

**Public Input on General Electric's
Final Revised Vernal Pool Pilot Study Work Plan for
Reach 5A, dated June 30, 2025**

July 2025 - August 2025

Public Input ended on August 15, 2025



TOWN OF LEE
32 Main Street, Lee, MA 01238
www.lee.ma.us

R. Christopher Brittain,
Town Administrator

August 1, 2025

Mr. Josh Fontaine
EPA New England
10 Lyman Street, Suite 2
Pittsfield, MA 01201

Dear Mr. Fontaine:

Please find comments from the Town of Lee regarding the **Final Revised Vernal Pool Pilot Study**:

1. The document provides the recommended 'ecological performance criteria' (section 2.3 PDF page 26, and others). GE states that the Revised Final Permit requirements for the identification of appropriate ecological performance criteria can only be met by using criteria that are basic parameters amenable to being designed, controlled and managed, and that can be readily documented and compared with pre-remediation conditions. As such, GE recommends the ecological performance criteria will be evaluated by assessing the physical conditions of the restored pools relative to each pool's pre-remediation condition and by conducting within-year comparisons to control pools that have similar pre-remediation physical and biological conditions. Key physical parameters to be evaluated include spring/early summer temporary flooding conditions, status of surface inlets or outlets, and availability of habitat features that indicate development of primary productivity/food sources and provide refuge for amphibians. This recommendation to use physical vernal pool conditions as the criteria for ecological performance raises the following questions/concerns:
 - The recovery of physical conditions of an aquatic setting does not ensure functional biological recovery. Other factors, such as chemical measurements including characteristics of the surface water, pore water and sediment, are key to ecological restoration success.
 - Measurement of ecological recovery should be the criteria for the assessment of ecological performance. It seems more appropriate to use vernal pool-specific measures of biological recovery as appropriate criteria.
 - GE acknowledges and proposes to monitor the vernal pools and intends to collect information on pool hydrology, presence of amphibian egg masses and fairy shrimp, amphibian larval development and recruitment,

macroinvertebrate community structure, vegetative plant community, general water quality, soil chemistry and other physical features of the pools. It seems appropriate to choose applicable measurements from this data set to measure restoration success. Since collection of this information is already included in the work plan, it seems important to apply the findings to more effectively measure restoration success.

The Town requests more information to confirm if the physical status of a given vernal pool is a suitable measure of ecological performance, and if it is possible to instead use the gathered vernal pool characterization data as the measure of restoration success.

2. In continuation with the issue raised in the previous comment: if the physical status of a given vernal pool is chosen as the measure of ecological performance, then what is the assurance to the community that EPA will require GE to continue work until an acceptable ecological endpoint is achieved? How will that acceptable ecological endpoint be defined? TASC previously recommended the use of the Massachusetts Division of Fisheries and Wildlife (MassDFW) Natural Heritage and Endangered Species Program (NHESP) biological and physical criteria for vernal pool certification. These methods were relied upon to identify vernal pools throughout the Rest of River area. These criteria could also be used as ecological performance criteria (MassDFW, 2009).

The Town would like EPA to assure that the ultimate goal of the vernal pool remedy efforts will be to achieve an ecological restoration status comparable to or better than pre-remediation conditions.

3. The document provides a thorough literature review of PCB sequestration by activated carbon and provides some information describing the chemical water quality impacts that may occur from activated carbon amendments. Research results indicate that activated carbon application has varying impacts on dissolved oxygen and benthic macroinvertebrate recolonization. Activated carbon may also influence the amount of oxygen in sediment. It may be important to measure sediment oxygen levels with the use of sediment probe instruments to ensure appropriate oxygen levels are available to support benthic macroinvertebrate recolonization. It is recommended that sediment pore space dissolved oxygen measurements be taken on a routine basis as part of the monitoring program (refer to Neill et al., 2014).

The Town would like to know if dissolved oxygen levels in sediment and water nutrient levels should be components of the monitoring plan.

Sincerely,

A handwritten signature in black ink, appearing to read 'RCS', enclosed within a light gray rectangular border.

R. Christopher Brittain
Town Administrator

From: [Kubel, Jacob \(FWE\)](#)
To: [Daneke Burke, Lisa](#)
Cc: [Fontaine, Joshua](#); [Dewey, Jeffrey](#); [Quinones, Rebecca \(FWE\)](#); [Jones, Michael T \(FWE\)](#); [Leddick, Jesse \(FWE\)](#)
Subject: RE: GE-Housatonic River Site: Final Revised Vernal Pool Pilot Study Work Plan
Date: Thursday, August 14, 2025 4:26:21 PM

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Hi Lisa,

Thank you for the opportunity to review and comment on GE's *Final Revised Vernal Pool Pilot Study Work Plan*. I have been asked to provide comment for MassWildlife.

We appreciate the amount of thought and work that has gone into earlier drafts of the plan and are pleased to see some of the revisions that have been made. With limited sample sizes, challenging logistics, and many variables to consider, the plan seems to do a reasonably good job of narrowing down specific treatment alternatives and exploring different methods. Ideally, the scope of the study would be much bigger to help ensure greater confidence in interpreting the results, but the plan appears to meet its need for practicality. With that said, we offer the following specific comments and questions.

