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2024 MCP Amendments Q&A

August 11, 2025 – This document contains all Q&As related to the 2024 amendments to the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000). It includes questions asked by Licensed Site Professionals (LSPs) and MassDEP staff at training sessions on the amendments. Questions on the MCP, including the 2024 MCP amendments, may be submitted to BWSC.Regulations@mass.gov.

GENERAL QUESTIONS – Excluding Subpart I
(added August 11, 2025)

Subpart A: GENERAL PROVISIONS (310 CMR 40.0000)

Q1: **The Well Installation, Geolocation, Maintenance and Security provisions at 310 CMR 40.0028, as amended in 2024, require that a well installed as part of MCP response actions be "maintained and secured throughout its period of service *and until it is properly decommissioned*…" Is MassDEP now making the decommissioning of monitoring wells a requirement?**

A: Prior to the 2024 amendments, the decommissioning of wells installed as part of MCP response actions was already implied by the language at 310 CMR 40.0028, which required that a well be maintained and secured "throughout its period of service" to prevent the introduction of contamination to the subsurface or exacerbation of groundwater contamination via such wells.

The amended provision clarifies that a well's period of service ends when the well is properly decommissioned. Until the well is properly decommissioned, the person conducting response actions has an ongoing obligation to maintain and secure the well.

Q2: Who is responsible for recording and reporting latitude and longitude "in a form provided by the Department for such purposes" for monitoring and remediation wells pursuant to 310 CMR 40.0028? The LSP, Potential Responsible Party (PRP), or certified well driller?

A: The Well Driller Regulations, 310 CMR 46.00, require the well driller to submit information on well locations. Under the MCP, the provision at 310 CMR 40.0028 requires "RPs, PRPs or Other Persons undertaking response action" to ensure it happens. The submittal of this information by the well driller using the well driller Monitoring Well Report form satisfies the MCP requirement to document the well location.

Q3: Does the requirement to provide documentation of the location of any well installed or constructed as part of MCP response actions apply to wells installed prior to March 1, 2024 (the effective date of the applicable provision)?

A: No. The MCP requirement applies to wells installed on or after March 1, 2024, the effective date of the geolocation requirement at 310 CMR 40.0028. This is consistent with ensuring completion of the Well Driller Program's Monitoring Well Report form to satisfy this requirement, as that form is intended for completion at the time of the well installation.

Q4: The 2024 MCP amendments revised the provisions related to the application of Remedial Additives. Are soil amendments used to stabilize or treat soil for leachability considered Remedial Additives?

A: Yes. Remedial Additives are defined (*see* 310 CMR 40.0006) as "any aqueous, gaseous, or solid phase agent that is designed to treat or enhance the treatment of, or assessment of, soil and/or groundwater. The term shall include oxidizing agents, encapsulants, sequestering agents, non-pathogenic microbes, enzymes, nutrients, surfactants, and anti-fouling agents used to inhibit microbial growth in remedial treatment systems and monitoring wells." An agent added to affect the leachability of chemical constituents in soil falls within this definition.

Subpart B: ORGANIZATION AND RESPONSIBILITIES (310 CMR 40.0100)

Q5: Do the MCP provisions that provide for the use of Notices of Activity and Use Limitation (AUL) at Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) sites apply to other federally regulated sites, such as Resource Conservation and Recovery Act (RCRA) Corrective Action Sites or Toxic Substances Control Act (TSCA) Sites?

A: No. The requirements in the MCP's "Adequately Regulated" provisions for implementing Notices of AULs in 310 CMR 40.0111, which were first added to the MCP in 2014 and amended in 2024, apply specifically to CERCLA sites and do not apply to RCRA and TSCA sites. These provisions are tailored to the CERCLA response action process and requirements.

RCRA Corrective Action sites are also addressed in the MCP's "Adequately Regulated" provisions in a separate section, 310 CMR 40.0112. Following a 2014 regulation amendment, many RCRA Corrective Action sites are now assessed and cleaned up following the same MCP provisions that apply to "state sites," which includes the provisions (outside of those specific to CERCLA sites) for implementing AULs.

There is no "Adequately Regulated" provision applicable to TSCA in 310 CMR 40.0110. Therefore, "TSCA" sites are no different from other "21E sites" and ***all*** the MCP provisions apply, including AUL requirements, just as they would apply to any other non-CERCLA 21E site.

Subpart E: TIER CLASSIFICATION AND RESPONSE ACTION DEADLINES (310 CMR 40.0500)

Q6: Is there a regulatory timeframe for submitting a Tier Reclassification from Tier I to Tier II following the elimination of one or more of the Tier I conditions?

A: No. It is anticipated that the person conducting response actions at a Tier I disposal site will reclassify a Tier I site to Tier II once it is possible to do so. Reclassification from Tier I to Tier II means reduced Annual Compliance Fees and reflects the reduction of potential risks posed by the site. However, the relevant provisions (see 310 CMR 40.0520(3) and 310 CMR 40.0530(2)) both use the word "may" rather than "shall" when referring to the process of reclassifying from Tier I to Tier II, indicating that reclassification in such case is optional.

It is important to note that the reverse is not true. Pursuant to 310 CMR 40.0530(1), a person performing response actions must submit a Tier Classification Submittal for reclassification of a disposal site from **Tier II to Tier I** to the Department "within 60 days of obtaining knowledge that the disposal site meets the Tier I Criteria." The provision at 310 CMR 40.0530(1) states,

(1) An RP, PRP or Other Person performing response actions at a disposal site following Tier Classification shall re-evaluate such disposal site using the Tier I Criteria specified in 310 CMR 40.0520(2) if he or she obtains information which could cause reclassification of the disposal site from Tier II to Tier I and shall submit to the Department a Tier Classification

Submittal for the reclassification of the disposal site within 60 days of obtaining such knowledge that the disposal site meets the Tier I Criteria.

Q7: If there is no specific timeframe for reclassifying a disposal site from Tier I to Tier II, can a Tier Classification Submittal for reclassification be submitted as soon as it can be shown that the Tier I Criteria no longer apply?

A: The 2024 MCP amendments clarified at 310 CMR 40.0530(2) that a submittal for reclassifying a disposal site from Tier I to Tier II may be made once the Tier I Criteria no longer apply AND, in such cases where the condition(s) associated with the Tier I Criteria required conducting an Immediate Response Action, once such Immediate Response Action has been completed and an Immediate Response Action Completion (IRAC) Statement is submitted. Reclassification may be done concurrently with or after submitting the IRAC.

Subpart H: COMPREHENSIVE RESPONSE ACTIONS (310 CMR 40.0800)

Q8: If response actions at a disposal site with Remedy Operation Status (ROS) extend beyond five (5) years from the effective Tier Classification date, is a Tier Classification Extension required under the MCP revisions?

A: No. A Tier Classification Extension is not required provided that ROS is maintained (i.e., not terminated). As stated at 310 CMR 40.0893(4), the effect of maintaining Remedy Operation Status is that the deadline for achieving a Permanent or Temporary Solution within five (5) years of the effective date of Tier Classification does not apply, and a Tier Classification Extension is not required. This provision predates the 2024 amendments and has not been modified.

