

**Commonwealth of Pennsylvania
Department of Environmental Protection
Hazardous Sites Cleanup Program**

RESPONSE TO PUBLIC COMMENTS

PART II – Response to Comments

September 8, 2022

**Bishop Tube
East Whiteland Township
Chester County**

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LIST OF ABBREVIATIONS

2020 Tech Memo	November 2020 Technology Assessment Memo
2021 FS	2021 Feasibility Study
2021 RI	2021 Remedial Investigation Report
AOA	Analysis of Alternatives and Proposed Response
AOCs	areas of concern
ARARs	applicable, or relevant and appropriate, requirements
AS/SVE System	air sparging/soil vapor extraction system
AST	aboveground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
AUL	activity and use limitations
Baker	Baker Environmental, Inc.
BMPs	best management practices
CDP	Constitution Drive Partners L.P.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
COC	contaminant of concern
CVOCs	chlorinated volatile organic compounds
DEP	Department of Environmental Protection
DNAPL	dense non-aqueous phase liquid
EAC	Environmental Advisory Council
Ecs	Environmental Covenants
EJ	Environmental Justice
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
EV	Exceptional Value
FS	feasibility study
GES	Groundwater & Environmental Services, Inc.
GW	groundwater
HHRA	Human Health Risk Assessment
HSCA	Hazardous Sites Cleanup Act
HSCA 512 Order	Administrative Order issued pursuant to section 512 of the HSCA

ISCO	in situ chemical oxidation
ISCR	in situ chemical reduction
JMI	Johnson Matthey, Inc
LVC	Little Valley Creek
mg/l	milligrams per liter
MNA	Monitored Natural Attenuation
MSCs	Medium-Specific Concentrations
NPL	National Priorities List
OU	operable unit
PADER	PA Department of Environmental Resources
PAHs	Polycyclic Aromatic Hydrocarbons
PAPL	Pennsylvania Priority List of Hazardous Sites for Remedial Response
PCBs	Polychlorinated biphenyls
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PPA	Prospective Purchaser Agreement
PRPs	Potentially Responsible Persons
RA	remedial alternative
RAO	remedial action objectives
RCRA	Resource Conservation and Recovery Act
RDC	residential direct contact
RI	remedial investigation
RIRs	remedial investigation reports
Roux	Roux Associates
RUA	Residential Used Aquifer
SGW	soil to groundwater
SHSs	Statewide health standards
SOD	Statement of Decision
SVOCs	Semivolatile Organic Compounds
TBC	to be considered
TCE	trichloroethene

TDC	total dissolved solids
TEG	Technical Evaluation Grant
TI	technical impracticability
UECA	Uniform Environmental Covenants Act
UIC	Underground Injection Control
VI	vapor intrusion
VOCs	Volatile Organic Compounds
Whittaker	Whittaker Corporation

RESPONSE TO COMMENTS

DEP appreciates the 102 comment submissions, containing hundreds of comments, received during the public comment period for consideration. Excerpts of comments received have been consolidated and categorized by subject below and are followed by DEP’s responses to those comments. Section VIII of the Statement of Decision (“SOD”) discusses Major Changes from the Proposed Response. In this document, DEP responds to all comments received. Certain technical comments that weren’t addressed as major changes to the proposed remedy will be addressed during the remedial action implementation process described below.

DEP’s public comment process

We would like to see the review, hearing and comment process revised as follows:

- November 9, 2021 date changed from a hearing to a presentation where DEP presents to the community the details of its remedial action plan and answers questions posed by the community regarding what is being proposed.
- A public hearing and written comment deadline in late January so communities have a full period of time to review what is being proposed and to consider their comments that is not impacted by year-end holidays and are scheduled no earlier than January 31, 2022.
- The public given a more rational amount of time to testify at the public hearing; 3 minutes is wholly inappropriate given the highly detailed and technical proposal at issue and given the serious and significant impacts suffered by the community. Seven minutes is more rational. And DEP should remove all suggestion that community groups and organizations should feel constrained in offering testimony with limitations that only one person from a group can speak – community members are organized and united and a part of several groups; to suggest that a resident should not be entitled to speak because they are part of an organization from which another person has already testified, or to suggest that an organization that has multiple technical experts should not be given the time to allow each of those experts to testify in order to ensure a fully informed DEP and present public is simply inappropriate and unacceptable. In addition, one week should be provided between the hearing and the end of the written comment period to allow residents to benefit from what they have heard and learned during the public hearing process. (Comment 4)

We would like to see the review, hearing and comment process revised as follows:

The November 9, 2021 date changed from a hearing to a presentation where DEP presents to the community the details of its remedial action plan and answers questions posed by the community regarding what is being proposed.

- A public hearing and written comment deadline in late January so communities have a full period of time to review what is being proposed and to consider their comments that are not impacted by year-end holidays and are scheduled no earlier than January 31, 2022.
- A 10 minute per person opportunity to speak at the public hearing that is ultimately scheduled and no limitation on who can speak regardless of organizational affiliations. (Comments 5-16, 34)

I want to express disappointment that you did not transform this hearing into a presentation and an opportunity for a question and answer for the people. That you simply provided a one way video for people to observe. We’d like to know that the potentially responsible parties and to the developer who

is seeking to develop this site have gotten all kinds of access to the DEP for not just months, but for years, with ample opportunity for back and forth, question and answer, clarification and more. But the public only had one meeting several years ago to have that kind of opportunity. That opportunity should have been provided, now, here, tonight, rather than this public hearing. This public hearing should have also been held later because there are literally thousands of pages of highly technical documents that need to be reviewed and understood in order for people to provide their public comment. So if you truly wanted a full fair opportunity for people to comment at this hearing you would have given them more time to digest all that highly technical information. I also just want to express, so the Delaware River Keeper network is going to be taken additional time, we have a lot of experts that need to take a look at this information and the 46 days provided simply was not enough. Saying that there will be equal weight given to written comments that are provided up to and through the end of the written comment period, that's really simply not a good answer. There are many people for whom providing testimony verbally is vitally important and they should have been given the opportunity to do that after reviewing all of the materials. (Comment 20)

You've had 21 years to do this investigation and proposal. Yet you have given us, the citizens, a couple of months to digest thousands of pages of data and recommendation. We have asked you repeatedly for the opportunity to meet and get answers to our questions. Our public officials have done the same. Yet the DEP has chosen to hide out and move directly to this hearing (Comment 21)

I appreciate that PA law puts the DEP hearings on record but I'm unhappy with the weakness of this information in effecting any change before decision or action is taken by government. Public hearings may appear to legitimize DEP and East Whitelands decisions even though the public input is not used in those decisions. The Pennsylvania DEP has well publicized this hearing today possibly because of the widespread interest in the problem of Bishop Tube including the widespread community expression for the return of the site to undeveloped green space versus housing development. The lack of agreement between the residents and both local and state governments has caused the final decision to be controversial. As a community of concerned residents of the state, county and towns in which Bishop Tube is found and through which the contaminants stream through our surface water and ground water, we beg you to take our researched opinions and personal stories of living near Bishop Tube seriously and allow them to affect your decision making. Our best hope is to have a face to face and honest and complete discussion of the size of the issue to the eventual status of Bishop Tube (Comment 22)

this hearing is being held far too soon after releasing a massive amount of technical data to digest literally weeks ago. (Comment 25)

I'm very concerned about the lack of a public hearing session prior to this hearing. The remediation exclamation is highly technical and is not easily understood by most residents, including myself. The video you provided, while somewhat informative, raised a number of questions but we are not being afforded any opportunity to have our questions answered. You claim in the video that community acceptance is a factor in your analysis of alternatives and choice of solutions. But you can't have true community acceptance if the community has no opportunity for meaningful dialogue and education. In other words if the community doesn't really understand what you're talking about. (Comment 26)

the public is being asked to comment now well before it's necessary and without DEP holding a Q&A session or public forum to explain this lengthy and extremely technical plan (Comment 27)

In 46 days from when you announced and released your remedial response we the public are supposed to have been able to read, analyze and absorb what has taken you more than two decades to produce. We, I guess, were to stop all that we are normally doing and jump on this at once to reviewed it when you finally released it. (Comment 28)

Holding this public hearing so soon after the voluminous and highly technical remediation plan was released is wrong and denies our community the opportunity to do a full review and share a fully informed comment with the DEP the press and others in our community. DEP should have agreed to the community on the process that it hosts a presentation and question and answer session for the community to discuss the remedial alternatives presented early in the process and certainly early to any scheduled hearing. The video provided does not serve this purpose. The site developer and the responsible parties had unfettered access to DEP officials for decades. All the community is seeking is a three hour public meeting to be able to ask and answer questions.... I am incredibly disappointed the DEP is holding this hearing on November 9th when there hasn't been enough time for people to review the highly technical documents or for the community to ask questions. (Comment 30)

.....it continued to advance a hearing process that failed to provide a meaningful opportunity to comment. The November date was too early after release of the extensive and highly technical materials to provide the public the opportunity to fully digest and assess the proposal in order to provide meaningful comment. Further, PADEP's use of a Zoom platform where disembodied voices got to speak to a faceless set of agency representatives was not conducive nor supportive to hearing the concerns, input, and questions of a community that has been deeply and profoundly impacted by the Bishop Tube contamination for decades. (Comments 45, 98)

The public hearing DEP held to allow residents to bring forth verbal comment was nothing short of abusive. The hearing was held November 9, 2021, a mere 45 days after release of the plan. Given the voluminous and highly technical remediation proposal, this was not enough time for full and fair community or expert review. There was no rational reason for a hearing to be held so early in the public comment process. The inequity of this short time in the one and only DEP hearing was compounded by the fact that residents were forced to testify to a blank computer screen that had nothing but a counting down clock. They could not see others who were in attendance, and they could not see if the officials they were supposedly testifying to were in fact paying attention or simply cooking dinner, cleaning their office or folding laundry. The people of East Whiteland deserved to be able to speak, face to face, with the decision makers to whom they were testifying, and to see who was in the room and listening to what they had to say. The process selected by DEP was intimidating and not conducive to securing meaningful public comment.

