. This is somewhat misleading as not all remediation programs contemplate (or establish an explicit approval process for) a formal SAP. Consider revising to clarify.*
2				
3	*2.2.4*	*23*		*Second full para: The meaning of the statement "Soil and other subsurface materials (including fill) need to be thoroughly described to collect representative samples." is not clear. Is this intended to convey that a record of the examination and description of subsurface materials is needed in order to document that samples are representative? Please revise to clarify.*
4	*2.2.5*	*25*		*The term "perimeters of compliance' is used. Please add a citation to the section where this term is defined.*
5	*2.2.5*	*26*		*under heading 'Groundwater Samples From Borings', suggest revision: … to collect groundwater "grab" samples from boreholes*
6	*2.2.5*	*27*		*under heading 'Groundwater Samples From Borings', suggest revision: … Release-related chemicals ~~often are distributed though~~ in ~~the~~ saturated ~~zone~~ unconsolidated deposits typically are distributed in ~~narrow stringers based on~~ relatively thin layers ~~minute~~ of higher-permeability material ~~variations in porosity~~ rather than ~~in~~ as a homogeneous solution distributed throughout the saturated zone. Similarly, release related chemicals in bedrock typically are distributed preferentially in fractures, voids and higher permeability zones, rather than uniformly throughout the bedrock matrix. Therefore, it is ~~very~~ important*
7	*2.2.5*	*27*		*Last paragraph - suggested revision: ~~Polyethylene diffusion bag samplers and other types of p~~ P assive sampling devices ~~may also be acceptable for long-term groundwater monitoring for projects~~ that meet a strict set of criteria (ITRC 2007 and IDEM 2021a) also maybe acceptable for long-term groundwater monitoring.*
8	*2.2.6*	*28*		*Second bullet point: "Method TO-17" is cited in association with sorbent sampling methods. However, in the previous bullet point where the vacuum canister sampling method is address, no method citation is given. Please either add a reference method to the first bullet point (e.g., TO-15), or delete the reference to TO-17 in the second bullet item.*
9	*2.2.6.2*	*31*	*22*	*Active Soil Gas Sampling Procedures - Please clarify if a leak test is only required after exterior soil gas port installation or if it is required before each sampling event.*
10	*2.2.6.3*	*34*	*1*	*Sampling Sub-Slab Soil Gas: Recommended Procedures - These procedures do not include a recommendation to conduct a leak test after sub-slab port installation. Please clarify if a leak test is required for a sub-slab port and if so, is it only required after installation or before each sampling event. Please also clarify that the "water dam" method of leak detection testing is acceptable when using the Vapor Pin or similar technology for sub-slab soil gas sampling.*

#	Subsection	Page #	Line #	Comment
Sec. 2.3				
1	*2.3.3*	*45*		*Please define (or delete) the term 'reasonably'*
2	*2.3.3*	*45*		*Footnote, suggested revision: … levels table s do ~~es~~ not include residential , ~~or~~ commercial or recreational soil levels*
3	*2.3.3.2*	*46*		*Paragraph 1: the term 'necessary' is used. Elsewhere in the document, the term 'advisable' is used in similar applications. Suggest using a consistent term throughout.*
4	2.3.3.2	46		Heading "When Mobile NAPL is Present": Per the superior heading at 2.3.3.2, this paragraph should address "determining future extent'. The draft text does not accomplish that. Please revise.
5	2.3.3.2	46		Heading "Downward Vertical Migration (Leaching) in the Soil Column": Per the superior heading at 2.3.3.2, this paragraph should address "determining future extent'. The draft text does not accomplish that. Please revise.
6	*2.3.6.5*	*55*	*Table 2C*	*2.3.6.5 Prompts for Vapor Intrusion Investigation, Table 2C: Prompts for a petroleum vapor intrusion investigation are specified as a building that has less than six feet of vertical or horizontal separation from groundwater with dissolved benzene above* ***50 ug/L.*** *This concentration is extremely conservative and not in line with EPA Petroleum VI Guidance, which specifies a six feet vertical separation distance from groundwater with dissolved benzene at concentrations less than* ***5,000 ug/L*** *. The EPA guidance also cites a more conservative study which specifies the use of a six feet vertical separation distance from groundwater with dissolved benzene at concentrations less than* ***1,000 ug/L*** *, which is what the current IDEM Remediation Closure Guidance (RCG) presents. Please clarify why the benzene concentration of 50 ug/L, which is 2 orders of magnitude lower than current EPA recommendations and 20 times lower than current IDEM recommendations for petroleum VI separation distance for benzene concentrations, was selected and consider revising this value to be consistent with EPA guidance recommendations for petroleum vapor*
7	2.3.6.6	55		What is the basis for the 500 ug/L criterion?
8	*2.3.7.1*	*56*		*Last sentence: Please define "sentinel" soil gas probe.*