Q9: What is required with respect to the need for a Tier Classification Extension if ROS is terminated?

A: At 310 CMR 40.0560(7)(g), the 2024 MCP specifies that a Tier Classification Extension submittal is required "upon termination of Remedy Operation Status" unless a Permanent Solution is submitted prior to the Remedy Operation Status (ROS) termination date. The Tier Classification Extension Submittal in such case must be submitted to the Department by the person conducting response actions prior to or concurrently with the written notice of the termination of ROS required pursuant to 310 CMR 40.0893(6)(c). The Tier Classification Extension is effective

for two years from the date that the Tier Classification Extension Submittal is received by the Department, unless otherwise specified by the Department.

Q10: Is there a way to look up Tier Classification expiration dates on a site-by-site basis?

A: No. There is no way to look up the expiration date other than to consult the site file and look at the relevant document submittal dates. Pursuant to 310 CMR 40.0560(1)(a), the Tier Classification for a disposal site expires five years from the effective date of the initial Tier Classification. Subsequent Tier Classification Extensions add an additional two years beyond the expiration date of "the previous Tier Classification" (*see* 310 CMR 40.0560(7)(d)).

Therefore, the Tier Classification expiration date for a disposal site may be determined by finding the date that the initial Tier Classification was submitted and adding five (5) years. If a Tier Classification Extension had been submitted subsequent to the initial Tier Classification, an additional two (2) years would be added to the five (5) years (for a total of seven (7) years from the initial Tier Classification submission date) to determine the expiration date.

Subpart J: PERMANENT AND TEMPORARY SOLUTIONS (310 CMR 40.1000)

Q11: Among the exhibits required for a Notice of Activity and Use Limitation (AUL) is an 8 ½" x 11" sketch plan (Exhibit B). The 2024 MCP Amendments expanded the information that must be depicted on a sketch plan. What other information must now be included?

A: Prior to the 2024 MCP Amendments, it was required that a sketch plan include the boundaries of the area subject to the AUL in relation to the boundaries of the disposal site. As specified at 310 CMR 40.1074(2)(a)5., sketch plans must now also include:

- the property boundaries; and
- the location of any Engineered Barriers, permanent caps, Active Exposure Pathway Mitigation Measures, or any other barriers or systems related to Obligations and Conditions or other terms of the AUL.

This additional sketch plan information is aimed at more clearly documenting disposal site features and systems relevant to complying with the AUL.

Although the MCP does not require the sketch plan to be prepared by a Massachusetts Registered Land Surveyor, it should contain accurate distances, include a North arrow, and be

to scale. In addition to the elements required by 310 CMR 40.1074(2)(a)5., the sketch plan may also depict features helpful in identifying the area subject to the AUL, such as buildings/structures, pavement and walkways, landscaping, fences, easements, and utility corridors.

Q12: The 2024 MCP Amendments provide for the implementation of an Activity and Use Limitation (AUL) at a disposal site with Remedy Operation Status (ROS). Is an AUL required for a disposal site with ROS?

A: No. An AUL is not required for a disposal site in ROS. However, as specified at 310 CMR 40.1012(3)(h), an AUL *may* be implemented at a disposal site in ROS (i.e., the property owner has the option), provided all substantial hazards have been eliminated and all ROS requirements have been met. In the 2024 MCP, bracketed text has been added to the Notice of AUL Form 1075 to be used when implementing an AUL for a disposal site in ROS.

Q13: Does the 2024 MCP provision at 310 CMR 40.1025(3)(d) that requires monitoring the vacuum range of a Sub-Slab Depressurization System operating as an Active Exposure Pathway Mitigation Measure (AEPMM) at a disposal site with a Permanent Solution apply if the Permanent Solution was achieved prior to March 1, 2024, the effective date of the amendments?

A: Pursuant to 310 CMR 40.1025(3)(d)6., if the Permanent Solution supported by an AEPMM was implemented prior to March 1, 2024, there is the option to provide alerts based on either the vacuum level or the shutdown and restart of the soil gas extraction system. For a disposal site where a Permanent Solution supported by an AEPMM was implemented on or after March 1, 2024, the remote monitoring system must monitor vacuum range and provide alerts when the vacuum level falls outside the acceptable range, and again when such level returns within the acceptable range, as specified at 310 CMR 40.1025(3)(d).

Q14: As part of the Active Exposure Pathway Mitigation Measure (AEPMM) registration process, the 2024 MCP states at 310 CMR 40.1027(2)(d) that written confirmation from the Department is required that indicates that the registration is complete. How will MassDEP issue this written confirmation?

A: The 2024 MCP codifies the AEPMM registration process that has been in place since 2014. The AEPMM registration process can be accessed online at: https://www.mass.gov/info-details/remote-telemetry-for-active-exposure-pathway-mitigation-measures-aepmm.

After MassDEP receives the Telemetry Device Registration Form, MassDEP will work with the contact person listed on the form to conduct a shutdown and restart test that demonstrates that MassDEP is receiving the proper notifications from the telemetry system. Once it is demonstrated to MassDEP's satisfaction that the system notifications are occurring properly, MassDEP will send email confirmation to the contact person stating the registration is complete.

Q15: The MCP requires remote monitoring systems on Active Exposure Pathway Mitigation Measures (AEPMMs) that mitigate vapor intrusion in support of a Permanent Solution, Temporary Solution or Remedy Operation Status (ROS) to alert "the owner and operator of the building protected by the Active Exposure Pathway Mitigation Measure" and MassDEP if the AEPMM is operating outside of the established range of effectiveness. What is the intent of these notifications?

A: These notifications are an important aspect of ensuring the AEPMM is operating to prevent or mitigate the migration of volatile oil and hazardous materials into a building. The notification sent to the building owner and operator is intended to prompt immediate action by the owner/operator to investigate and correct issues affecting the AEPMM's effectiveness and reliability. The notification sent to MassDEP provides the agency with information about the frequency and duration of such events, which indicate whether the AEPMM is performing according to its operating regimen and maintaining a condition of No Significant Risk. (*See* related requirements at 310 CMR 40.1025(3)(d)3 for AEPMMs supporting Permanent Solutions and 310 CMR 40.1026(3)(d)3 for AEPMMs supporting Temporary Solutions or ROS.) Notification MUST be sent to MassDEP in ALL cases when the AEPMM is operating outside of the established range of effectiveness.

Q16: If an Active Exposure Pathway Mitigation Measure (AEPMM) fails to operate or is operating outside its range of effectiveness, how soon does it need to be repaired and back on-line?

A: As specified at 310 CMR 40.1025(7) for disposal sites with a Permanent Solution and at 310 CMR 40.1026(5) for a disposal site with a Temporary Solution or in Remedy Operation Status, "immediate steps to return the Active Exposure Pathway Mitigation Measure to full operating condition" must be taken if the AEPMM (e.g., Sub-Slab Depressurization System mitigating

vapor intrusion or Point of Entry Treatment System treating a private drinking water supply) is not operating or not operating properly. Additionally, if the failure or suspension of the AEPMM lasts thirty (30) or more consecutive days, notice must be given to the Department and any non-transient occupants of the building protected by the AEPMM.