Section 5.4

- It is good to see the amendment mixing approach will now be tested at 2 of 5 pools (instead of just 1), and the assignment of treatments by pool (or sector of pool) in Table 5-1 seems logical given the variable involved (e.g., pool size and PCB concentration).
- The plan appears to be aiming for 2.5% PAC concentration (by weight) within the top 6 inches of soil, applying a thin layer (0.4–0.6 inches) of a PAC and sand blend (or PAC, sand, and clay blend) over the existing pool bottom and covering that with imported leaf litter. However, it is not entirely clear or intuitive as to why a 2.5% PAC concentration is chosen given the results of the bench-scale column testing. **Why propose half the concentration that was used in the bench-scale column testing, where a 5% PAC thin-layer placement method just barely met the performance criterion (<40 ng/L) for 1 of 2 pools sampled? It seems risky to reduce the concentration by half and hope for equal or better results within the pool environment.** Perhaps a rationale can be provided more explicitly?

Sections 5.4 and 5.5

- On the subject of weighing comprehensive amendment application or topsoil removal against disturbance to pool vegetation, it may be better to err on the side of altering/removing vegetation than to risk missing performance criteria for PCB concentrations. Soil chemistry is likely to have longer-term (and farther reaching) implications for pool ecology than temporary loss of trees and shrubs. We would not object to greater tree and shrub loss if it meant that there would be greater likelihood of meeting performance criteria.

Section 8 Introduction

- States that amendment-based and removal-based pools will be monitored, yet control pools are not mentioned. Although it is addressed elsewhere, control pools should be included in that statement about the pools that will be monitored.

Section 8.1

- We request adding “within 10 days of the observation” to the end of the last sentence. This is a common standard we use in Scientific Collection Permits, and it would seem appropriate for this study, as well.

Section 8.3.2

- The last sentence indicates that post-construction monitoring at removal pools will not include PCB soil sampling. In a study designed to compare the effectiveness of different treatment strategies (including no treatment), it would seem important to sample for PCB contamination in all 17 study pools post construction, regardless of assumptions.

Sections 2 and 8.5

- It is unclear why there seems to be debate over the depth to which performance criteria should be applied in the amendment treatment when the removal treatment calls for treatment of the top 12 inches of soil. Why should performance criteria not be applied to the same depth across all treatments? Perhaps this reasoning could be made more explicit in the text of this plan.

Appendix I, Section 4.3, Bullet 5

- The second sentence currently states, “Up to three rounds of dip net surveys for amphibian larvae and macroinvertebrates will be conducted . . .” We suggest a firmer commitment to these surveys by stating, “2–3 rounds of dip net surveys for amphibian larvae and macroinvertebrates will be conducted . . .”. We also suggest that larval amphibian and macroinvertebrate observations be better quantified during data collection and analysis so that relative abundance and density of various taxa can be compared among treatment types and controls. For example, in addition to simple presence and count data, metrics on catch per unit effort (by species or other taxonomic classification) would be useful. We further suggest adding a statement that observed amphibian larvae will be inspected for malformations and that malformations observed will be photographed, described, and quantified over the course of post-construction monitoring. We recommend these commitments to a more robust study of amphibian larvae and macroinvertebrates because temporal constraints on ecological monitoring (i.e., monitoring period of only 3 years) will limit the ability to make inferences concerning adult amphibian populations. Therefore, detection and comparison of potential ecological effects of treatment types (and controls) will be more feasible with a closer examination of amphibian larvae and macroinvertebrate

communities.

- To date, the precise methodology of dip net surveys has not been clear (e.g., systematic vs. haphazard sampling, numbers of dips or passes per unit area or per pool), which makes interpretation of capture results difficult. We recommend that the methodology be clarified to better explain sampling approach and effort.

Thank you again for the opportunity to comment. We look forward to working with you as needed during the course of the study.

Best,
Jake

Jacob E. Kubel

Conservation Scientist
Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife
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From: Danek Burke, Lisa <DanekBurke.Lisa@epa.gov>

Sent: Thursday, July 10, 2025 8:25 AM

To: Quinones, Rebecca (FWE) <rebecca.quinones@mass.gov>; Madden, Andrew (FWE) <andrew.madden@mass.gov>; MAHousatonicSF (FWE) <MAHousatonicSF@mass.gov>

Cc: Leddick, Jesse (FWE) <jesse.lednick@mass.gov>; Schluter, Eve (FWE) <eve.schluter@mass.gov>; Fontaine, Joshua <Fontaine.Joshua@epa.gov>; Dewey, Jeffrey <Dewey.Jeffrey@epa.gov>

Subject: GE-Housatonic River Site: Final Revised Vernal Pool Pilot Study Work Plan

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Good morning,

GE has submitted the *Final Revised Vernal Pool Pilot Study Work Plan* to EPA for review and approval.

Due to the large file size, a link to the full document, including all appendices, is provided here:
<https://semspub.epa.gov/work/01/691939.pdf>

Please reply with any comments from DFW by COB **Friday, August 15th, 2025**, or if none, please also reply indicating there are no comments.

Please feel free to contact me if you have any questions or trouble accessing the file through the provided link.

Best regards,

Lisa Danek Burke
Remedial Project Manager

ME/VT/CT Superfund
U.S. EPA Region 1
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Boston, MA 02109
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BERKSHIRE ENVIRONMENTAL ACTION TEAM
20 Chapel St. Pittsfield, MA 01201 • thebeatnews.org
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Protecting the environment for wildlife in support of the natural world that sustains us all.