PADEP should have agreed to the community request that it host a presentation and question & answer session for the community to discuss the remedial alternatives presented early in the process and certainly prior to any scheduled hearing. The video provided does not serve this purpose. The site developer and responsible parties have had unfettered access to DEP officials for decades. All the community has been seeking as part of this open comment period is a 3 hour public meeting to be able to ask questions and secure answers. To date, DEP has held only one public meeting years ago, which did not address the current proposed remedial action plan and therefore did not serve to inform the community in a way helpful to the current public comment process. (Comments 43, 48, 82)

...Why won't the DEP give more than 45 days for public comment on this matter? Can you extend this another 100 days?.... Will you hold a public hearing? (Comment 52)

In reading the transcript from the public hearing from November 9, 2021. The public hearing where my community and I were forced to testify to a blank computer screen that had nothing but a counting down clock. Where we were unable to see others who were in attendance, nor the the officials we were supposedly testifying to! My community deserves to speak, face to face with the decision makers to whom they were testifying, and to see who was in the room and listening to what they had to say. It felt extremely disrespectful. (Comment 57)

Please allow the community a question and answer period to explain the technical aspects of the alternatives to clean up the site. (Comment 85)

When the original proposal was released back in September the community was not afforded an opportunity to ask questions and receive answers about its' contents. We were led to believe that the DEP was exploring options to find a venue to meet with the citizens of East Whiteland Township. In stead of meeting with the community to discuss the merits of the proposal and answer questions, the DEP chose to move directly to a hearing at an early point in the review process. This hearing was scheduled so quickly that even the township's consultants had not enough time to review the thousands of pages of data. Community members and township supervisors asked repeatedly to meet with the DEP before the hearing, yet our requests were denied.

The DEP indicated that all questions which arouse from the hearing would be answered at a later time, after the response period ended on January 31st. Once again the community was denied the opportunity to have an open dialog with the DEP in order to help them determine the merits of the proposal which is currently on the table. The DEP must ensure that adequate opportunity for public input into decisions as additional information becomes available. (Comment 101)

DEP response to comments regarding the public comment process.

DEP scheduled the public comment period in accordance with Section 506(c)(1) of the Hazardous Sites Cleanup Act ("HSCA"): "the public comment period shall extend for at least 90 days from the date that notice is published in the *Pennsylvania Bulletin*", which in this case was September 25, 2021. DEP contemplated the holidays when it originally scheduled the public comment period to end on January 3, 2021, a period of 101-days; however, in response to several requests, on October 26, 2021, DEP extended the public comment period from January 3, 2022 to January 31, 2022, providing a total of 129-days. Please note that, in addition to increasing the required duration by over forty percent more time, this time-period is longer than EPA typically provides for their Proposed Remedial Action Plans associated with Sites that are on the National Priorities List. EPA typically provides the public with 30-60 days to comment.

The public hearing was conducted largely in accordance with 25 Pa. Code Chapter 3. Standards for Administrative Records for Hazardous Waste Sites. §3.25. *Public hearing on the response. (b) In conducting public hearings under this chapter, the Department will conform to the following procedures:*

(4) The public hearing will be held no less than 30 calendar days, nor more than 60 days, from the beginning of the public comment period.

(5) The public hearing will be conducted in compliance with the following: ...

- (iii) Associations, groups, lobbyists or persons with a recognized common interest shall appoint a single spokesperson for the hearing.*
- (iv) The chairperson will have the authority to limit the time for each speaker at the outset of the hearing.*

25 Pa. Code § 3.25.

The hearing was scheduled on November 9, 2021, the 46th day of the public comment period. The 60th day of the comment period would have occurred on November 24, 2021, the day before Thanksgiving. Typical of DEP hearings, organizations were asked to designate one commenter to present on their behalf, which is consistent with DEP guidance and allows more members of the public the opportunity to be heard. Each individual who registered to speak on his or her behalf was allowed to testify.

Prior to the hearing, the time allotment for oral comments was extended from 3 minutes to 5 minutes, which allowed ample opportunity to present comments by any person, who wished to testify.

Typically, public hearings would be held in person at an accessible community location near the proposed project; however, in accordance with the Governor’s guidance on COVID-19, for public health and safety reasons, in-person events were suspended. In advance of the public hearing, on October 26, 2021, DEP placed a 30-minute virtual presentation on DEP’s website for Bishop Tube, to present the considered alternatives and its proposed response. The virtual presentation gave more individuals the opportunity to watch the presentation at any time, rather than a one-time in-person presentation.

DEP Southeast Regional Office personnel were not on camera due to technology limitations and broadband concerns. Personnel who listened to the public hearing included

- Patrick L. Patterson, Regional Director
- Ragesh R. Patel, Environmental Program Manager
- Richard Staron, Professional Geologist Manager
- Bonnie McClennen, HSCA Group Manager
- Joshua Crooks, HSCA Supervisor
- Dustin Armstrong, Site Project Officer
- Virginia Nurk, Community Relations Coordinator
- Adam Bram, Supervisory Counsel

An “off the record” question and answering session was not scheduled for various reasons, including the existence of multiple, ongoing legal actions involving the Site and the technical difficulties of such a format in a remote/virtual context.

DEP's Community Outreach

...Throughout that time you have interacted with the responsible parties and the proposed residential developer, as well as their experts and your experts, with regularity. Community engagement with DEP has been limited at best. (Comments 5-16, 34)

My basic concerns are for the process and the contention between your agency and the township sense of community - barricade but there has not been a time of - now there are in place, the supervisors of course, agree to building – because they didn't have the depth of information they needed to say no. It shouldn't be done (Comment 23)

....The DEP must address the public again after the plan is finalized and provide more time for our questions and comments (Comment 27)

No DEP initiated contact with the community or township officials. Only from legal support from Delaware River Keepers have neighbors have their health concerns and their voices made known. (Comment 29)

To date the DEP has had only one public meeting years ago which did not discuss the current remedial action plan and therefore did not serve to inform the community in a way helpful to the current public comment process. (Comment 30)

There has been no direct community out-reach to those bordering the property. We are left to find the information for ourselves and you have not engaged in direct communication with residents who are at serious health risk as a result of this cleanup....
There needs to be an active and present liaison between the DEP and neighboring residents when issues or problems arise as a direct result of the remediation. (Comment 33)

The plan should entail provisions for communicating each phase to the community. The community needs to be ensured that the clean up continues to be done safely at each stage. Community members should not need to hire lawyers or consultants to get up to date information about what is going on. (Comment 70)

Furthermore, the plan lacks any methods or procedures for future input from the community. The PADEP should ensure that adequate opportunity is provided for public input into remedial decisions as this additional information becomes available. (Comments 72, 74)

The DEP must inform the community how technical and management challenges to remediation will be met (Comments 75, 100)

The DEP must address community concerns and provide close oversight and ensure adequate communication with the community throughout the remedial process.
The Township and community must have an opportunity for input into important decisions about remedial implementation. (Comments 76, 100)

I strongly encourage DEP to consider making more information on this planned action available to the public and/or to further provide additional opportunities for public input when such important decisions are made. (Comment 80)

I would ask that you invite the residents of the General Warren Village, the township supervisors, the Delaware Riverkeeper, members of the BTOG, any interested members of the community and the developer to an open forum where questions can be raised with regard to the specifics of remediation including costs and time frame. (Comment 83)

31. Has a written public involvement plan been developed for this site? If not, I recommend that DEP prepare such a plan..... we recommend that PA DEP provide opportunities for increased public participation in the future and assign a member of staff to serve as the coordinator for public participation to actively solicit input and to respond to questions from the stakeholder community. Active outreach by DEP to encourage public participation needs to be implemented before, during, and after the site remediation.

33. The VCTC requests that the PA DEP provide it all future documentation and data re: any and all additional site investigation, treatability studies, selected remediation techniques and treatment amendments, ecological risk assessments, and pre-treatment sampling as well as monitoring results during and following implementation of the selected remediation methods. (Comment 92)

5) How does the PA DEP intend to solicit additional public comment once pre-design investigations have been completed and a detailed remedial design is developed? Will the format of public input allow for asking questions and receiving answers within a reasonable time frame?

27) Who will be the public point of contact at the PA DEP for matters pertaining to remediation at the Site? How will this point of contact be empowered to respond to public comments and concerns throughout the pre-remedial investigation and design process and during remediation?

33) When and how will PA DEP provide the public, who may be affected by remedial activities, an opportunity to provide input on monitoring and mitigation required during remediation?

34)..and how will PA DEP proactively communicate these oversight measures to the public?