#	Subsection	Page #	Line #	Comment
Sec. 3				
1		*59*	*Line No.*	Paragraph 1: Please define "chemical release".
2		59		*Paragraph 3: Draft text reads: "Projects should proceed in a reasonably systematic way that makes sense given the circumstances of the release, and at a pace that results in timely implementation of remedies that address any unacceptable risks arising from the release." While the spirit and intent of this statement is acknowledged, it is not clear how attainment of these subjective criteria will be demonstrated how such demonstration will be evaluated by IDEM. Please explain.*

#	Subsection	Page #	Line #	Comment
Sec. 3.1				
	Subsection	*Page No.*	*Line No.*	*Comment*

#	Subsection	Page #	Line #	Comment
Sec. 3.2				
1	*3.2.2.2*	*66*	*Line No.*	*Please clarify the statement "Unless there is reason to believe that a recurrence of release-related chemical concentrations in groundwater is reasonably likely, IDEM will not typically require a remedy based on superseded groundwater sampling results".*

#	Subsection	Page #	Line #	Comment
Sec. 3.3				
1	*3.3.7*	*80*	*Line No.*	*Fifth bullet item: Please revise to address situations where characterization, remediation, closure are being performed using criteria established in an IDEM-approved RWP or similar, and the approved criteria pre-date "IDEM's most recent table".*

#	Subsection	Page #	Line #	Comment
Sec. 3.4				
1	3.4.3	84		Heading "Current and likely future use of the decision unit": Please explain the basis for IDEM's authority to "require soil management plans".
2	3.4.3	84		Heading "Current and likely future use of the decision unit": Please explain what potential exposure risks are addressed by a soil management plan that are not already addressed by existing solid and hazardous waste rules (rules that this NRPD cannot usurp or modify).
3	3.4.3	84		Heading "Current and likely future use of the decision unit": Please explain the basis for IDEM's authority to bind "future owners to comply with the approved soil management plan".
4	3.4.3	87		Heading "Vapor: Size of data sets": This appears to be the only instance where "size of data set" is addressed. Should the 'size of data set' be addressed for all media? Or, perhaps this section is attempting to accomplish what 'plume behavior demonstration' seeks to demonstrate for the groundwater medium. In which case the point is not 'size of data set', but imperative that a sufficiently robust data set is acquired to demonstrate that the vapor CSM is complete and accurate.
5	3.4.4	88		first para: reference is made to release related chemicals in soil as a source of release-related chemicals in vapor. Please clarify how soil conditions can/would/should be used to evaluate whether a remedy is necessary for soil exposure as it pertains to potential exposure risks to vapor.
6	3.4.4.1	89		List item 7, the criterion "make sense" is stated. How is this term defined and demonstrated?
7	3.4.6	97		First para, suggested revise: ... from ~~drinking~~ ingestion of and ~~touching~~ direct-contact with release-related chemicals in groundwater, and from ~~breathing~~ inhalation of release-related chemicals that volatilize from groundwater ~~that is used inside structures~~ causing soil gas or indoor air concentrations exceeding remediation objectives. IDEM will generally will assume, unless convincing lines of evidence suggest otherwise, that release-related chemicals exceeding unconditional remediation objectives in any water from below the ground surface may pose a groundwater exposure risk. IDEM will not limit groundwater exposure risk evaluations to water issuing from a tap. ~~Indirect groundwater risks occur mostly when release-related chemicals in groundwater volatilize in the subsurface and enter structures via vapor intrusion~~.

8	*3.4.6*	*97*		*Penultimate paragraph reads "In general, IDEM prefers conservative approaches to predicting the ultimate extents of release-related chemicals in groundwater." Please explain what this means, and how IDEM intends to administer*

#	Commenter Name	Subsection	Page #	Line #	Comment
Sec. 4					
1	*Name here*	*Subsection*	*Page No.*	*Line No.*	*Comment*
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#	Subsection	Page #	Line #	Comment
Sec. 4.1				
1	4.1.2	108		First bullet item: Suggested revision … over the likely lifetime of the subject exposures ~~release-related chemicals~~
2	4.1.2	108		Second bullet item: Please define "quickly enough", clarify how the condition is demonstrated, or avoid use of the subjective term.
3	4.1.2	108		Last bullet item: Please explain/clarify IDEM's authority to approve/disapprove a remedy/method, vs its authority to approve the exposure endpoints achieved by implementation of a remedy (regardless the remedy used to achieve them).
4	4.1.4	110		The term "Active Remedies" implies that there are 'passive' remedies; however, the topic of passive remedies is not addressed. Add a section addressing passive remedies or otherwise clarify?
5	4.1.9	113		Paragraph 1, suggested revision: … to ~~evaluate proposals for active remedies and engineered exposure controls~~ proposed remedies include the following:

#	Commenter Name	Subsection	Page #	Line #	Comment
Sec. 4.2					
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#	Subsection	Page #	Line #	Comment
App. A				
1	*A.4.1.3*	*121*	*Line No.*	*Paragraph 1 and Table A-1: terms "industrial" and "commercial" appear to be used indiscriminately. Please select one term and use consistently throughout text and tables.*
2				
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#	Subsection	Page #	Line #	Comment
App. B				
1	B.2.2	130		Paragraph 1, suggested revision … in turn compared against sample data from the decision unit. Appropriate ~~approaches~~ calculation methods for BTVs vary ...
2	*B.4.*	*141*	*Line No.*	*Paragraph 1, suggested revision … not aware of ~~any~~ naturally occurring sources of significant ambient air concentrations of the chemicals ~~(chlorinated solvents and benzene)~~ that typically drive release-related indoor air risk (chlorinated solvents and benzene).*
3				

#	Subsection	Page #	Line #	Comment
App. C				
1		143		Paragraph 1, suggested revision: ~~Measuring the~~ Spatial and temporal concentration changes within a plume can be a strong line of evidence that a plume of a release-related chemical in groundwater is behaving consistently~~, both temporally and spatially~~. Analysis of these concentration changes (“trends”) requires
2	*C.1.*	*143*		*Third bullet item, suggested revision: The ~~intent~~ short-term remediation objective is to ~~quickly drive plume~~ reduce concentrations of release-related chemicals to levels less than ~~below an~~ unconditional remediation objective s*

#	Subsection	Page #	Line #	Comment
App. D				
1	*D.5*	*158*	*Step 1*	*Clarify the reference to "Indiana State Map" (Is this the IndianaMAP system that is cited elsewhere in the document?)*
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#	Subsection	Page #	Line #	Comment
App. E				
1	Table E-1.	161		"Soil", "IDEM ... Commercial level", last bullet item: Regarding Soil Management Plan, please see comments at Section 3.4.3.
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#	Subsection	Page #	Line #	Comment
App. F				
1	Multiple	Multiple		Multiple references are made to a recommended or suggested 'buffer zone'. Please define this term and explain how this feature is intended to be designed, incorporated into a remedy, etc.

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App. G					
1	*Name here*	*Subsection*	*Page No.*	*Line No.*	*Comment*
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Acronyms				
1	*Glossary*	*179*	*Line No.*	*Active Remedy: the term 'significant' may be interpreted to have a particular statistical meaning. Suggest omitting or using alternate term.*
2	*Glossary*	*179*		*Commercial indoor air action level, suggest revise: For a given chemical, a value equal to ~~T~~ t en times ~~a chemical's~~ the IDEM*
3	*Glossary*	*179*		*Conceptual Site Model, suggested revision: … and ~~any~~ remedy /ies proposed*
4	*Glossary*	*179*		Conditional Remediation Objective, suggested revision: … decision unit (i.e., is established/applied in conjunction with a particular condition(s). … they are ~~calculated assuming no residential land use~~ applicable in conjunction with the condition that residential land uses are prohibited
5	*Glossary*	*179*		*Decision Unit, suggested revision: … human ~~s (~~ or organisms ~~)~~ ecological receptors may be exposed*
6	*Glossary*	*NA*		*Add definition of the term "Release".*
7	*Glossary*	*180*		*Residential indoor air action level, suggest revise: For a given chemical, a value equal to ~~T~~ t en times a chemical's the IDEM*
8	*Glossary*	*180*		*Source Area, suggested revision: A physical location W ~~w~~ here release-related chemicals*
9	*Glossary*	*180*		*Source facility, suggested revision: The building, land, ~~or~~ operation, enterprise, etc. from which release-related chemicals were released into the environment ~~used for one or more purposes (e.g., gasoline sales and storage, dry cleaning, manufacturing, etc.), where the release occurred~~*
10	*Glossary*	*181*		*Unconditional Remediation Objective, suggested revision: … unrestricted use of a ~~property~~ decision unit (i.e., is established/applied with no conditions associated).*

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