Q17: For disposal sites that currently have an operating Sub-Slab Depressurization System (SSDS) or a Point of Entry Treatment (POET) System, but do not have a documented operating regimen, does an operating regimen need to be prepared under the 2024 MCP?

A: Yes. The requirement to have a documented operating regimen for an Active Exposure Pathway Mitigation Measure (AEPMM) that supports a Permanent Solution, Temporary Solution or Remedy Operation Status (ROS), whether an SSDS or POET System, predates the 2024 MCP amendments. Since 2014, the MCP has required that an operating regimen, designed to maintain a condition of No Significant Risk and that documents the AEPMM operating parameters and monitoring frequency, be established and included in the Permanent Solution Statement, Temporary Solution Statement or Phase IV Operation, Maintenance and Monitoring Plan, as applicable. The 2024 MCP amendments provide more specific requirements as to what must be contained in an operating regimen. (*See* 310 CMR 40.1025(3) and 310 CMR 40.1026(3)). In such cases where an operating regimen has not been established and documented, it will be necessary to prepare one to comply with the MCP AEPMM requirements.

Frequently SSDS and POET Systems are installed and operated as an Immediate Response Action (IRA), prior to the achievement of a Permanent Solution, Temporary Solution or ROS. The IRA provisions do not have specific references to an AEPMM "operating regimen." An effective IRA, however, will necessitate establishing and documenting the conditions under which such systems need to be operated and the frequency with which they will be monitored to meet the IRA mitigation objectives, consistent with the requirements of an IRA Plan, IRA Remedial Monitoring Reports, and Status Reports.

Q18: How should notice pursuant to 310 CMR 40.1025(7) or 310 CMR 40.1026(5), be given to the Department and any non-transient occupants of a building where an Active Exposure Pathway Mitigation Measure (AEPMM) shutdown or failure has lasted thirty (30) or more days?

A: To notify the Department if the operation of an AEPMM has been shutdown or has failed to operate effectively for a period of thirty (30) or more consecutive days, a BWSC126 can be used

with supporting information documenting the reason for the AEPMM shutdown or failure. In addition to this notification documenting the reason for the AEPMM shutdown or failure, the notification must also state any efforts made or steps to be taken to resume operation of the AEPMM, and the expected timeframe for resuming operation of the AEPMM. If the AEPMM is operating under a Temporary Solution or Remedy Operation Status, the above information must also be included in the next required Status Report. Non-transient building occupants must be provided with the same information in writing either by letter, or if agreeable to the building occupants, via email.

Q19: Typically, I have designed passive venting systems addressing vapor intrusion with a wind-driven turbine. The 2024 MCP's Active Exposure Pathway Mitigation Measure (AEPMM) definition includes measures that rely upon "the continual use of a mechanical or electro-mechanical device…" Would a wind-driven turbine component make an otherwise passive system an "active" system?

A: The use of the term "mechanical" as part of the definition of AEPMM is not new to the 2024 MCP AEPMM definition and the question of whether such component on a passive venting system would render it active is addressed in Section 3.5.2 of MassDEP's *Vapor Intrusion Guidance* (Policy #WSC-16-435). The guidance states that a passive venting system that incorporates a wind-driven turbine on the top of the vent pipe to enhance flow would be considered an active system *if* the turbine is determined to be necessary to maintain No Significant Risk. If the turbine is <u>not</u> necessary for maintaining No Significant Risk, then the use of the turbine with an otherwise passive system would not make it "active."

Q20: What if a homeowner wants to continue to operate a Point of Entry Treatment (POET) System that was installed as part of MCP response actions, but is not needed to maintain a Permanent Solution? Will the ongoing operation of the POET System in such a case affect the Permanent Solution category and related obligations?

A: If it has been demonstrated that the ongoing operation of the POET System is not necessary to maintain a Permanent Solution (i.e., oil and hazardous materials (OHM) concentrations in the well water in the influent/prior to treatment are at a level of No Significant Risk), the owner of the property served by the private water supply well may continue to operate the POET System voluntarily "outside of the MCP." This circumstance may arise at the time that a Permanent Solution Statement is first submitted, or it may arise at some point after a Permanent Solution Statement has been submitted and after exposure conditions have changed.

In the first case, when it is demonstrated at the time that the Permanent Solution is first documented that the ongoing operation of the POET System is not necessary to maintain a Permanent Solution, the voluntary basis of its ongoing operation should be clearly documented in the Permanent Solution Statement. Such documentation will serve to explain the status of the POET System in terms of MCP compliance and make clear that its ongoing operation is not subject to the requirements in 310 CMR 40.1025 (Requirements for Active Exposure Pathway Mitigation Measures Implemented as a Part of a Permanent Solution with Conditions), including the requirement for an Activity and Use Limitation (AUL).

In the second case, where the POET System was necessary to support the Permanent Solution at the time the Permanent Solution Statement was submitted, but is later determined to be no longer necessary, the MCP specifies at 310 CMR 40.1025(10) requirements for terminating the operation of the POET System. This provision is also applicable if the POET System continues to be used on a voluntary basis but will not be complying with the requirements in 310 CMR 40.1025. The documentation required at 310 CMR 40.1025(10) to support no longer operating the POET System on a mandatory basis "shall include a Risk Characterization conducted pursuant to 310 CMR 40.0900 that evaluates and documents exposure to OHM for Receptor(s) of concern in the absence of the Active Exposure Pathway Mitigation Measure over a period of time sufficient to account for temporal variability and supports a conclusion that a condition of No Significant Risk exists in the absence of such Measure." Additionally, if the AUL is terminated (because it is no longer required to document the obligations and conditions associated with the mandatory operation of the POET System to maintain No Significant Risk), then pursuant to 310 CMR 40.1083(1)(d), a revised Permanent Solution Statement that provides justification for the termination of the AUL must be submitted. In short, a revised Permanent Solution Statement in such case must support that the mandatory operation of the POET System is no longer necessary, the associated termination of the AUL, and should document that the property owner is opting to continue to operate the POET System on a voluntary basis.

See also the guidance MassDEP provided in Section 4.8.1 of the *Vapor Intrusion Guidance (Policy #WSC-16-435)* for an analogous scenario, the ongoing voluntary operation of a Sub-Slab Depressurization System that is no longer necessary to maintain a condition of No Significant Risk and a Permanent Solution.

Q21: With regard to the frequency at which Status Reports must be submitted for a site with a Temporary Solution (310 CMR 40.0898), could you confirm that routine monitoring of

environmental conditions at a disposal site (e.g., groundwater sampling or air sampling) does not constitute Active Operation and Maintenance?