August 15, 2025

Josh Fontaine
Remedial Project Manager
US EPA Region 1
Superfund and Emergency Management Division
5 Post Office Square (07-02) | Boston, MA 02109

Via email: R1Housatonic@epa.gov

Re: June 2025 Final Revised Vernal Pool Pilot Study Work Plan – GE-Pittsfield/Housatonic River Site

Please accept the following comments from the Berkshire Environmental Action Team (BEAT) on the General Electric Company's (GE's) June 2025 Final Revised Vernal Pool Pilot Study Work Plan for the Housatonic River site.

BEAT's mission is to protect the environment for wildlife in support of the natural world that sustains us all. Over the last twenty-two years, BEAT has certified more than a dozen vernal pools in the Berkshires and held workshops for both amateurs and professionals about vernal pools and how to certify them under the Massachusetts Natural Heritage and Endangered Species' (NHESP's) Guidelines for the Certification of Vernal Pool Habitat.

Further bench scale testing necessary

We are concerned that the proposed Pilot Study Work Plan has not completed bench scale tests that would prove adding activated carbon to a vernal pool will not harm the wildlife in that pool. Before activated carbon is added to a pool, we request that GE raise at least woodfrog eggs, but ideally spotted salamander and fairy shrimp as well, in a tank with activated carbon mixed with vernal pool sediment. The egg masses should be raised to an age where limb buds are visible before releasing the juveniles back to the pools from which the eggs were collected. Activated carbon faucet filters can alter the pH of water making it unsuitable for use in a tank containing amphibians.

1.4.1 Test Pools

Capturing the characteristics of Core Area 1 vernal pools

When selecting pools for the pilot study, please be sure to consider that data from vernal pools within Core Area 1 are considered, so that these pools too are represented in the group of pools selected for the pilot study.

1.5 Pilot Study Objective

The Study states, “*The principal objective of the vernal pool pilot study is to evaluate the effectiveness and potential adverse impacts of removal-based and amendment-based remediation of the pools to facilitate the selection of an appropriate remedial approach for the remaining vernal pools in Reach 5A as well as those in downstream reaches.*”

Criteria for remediation to be considered successful

BEAT does not believe that sufficient performance-based criteria have been established. Vernal pools are detritus-based food ecosystems.

2.2 Porewater Performance Criterion and Compliance Depth

BEAT agrees that “Vernal pools are unique systems, and no prior studies documenting measurements of mixing depths in vernal pools have been identified.” However, spotted and Jefferson/blue-spotted salamanders are known to burrow up to 1.3 meters deep outside of vernal pools.¹ This may suggest a much deeper exploration of porewater than is being proposed.

5.5.3 Soil Removal Activities

Tree canopy cover

Please require the same amount of tree canopy cover after remediation as before. It is critical that the pools receive the same amount of shading after remediation as they did before. Currently, the Study requires trees greater than 6” DBH to be left in place “to the extent practicable”. Instead, the Study should require that trees greater than 6” DBH be left in place, and all smaller trees should be left in place to the extent practicable. Post-excavation surveying should be required to document any change in canopy cover.

¹ Virginia Herpetological Society
<https://virginiaherpetologicalsociety.com/amphibians/salamanders/spotted-salamander/>

5.5.8 Restoration

All-Terrain Vehicle (ATV) Exclusion

The Study document states, “The primary access roads will not be subject to restoration as part of the pilot study because the same access roads will be used for the upcoming Reach 5A remediation.” How will GE keep All-Terrain Vehicles from using these access roads and riding through the pilot study pools?

Obligate species use within each pool

Obligate species - including woodfrog, spotted salamander, Jefferson/blue-spotted salamander, and fairy shrimp - tend to use specific areas of a vernal pool. We do not believe that one area of a pool can be successfully compared to another area of the same pool without first knowing that both those areas were used in a similar way before remediation.

5.7 Equipment Cleaning

While BEAT appreciates the detailed plans for decontaminating PCBs from equipment used for remediation, there are special concerns for vernal pools where the spread of pathogens, chytrid fungus *Batrachochytrium dendrobatidis* and ranavirus in particular, are major concerns. When moving between pools **all** equipment should be washed and ideally allowed to dry.

5.10 Sustainability Considerations

Leaving PCBs in the floodplain

We believe a major sustainability consideration should be to seriously consider whether leaving PCBs in vernal pools where they could be mobilized during a flood event makes sense. Even bound to activated carbon, these PCBs will still be in our floodplain and once mobilized could be ingested or just released to the surrounding water. Removal protects our environmental health from this potential recontamination.

Equipment choices and anti-idling requirements

Wherever possible, GE should use electric equipment rather than diesel. For example, if a generator is needed, there are now many electric generators available like the ones that power temporary traffic lights. There are also many examples of small excavation equipment that is battery-powered. Use of this type of equipment will reduce greenhouse gas emissions. Adding a requirement that any fossil fuel powered equipment should be turned off and never be allowed to idle when not in immediate use. *“Studies indicate that the trade-off for light- and medium-duty gasoline powered vehicles is about 10 seconds (i.e. the vehicle will*

produce more pollution idling longer than 10 seconds than it will by shutting down and restarting the engine). The time trade-off on medium- and heavy-duty diesel engines is about 30 seconds.”²

BEAT looks forward to reviewing the Supplemental Information Package that will delve into the details including:

- Site-specific Stormwater Pollution Prevention Plan
- Adjacent Area Site Restoration Plan
- Rare Species Mitigation Plan
- Operations Plan
- Flood Control Contingency Plan
- A detailed construction schedule
- Information on imported backfill material sources

7.2 Air Monitoring

Continuous, near-real-time, publicly accessible air quality monitoring

BEAT requests that EPA require GE to provide continuous air quality monitoring for PM2.5 and NO2 that the public can access in near real time. BEAT currently has 9 air quality monitors around the City of Pittsfield that people can view on our [Breathe Easy Berkshires website](https://breatheeasyberkshires.org/)³.