41) How will the Township and public be kept informed by the PA DEP of what the PA DEP perceives to be the Township's role in future remediation, including any maintenance and inspections? (Comment 93)

DEP has a responsibility to communicate with the community which is affected by the Bishop Tube contamination. Thus far in the process it has failed to adequately communicate its work, its decision, and even follow its own rules when public input was required. DEP must do better. It must proactively ensure the safety of residents and clearly communicate how these efforts will be developed and executed. DEP needs to ensure an adequate opportunity for public input into remedial decisions as additional information becomes available. (Comments 94, 100)

However there are no methods within the proposal to communicate the data or update the methods to the public at large. The DEP must develop a plan which included methods of communication as well as opportunities for the community to give input into the on-going phases of the project.

..... methods of communication with the community, and the hierarchy of individuals who will be responsible for communication within the DEP. The DEP must provide close oversight and ensure adequate communication with the community throughout the remedial process.

The current proposal fails to give the community an adequate overview of the project..... The DEP will need to provide a method of communicating the progress which has been made with regard to the timeline and/or scope and sequence of the project. The DEP needs provide a hierarchy by which the community can continually get answers to questions, provide input, report problems, and communicate particularly when there is an emergency.... (Comment 101)

DEP response to comments regarding Community Outreach.

Previous public outreach efforts, included a public hearing, which was held on January 30, 2007, to discuss the prompt interim response action, which consisted of installing an air sparging and soil vapor extraction remedial system to address soils contaminated with trichloroethene (“TCE”) in three source areas on the Source Property, a 13.7 acre property, located at 1 South Malin Road, Malvern (East Whiteland Township), Chester County, PA (Chester County Tax Parcel No. 42-4-32-4). Nine individuals offered testimony during that hearing.

In 2017, DEP created a website for the Bishop Tube HSCA Site (“Site”). (www.dep.pa.gov/bishoptube). Since its creation, DEP has routinely been updating it with information. In winter 2022, DEP added a timeline for the Site to include project milestones and estimated dates. The timeline will be expanded and updated, as information becomes available. DEP will continue to post investigation data, work plans, remedial design documentation, and additional relevant information on the website. The website includes contact information for DEP personnel working on the Site.

The public comment process established by the Hazardous Sites Cleanup Act (“HSCA”) is intended to provide community outreach. Additionally, DEP issued a Technical Evaluation Grant (“TEG”) for \$50,000.00 to East Whiteland Township to assist the local government to provide DEP with its input on the proposed response action.

Prior to opening the Administrative Record, DEP compiled an email distribution list of people who had expressed interest to DEP in the Site. Since September 2021, DEP has been updating its distribution list and using it to send Community Update emails when the website is updated or when DEP learns of activities being conducted on the Bishop Tube Property. Individuals who submitted a public comment were automatically added to the email distribution list, although not every recipient wished to remain on the list. There are currently over 110 email addresses on that distribution list. DEP plans to continue using its email distribution list and the website to provide additional Site-related information. Instructions on how to be added to the email distribution list are on the website.

In addition, DEP has regularly copied East Whiteland Township on DEP communications regarding the Site and further communicated with Township public officials since initiating its HSCA investigation at the Site, primarily through East Whiteland’s Environmental Advisory Council (“EAC”). As an example, DEP has attended several EAC meetings in the past, which were open to the public. Throughout the investigation, EAC members routinely contacted DEP for updates prior to their meetings. Additionally, during the remedial investigation and feasibility study stage, East Whiteland Township was directly copied on many documents, including monthly progress reports and technical reports submitted by Roux Associates. DEP has also typically communicated security concerns to the Township and has asked for police support to address signs of trespassing. DEP expects such communications to continue. DEP will continue to ask the Township for their support with community outreach.

DEP intends to schedule informal public meetings, as necessary, as significant decision points and milestones are reached during the remedial design, remedial action, and operation and maintenance stages of the remedy. The purpose of these meetings would be to describe the planned and/or completed activities and answer the public's questions regarding those activities.

Source Property Land Use and the Appropriate Cleanup Standards

This property should not be developed for residential use. (Comment 1)

Non-residential uses for the property should be required. (Comment 2)

Nothing should ever be built on this ground. (Comment 3)

Please consider stronger remediation requirements for this site, to bring up to the level where it would be safe for human occupancy.

Please do not allow homes to be built on this site following remediation, especially at the current level you are requiring. (Comment 17)

Act 2. It is not capable of doing what is necessary to achieve the necessary protection (Comment 18)

... we know that there's not just proposed residential development for the site but that residential development has already been approved by the township and is certainly anticipated by the township by the developer, that should have been the anticipated outcome by the Department of Environmental Protection and that should have been the goal post that was identified for this remedial action plan. (Comment 20)

Yet the experts you are using, and the other government bodies involved in giving opinions, such as the Agency for Toxic Substances and Disease Registry evaluation report of 2008 the Chester County Planning Commission and the East Whiteland Environmental Advisory Council have all recommended against building homes on the site.....We would like DEP to recommend against building homes on this site and furthermore to enact your role as trustee of our natural resources under the Pennsylvania Constitutional environmental amendment and recommended both engineered remedial techniques and actual remediation processes be used to return the site to a natural area to expand the riparian buffer along Little Valley Creek and provide needed open space..... This exposure is at odds with permitting housing development there. Yet the DEP uses expert derived methods that do not bring the hazardous chemical exposures to meet Pennsylvania health standards but rather use a site specific comparison for exposure that permits this housing development, .. (Comment 22)

...the supervisors of course, agree to building – because they didn't have the depth of information they needed to say no. It shouldn't be done... you would be saying to the developer, knowing what you guys know about this contaminate in something that has a lifelong - you know living environment – but it should never be built upon the grounds. (Comment 23)

I urge you to clean up the Bishop Tube site to the highest standard possible and reject any development on the site.

I was on the special parks taskforce for East Whiteland Township and the Bishop Tube site was identified as one of the few remaining open parcels in the township and was recommended for preservation. (Comment 26)

The DEPs remedial response fails to fully address residential development of the site but East Whiteland Township has approved a housing development there.It's bewildering and beyond frustrating that everyone, the DEP, East Whiteland Township, the experts, the public, knows it's a toxic site unfit for development and we all know the right thing to do is to preserve it as natural open space rather than build townhouses and endanger the lives of unsuspecting residents. No one seems able or willing to stop this runaway train being helmed by an irresponsible developer and an ineffectual township leaders and enabled by DEP.....(Comment 27)

And finally what does the final cleanup look like? Would you let your grandson play in the dirt after the remediation at the site? (Comment 28)

I am for keeping Bishop tube open space allowing forest and plants to grow undisturbed. (Comment 36)

The cleared site should be protected from further development. Overdevelopment as a whole is rapidly becoming a major issue in the township, let alone on a previously contaminated site. It would be irresponsible to allow ANY number of residences to be built here. (Comment 37)

Remediation and maintenance of a healing Green Space is essential. (Comment 38)

I want the Bishop Tube site in the Malvern/Frazer PA contaminated site fully remediated to the highest legal standards ... for the site once cleaned up to remain protected as an open space for the community in perpetuity.Building homes or any other building on this site would negatively impact the environment and community. (Comment 40)

The site has been rezoned to accommodate a residential use, a residential development of approximately 90 homes is proposed for this site, and a residential site preliminary plan has been approved by the Township. It is clear that the proposed future use of this site, against the wishes of the community, is a residential development. Therefore, remediation of the site must meet the highest standards available for residential use.

The RIR and FS on which the AOA is based, however, expressly states that the analysis is based on the assumption that present and future use of the Site will be non-residential only. Feasibility Study Report - Former Bishop Tube Property, at 2 (Jan. 13, 2021) ("As agreed with [PA]DEP, both this FS Report and the 2021 RIR assume that present and future use of the Property will be non-residential only."). The failure by PADEP to address a residential end use of the site while investigating the feasibility of various remedial alternatives is a fundamental failing. This is especially true where, as here, Statewide Health Standards are being utilized as part of the cleanup standards for the remediation. Statewide Health Standards vary based on whether the end use is residential or nonresidential. Thus, a cleanup plan selected based on its ability to achieve Statewide Health Standards for a nonresidential end use will not meet the standards required for a residential end use.