A: Active Operation and Maintenance is defined in 310 CMR 40.0006 as "activities related to: (a) operating and maintaining an Active Remedial System; (b) operating and maintaining an Active Exposure Pathway Mitigation Measure (AEPMM); or (c) conducting an Active Remedial Monitoring Program." If the sampling conducted is associated with such remedial actions (as those remedial actions are further defined in 310 CMR 40.0006), then it would trigger the requirement to submit Status Reports and Remedial Monitoring Reports every six (6) months. That includes monitoring of environmental media associated with conducting an Active Remedial Monitoring Program, such as Monitored Natural Attenuation, a reactive barrier system, or the application of Remedial Additives. Other monitoring, such as groundwater sampling conducted to document plume stability that is <u>not</u> associated with monitoring an Active Remedial System, AEPMM, or an Active Remedial Monitoring Program, would not require reporting every six (6) months. The sampling results in such case would be reported with the Temporary Solution Periodic Review Opinion (every five (5) years), unless the Department required reporting at a higher, alternative frequency.

Q22: Pursuant to 310 CMR 40.0898(1)(b), for a disposal site with a Temporary Solution where Active Operation and Maintenance is <u>not</u> occurring, a Post-temporary Solution Status Report is required every five (5) years, concurrent with the Periodic Review of a Temporary Solution Opinion *unless* the Department notifies the person conducting response actions that it is requiring Status Reports at a higher frequency. Can the person conducting response actions assume that their conclusion that Status Reports are due every five (5) years is correct, or is there a mechanism to "ask" the Department for its determination?

A: If the Potentially Responsible Party (PRP), Other Person (OP), or Eligible Person(EP) has concluded that Active Operation and Maintenance is not occurring, the person may proceed on the assumption that the Post-temporary Solution Status Report is due with the next Periodic Review of a Temporary Solution Opinion unless and until the person hears otherwise from the Department (i.e., unless the person receives a written notice from the Department pursuant to 310 CMR 40.0898(1)(c)). If there is some question as to whether the response actions occurring at the disposal site constitute Active Operation and Maintenance, it is appropriate to ask the Department for guidance.

The Department may decide to require more frequent Status Reports pursuant to 310 CMR 40.0898(1)(c) based on factors that include, but are not limited, to the potential risks posed by the site, concerns about the stability of site conditions, or a lack of progress being made toward a Permanent Solution.

Q23: To confirm, at a disposal site with a Temporary Solution where a Permanent Solution is not currently feasible, the 5-year Periodic Review evaluation is required and semi-annual status reports are not required, unless so required by the Department. Is that correct?

A: No, that is not correct. The basis for whether a Post-temporary Solution Status Report and Remedial Monitoring Report is required is whether Active Operation and Maintenance is occurring. You may have a disposal site where a Permanent Solution is not currently feasible, but remedial actions that constitute Active Operation and Maintenance are occurring (e.g., an Active Exposure Pathway Mitigation Measure is mitigating vapor intrusion, but there is no feasible remedy for achieving a level of No Significant Risk for the disposal site). While it is often the case that Active Operation and Maintenance is not occurring at a disposal site where no feasible Permanent Solution has been identified, that is not always the case.

Q24: At 310 CMR 40.1012(2)(d), the 2024 MCP requires that an Activity and Use Limitation (AUL) be implemented at a disposal site with a Permanent Solution where the thickness of visible Nonaqueous Phase Liquid (NAPL) remaining at the disposal site "is or is anticipated to be greater than ½ inch." Can MassDEP provide examples of an appropriate standard of care for determining 'anticipated NAPL' for the purpose of determining whether an AUL is required?

A: As described in Section 4.3 of MassDEP's *LNAPL and the MCP: Guidance for Site Assessment and Closure,* "LNAPL Guidance" (Policy #WSC-16-450), "[a] Permanent Solution may be achieved at a disposal site where some NAPL remains in the environment, provided a level of No Significant Risk has been achieved, Non-stable NAPL is not present (i.e., the overall LNAPL footprint is not expanding), and all LNAPL with Micro-scale Mobility has been removed if present and to the extent feasible. Where the remaining NAPL exhibits "Micro-scale Mobility," 310 CMR 40.1012(2)(d) requires an AUL as part of the Permanent Solution if the observed or anticipated NAPL thickness in an excavation, boring, or monitoring well at the disposal site is greater than **½** inch.

Including consideration of 'anticipated NAPL' in this provision is intended to account for the variability in observed NAPL that occurs as the result of rising and falling water table levels. If

past observed NAPL levels have exceeded ½ inch and variability in observed NAPL levels persists, then an AUL is warranted. If, however, all NAPL levels, regardless of depth, observed at both high and low water table conditions and at an adequate frequency are found to be below ½ inch, an AUL would not be required. As stated in Section 4.1 of the LNAPL Guidance, "Lines of Evidence for LNAPL Occurrence, Mobility, and Recoverability," with respect to well data, "an adequate sampling frequency to evaluate and document the stability of a significant LNAPL plume is generally quarterly sampling/gauging over at least a one-year period, with sampling events occurring at both high and low water table conditions, and where water table measurements are not influenced by significant recent rainfall." If NAPL levels are never observed at a thickness greater than ½ inch in any well over the course of such sampling, it is reasonable to conclude that LNAPL at the disposal site is not anticipated to exceed ½ inch.

Subpart N: PUBLIC INVOLVEMENT (310 CMR 40.1400)

Q25: 310 CMR 40.1403(2)(a) was revised in the 2024 MCP amendments to allow for notices to local officials to be sent by email "upon agreement by the intended recipient of such notice..." In what manner should the person who is providing notices to local officials obtain agreement from the intended recipient(s)?

A: The relevant provision does not specify how such agreement should be obtained. It is sufficient to seek email confirmation from the local official who was sent a written notice by email that they have received the notice (along with any related information required to be included with the notice) and are agreeable to receiving written notices pursuant to the MCP by email.

To facilitate the implementation of the email option, MassDEP sent a letter via email to all Chief Municipal Officers and Boards of Health. A copy of that letter, which may be referenced in communications with local officials about the email option for written notices, may be found on MassDEP's website here: https://www.mass.gov/doc/letter-to-local-officials-about-option-to-receive-written-notices-by-email-april-29-2024/download. MassDEP anticipates that many local officials will favor the option to receive written notices by email, as it should reduce the time needed to manage and store the physical site-related documents.

Q26: 310 CMR 40.1403(11) requires posting notices when an Immediate Response Action that is addressing an Imminent Hazard or Critical Exposure Pathway involves assessment or remedial actions at a multi-unit or industrial or commercial building. Such notices must be placed "in a location(s) proximate to the area where the potential for exposure to oil and hazardous

materials is most likely and where it will be visible to individuals who are routinely present in such location(s) for the duration of the Immediate Response Action." If the individuals who are routinely present have limited English proficiency, should the notice be posted in languages that the people in that area are likely to understand?

A: Yes. The objective of public involvement is informing the affected community about the potential risks posed by, and the status and nature of response actions occurring at a disposal site. Effective communication may include translating material into languages used by members of the affected community. If the person conducting response actions and their LSP is seeking guidance on communicating with residents of limited English proficiency, the Department recommends reaching out to either the local health department (it is likely the municipality has resources available to communicate with their residents) and/or the DEP BWSC regional office where the site is located.