8.1 Pre-Construction Screening for Rare Species

Screening for nesting bird species as well as turtles

The study indicates that prior to the initiation of on-site construction of pilot study activities, screening will be conducted for the presence of state-listed turtle species, in all areas to be impacted by construction activities, and goes on to say that this is not necessary for the state-listed bird species because they are mobile. However, a survey should be conducted for nesting of these bird species if work is to take place in the time frame of nest building to fledging of the young birds.

All turtles, not just state-listed species

In addition, all turtles found, even common species, should be removed from the construction areas. Turtles are extremely long-lived, and the loss of adults of our common species may eventually lead to those species no longer being common.

² The Massachusetts Anti-Idling Law.

<https://www.mass.gov/doc/massdep-faq-the-massachusetts-anti-idling-law/download>

³ <https://breatheeasyberkshires.org/>

8.3 Removal-Based Pool Monitoring

Testing to prove to the community that the sediment PCB levels were reduced

The top foot of sediment in any remediated pool should be tested after one year to ensure that the removal of contamination and relining with clean sediment resulted in the top foot of sediment remaining under the threshold of PCBs. We need to know that truly clean sediment was used and that the underlying material was not stirred up and redistributed into the clean layer.

Appendix I Vernal Pool Pilot Study Performance Monitoring Plan

1.2.1 Amendment-Based Pilot Study Overview

At what time of year will the amendments be added to the vernal pools?

What will prevent the amendment from smothering the animals in the pool. Turbidity is a known problem for gill-breathing macroinvertebrates and could smother amphibian eggs and juveniles as well, depending on its tendency to adhere.

How will you prevent the procedures for mixing in amendments from killing animals (macroinvertebrates as well as amphibians) in the vernal pool?

2.2 Porewater PCB Performance Criterion and Compliance Depth

Is porewater PCB performance an appropriate criterion?

BEAT would like proof that a porewater-based performance criterion is in any way an appropriate gauge of PCB bioavailability for obligate vernal pool amphibians. Vernal pools are detritus-based systems and, as such, may incorporate carbon from the sediment into the food web. We are not convinced that the activated carbon with its associated PCBs will not enter the food web.

4.3 Ecological Monitoring

Are we reading this correctly that the annual post-remediation ecological monitoring will not be one visit, but multiple visits each year? It is highly likely that amphibians will return to these

pools to lay their eggs. The presence of egg masses does not reflect viability. These pools must be monitored multiple times each year for at least three years to be sure eggs are hatching and juveniles are surviving to emerge from the pools. In the case of salamanders, it may be seven years before those amphibians return to breed in that pool. Annual, or at least occasional, monitoring should continue for a decade or more.

Thank you for considering our suggestions.

Sincerely,

A handwritten signature in purple ink, appearing to read "Jane Winn".

Jane Winn
Executive Director

A handwritten signature in black ink, appearing to read "Brittany Ebeling".

Brittany Ebeling
Deputy Director



Technical Assistance Services *for* Communities GE-Pittsfield/Housatonic River Site Comments on Final Revised Vernal Pool Pilot Study Work Plan June 2025

Contract No.: 68HERH21A0018

Call Order Number: 68HERH22F0082 (14.0.0 OSRTI – Regional & Headquarters
TASC/CI Support)

Technical Direction: R1 2.12.14 GE Pittsfield

**Technical Assistance Services for Communities (TASC)
Comments on GE-Pittsfield/Housatonic River Site – Final Revised Vernal Pool Pilot Study
Work Plan,
June 2025**

Introduction

This document provides TASC comments on the Final Revised Vernal Pool Pilot Study Work Plan for the GE-Pittsfield/Housatonic River Site. This document is for the Berkshire Regional Planning Commission (BRPC), the city of Pittsfield, Massachusetts Audubon and other entities to use as they develop comments to share with the U.S. Environmental Protection Agency (EPA). TASC does not make comments directly to EPA on behalf of communities. This document is funded by EPA's TASC program. The contents do not necessarily reflect the policies, actions or positions of EPA.

Pursuant to the Revised Resource Conservation and Recovery Act (RCRA) Permit Modification (Revised Final Permit) issued by EPA to the General Electric Company (GE) on December 16, 2020, for the Rest of River portion of the GE-Pittsfield/Housatonic River site, GE is required to conduct a pilot study to evaluate the use of both traditional excavation as well as restoration techniques and amendments such as activated carbon for the remediation of vernal pools.