While the community is 100% opposed to any development of this site and is demanding that all government officials work to ensure its protection as natural open space, in perpetuity, for the benefit of the community, currently the proposed-approved-use is residential. Therefore, the evaluation process must be initiated with an understanding that the end goal of the remediation plan is a

residential use. Instead, however, PADEP based its AOA on multiple reports that assumed the site as a non-residential development. (Comments 45, 98)

given that the intended use is Residential, protection of and the safety and health of future residents is mandatory. (Comment 51)

What do the case studies for trichlorethylene (TCE), including the EPA investigative report, show as far as what cleanup was required when this chemical was found at other sites, the danger it presents to the human body, how long the danger remains, and whether such sites permitted development such as is proposed here?. (Comment 52)

The remediation proposal fails to protect residential development of the site. And yet, residential development of over 90 homes is not just proposed for this site, but a residential site plan has been approved by the Township. Based on current facts, the future use of this site will be residential. Therefore, remediation of the site should meet the highest standards available for protecting residential uses at the site. Anything less than protection for residential use risks putting future families at risk. While the community is 100% opposed to any development of this site and is demanding that all government officials work to ensure its protection as natural open space, in perpetuity, for the benefit of the community, currently the proposed-approved-use is residential and that must be the end goal of this remediation plan. (Comments 30, 43, 48, 82)

In general, the process of formal discussion of this site has always defended the use of the property for residential housing to produce monetary benefits to the developer and the township of East Whiteland, and has never directly addressed the many problems the people and other agencies (County Planning Comm., township EAC, federal ATSDR) have expressed about the risks to human and environmental health..... At no time has the actual reason for the refusal to protect this site been explained. The discussions and hearings describe a result that has been written in stone from the beginning – this is disturbing and both legally and morally wrong. It is heartless that the DEP and local government officials remain obdurate and uncaring, not even willing to explain or apologize for their decisions and willingness to put the health of the people and the environment at risk of both near-term and long-term harm. (*Paraphrase of* Comments 43, 48, 68, 82, 91)

East Whiteland Township paid for the open space evaluation from Natural Lands. That evaluation recommended the Bishop Tube site as permanent open space. DEP should comply with existing recommendations from the township and county and do their part to bring these plans to fruition. (Comment 43, 48, 55, 82)

At its current state, the remediation plan fails to find proper solution to remediate the site as a preserved open space, which is what the locals desire, let alone redevelopment as residential housing. (Comment 46)

....This site is not a place to build homes or let people live and or work... WE cannot do nothing, we need to clean up our mess as much as possible. After responsible remediation the Bishop Tube site should be again tested to see if it is safe for use as a park or open space. Should we allow the current housing project it will be too late to fix the damage what we have done, (Comment 50)

Why do you not consider the Agency for Toxic Substances and Disease Registry, Chester County Planning Commission, and East Whiteland Township Environmental Advisory Council recommendations that

residential housing not be approved here? Was it approved at other sites with comparable levels of TCE? If not, why approve this development (Comment 52)

Your standards of protection are inadequate to protect these properties and pieces of land. Additionally, you are failing to protect our residents by allowing this property to be used for residential development. (Comment 59)

This site should be cleaned with the highest standard possible in mind, No matter what the site is used for in the future, we must make it as safe as possible. (Comment 62)

....I can only question the general advisability of building on this site. The developer projects a high-density townhouse mix, but the prospect of living on top of a contaminated site, regardless of the hoped-for effectiveness of the remediation plan, would seem to be dangerous one for the townhouse purchasers.

In view of the ancillary problems of traffic, access to the site through the low railroad bridge, and the general negative effect the building of more townhouses in the Township leads me to believe the site would best be designated as a green space. In this use, no remediation would be needed. (Comment 69)

This approach fails to meet the standards for residential development. This property has been zoned residential and tentative plans have been approved for housing. This has not been specifically addressed in the DEP's approach.

The most stringent standards should be applied throughout the remedial process when designing, monitoring and evaluating remedial actions.

Your chosen strategy which includes soil intrusions may be less costly but does not meet the standard needed for residential use.

Making sure the land meets those environmental standard for residential use at a later time will place additional burdens on future residents and the township after the responsible parties have fulfilled their obligations. (Comments 71, 78)

Remediation goals must be consistent with residential use of the site.

The property is zoned residential, but this is not addressed in the remedial approach.

A residential standard has previously been identified by DEP consultants as a possibility, but the methods to achieving this have not been identified.

While responsibility for remediation may fall to different parties at different times, the PA DEP is responsible for ensuring the remediation protects human health and the environment.

The most stringent residential standards should be applied throughout the process when designing, monitoring, and evaluating remedial actions. (Comments 73, 100)

The DEP needs to address topics including risk assessment for expected future residential use, development and implementation of safety measures during remediation, and expectations for development (Comments 76, 100)

This site needs to meet the EPA regulations in order to develop this site. Also this site isn't suitable for being residential housing. Also the builder must disclose to everyone the past use of the property. (Comment 79)

any proposed Remedial Response Action at the Bishop Tube site must be fully and comprehensively assessed in the context of the potential residential development there. Given that the township has already approved the site for residential use and a development plan for nearly 90 homes, it is imperative that Remedial Response Action and recommended alternatives directly address its effectiveness and potential impacts in the scope of an anticipated residential setting – including families, expectant mothers, children, and senior citizens (Comment 80)

Why on Earth would anyone allow homes to be built on a site where it's an absolute that it will cause Cancer in your children. Will O'Neill Developers reveal to homebuyers that their children will more than likely get rare Cancers like the children of Franklin IN. (Comment 81)

The township's decision to approve a plan to develop single family houses on a highly contaminated site must be reversed. Both current and even past supervisors have openly admitted that this toxic site should have never been approved for residential development.....

..... No matter what new information has been yielded upon further analysis, this developer has never backed off from pursuing residential development. How concerned is he about the impact of developing residential housing on a highly contaminated site? What about the children who may one day be playing in the dirt surrounding their parents' home?

You have received a document that was produced by an independent group of consultants hired by our East Whiteland township supervisors and it is clearly stated that this land will never be completely safe for residential housing even after DEP completes the costly and years long task of remediation. The DEP is responsible for the wellbeing of present and future subjects who will be affected by the decisions you make and actions you take on behalf of clean air, water and soil in the environs of Bishop Tube. There are many recommendations in this report can we depend upon the DEP to follow their lead and ensure that this land will preserved not developed?

..... We have heard it spoken on record that had our supervisors known the extent of the contamination of the Bishop Tube site they would not have approved it for residential development... Where we can discussopen space in the only sector of East Whiteland township that does not have open space. (Comment 83)

Long term, the surface of that 16-acre site must be sealed off as would other brown sites and planned as a green area, with vegetation cover, wooded areas, and other amenities for intermittent public use, but never be zoned for permanent residential use. (Comment 84)

I urge the department not to allow this development at the Bishop Tube site. I was shocked to hear it is being considered by the DEP, after having already been approved by the township. (Comment 85)

32..... there appears to be some uncertainty about the potential use of the property for residential purposes based on the omission within the Remedial Response Action of any such discussion limiting future land use. The use of the site for only non-residential purposes needs to be definitively stated by DEP within the Remedial Response Action. (Comment 92)

Insane development plan puts residential housing on toxic waste land! (Comments 88, 102)

If you, or anyone that has the power to proceed with the development of Bishop Tube site, wouldn't want to live there... why is it being approved? No one would want to live there knowing it's on a super fund, brown site! There's a handful of people that can prevent this. The DEP, EPA and our township

officials know the toxicity of BT. They also are suppose to protect our community and environment. Based on the results of any studies, how is residential development still an option? (Comment 90)

Why Is Housing Being Built at Bishop Tube? The ATSDR, Chester County Planning Commission, and East Whiteland Environmental Advisory Council have all opined against taking the health risks of building homes at Bishop Tube.....

This exposure is at odds with permitting housing development there, yet the DEP proposes remedial methods that do not bring the hazardous chemical exposures to meet PA health standards, but rather use a site specific comparison for exposure that permits housing development.....

There are benefits of remediating BT to the highest standards required by law, and then allowing natural geological, biological, and physical remediation of land, of expanding the forest cover, and of putting the area under permanent conservancy. (Comment 91)

2) Given that the Township's preliminary land development approval contained conditions for residential site use, which conditions were accepted by the developer, why has the PADEP not required the planning of remediation to achieve residential standards?

3) How does the PADEP intend to ensure the safe residential use of the property if remediation is not conducted to achieve compliance with residential standards?

4) How does the PADEP intend to resolve the disconnect in assumed site use, applicable standards, and exposure pathways between the scope of work which the PADEP has required of the Bishop Tube Working Group and that which the Township has required as part of future development? (Comment 93)

Will the Final Plan address clean-up to a residential standard? Will it be to the strictest human health standard? (Comment 94)

There is no standard specified to which the site is to be cleaned upDEP must explicitly consider the fact that the site has been approved for residential use by the township. It would appear that it has not done so. (Comment 95)

...Please do the right thing concerning this potential development. Please do not allow this to move forward without getting all the necessary facts first. Please consider the well being of local residents and the environment over the desires and pushiness of a zealous developer... (Comment 96)

GC5 – The Overall Remedial Approach Is Compatible with a Residential Use, But Supplemental Measures by the Developer Would Be Necessary. Some in the community have suggested because the RIR and FS Reports contemplated a non-residential use for the Property (which was rezoned to residential use by East Whiteland Township [“EWT”] at the request of the owner/developer in 2014), the DEP’s proposed remedial approach is not protective of future land use. By extension it is suggested by some that the Site hasn’t been studied sufficiently to support DEP’s selection of a remedy. In response to these public comments, DEP should explain that its proposed remedial approach, subject to the suggested revisions described herein is compatible with both existing residential and commercial land uses off the Property, as well as with a potential future residential (or open space) use, subject to certain conditions. Those conditions are generally described in the FS Report (for residential use) and are also described in some detail by EWT in the conditions it has required the developer meet before any residential redevelopment can occur. (Comment 97)

If the land is developed for housing and children get cancer from exposure to dangerous contamination, the DEP is directly responsible. (Comment 99)

DEP response to comments regarding Source Property Land Use and the Appropriate Cleanup Standards.

DEP acknowledges that it is the preference of many commentors that the property be used as open space. However, zoning and land use decisions are under the purview of the local government and outside of DEP's authority. As such, DEP has no authority to change the use of the property. As the property is privately-owned, the property owner has the choice about how to use the property, as allowed by East Whiteland Township and in accordance with all applicable laws.