Q27: Does DEP have an example template for notices to be posted when Immediate Response Actions are being taken to address Imminent Hazards or Critical Exposure Pathways?

A: Yes. Form BWSC124 ("Informational Notice About Immediate Response Actions") must be used to provide the required notice. When response actions are occurring at a multi-unit or industrial or commercial building, pursuant to 310 CMR 40.1403(11)(d), the notice must be posted for the duration of the Immediate Response Action. In such case, both sides of BWSC124 should be posted in a location near the area where the potential for exposure to oil and hazardous materials is most likely and where it will be visible to people who are routinely present in the area. BWSC124 has been revised to reflect the 2024 amendments to 310 CMR 40.1403(11). Those amendments include requiring that notice be given when the *assessment* confirms the existence of an Imminent Hazard or Critical Exposure Pathway. Prior to the amendments, notice was only required if *remedial actions* were being taken.

The updated BWSC124 also contains a QR code that links to additional information on MassDEP's website written for the general public to facilitate communication about the purpose of the notification and the regulatory terms Imminent Hazards and Critical Exposure Pathway. The content of this explanatory webpage may also be printed and posted with BWSC124.

TRANSMITTAL FORMS

Q28: Will the BWSC Transmittal Forms submitted via eDEP be updated to reflect the MCP amendments?

A: Yes. All the BWSC eDEP transmittal forms have been reviewed and are being updated to be consistent with the 2024 MCP Amendments. As of March 2024, the following BWSC Transmittal Forms have been updated to reflect MCP amendments covered by the forms:

- 104 Permanent & Temporary Solution Statement Transmittal;
- 105 Immediate Response Action (IRA) Transmittal;
- 107 Tier Classification Transmittal;
- 108 Comprehensive Response Action Transmittal and Phase I Completion Statement; and
- 119 Utility-Related Abatement Measure (URAM) Transmittal.

These BWSC forms have been updated to include check boxes and added data fields for:

- Active Exposure Pathway Mitigation Measure (for vapor intrusion and for private drinking water supply wells) and Passive Exposure Pathway Mitigation Measures;
- References to Eligible Person status; and
- Remedial Actions including the application of remedial additives.

The BWSC104 form has been updated to include greater specificity in documenting site conditions that require the implementation of an Activity and Use Limitation pursuant to 310 CMR 40.1012.

The BWSC107 form has been updated to include voluntary submission of information related to Brownfields sites to facilitate Waste Site Cleanup Program support of Brownfields projects. Section B.9 includes the "self-certification" questions indicative of a Brownfields site (these same questions have been included on the BWSC104 form since the 2014 MCP Amendments).

As of April 2025, all the BWSC transmittal forms are being revised to update MassDEP's Boston office address and electronic mail address.

Subpart I: RISK CHARACTERIZATION (310 CMR 40.0900)
(added November 1, 2024)

Coal Tar Waste Deposits

Q1: The MCP uses the term "visible coal tar waste deposit". What is meant by this term?

A: "Visible coal tar waste deposits" are a sub-set of coal tar wastes. Coal tar wastes are by-products or residuals from the processing of coal for coal gas. The term "visible coal tar waste deposits" is intended to apply to distinct layers or accumulations of solid and semi-solid coal tar wastes that are clearly (visibly) discernable from the surrounding environmental media. "Visible coal tar waste deposits" exist as a separate phase, distinct from the surrounding soil, sediment, surface water or groundwater. Coal tar wastes that always exist strictly as a liquid (i.e., year-round regardless of ambient temperatures) may be addressed as NAPL under the provisions at 310 CMR 40.1003(7).

The term "visible coal tar waste deposits" is not intended to include sporadic occurrences of limited coal tar wastes that are entirely interspersed in and comprise a small part of the soil matrix. Such limited coal tar wastes: (1) do not occur as distinct layers; (2) do not include layers that are or could be described as "soil mixed in coal tar waste" or a "coal tar waste-rich soil layer"; and (3) can be (*must be*) adequately characterized through analysis of representative soil samples. These occurrences of limited coal tar wastes may be considered to be part of soil and not a "visible coal tar waste deposit," and accordingly, they can be evaluated as soil in a Risk Characterization.

These limited coal tar wastes may be found on the fringes of a "visible coal tar waste deposit" site or as part of mixed wastes at locations that are not otherwise considered a coal gasification waste site.

Q2: Should DNAPL from coal tar be managed under the NAPL control and removal requirements (310 CMR 40.1003(7)) of the MCP?

A: DNAPL from coal tar or other origin should be treated as "NAPL" *if* it flows in a manner consistent with the principles of fluid flow in porous media (i.e., Darcy's Law) as described in the Conceptual Site Model definition at 310 CMR 40.0006. "Solid" material cannot be characterized in that manner. While coal tar wastes can, under certain conditions, exhibit separate phase mobility (i.e., behave as a liquid), coal tar wastes typically exist in a solid state with little or no mobility. Most coal tar wastes in the Commonwealth are likely to be aged/weathered. In short, most coal tar wastes are expected to be solid under ambient conditions and would not be considered DNAPL. Only coal tar wastes that always exist strictly

as a liquid (i.e., year-round regardless of ambient temperatures) may be addressed as NAPL under the provisions at 310 CMR 40.1003(7).

Q3: Why does BWSC allow the use of published values to estimate coal tar waste deposit Exposure Point Concentrations, rather than requiring environmental sampling?

A: Coal tar wastes can be highly concentrated and analytically "messy" to the point that it can damage lab equipment, so a typical lab may be unable to analyze environmental coal tar samples. While Exposure Point Concentrations should be based on environmental samples where possible/feasible, there is flexibility to evaluate coal tar waste deposits qualitatively or quantitatively. When the environmental sample is coal tar, this presents potential analytical problems. The MCP Exposure Point Concentration provisions (310 CMR 40.0926(8)(a)3.) therefore indicate that in the case of visible coal tar waste deposits the EPC "shall be based on the OHM concentration known or estimated to be present in the coal tar itself."

Q4: Can risk characterization methods other than Method 3 be used for sites with visible coal tar waste deposits?

A: No. Methods 1 and 2 can only be used to characterize potential risks from oil or hazardous material ***in*** soil or groundwater, and visible coal tar waste deposits are a separate and distinct phase from these media. The MCP describes the options available to characterize the risk from contamination in media other than soil and groundwater at 310 CMR 40.0942(1)(b). As described therein, Method 3 alone or a combined Method1/Method 3 approach may be appropriate.

Q5: For the purposes of characterization risk, is there some *de minimis* amount of coal tar waste deposits that is not subject to the MCP coal tar provisions?

A: No. The MCP does not specify a *de minimis* amount of coal tar waste deposit. With some site-specific exceptions, it is reasonable to expect that relatively small amounts of coal tar waste deposits can, and should, be removed to minimize long-term management of the material on-site. For sites with significant coal tar waste deposits, a site-specific determination is needed to indicate whether it makes sense to manage the coal tar waste deposits on-site or to remove the wastes.