The June 2023 Initial Pilot Work Plan, as revised in the November 2023 Revised Pilot Work Plan and the June 2025 Final Revised Vernal Pool Pilot Study Work Plan, contains the design information related to pilot study activities to be conducted in each of the 10 selected pools. Section II.B.3 of the Revised Final Permit requires remediation of any vernal pool where polychlorinated biphenyl (PCB) concentrations in the soil/sediment exceed a spatially weighted average total PCB concentration of 3.3 milligrams per kilogram (mg/kg). This is in addition to any remediation required in the vernal pools to meet the performance standard for floodplain soils. For vernal pools exceeding the performance standard, the Revised Final Permit requires remediation by either:

1. Excavation and backfill to pre-excavation elevations to achieve a spatially weighted average concentration of 3.3 mg/kg (removal-based remediation), or
2. Placement of an amendment, such as activated carbon or another comparable amendment, in the vernal pool to reduce the bioavailability of PCBs in soil to a level less than or equal to the bioavailability of PCBs associated with the 3.3 mg/kg performance standard (amendment-based remediation).

The Revised Final Permit requires a pilot study to be conducted on no more than 10 vernal pools as a means of evaluating the two approaches. The Revised Final Permit also calls for the submission of a Pilot Study Work Plan that identifies the methods to be used for the study and the criteria for success. The criteria for success must consider the methods for evaluating the reductions in bioavailability achieved by the amendment-based alternative, as well as the impact of such amendments on the ecology of vernal pools. The results of the pilot study are to be documented in a report describing the effectiveness of both the removal-based and amendment-based remediation approaches in achieving the vernal pool performance standards, as well as the ecological effects of the amendment-based remediation. Based on the results of the pilot study, EPA will determine the preferred method for remediation and restoration of the remaining vernal pools, considering the Core Area habitat restrictions specified in the Revised Final Permit.

Summary

The June 2025 Final Revised Vernal Pool Pilot Study Work Plan has 10 sections:

1. Introduction and Overview
2. Pilot Study Performance Criteria
3. Bench-Scale Testing
4. Vernal Pool Baseline Monitoring
5. Vernal Pool Pilot Study Design
6. Contractor Selection, Supplemental Information Package, and Project Closeout
7. Quality of Life Considerations
8. Pilot Study Monitoring and Evaluation
9. Pilot Study Implementation Schedule and Reporting
10. References

The principal objective of the vernal pool study is to evaluate the effectiveness and potential adverse impacts of amendment-based and removal-based remediation of the vernal pools, in order to facilitate selection of an appropriate remedial approach for the remaining vernal pools in Reach 5A, as well as those in downstream reaches. GE identified a total of 60 vernal pools in Reach 5A floodplain that meet both the biological and physical criteria for certification of vernal pools issued by the Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (shown in Figure 1-1 of the Work Plan). In addition to the 10 test vernal pools, GE selected seven additional vernal pools that will be used as field controls or control pools. The control pools will be used to differentiate any changes that may occur in vernal pool ecology as a result of remediation from changes that may occur naturally. The Work Plan objectives also include:

- Establishing a pore-water based performance criterion that can be used to evaluate the effectiveness of the amendment-based alternative in reducing the bioavailability of PCBs

to a level less than or equivalent to the bioavailability of PCBs associated with 3.3 mg/kg total PCBs in vernal pool soils;

- Establishing the physical, chemical and/or ecological metrics and criteria to evaluate the effectiveness of the alternatives;
- Developing a monitoring program to assess the performance of the amendment-based and removal-based alternatives; and
- Finalizing the experimental design of the pilot study.

The November 2023 Revised Pilot Work Plan incorporated revisions to the baseline monitoring and ecological survey program, the final experimental design for bench-scale testing of amendments, and the conceptual design of the pilot study implementation. The June 2025 Work Plan presents the results of the baseline monitoring and ecological survey program; the results of the amendment-based bench-scale testing; the final list of the vernal pools to be included in the pilot study; the final experimental design of the pilot study; and the final design of the pilot study implementation for both the amendment-based and removal-based alternatives, including final plans, specifications, sequencing and schedule.

After EPA review and approval, the vernal pool pilot study will be implemented. That will be followed by three years of post-remediation monitoring, which will be summarized in a Vernal Pool Pilot Study Summary Report. These steps and those that will follow are summarized in Figure 1-3 of the Pilot Study Precedence Flowchart.

TASC Comments

TASC reviewed the June 2025 Work Plan to determine if:

1. Final Vernal Pool Work Plan design is supported by the initial Vernal Pool Pilot Study Work Plan findings (June 8, 2023 – referred to as the Initial Pilot Work Plan; Anchor QEA and AECOM 2023),
2. Previously provided TASC comments from the 2023 Initial Pilot Work Plan review have been addressed, and
3. Final Vernal Pool Work Plan study design raises any questions or concerns of potential interest to the community.