DEP is aware that the current property owner sought and was granted a change in zoning for the property in 2014. Even though East Whiteland Township was copied on monthly progress reports and early versions of remedial investigation reports ("RIRs"), prepared by Roux Associates ("Roux") for the Site and other Site-related correspondence, it did not seek DEP input prior to changing the zoning of the property. DEP is required to ensure that the property is remediated to the applicable Act 2 standard, based on the planned end use of the property, which in this case is residential.

On page 10 of the 2021 RIR, Roux acknowledged the current zoning of the property and on page 26 indicated that "*the soil data are compared to SHSs [Statewide health standards], both residential and non-residential direct contact as well as soil to groundwater MSCs, [Medium-Specific Concentrations] as benchmarks for DEP to assess the nature and extent of soil contamination on the Property... Similarly, groundwater data are compared to SHSs.*"

On page 43 of the 2021 Feasibility Study ("2021 FS") "*In defining the Site in this FS, it is acknowledged that the Property is zoned residential⁴⁴. Based on the residential zoning, the Site is defined by the most restrictive standards as follow:*

- *Soil: residential direct contact ("RDC") [0 to 15 ft bgs] MSCs or RUA [Residential Used Aquifer] SGW [soil to groundwater] MSCs;*
- *GW: RUA (<2,500 milligrams per liter ["mg/l"] total dissolved solids ["TDS"]) MSCs"*

The Analysis of Alternatives and Proposed Response ("AOA") was based on the contents of the Administrative Record and not solely on the 2021 RIR and the 2021 FS, discussed above. To further evaluate soil remedial technologies where the FS did not, DEP contracted Groundwater & Environmental Services, Inc. ("GES") to prepare a Final Remedial Alternatives Analysis, dated August 5, 2020 and a Technology Assessment Memo dated November 10, 2020.

The current owner's planned property use was acknowledged in the Site Location and Description (Section II. A.) of the AOA. In the Release of Hazardous Substances Section (Section II.C.), DEP discussed each contaminant of concern ("COC") in relation to an Act 2 Residential Scenario. In the Statement of Decision ("SOD"), DEP provides further clarification that the Act 2 standard will be achieved based on the zoned and proposed residential use of the Source Property. These clarifications will be discussed in the SOD in Section VIII, Major Changes from Proposed Response. Because of the COC concentrations

in various environmental media (including soil, groundwater, soil vapor, rock material, and trapped residual/isolated non aqueous phase liquid), attainment of SHSs for all COCs is not technically achievable in a reasonable timeframe. Therefore, attainment of a site-specific residential standard will be required for COCs, in accordance with Act 2, which do not meet SHSs after active remediation is completed. This is consistent with the remedial action objectives (“RAOs”) specified for each operable unit (“OU”) within the AOA. A residential site-specific standard is protective of human health because it ensures that exposure pathways are eliminated by using engineering controls and/or institutional controls to prevent exposure to contamination. Pathway elimination is a common method of addressing contamination that is used at many sites. An engineering control, as defined by Act 2, is a remedial action directed exclusively toward containing or controlling the migration of regulated substances through the environment. Examples of engineering controls may include:

- a vapor intrusion barrier, which is typically installed to seal off any exposure pathways;
- a vapor mitigation system (similar to a radon system), which is used to prevent vapors from entering the buildup; and/or
- a cap consisting of an impervious surface such as concrete or asphalt, which prevents direct contact with contaminated soil and addresses storm water infiltration.

An institutional control, as defined by Act 2, is a measure taken to limit or prohibit certain activities that may interfere with the integrity of a remedial action or result in exposure to regulated substances at a site, and typically involve activity and use limitations (“AULs”). AULs are established to prevent exposure to COCs and protect the remedy. Environmental Covenants (“ECs”) on the Source Property would be drafted and recorded to implement the AULs in accordance with the Uniform Environmental Covenants Act (“UECA”). Pursuant to Section 512 of the Hazardous Sites Cleanup Act (“HSCA”), DEP could issue an Administrative Order (“HSCA 512 Order”) to a property owner who refuses to sign and record an EC, as an alternative to enforce AULs. Such an EC or HSCA 512 Order would be attached to the deed of the property and be permanent, running with the land.

As stated in the AOA, a background standard may be applied to certain inorganic contaminants or other organic compounds, if the contaminant is determined to be present because it is a natural component of soil/groundwater or because it has been released from an off-site facility and migrated onto the Site. The determination of attainment of soil background standards is based on a comparison of the distributions of the background concentrations of a regulated substance with the concentrations in an impacted area. Groundwater Background Standards include two general categories. The first is naturally occurring background or area-wide contamination. The second is background associated with a release of regulated substances at a location upgradient from the Site that may be subject to such patterns and trends.

Because the current property owner elected to change the land use, they will be responsible for incorporating and maintaining pathway elimination into their development plan and demonstrating attainment of residential standards and the RAOs for the Source Property.

Current Exposure Pathways vs Future Exposure Pathways

Testing indicates that TCE from Bishop Tube has been found in occupied buildings off site. Yet you seem to indicate that this was an acceptable risk. With all we know about TCEs there is no acceptable risk. Your plan should include remediation measures for these sites and additional testing for all buildings within the plume of contamination. (Comment 21)

I'm distressed and saddened to realize that since the year 2000 children growing up in this neighborhood including my son have been exposed to these hazardous chemicals and DEP has given no heed to the health of the children in the General Warren Village. (Comment 29)

Mr. Dustin Armstrong explained how humans can become exposed to the hazardous substances at Bishop Tube; he stated that the exposures could develop from multiple pathways over time, even after homes are built there. People could come into contact with contaminated soil. Construction and utility workers could be exposed when working on the property. Vapor intrusions can migrate from soil or groundwater and enter occupied buildings. If buildings are constructed over or near soil contamination, a vapor intrusion (VI) exposure pathway could be opened. Vapor can intrude through cracks in foundation of homes. Contaminants can migrate into rain water and into ground water (as has been already found here though the full extent is not known). The DEP's recommended remedial actions might not treat all of the soil at this site. Contaminants can be transferred from soil and migrate further into groundwater as rainwater moves downward. Contaminants can also be trapped in the soil only to be released into groundwater for the long term. TCE is the primary contaminant of concern in ground water and is found further away from the source than any other contaminant. Based on TCE concentration from some monitoring wells, residual free product could act as a long term source of ground water contamination, and also discharge to Little Valley Creek. There is the potential that if there are changes to homes, or construction of new buildings, such as installing a new sump pit, changes could open a new VI pathway. (*Paraphrase* of Comments 22, 43, 48, 55, 82, 91)

Therefore, these risks potentially are a long term and possibly permanent risk to development there. (Comment 22)

the DEP video only briefly notes that construction and utility workers could be exposed to dangerous contaminants while working on the property and that vapor intrusion might keep the structures there. The scary fact that people working at or living on the site are directly in the path of known cancer causing contaminates by TCE is treated as a side note at best..... (Comment 27)

DEP has failed to use full, accurate, and robust science to ensure a complete total site cleanup that will protect present and future residents at the site, downstream from the site, and in neighboring communities (Comments 43, 48, 68, 82)

Community members and the environment have been deeply impacted by the toxins at, and emanating from, the Bishop Tube site. (Comments 4, 5-16, 34, 43, 48, 82)

Toxic vapors are escaping and will continue (Comment 50)

29) At what point in the remedial process will risk associated with residential use of the property be assessed and by whom?

30) Should redevelopment of the Site not occur, or be significantly delayed, who will undertake assessment of the exposure pathways excluded from the scope of work required by the potentially responsible parties? (Comment 93)

GC12– The Agency for Toxic Substances and Disease Registry (“ATSDR”) Has Reached Important Conclusions that Should Be Communicated to the EWT Community. In the risk evaluation portion of the AOA, DEP briefly summarized select findings from a Final July 16, 2008 Health Consultation for the Bishop Tube Site (“Health Consultation” or “Report”) prepared by ATSDR. The Health Consultation presented a number of findings and conclusions of potential interest to the EWT community. DEP’s response to public comments should describe several of these important findings and conclusions as summarized below...

- o No Current Public Health Hazard - ATSDR concludes that there is No Apparent Public Health Hazard for any current, completed exposure pathways associated with the Site. In addition, ATSDR concludes that, “based on the levels detected and the exposure pathways identified, we do not expect adverse health effects to result from children’s exposure to TCE and other VOCs”. Further, Section 5.0 notes that “Off-site exposures to high concentrations of these contaminants [contrasting off-Property with on-Property conditions] are not expected at this time. ATSDR does not expect adverse effects due to current or past exposures to these chemicals.”
- o No Current Drinking Water Well Exposure - The Report correctly documents that the area in the vicinity of the Site is serviced by a public water supply, and that only one property uses a private well for its drinking water. That well, as reported by ATSDR (and proposed by DEP to be connected to public water as part of OU3), historically had a whole-house carbon treatment system that was sampled and maintained by DEP. As a result, the Site poses no drinking water risk.
- o No Current Drinking Water Exposure via Surface Water or Springs - The Report notes that LVC and several natural springs are present in the general vicinity of the Site. PADEP had investigated the area and found no evidence that LVC or any of the identified springs are used as a drinking water source. ATSDR found no contrary information. In fact, the Report states “[t]he residential community within AOC 1 is served by public water and ATSDR is not aware of any residents using LVC or any of the natural springs in the area as a primary drinking water source”. (Comment 97)

DEP response to comments regarding Current Exposure Pathways vs Future Exposure Pathways.