Q6: Soil beneath a building is considered inaccessible or defined as "isolated" under the MCP (310 CMR 40.0933(4)(c)3.). The coal tar provisions appear to consider coal tar waste deposits under buildings "accessible" or "potentially accessible"? What is the reasoning behind this?

A: The soil accessibility descriptions ("accessible", "potentially accessible" and "isolated") inform human health risk characterizations. The new coal tar waste deposit regulations are modeled

on the rules for the Method 3 Ceiling Limits (M3CLs), formerly known as the Upper Concentration Limits. Both provisions address the risk of harm to Public Welfare and the Environment related to leaving high concentrations ("gross contamination") on-site as part of a Permanent or Temporary Solution. Neither provision involves a quantitative or qualitative evaluation of exposure as would be found in a human health risk characterization, and thus the soil exposure characteristics described in 310 CMR 40.0933(4) are not applicable.

Q7: Would you need an Activity and Use Limitation if all the remaining visible coal tar waste deposits at a site were limited to a depth greater than 15 feet from the ground surface?

A: Yes. For a Permanent Solution at a site, all remaining visible coal tar waste deposits must be located *either* at a depth greater than 15 feet from the ground surface *or* beneath an Engineered Barrier, and both conditions also require an Activity & Use Limitation (310 CMR 40.0997(3)). Where the visible coal tar waste deposit is located beneath a building that is not constructed to serve as an Engineered Barrier, the "ground surface" begins at the surface of the soil immediately below the building (310 CMR 40.0997(4)).

Q8: Since old asphalt can contain coal tar as can asphalt base materials and sealcoating products, how does this fit with new coal tar waste deposit regulations?

A: Asphalt and seal coating products are not themselves a by-product or residual from the process of producing coal gas from coal but are products that may incorporate some amount of coal tar material. Asphalt and sealcoating are not subject to the MCP coal tar waste deposit provisions.

Q9: The provisions at 310 CMR 40.0997 indicate that an Engineered Barrier is required to achieve a Permanent Solution if visible coal tar waste deposits remain at a site at a depth less than 15 feet. Are there any other remedial alternatives that could be considered a valid means of achieving a Permanent Solution at a site with visible coal tar waste deposits?

A: Currently, the coal tar waste deposit regulations do not explicitly include a provision allowing the waste to be "permanently immobilized or fixated as part of a remedial action." However, MassDEP has considered alternative means to *remediate* coal tar waste deposits if the alternative effectively reduces or eliminates the potential risks posed by the coal tar wastes by permanently transforming the nature of the material to the point where it no longer has the characteristics of the visible coal tar waste deposit. Persons contemplating the use of such alternatives should contact the BWSC Deputy Regional Director for the region where the project site is located to discuss the proposal before proceeding. The treatment alternative must be adequately justified, e.g. documentation of bench scale and QA/QC testing as appropriate in the Phase III RAP, Phase IV RIP and Phase IV FIR. This material would be considered similarly to materials treated to address M3CL exceedances, including the implementation of an Activity and Use Limitation (310 CMR 40.0996(6)).

Exposure Point Concentrations

Q10: Where in the MCP does it indicate the use of a conservative estimate of the Exposure Point Concentration as being the average mean concentration contacted by a receptor at each Exposure Point?

A: 310 CMR 40.0926(5) states "In estimating the Exposure Point Concentration, the objective shall be to identify a conservative estimate of the mean concentration contacted by a receptor at each Exposure Point over the relevant exposure period".

Q11: For surface water and sediment EPCs, is there a comparable 75/10 rule requirement for justifying using the average?

A: No. The MCP Exposure Point Concentration provisions for surface water and sediment, 310 CMR 40.0926(10) and (11), respectively, do not have a comparable rule. The 2024 MCP amendments do not change the performance standard of calculating "a conservative estimate of the mean." This is partly due to surface water and sediment sampling being more complex than soil sampling.

Q12: For soils in categories that span both the 0-3 foot and the 0-15 foot depth interval, are two separate EPC calculations required?

A: Yes. These two depth intervals are considered two Exposure Points because the potential for exposure is different in the short-term (0-3 feet) compared to the longer-term (0-15 feet). See 310 CMR 40.0924(7)(a) and (b) for applicable soil Exposure Points under Methods 1/2 and Method 3. By calculating a separate EPC for the more surficial soils, you have a more accurate estimate of potential exposure under current conditions.

Systematic Sampling

Q13: What is the recommended/proper spacing between samples when performing systematic grid sampling?

A: The spacing of sampling locations will depend on the size of the target area and the number of samples to be collected. MassDEP generally recommends 25- to 50-foot grid squares. However, for small exposure areas (e.g., a residential yard) spacing of grid samples may need to be closer to collect a representative sample. Justification for the grid spacing used at a given site should be included in the risk characterization.

Q14: How many sample points are needed when performing systematic grid sampling to obtain a representative sample for an EPC estimate?

A: MassDEP generally considers 20-30 systematic discrete samples sufficient to estimate an Exposure Point Concentration using an upper confidence limit. The number of samples required for a representative EPC estimate will depend on the variability of contaminant concentrations as well as the size of the parcel under investigation. When preliminary soil sampling study data are available, statistical calculations such as those used in the U.S. EPA ProUCL "DQOs Based Sample Sizes" tool can be used to estimate the size of the data set needed for a specified level of certainty based on the estimated variability in the preliminary data set.

Q15: The latest version of the U.S. EPA ProUCL software no longer recommends the Chebyshev method. Why is the Chebyshev method specified in the MCP?

A: The technical guide for the ProUCL version 5.2 update cited concerns that the 95th percentile Chebyshev non-parametric upper confidence limit can result in gross overestimates of the mean. MassDEP agrees that the 95th percentile Chebyshev upper confidence limit can be overly conservative, and therefore specifies the use of the 90th percentile Chebyshev non-parametric upper confidence limit in the MCP.

Q16: Can I use ProUCL to calculate and choose alternative upper confidence limits (UCLs)?

A: Yes. With appropriate justification (310 CMR 40.0926(8)(a)2.a.), ProUCL may be used to calculate a number of UCLs including the 90% Chebyshev UCL. However, MassDEP disagrees with USEPA's implementation of ProUCL version 5.2 for selecting a "Suggested UCL to use." The recommendations from ProUCL version 5.2 alone are therefore not a sufficient technical justification for using an alternative 95% parametric UCL instead of the 90% Chebyshev UCL specified in the MCP. The previous version of ProUCL, version 5.1, does not have these issues with the suggested UCL selection, so it may be used to select an alternative 95% parametric UCL.

Q17: Can I use Excel to calculate the 90th percentile upper confidence limit on the mean rather than ProUCL?

A: Yes. For a given range of data points (DataRange), you can use following formula to calculate the 90% Chebyshev UCL in Excel:

=AVERAGE(DataRange)+(STDEV(DataRange)/SQRT(COUNT(DataRange)))*SQRT((1/0.1)-1)

This formula is only applicable to data sets that do not include non-detect (ND) values.

(Note that the 90th percentile upper confidence limit on the mean is different from the 90th percentile of site data, which uses a different Excel function.)