In general, the Final Vernal Pool Work Plan is well founded on the Initial Pilot Work Plan findings, and adheres to requirements set forth within the Statement of Work and Permit. Furthermore, the Work Plan does a good job of addressing other concerns, such as the treatment of cultural resources, and includes recent additional Rest of River documents of value and interest to the community including the Quality of Life Compliance Plan and the Revised Transportation and Disposal Plan. Given that the forthcoming in-field pilot study parameters are now known, TASC found several elements for further consideration for the study design, including additional dissolved oxygen testing of sediment to determine activated carbon impacts to sediment habitat suitability. Specific TASC comments are presented below:

1. The document provides the recommended ‘ecological performance criteria’ (section 2.3 PDF page 26, and others). GE states that the Revised Final Permit requirements for the identification of appropriate ecological performance criteria can only be met by using criteria that are basic parameters amenable to being designed, controlled and managed, and that can be readily documented and compared with pre-remediation conditions. As such, GE recommends the ecological performance criteria will be evaluated by assessing the physical conditions of the restored pools relative to each pool’s pre-remediation condition and by conducting within-year comparisons to control pools that have similar pre-remediation physical and biological conditions. Key physical parameters to be evaluated include spring/early summer temporary flooding conditions, status of surface inlets or outlets, and availability of habitat features that indicate development of primary productivity/food sources and provide refuge for amphibians. This recommendation to use physical vernal pool conditions as the criteria for ecological performance raises the following questions/concerns:
 - The recovery of physical conditions of an aquatic setting does not ensure functional biological recovery. Other factors, such as chemical measurements including characteristics of the surface water, pore water and sediment, are key to ecological restoration success.
 - Measurement of ecological recovery should be the criteria for the assessment of ecological performance. It seems more appropriate to use vernal pool-specific measures of biological recovery as appropriate criteria.
 - GE acknowledges and proposes to monitor the vernal pools and intends to collect information on pool hydrology, presence of amphibian egg masses and fairy shrimp, amphibian larval development and recruitment, macroinvertebrate community structure, vegetative plant community, general water quality, soil chemistry and other physical features of the pools. It seems appropriate to choose applicable

measurements from this data set to measure restoration success. Since collection of this information is already included in the work plan, it seems important to apply the findings to more effectively measure restoration success.

The community may want to ask EPA if the physical status of a given vernal pool is a suitable measure of ecological performance, and if it is possible to instead use the gathered vernal pool characterization data as the measure of restoration success.

2. In continuation with the issue raised in the previous comment: if the physical status of a given vernal pool is chosen as the measure of ecological performance, then what is the assurance to the community that EPA will require GE to continue work until an acceptable ecological endpoint is achieved? How will that acceptable ecological endpoint be defined? TASC previously recommended the use of the Massachusetts Division of Fisheries and Wildlife (MassDFW) Natural Heritage and Endangered Species Program (NHESP) biological and physical criteria for vernal pool certification. These methods were relied upon to identify vernal pools throughout the Rest of River area. These criteria could also be used as ecological performance criteria (MassDFW, 2009).

The community may want to ask EPA if EPA can assure that the ultimate goal of the vernal pool remedy efforts will be to achieve an ecological restoration status comparable to or better than pre-remediation conditions.

3. The document provides a thorough literature review of PCB sequestration by activated carbon and provides some information describing the chemical water quality impacts that may occur from activated carbon amendments. Research results indicate that activated carbon application has varying impacts on dissolved oxygen and benthic macroinvertebrate recolonization. Activated carbon may also influence the amount of oxygen in sediment. It may be important to measure sediment oxygen levels with the use of sediment probe instruments to ensure appropriate oxygen levels are available to support benthic macroinvertebrate recolonization. It is recommended that sediment pore space dissolved oxygen measurements be taken on a routine basis as part of the monitoring program (refer to Neill et al., 2014).

The community may want to ask EPA if dissolved oxygen levels in sediment and water nutrient levels should be components of the monitoring plan.

4. Activated carbon has demonstrated success as a material that can sequester pollutants. The Work Plan provides a concise summary of other studies showing these results. Activated carbon as a passive adsorbent (use as a cap to sequester underlying contaminated material) is very effective. Activated carbon as an active adsorbent has shown limits to its capacity for sequestration (such as the use of activated carbon filters on faucets). For example, once saturated, these faucet filters can release previously adsorbed contaminants back into the water, a phenomenon known as “breakthrough.” GE did test short-term activated carbon breakthrough with the use of a series of wet and dry cycles during the bench scale test. The results favorably showed the effectiveness of activated carbon over several seasonal cycles. However, it may be prudent to run a more prolonged bench scale test concurrent with the in-field pilot study to test whether breakthrough can occur over a longer time frame.

The community may want to ask EPA if concurrent, prolonged bench scale tests would be of benefit to the pilot study to test if breakthrough of the activated carbon barrier can occur over time.

5. An objective of the forthcoming vernal pool pilot study is to determine what the appropriate sediment depth range is in which to apply the porewater performance criterion. As stated in the document (PDF page 26) “the depth over which the performance criterion is applied should be consistent with the depth over which the organisms to be protected may be exposed... since the mixing (of activated carbon amendments) is primarily a result of bioturbation [disturbance and mixing of sediments by living organisms, such as benthic macroinvertebrates], the observed mixing depths will be indicative of the depth of biological exposure and, therefore, will be used to develop the appropriate depth over which the porewater criterion will be applied.” This statement raises two questions, as follows:
 - The depth of bioturbation to occur within these pilot study pools may not be typical due to the disturbance created by amendment application. The rates and depths should be determined using control pool information.
 - The organisms to be protected include amphibians, which may be exposed to contaminants through bioturbation. As noted in the results of the Vernal Pool Pilot Study Baseline Monitoring (Appendix C, PDF page 492), the obligate amphibian species that occur include the wood frog, and facultative amphibian species included spring peepers, gray treefrogs, green frogs and northern leopard frogs. Literature studies indicate that the wood frog barely creates any bioturbation. However, the other species may be more disturbing to the sediment. It seems appropriate to review the literature information to determine the appropriate bioturbation depths associated with the known species that occur within the pools.