Please refer to the Agency for Toxic Substances and Disease Registry (“ATSDR”) Evaluations, which are available on DEP’s website for Bishop Tube and were incorporated as part of the Administrative Record for the case:

- April 6, 2016: [ATSDR letter](#) (PDF)
- July 16, 2008: [ATSDR Consultation](#) (PDF)

Identification of open exposure pathways has been a primary focus of DEP’s and Roux’s investigation throughout the Hazardous Sites Cleanup Act (“HSCA”) Program’s involvement at the Site. There are no open exposure pathways to the residents of General Warren Village. All homes in the General Warren Village are connected to a public waterline. Where potential open exposure pathways were identified, such as recreational use of Little Valley Creek or vapor intrusion (“VI”) into some homes and businesses above the contaminant plume, sample analytical data (i.e., surface water, indoor air and outdoor air) was evaluated to confirm there was no unacceptable risk to human health.

Indoor air results did not exceed risk thresholds. The investigations are discussed in Sections 7.3 Vapor Intrusion Investigation (beginning on page 71) and 9.2 Indoor Air Vapor Intrusion Cumulative Risk Assessment (page 105) of the 2021 Remedial Investigation Report, prepared by Roux Associates (“Roux”). The indoor air sampling data collected during the Remedial Investigation was evaluated using the most up-to-date risk calculation tool created and maintained by the EPA. Acceptable risk is defined as a non-cancer risk Hazard Index value of less than 1 and/or an increase of the cancer risk by 1 additional cancer in a population of 10,000. These risk thresholds are used by EPA at Federal Superfund sites and are incorporated into DEP’s cleanup standards.

An open exposure pathway must be present to cause an exposure. An example of an open exposure pathway that was historically present at the Site is the impacted domestic water supply addressed in the proposed response as Operable Unit 3. The exposure pathway was closed in 1999, when a point-of-entry filtration system was installed at DEP’s request, eliminating use of water, which contained trichloroethene (“TCE”), exceeding the safe drinking water standard. This pathway had remained closed as a result of filter maintenance performed by DEP and Roux. In 2019, DEP and Roux Associates learned that the property, where this point-of-entry filtration system was installed was not currently occupied, and DEP and Roux told the property owners not to consume water from this property. The exposure pathway is considered a potential future route of exposure because it relies on continued maintenance of the treatment system. Likewise, use of water from any new well installed within the Site may result in an open exposure pathway. In order to justify response under HSCA, DEP must demonstrate that risks or potential future risks to human health and/or the environment exist at a site. The Analysis of Alternatives and Proposed Response lists these potential risks, including risks from groundwater use, vapor intrusion, and construction/utility worker exposure in addition to ongoing impacts to groundwater and surface water as a justification for taking actions to address the contaminated media. Any developer of the Site would need to consider risks to construction/utility workers and future residents during the planning stage of any development. Health and Safety plans would be required to mitigate risks to workers.

All exposure scenarios would need to be evaluated and addressed based on planned use of the properties. Engineering and institutional controls will be implemented as necessary to address future exposure pathways. Based on the ownership, development, and/or reuse of the Source Property, long-term assessment exposure risk may be performed by the property owner, the developer, the remediators, DEP, and/or others.

If the community is aware of current open exposure pathways to Site contaminants, which have not been identified, please contact DEP so they may be evaluated and addressed.

Cancer Cluster

Children continue to die from brain tumors in the Gen. Warren Village and adults continue to die of cancer. (Comment 18)

since the 70s this neighborhood near Bishop Tube was considered a cancer hub. How insane is that and how many people in this neighborhood were sick? (Comment 24)

We have been waiting for more than 20 years for you to do the right thing while our neighborhood has become a cancer cluster (Comment 27)

Three of my dogs died of cancer like so many other residents in the General Warren Village. (Comment 30)

Villagers continue to die of cancer and children continue to suffer brain tumors and die.(Comment 32)

A few additions but the important message is that: ROUX's document omits so much evidence re: health and cancers, Cancers and tumors continue to show up in young girls... (Comment 41)

We did not know at the time of purchasing our home in 1987 that our neighborhood was known as "The Cancer Hub" because of Bishop Tube. (Comment 53)

We believe the cancer rate in our neighborhood is above average as we have witnessed residents fight the disease of cancer. Some survive, while others pass away at a young age. (Comment 63)

The Village Way community is known as a cancer hub.....

While it is not possible to draw a causative connection to the cancers in Village Way residents and their progeny and the hazardous chemicals at Bishop Tube, this Chester County data serves to warn that the chemicals in our environment have consequences for human health, and that there is growing concern in the scientific community that the high rates of chemicals in our environment are related to increasing illnesses of many types, especially cancers and neurological illnesses. (Comment 91)

GC12 ...o No Evidence of a "Cancer Cluster" - While some community members voiced concern to ATSDR about cancer in the neighborhood, ATSDR found no evidence of a cancer cluster in the vicinity of the Site. ATSDR includes an assessment of cancer outcomes within the proximate neighborhood of the Site from Pennsylvania Department of Health records, and reports that "state epidemiologists did not find increased cancer rates in areas surrounding the Site as compared to overall statewide cancer rates". In addition, there is no known link between TCE exposure and brain cancer. 26 This important conclusion should be clearly communicated to the community. (Comment 97)

DEP response to comments regarding a Cancer Cluster.

Please see the discussion above regarding current exposure pathways and refer to Agency for Toxic Substances and Disease Registry ("ATSDR") Evaluations which are available on DEP's website for Bishop Tube and were incorporated as part of the Administrative Record for the case:

April 6, 2016: [ATSDR letter](#) (PDF)

July 16, 2008: [ATSDR Consultation](#) (PDF)

According to ATSDR’s 2008 Health Consultation, “*by screening this data for the overall area, the state epidemiologists did not find increased cancer rates in areas surrounding the site as compared to overall cancer rates.*”

Private Drinking Water Well

And we are one of the families affected by water pollution!

The truth is that we were not so aware of how polluted the water was and we and our children were drinking from it! And after reading information about this if we are very concerned about pollution!

We hope that soon we can have some affirmative answer for both families and the environment!

(Comment 19 *translated into English*)

DEP response to comments regarding the private drinking water well.

The drinking water supply on your property is equipped with a carbon filtration system which is designed to remove contaminants from your drinking water supply. This system has been routinely sampled by DEP or by Roux Associates at the request of DEP to ensure that it is working properly. When DEP learned that your family had taken ownership of the property, we contacted your husband, Mr. Leon, by telephone and mailed a follow up letter on August 22, 2019. The letter explained the need for the filtration system and basement sump cover, which have been installed in your house, to prevent ingestion and contact with contaminated water. Attempts were made to inspect the filter system and basement sump and to sample the water supply. Since our first conversation in 2019, Mr. Leon, has repeatedly told DEP that the property was in the process of being renovated and was not occupied. The sample collected in November 2021 revealed that the untreated water met safe drinking water standards. When the sample was collected, DEP noted that the filtration system was not connected to the home plumbing system.

Based on historical sample results, DEP has selected Alternative 3 – Connection to the Existing Public Water Supply with Institutional Controls for Operable Unit 3, which directly pertains to the water supply. This selected response will permanently address concerns related to using the water.

DEP will contact you regarding implementing this action. Until the connection to public water is completed, DEP recommends that you not use the well water unless it is treated by the carbon filtration unit, installed on your home, and that you maintain and use the sump pump well cover that has been installed or a similar cover.

Respuesta del DEP a los comentarios sobre el pozo privado de agua potable.

El suministro de agua potable en su propiedad está equipado con un sistema de filtración de carbono que está diseñado para eliminar los contaminantes de su suministro de agua potable. Este sistema ha sido muestreado rutinariamente por el DEP o por Roux Associates a petición del DEP para asegurarse de que funciona correctamente. Cuando el DEP se enteró de que su familia había tomado posesión de la propiedad, nos comunicamos con su esposo, el Sr. León, por teléfono y enviamos una carta de seguimiento por correo el 22 de agosto de 2019. La carta explicaba la necesidad del sistema de filtración y la cubierta del sumidero del sótano,

que se han instalado en su casa, para evitar la ingestión y el contacto con el agua contaminada. Se intentó inspeccionar el sistema de filtro y el sumidero del sótano y tomar muestras del suministro de agua. Desde nuestra primera conversación en 2019, el Sr. León le ha dicho repetidamente a DEP que la propiedad estaba en proceso de renovación y no estaba ocupada. La muestra recolectada en noviembre de 2021 reveló que el agua no tratada cumplía con los estándares seguros de agua potable. Cuando se recolectó la muestra, el DEP notó que el sistema de filtración no estaba conectado al sistema de plomería del hogar.

Basado en los resultados históricos de muestras, el DEP ha seleccionado la Alternativa 3 – Conexión al Suministro Público de Agua Existente con Controles Institucionales para la Unidad Operable 3, que se refiere directamente al suministro de agua. Esta respuesta seleccionada abordará permanentemente las preocupaciones relacionadas con el uso del agua.

El DEP se pondrá en contacto con usted para implementar esta acción. Hasta que se complete la conexión al agua pública, el DEP recomienda no usar el agua del pozo a menos que sea tratada por la unidad de filtración de carbono instalada en su hogar, y que mantenga y use la cubierta de pozo de la bomba de suma que se ha instalado o una cubierta similar.