Q18: How should "non-detect" values be handled in UCL calculations?

A: MassDEP recommends the use of Kaplan-Meier (KM) estimates of the sample mean and standard deviation to incorporate non-detect values in the calculation of the 90th percentile Chebyshev non-parametric upper confidence limit of the mean. ProUCL provides this calculation as the "90% KM Chebyshev UCL" in its output UCL statistics for data sets with non-detects.

Excel is not capable of providing KM estimates without downloading add-ins. A paper that provides SAS code for the calculation is available at https://analytics.ncsu.edu/sesug/2010/SDA09.Beal.pdf.

Alternative statistical software or approaches to address non-detect values in UCL calculations should be adequately documented with appropriate technical justification.

Incremental Sampling

Q19: Does incremental sampling require the use of an upper confidence limit (UCL) for EPC calculations?

A: MassDEP does not require the use of a UCL for Incremental Sampling Methodology (ISM) sample and replicate results. For incremental sampling, the arithmetic mean of the three results may be used as an estimate of the Exposure Point Concentration because the nature of ISM sampling reduces the uncertainty in the calculated mean.

Judgmental Sampling

Q20: Can data collected using judgmental sampling be used for upper confidence limit (UCL) calculations? This is of particular concern at older sites where all (or most) of the past sampling was judgmental.

A: UCL calculations are generally only appropriate for systematic sampling approaches. Judgmental sampling data collected using either discrete or composite sampling procedures cannot be used in combination with systematic sampling data in a UCL calculation as the different sampling strategies provide different (and incompatible) data sets.

As indicated in 310 CMR 40.0926(8)(a)1.b., if judgmental data do not meet the 75/10 rule, the arithmetic mean can still be used as long as the LSP provides technical justification. While not specifically stated, the calculation of an alternative conservative estimate of the arithmetic mean considering "the size of the data set, density and potential biases of the sampling, and

other relevant factors" is also acceptable under this provision, with the corresponding technical justification. It is unlikely that a technical justification can be used to justify a UCL calculation in this case.

The MCP soil Exposure Point Concentration provisions at 310 CMR 40.0926(8)(a)2. provide for the use of an upper confidence limit where systematic sampling has been implemented. Again, an alternative conservative estimate of the arithmetic mean may be used considering "the size of the data set, density and potential biases of the sampling, and other relevant factors" with technical justification, but only after it is demonstrated that the 90th percentile Chebyshev UCL is not suitable. If appropriate and justified, this may not include a UCL calculation.

Thus, when calculating an alternative conservative estimate of the arithmetic mean pursuant to either 310 CMR 40.0926(8)(a)1.b. or 40.0926(8)(a)2., the regulations require consideration of "the size of the data set, density and potential biases of the sampling, and other relevant factors". Presumably the inclusion of mixed data (from both judgmental and systematic sampling) in an exposure point concentration calculation pursuant to either 310 CMR 40.0926(8)(a)1.b. or 40.0926(8)(a)2. would necessarily have to consider the same list of factors, and the technical justification would explicitly address how and why the use of such mixed data results in a "conservative estimate of the mean".

Caps and Engineered Barriers

Q21: What is the distinction between a cap and an Engineered Barrier?

A: The term cap is not specifically defined in the definition section of the MCP, but it is used in several places in 310 CMR 40.0000 to refer to a barrier that reduces or eliminates exposure to media beneath it. A cap may also minimize percolation of water into the subsurface. An Engineered Barrier is a defined MCP term and a specific type of cap/barrier system that meets the requirements in 310 CMR 40.0998.

CLIMATE CHANGE

(added March 29, 2024)

Q1: Why did MassDEP include the consideration of climate change impacts in the 2024 MCP amendments?

A: The MCP requirement to consider climate impacts at 21E sites stems from Executive Order 569 (link here) and the Commonwealth's 2018 State Hazard Mitigation and Climate Adaptation Plan (2018 MA SHMCAP, link here.) The 2018 MA SHMCAP was revised in 2023 and renamed as the 2023 ResilientMass Plan, or 2023 MA SHMCAP (link here.)

Executive Order 569 states "WHEREAS, our state agencies and authorities, as well as our cities and towns, must prepare for the impacts of climate change by assessing vulnerability and adopting strategies to increase the adaptive capacity and resiliency of infrastructure and other assets."

The 2018 MA SHMCAP detailed the requirements for Executive Order 569 and directed all Executive Office of Energy and Environmental Affairs (EOEEA) agencies to "review, evaluate, and implement revisions as needed to environmental and energy policies, regulations, and plans." For MassDEP, this included revising the MCP to address the assessment and mitigation of potential impacts related to climate change at disposal sites.

Q2: What are the MCP requirements related to potential climate change impacts at disposal sites?

A: The MCP climate change-related requirements are found in the definition of Conceptual Site Model (CSM) at 310 CMR 40.0006, in the Response Action Performance Standard (RAPS) provisions at 310 CMR 40.0191, and in the "Defining Foreseeable Period of Time for Purposes of a Permanent Solution" provision at 310 CMR 40.1005(1).

The Conceptual Site Model definition has been revised to reference "current and foreseeable" site characteristics and risk. The change at 310 CMR 40.1005(1) adds to the description of foreseeable period of time for a Permanent Solution, "considering existing site conditions and reasonably foreseeable future changes in site conditions, including anticipated impacts associated with climate change." This foreseeable period of time definition is cross-referenced in RAPS at 310 CMR 40.0191(1).

Other climate change-related changes to RAPS include referencing the Executive Office of Energy and Environmental Affairs (EOEEA) as a source of relevant policies and guidelines to reflect that EOEEA is the appropriate source for information on climate change forecasts. Also added to RAPs is a general requirement that the MCP Response Action Performance Standard

include consideration of "response actions that incorporate climate change resilience to the extent practicable and consistent with response action requirements."

Together, these changes are intended to ensure that anticipated climate change impacts are taken into account as part of a Permanent Solution and are otherwise generally incorporated into the overall response action approach at a disposal site.

Q3: When considering a Permanent Solution, what timeframe is appropriate for assessing "reasonably foreseeable future changes in site conditions, including anticipated impacts associated with climate change"?

A: The MCP does not specify a timeframe that applies to all sites. The timeframe will vary based on the nature of the contamination that remains on-site, as well as the vulnerability of the site and the surrounding area. LSPs should exercise professional judgment in identifying an appropriate timeframe considering site-specific information in combination with forecasts of climate change impacts.

Most of the forecasts related to Executive Order 569 and the 2023 ResilientMass Plan use planning ranges between the years 2050 and 2100. Selecting a target date that falls within these years (30, 50 or 80-years out) will allow the assessment of the Permanent Solution against specific climate change scenarios.

Q4: To what extent do the MCP requirements to consider climate change impacts at a disposal site apply to a Temporary Solution or Remedy Operation Status?