The community may want to ask EPA if GE should consider a range of amphibian species bioturbation depths (literature based) to help develop the appropriate depth over which to apply the porewater performance criteria.

6. The Work Plan describes the next step in the vernal pool pilot study, in which testing of remedy approaches advances from the bench scale (jar tests) to an in-field test. The bench scale tests relied on bulk sediments taken from vernal pools that are being studied, and additional vernal pool sediments.¹ The elevation of the pilot study from a jar test reliant on a mix of sediment samples that are not truly representative of the vernal pools to an in-field test introduces some uncertainty into the pilot study. It may be prudent to run concurrent bench scale tests with the in-field test using the field-identified vernal pool sediment (on a small scale). These concurrent tests may be insightful to interpret erroneous results if they occur.

¹ To obtain sediments with higher PCB levels, GE remobilized during the week of December 11, 2023, to collect soils from an additional eight locations (including several locations in non-pilot pools) that exhibited some of the highest concentrations in the Reach 5A vernal pools during the pre-design investigation. These sediments are not being studied in the in-field test (refer to Section 2.0 of Appendix B, PDF page 185).

The community may want to ask EPA if it would be beneficial to run concurrent bench-scale tests coinciding with the in-field pilot study in order to obtain a more robust measure of activated carbon impacts.

7. Section 1.4.1 (PDF page 17) of the Work Plan describes the criteria used to select the test pools. The Core Area 1 bullet states “fifteen of the vernal pools in Reach 5A are located in Core Area 1 habitat and therefore were eliminated from consideration for the pilot study.” It is appropriate that these important vernal pools be eliminated from test pool consideration. However, it is important to be sure that these pools’ characteristics are captured by the test pools that were selected.

The community may want to ask EPA if the characteristics of the vernal pools within Core Area 1 (presence of protected species and any unique habitat characteristics such as water quality or bottom substrate composition) area are captured by the vernal pools selected for the pilot study.

8. Section 5.6 (PDF page 68) of the Work Plan describes the potential impacts on rare species and the measures to address them. The Work Plan provides a thorough narrative describing the treatment of any encountered turtles. However, there is no mention of the methods to address the two protected bird species. It is recommended that the construction area footprint be pre-surveyed for these species and any bird nest sites. Results of the survey should be used to determine if any steps need to be taken to minimize impacts to protected birds.

The community may want to ask EPA if measures to address protected bird species should be included in the construction specifications for the pilot study.

9. Section 8.3.2 (PDF page 84, and Appendix I) of the Work Plan describes the plan for post-construction monitoring. This section describes the very thorough regimen of proposed monitoring efforts to be completed after a removal-based cleanup. However, this section states “no additional soil PCB sample collection and analysis will be performed in the pilot study pools subject to removal.” The removal will remove the top one foot of vernal pool sediment. It is difficult to determine if the remaining subsurface sediment contains any PCBs at levels of concern. The figures depicting PCB levels for the vernal pools to have sediments removed (Figures 5-8, 5-9, 5-10 and 5-11) only show PCB levels down to 12 inches. There may not be any PCB information at depths below 12 inches. It seems appropriate to determine if there are any remaining PCBs now exposed at the surface following removal of the top 12 inches.

The community may want to ask EPA if it would be appropriate to sample the newly exposed sediments (upon removal of the top foot of sediment material as part of the pilot study) to determine if PCBs occur below a depth of 12 inches.

10. Figures 5-8 through 5-11 of the Work Plan depict the Toxic Substances Control Act (TSCA) and non-TSCA removal areas for each of the vernal pools to undergo removal action.² The removal-based alternative requires removal of the entire top one foot of sediment. Based on the figures referenced above, all areas within each vernal pool where a removal is planned should be clearly defined as addressing either 'TSCA' or 'non-TSCA' waste. However, there are portions of the vernal pools that show undefined areas (for instance, the Figure 5-8 map of 0-12 inches depth shows open areas of yellow and green that are not defined as either TSCA or non-TSCA). This indicates that these areas will be left in place. If that is true, this presents an opportunity to use the pool itself as a measure of restoration success by direct comparison of the area removed vs. the area retained in place. Alternatively, if this is not true, additional information is needed to explain the rationale behind the selection of the portion of VP chosen for removal. Recommendations for the use of individual pools as their own measures of success are summarized as follows:

- Figure CO1, Appendix E shows 5A-Vernal Pool-4 areas to be excavated. This includes a central area and a southern area that are not part of the pilot test. Dividers similar to those used for the mixing and amendment tests for pools 5A-Vernal Pool-15 and 5A-Vernal Pool-22 could be set up during construction to isolate a portion of this pool from removal disturbance. Once the removal is completed, the divider could be removed and the two areas compared to each other as measures of restoration success. This same approach applies to all the pools listed in this comment.
- Figure CO2, Appendix E shows 5A-Vernal Pool-7. The entire southern portion is to be excavated leaving the northern area that is not part of the pilot test untouched. This northern area could be initially divided from the southern area during construction and then used as a comparison to the removal area.
- Figure CO7, Appendix E shows 5A-Vernal Pool-57. The entire southern portion is to be excavated leaving the northern area that is not part of the pilot test untouched. This northern area could be initially divided from the southern area during construction and then used as a comparison to the removal area.