Environmental Justice Area

I will just add that Bishop Tube is under a mile and a half from Environmental Justice area and the Village Way community themselves is an Environmental Justice area because of their long term exposure. (Comment 22)

Bishop Tube is less than 1.5 miles from a DEP Environmental Justice area, and return of the site to a natural park, to blend into the forest around it and to protect Little Valley Creek, would provide Environmental Justice to those designated communities. (Comments: 43, 48, 55, 82)

DEP response to comments regarding the Environmental Justice Area.

Environmental Justice (“EJ”) Areas are mapped on DEP’s EJ Areas Viewer at dep.pa.gov/EJViewer. General Warren Village and the area impacted by the contamination are not within the EJ Area as defined by [DEP’s policy](#). For more information about EJ please visit, [Office of Environmental Justice - Pennsylvania DEP](#).

AOA Compliance with Law

....(PADEP) has failed to fulfill its regulatory, statutory, and constitutional obligations with its remedial action proposal for the Bishop Tube Site.

PADEP released this remediation proposal prematurely, seemingly in response to the fact that PADEP is the subject of a legal challenge, rather than having a fully composed and understood remediation plan that complies with the law and is appropriate for public review and comment.

Contamination concentrations in the surface and groundwater at and near the site represent a threat to human health and the environment. The proposed Analysis of Alternatives and Remedial Response (AOA) fails to address known contamination at, and leaving, the site; the AOA is fraught with misinformation that prevents formation of an informed plan that will effectively and completely address

contamination at the site and ensure compliance with the law and protection of human health and the environment.

The AOA Fails to Fulfill Requirements of Law (Comments 45, 98)

As a result of the misinformation and missing information, it cannot be determined nor demonstrated that the Remedial Response could or would address the site contamination to the degree required by law. In addition, absent this information, this is not a proposal that experts or community members can fully understand and comment upon. This proposal more closely resembles a draft interim set of ideas than a remedial action plan intended to comply with the requirements of the law. (Comments 45, 98)

this is not a final plan upon which the community or experts can comment as there is a wealth of outstanding information and decisions to be made. (Comments 30, 43, 48, 82)

Insufficient and vague remediation plan insures lack of accountability and failure. (Comment 88)

The Remediation Plan that DEP has put forward is hardly a plan. Although the plan document is long in its number of words, even with its profane use of anachronisms, it lacks critical details in identifying the contaminates of the site, the expanse of the plume and concentration, the remediation chemicals to be used and the final cleanup standards to be achieved. (Comment 94)

29. There needs to be a discussion in the DEP RRA about the specific requirements for various permits, EV wetland protection, and stormwater management that will need to be met prior to the implementation of any contaminant remediation measures. (Comment 92)

Pennsylvania's constitution Article 1, Section 27 "The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people." (*Paraphrase* of Comments 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 33, 53, 54, 55, 57, 80, 94, 95)

DEP response to comments regarding AOA Compliance with Law.

The function of the Analysis of Alternatives and Proposed Response ("AOA"), is to formally document, for the Administrative Record, the evaluation of the alternative responses that were considered and the selection of a proposed response. The AOA, prepared for the Bishop Tube Site, complies with Section 504 of the Hazardous Sites Cleanup Act ("HSCA") which requires that final remedial responses meet (or waive or modify) all applicable, or relevant and appropriate, requirements ("ARARs"), and be cost effective. Section 504(a) also requires that HSCA responses be consistent with cleanup standards of Section 121 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). Section 121 of CERCLA states that remedial responses must protect the public health and the environment, be cost effective, and utilize permanent and effective solutions and treatment technologies to the maximum extent practicable. Based on these statutory requirements the alternative responses are analyzed to determine: 1) the extent to which each alternative protects the public health and the environment; 2) the extent to which each alternative complies with or otherwise addresses ARARs; 3) the extent to which each alternative is

feasible, effective, implementable, permanent; and 4) the relative cost effectiveness of each alternative.

In addition, the AOA provides a summary of the information relied upon to propose the remedy and is used to compare the pros and cons of each alternative under consideration to determine which alternative(s) provide the best balance of the evaluation criteria described above. After DEP selects the alternative(s) in the Statement of Decision, the remedial design phase serves as the engineering phase of the response during which specifications and technical drawings are developed for the selected remedy. In some instances, pre-design investigations are necessary to refine the scope of the remedial design. These documents/reports will be published on DEP's website for Bishop Tube to be shared with the community as they become available.

As stated in the Cleanup Standards Section (Section IV) of the AOA, Section 106 of Act 2 states that environmental remediation standards, established under that statute, shall be applicable to remediation conducted under HSCA. As such, this Site will be remediated to a combination of the Act 2 standards, including background, Statewide health, and site-specific, based on the zoned and proposed residential use of the property. In accordance with Section 506(g) of HSCA, *"no State or local permits shall be required for a response action conducted entirely on the site if prior written approval is obtained from the department."* The selected response will meet all ARARs described in Section V of the AOA and discussed throughout the document.

DEP has satisfied Article I, Section 27 of the Pennsylvania Constitution in the development of the AOA for the Site. As described in the AOA, DEP initiated and oversaw a thorough investigation of the Site and ensured that the contamination at and emanating from the Site was comprehensively characterized. DEP removed immediate threats to public health and safety by ensuring that the impacted private water supply was equipped with a properly maintained carbon filtration system and by overseeing modifications of the basement water collection and pumping system to address indoor air quality concerns. Additionally, with DEP oversight, Constitution Drive Partners L.P. located and plugged pipes that were potential discharge points from the Site to a proximate surface water. DEP identified the remedial action objectives and proposed remedial response activity for each operable unit to address the remaining degradation to public natural resources of the Commonwealth from the historic releases of hazardous substances at the Site. Cognizant of its role as a trustee of public natural resources, DEP has evaluated alternative response actions and proposed a remedy that effectively addresses the historic degradation of public natural resources and additionally aims to prevent unreasonable diminution and degradation of public natural resources during remediation, consistent with Article I, Section 27.

Suggested AOA Revisions

GC11 – Other "Sources" of COCs Have Been Identified at This Site. In the AOA DEP uses the term "Source Property" without providing an adequate definition of its meaning. There have been releases on the Property, and there have been other documented, contributory sources of COCs within or immediately proximate to the "Site." The term "Source Property", if it refers solely to COCs released on the Property,

should be clearly defined to exclude other known and unknown sources of COCs. It should also exclude natural background conditions (such as the presence of certain metals in soils) and upgradient conditions (such as MTBE in groundwater), as discussed in the RIR.

GC14– There Are Revisions and Clarifications Necessary in “Section B. Site History” of the AOA to Correct Errors and Avoid Inaccuracies. DEP provides a summary of the Site history in Section B of the AOA. As part of its response to public comments, the BT Team requests that DEP modify the Site history section of the AOA to correct those errors and inaccuracies as noted below.

- When the J. Bishop Company began manufacturing operations in the newly constructed Plant 5, it was solely for the production of stainless steel tubing. Precious metals processing was moved into a portion of Plant 5 in 1959, upon completion of Plant 8 construction. Transfer of some Plant 5 operations into Plant 8 made equipment and space available there for precious metals processing.
- The two production wells on the Property met Safe Drinking Water Act standards in the early 1980s when sampled by the USGS. The East Well/CH2432 was tested in 1981, the West Well/CH2749 in 1984. Results are documented in a 2010 USGS report³⁰ (see Attachment A). The report documents that “samples near... industries were analyzed for selected metals; one or more types of anthropogenic organic compounds, including VOCs such as trichloroethylene (TCE)...” and the tabular and mapped results show that the two production wells on the Property had no detections of VOCs or other anthropogenic contaminants of concern. A few metals were detected at very low or background concentrations and fluoride was detected at 1.0 parts per million (“ppm”), below the USEPA 4.0 ppm drinking water standard. It is worth noting that a DER inspection report in 1974 stated the two wells were pumped at 80 gpm / 18 hours per day³¹. Under those conditions, if there were detectable concentrations of VOCs or any other metals in the groundwater, they would have been identified.
- The AOA states that according to former Bishop Tube employees, solvent waste was disposed “outside of the two buildings”. If solvent waste was disposed on the Property, employees reported no such occurrence when questioned in 1981. In 1981, Johnson Matthey interviewed some Christiana Metals employees who had worked at the Property since the 1960s to enable completion of a “Notification of Hazardous Waste Sites” report³². Employees recalled acid waste and non-EP toxic metals from stainless steel pickling as the only hazardous wastes discharged onsite. The report was submitted to US EPA in June 1981 by Johnson Matthey as past owner/operator of the Site, in compliance with CERCLA.
- The AOA states that the Drum Storage Area (DSA or Armco building) was used to store raw (unused) and waste materials from 1963 until the mid-1990s, but DEP does not have any documentation to support the 1963 date. Documents in the Administrative Record establish that the Armco building was converted from equipment storage to a drum storage area near the end of 1982, sometime after a September 1, 1982 Pennsylvania Department of Environmental Resources (“PADER”) Site inspection. Before that, drums were stored inside the manufacturing facility and at an outside storage location that was not associated with the Armco building.
- The AOA states that a 40-foot long vapor degreaser (approximately 40’ L x 4’ W x 10’ H) was located in an unlined, concrete subfloor pit in the western portion of Plant 8.DEP’s statement that the degreaser was present in an “unlined” pit incorrectly implies that the degreaser was in a pit open to the environment.
- The AOA states that according to former Bishop Tube Employees and PADER inspection reports, acid rinse waters were discharged from a transfer pit immediately east of Plant 8 across the ground surface into LVC. The August 18, 1972 Waste Discharge Inspection Report documents that this situation occurred when a pump was broken; such discharges were not a routine or continuous practice. The inspection report also documents that a temporary sump pump was

installed until the original pump could be repaired, and DEP records confirm that the pump was fixed and in operation on August 23, 1972.....