A: The climate change related references in the RAPs provisions at 40.0191(2) and (3) and in the Conceptual Site Model (CSM) definition that includes consideration of "current and foreseeable future site characteristics and risk" apply to the overall and long-term response strategy at the site and therefore are relevant to the achievement of Temporary Solutions and Remedy Operation Status. Achieving Temporary Solution and/or Remedy Operation Status requires evaluating the feasibility of achieving a Permanent Solution, which requires considering "existing site conditions and reasonably foreseeable future changes in site conditions, including anticipated impacts associated with climate change."

Q5: How is vulnerability to climate impacts at 21E sites to be assessed?

A: As described in the 2018 MA SHMCAP, vulnerability to climate change is a function of "Exposure," "Sensitivity," and "Adaptive Capacity" relative to four primary climate changes:

- Precipitation (e.g., inland flooding, drought, landslide);

- Sea Level Rise (e.g., coastal flooding, coastal erosion, tsunami);
- Rising Temperature (e.g., average/extreme temperatures, wildfires, invasive species); and
- Extreme Weather (e.g., hurricanes/storms, nor'easters, tornadoes).

"Exposure" to these changes can be determined by using available climate models/forecasts, such as those at ResilientMA.org (link here.)

Site-specific "Sensitivity" factors to consider include:

- Location within exposure area(s) and relative to environmentally sensitive resources;
- Demographics (e.g., population proximity and density, Environmental Justice communities);
- Vulnerability of equipment and structures still in use (e.g., wells, site/remediation equipment);
- Status of the Remedial Action at the disposal site, including whether there are active systems (Active Remedial Systems, Active Exposure Pathway Mitigation Measure), sensitive human or environmental exposures (Imminent Hazard, Critical Exposure Pathway), and/or long-term considerations (NAPL, Activity and Use Limitation); and
- Contaminant nature, concentration, and fate & transport (e.g., degradation rates, remobilization as a bulk material, adsorption/desorption, volatilization and/or dissolution).

"Adaptive Capacity" addresses the potential for modification of operations, policies, or other functions in response to changing natural hazards and climate change impacts.

Consulting applicable professional standards and practices, such as those described in the "MCP Climate Change Toolkit" published by the Licensed Site Professional Association (LSPA) Climate Change Subcommittee (link here), may be helpful in performing this analysis. This Toolkit includes a "Climate Vulnerability Assessment Checklist," flow chart, glossary, list of tools & resources, and case studies.

Q6: Do these climate vulnerability assessment requirements apply to all 21E sites?

A: The requirement to consider potential climate impacts applies to all sites, but the level of effort will depend on the site sensitivity factors. A detailed climate vulnerability assessment would not be necessary, for example, at a disposal site where risk due to these sensitivity factors is shown to be absent and/or the site has been restored to background concentrations of oil and/or hazardous materials (OHM). Conversely, a comprehensive assessment would be appropriate where elevated levels of a toxic contaminant are capped at a location that climate change forecasts predict to be susceptible to future storm surges and coastal flooding.

Q7: How should climate-related impacts to groundwater be assessed?

A: Correlations and estimations of climate impacts on groundwater levels are possible using various methods, but the uncertainty and complexity of these predictions are significant. Because there are and will continue to be climate change-related impacts on groundwater elevations, broader and more direct fate and transport questions that apply are: "What happens to contamination in the vadose zone when inundated with water if groundwater levels rise?" and, conversely, "What happens to contamination if groundwater levels drop?" These questions should be considered as an element of a climate vulnerability assessment regardless of any analytical/statistical groundwater level prediction variabilities.

Q8: What adaptive/resilience measures should be considered?

A: Resilience measures, or best management practices (BMPs), for potential climate change impacts should be considered during the entire MCP process and implemented as part the selected response actions, as appropriate. Some examples of resilience BMPs are included in Section 4 of the Commonwealth's Climate Resilience Design Standards and Guidelines Project by the Resilience Massachusetts Action Team (RMAT, link here,) EPA's Superfund Climate Resilience Webpage (link here,) and in the ITRC Sustainable Resilient Remediation Guidance (ITRC SRR, link here.)

Q9: Does MassDEP plan to re-visit previously closed sites on the basis of climate change?

A: MassDEP does not intend to revisit previously closed sites on the basis of climate change impacts as long as the activities, uses or exposures upon which a Permanent Solution is based do not change in a way that increases potential for human or environmental exposure to OHM and pose significant risk. An example of an impact that could affect a Permanent Solution is the erosion of a cap over contaminated soil as a result of flooding at a closed site where the person liable for maintaining the cap has failed to undertake response actions to repair it.

Q10: Do the MCP climate change related provisions affect Activity and Use Limitations?

A: The climate change MCP provisions do not directly affect AUL requirements and need not affect the manner in which an AUL documents a property owner's ongoing obligations and conditions for maintaining a condition of No Significant Risk. For example, an AUL may say "maintain the integrity of the cap, including repairing as needed. Inspect annually at a minimum." If there are impacts over time, the AUL requires the cap to be repaired over time, regardless of the climate change vulnerability assessment.

Q11: What technical resources and climate forecasts are recommended for performing assessments of potential climate change impacts?

A: Most of the technical information needed to conduct vulnerability assessments is included in ResilientMA.org (link here,) which is a resource:

"…produced to ensure continued access to information and provide communities with the best science and data on expected climate changes, information on community resiliency, and links to important grant programs and technical assistance. This website also catalogs specific vulnerabilities, risks and strategies concerning agriculture, forestry, local government, education, energy, recreation, and transportation. All of the climate projections included on the website are specific to Massachusetts… includes an interactive map so that users can understand how climate change will affect their specific location and the resources they manage."

ResilientMA.org and its associated contents are reviewed and updated regularly and it is the primary resource for this work. The site includes a map tutorial video (link here) and a data graphing tutorial video (link here.)

In addition, the LSPA's "MCP Climate Change Toolkit" (link here) provides a "Climate Vulnerability Assessment Checklist," flow chart, glossary, list of tools & resources, and case studies.

Other helpful resources to consider include, but are not limited to:

- RMAT Climate Resilience Design Standards and Guidelines Project (link here)
- Massachusetts (MA) Office of Technical Assistance and Technology (OTA) Mapping Toxics in Communities and Assessing Climate Vulnerability (link here)
- MA Coast Flood Risk Model (MC-FRM) (link here)
- ITRC SRR Guidance (link here)
- EPA Superfund Climate Resilience webpage (link here)
- EPA 2021 Climate Adaptation Plan (link here)
- EPA 2021 Climate Smart Brownfields Manual (link here)
- First Street Foundation Defining America's Flood Risk (link here)
- Federal Emergency Management Agency (FEMA) National Risk Index for 18 natural hazards (link here)
- Coastal Zone Management (CZM) Massachusetts Sea Level Affecting Marshes Model (SLAMM) viewer (link here)
- ASTM Standard Guide for Remedial Action Resiliency to Climate Impacts (ASTM E3249-21) (link here)

Q12: What funding sources are available for this work?

A: At this time, there are no funding sources specifically targeted for addressing climate change impacts at MCP sites. However, the Municipal Vulnerability Preparedness (MVP) grant program (link here) provides support for cities and towns across the Commonwealth to identify climate change vulnerabilities, prioritize critical actions, and build community resilience.