The community may want to ask EPA if certain individual vernal pools to be amended as part of the pilot study could be studied in areas where removal occurs as compared to areas that are not a part of the pilot study. These paired study areas may provide vernal pool-specific measures of restoration success.

11. The proposed monitoring program for the forthcoming pilot study is described in Appendix I (PDF page 943) of the Work Plan. TASC has the following recommendations for this program:

- Most first round monitoring will not occur until three months following removal/amendment. The first few months after the action should include close monitoring to ensure the integrity of the action. This monitoring could be as simple as visual observation along with random core samples to verify activated carbon

² The Toxic Substances Control Act of 1976 provides EPA with authority to require reporting, record-keeping and testing requirements, restrictions and disposal requirements relating to chemical substances and mixtures. TSCA-regulated wastes include PCBs, asbestos, radon and lead-based paint. Non-TSCA-regulated wastes include, among others, food, drugs, cosmetics and pesticides.

depth, or depth measurements to confirm the final excavation depths achieved in a vernal pool following a removal.

- All 17 pilot study pools had some invasive plant species as noted in Appendix C (PDF page 494) of the Work Plan. The first few months following a physically disturbing activity are critical to the control of invasive species. It seems important to include an aggressive monitoring (and removal) of any occurring invasives during the first few months following the action.
- Most of the monitoring will be completed at three months, six months, one year, two years and three years after removal/amendment (refer to Table 4-1, Appendix C, PDF page 501). Given the seasonal variability observed over the past few years, it seems prudent to conduct semiannual monitoring through the duration of the pilot study in order to capture the potential for extreme seasonal conditions.

The community may want to ask if monitoring post-construction could be more aggressive in order to observe any issues with the construction and to address invasive species. In addition, given the recent and dramatic seasonal changes, the community may want to ask if the annual monitoring could include two sampling events each year to capture seasonal changes.

12. Vernal Pool 5A-Vernal Pool-15 is to be divided in half to test differences between till vs. tine mixing of the activated carbon. Comparison of the pool construction specifications shown in Figure CO4, Appendix E (PDF page 788) to the vernal pool PCB modeling shown in Figure 3-3 indicates that the majority of PCBs will be captured on the west side. It is unclear if this will cause an impact to the study results. It seems important to divide the PCB polygon in half as part of this vernal pool study.

The community may want to ask EPA if the proposed division of pool 5A-Vernal Pool-15 should divide the PCB spatial footprint in half as part of the design to permit comparison of till vs. tine mixing of the activated carbon.

13. Figure C80 (PDF page 797) in Appendix E of the Work Plan provides construction specifications for certain management practice features to be used during construction. The Work Plan does not define the specifications for the divider to be placed in vernal pools 5A-Vernal Pool-15 and 5A-Vernal Pool-22. These dividers are to separate each pool to enable parallel testing of certain variables (tine vs. till mixing, powdered activated carbon/sand vs. SediMite application). This divider needs to be robust with features ensuring temporal integrity.

The community may want to ask EPA if the Work Plan should provide the construction specifications for the divider to be placed in vernal pools 5A-Vernal Pool-15 and 5A-Vernal Pool-22.

14. The results of the pilot study will provide conclusions about the effectiveness and potential adverse impacts of removal-based and amendment-based remediation of vernal pools. The Work Plan indicates that forthcoming decisions that define whether amendments or removal actions are to occur may be based on other factors such as sensitive habitat or ease of access (PDF page 86). If both approaches (removal and amendment) are shown to be able to meet the established performance criteria, these additional factors may affect

the final remedy approach decision. The community may want to consider additional factors such as flooding. Flood scour could compromise an amendment remedy. It seems appropriate to include flood prone status as a part of remedy selection.

The community may want to ask EPA if future remedy approach selection will include an evaluation of potential flood impacts.

15. The forthcoming in-field pilot study presents a unique opportunity to gain useful information of use to advance the understanding of PCBs in aquatic environments. The results of these studies have potential usefulness and application to other PCB affected sites. TASC recommends the following activities to help further the scientific understanding of these chemicals.

The methods and results of this pilot study are of benefit to the scientific community. GE should consider publishing this information upon completion of the study.

16. The vernal pools to test removal impacts are likely to cause mortality of resident species of plants, invertebrates and amphibians. There may be an opportunity to harvest and transport species to other areas if amenable to the appropriate trustees. These species could be captured and retained for tissue analysis of PCBs.

Some potential recommendations are as follows:

- Transport aquatic amphibians and fish from the pools to be impacted from removal of sediment to the river, if appropriate.
- Retain cuttings of woody vegetation, such as willow species, for vegetation restoration of the affected vernal pool or adjacent, affected vernal pools (methods and guidance for willows is provided by Jorgenengo, J. 2018).
- Retain samples of bulk sediment, surface water and tissues to evaluate for bioaccumulation and food chain partitioning.

The community may want to ask the EPA if there are opportunities to harvest the aquatic species likely impacted by the removal actions.

Additionally, Footnote 12 on PDF page 52 of the Work Plan states that “discussion with the City of Pittsfield will be needed regarding load limits or other concerns associated with the access routes on City of Pittsfield utility easements prior to finalizing the locations of temporary access roads.” TASC is restating GE’s request here to be sure the community remains aware of this issue and that it needs to be carried forward for City of Pittsfield review.

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