- The AOA states that starting in 1975, Christiana Metals supplied TCE and 1,1,1 TCA to the degreaser from a 5000-gallon AST through subfloor piping. The administrative record confirms that the volume of the solvent AST was 4000 gallons, not 5000 gallons. (Comment 97)

DEP responses to comments regarding Suggested AOA Revisions.

The Analysis of Alternatives and Proposed Response (“AOA”) defines the 13.7-acre former Bishop Tube property as the Source Property currently owned by Constitution Drive Partners, L.P. The Source Property’s address is listed as 1 South Malin Road, Malvern, PA. The Chester County Tax Parcel Number is 42-4-321.2. The purpose of this was to distinguish the Source Property from the Site which is defined as the areas of groundwater, soil, and surface water contamination. The Site extends beyond the boundaries of the Source Property. The AOA also acknowledges that other contaminants of concern exist as a result of potentially natural background conditions or upgradient sources.

The Site Information Section (Section II) describes the nature of the Site and the conditions which justify a Hazardous Sites Cleanup Act (“HSCA”) response and the proposed response. It is not intended to be a detailed description of every condition at the Site but is intended to address the basis of the determinations of releases and threats at the Site. To write the section, DEP relied on worker interviews and information contained in reports previously submitted to DEP or its predecessor agencies. DEP formally requested information from each of the former operators of the Bishop Tube facility but did not receive notes or other reports from the referenced employee interviews conducted before the June 1981 notification submitted to EPA.

Regarding the comment “*DEP’s statement that the degreaser was present in an “unlined” pit incorrectly implies that the degreaser was in a pit open to the environment.*” As stated in the comment, DEP referred to it as “*an unlined, concrete subfloor pit*”. DEP believes that the pit is constructed of concrete which may not have served as adequate containment of releases to the pit. When referring to the word “unlined,” DEP is referring to a coating or a liner that would have been capable of resisting permeation of trichloroethene (“TCE”) or other chlorinated solvents used in and released from the vapor degreaser. A footnote was added to the Statement of Decision (“SOD”) to provide the definition of “unlined.”

Regarding the comment “*The administrative record confirms that the volume of the solvent AST [aboveground storage tank] was 4000 gallons, not 5000 gallons.*” DEP verified that the registration document included in the Administrative Record does list the tank to be 4,000 gallons; the SOD has been revised accordingly.

PFAS Sampling

PFAS permeates all phases.

There is no mention of sampling for PFAS but it must be sampled for because it is being found everywhere, in human samples, in streams, in soil and in air. (Comment 18)

There is exclusion of sampling for PIFA, which is 90 percent or more likely to be there because of the type of industry that was practiced there (Comment 31)

Very important is the absence of past, present or proposed testing in every capacity and every media for perfluorinated carboxylic acids (PFAS) commonly used in metallurgical processes since the 1930s. These chemicals are soluble, are in our air, streams, groundwater and in our bodies. (Comments 32, 41)

The site is a likely source of PFOS/PFAS contamination. (Comments 45, 98)

The proposal does not include adequate information concerning the evaluation of emerging contaminants including PFAS compounds (*Paraphrase of Comments 72, 74, 100*)

1. During the metals manufacturing process hydrofluoric acid was used and fluoride was stored on site. Concentrations of fluoride in site groundwater (Figure 36 of the Roux Remedial Investigation, Table R-4) and surface water (Table R-3) warrant a determination of the source. Fluoride in groundwater is indicative of per- and polyfluoroalkyl substances (PFAS) degradation. Chromium was also used during manufacturing and it and hexavalent chromium remain on site as constituents of concern and continue to leave the site via groundwater and surface flows. PFAS are known to be associated with chromium processes. (Comment 92)

7) What, if any, evaluation has the PADEP performed to evaluate the risk of PFAS contamination at the Site? Has sampling for PFAS compounds been performed at the site or requested by the PADEP? If not, why has no sampling/or PFAS compounds been required? (Comment 93)

What about PFAS and PFOS? They are being monitored downstream of Bishop Tube in Valley Creek? Is Bishop Tube a source? What is proposed to be done about these chemicals? (Comment 94)

Pre-remedial investigations should evaluate the site for the presence of emerging and newly regulated contaminants (such as PFAS compounds which are known to exist in Valley Creek.) (Is Bishop Tube a source?) and fully delineate the impacts in soil and ground water to the most stringent applicable MSC's or another applicable standard. (Comment 95)

GC1.... PFAS compounds are another class of emerging contaminants for which sampling is sometimes warranted depending upon a particular site's operational history. In November 2021, DEP published Chapter 250 revisions that introduced, for the first time, soil and groundwater standards (i.e., MSCs) for three PFAS compounds: perfluorooctanoic acid ("PFOA"), perfluorooctane sulfonate ("PFOS") and perfluorobutane sulfonate ("PFB"). Some in the community have suggested that groundwater at this Site should be sampled for these compounds, alleging that prior operations – specifically, the vapor degreasing or pickling - were a likely source of PFAS contamination. However, review of the available literature¹² does not support those claims. Furthermore, there is no evidence that aqueous film-forming foam ("AFFF") fire suppression systems were ever used at the Site (and that would not be expected given the nature of the operations conducted there), and no fires that might have warranted the use of AFFF¹³ are reported in the historical documentation. In sum, PFAS use has not been documented and would not be expected at this Site. (Comment 97)

DEP response to comments regarding PFAS Sampling.

After the close of the comment period, Roux Associates (“Roux”), on behalf of Johnson Matthey, Inc. (“JMI”) and Whittaker Corporation (“Whittaker”), elected to collect groundwater and surface water samples on the Source Property for three per- and polyfluoroalkyl substances (“PFAS”): perfluorooctanoic acid (“PFOA”), perfluorooctane sulfonate (“PFOS”), and perfluorobutane sulfonate (“PFBS”) for which DEP recently established Statewide health standards (“SHS”) in November 2021.¹ The sampling was conducted in early-March 2022. On April 8, 2022, the results were added to the website. PFOA was identified in groundwater above the SHS and has been included as a contaminant of concern (“COC”) in the Statement of Decision (“SOD”).

PFOA was also detected in surface water samples collected by Roux, but below its SHS. (*No surface water criteria currently exist for PFAS*). Because PFOA has been attributed to the Site and appears to increase in Little Valley Creek, as it passes through the Source Property, it has been added as a COC for surface water. Additional soil analysis will be necessary to determine if PFAS is a COC in soil.

As part of pre-design investigations, PFAS analysis was anticipated by DEP to determine an appropriate in situ amendment for application. The discovery of PFAS has eliminated certain types of in situ chemical oxidation (“ISCO”) amendments from consideration because ISCO interactions with PFAS may form breakdown compounds, increasing PFAS toxicity. Commercially available in situ chemical reduction (“ISCR”) and bioremediation amendments which incorporate granular activated carbon technology may be used to simultaneously address chlorinated volatile organic compounds (“CVOCs”) and PFAS. The Analysis of Alternatives and Proposed Response (“AOA”) was intended to provide for sufficient flexibility to allow for such modifications without delaying implementation. Further pre-design investigation of PFAS, including soil sampling, additional groundwater analysis, and additional surface water sampling will be necessary.

DEP does not agree that detections of fluoride in groundwater and surface water are indicative of PFAS in the same media. PFAS are considered extremely stable and would be unlikely to breakdown into fluoride. A review of fluoride data shown on Figure 36 of the 2021 Remedial Investigation Report (“2021 RIR”) reveals no correlation with elevated PFAS concentrations detected in March 2022. Additionally, the presence of PFAS at hazardous waste sites where chromium is present is associated with use of PFOS-containing foam or mist to prevent occupational exposure from chromium plating processes. Based on DEP’s review of the historical record, DEP is unaware of such plating processes having occurred at the former Bishop Tube Site. DEP has concluded that chromium and fluoride contamination are related to hydrofluoric/nitric acid treatment of stainless steel tubing, which was comprised of nickel and chromium alloys. Fluoride exceedances of the SHS in groundwater

¹ EPA has issued Health Advisories for certain PFAS and is in the process of developing MCLs under the Safe Drinking Water Act (“SDWA”) for PFOA and PFOS. Furthermore, the DEP has proposed MCLs for PFOA and PFOS, which proposed regulations may be To-Be-Considered criteria (TBCs) for purposes of selecting response actions at the Site; and these proposed MCLs may be promulgated in the near future. The response action is expected to achieve protection with respect to all unacceptable human health risks posed by PFAS constituents. DEP will automatically consider DEP or Federal MCLs or Health Advisories for PFAS constituents as ARARs or TBCs, respectively, as appropriate, when one or more of these standards is promulgated or finalized.

as depicted in 2021 RIR Figure 36 do appear to be correlated with the former acid treatment and acid waste handling activities (i.e., Plant 8 Pickle House, acid rinse water transfer area, and former cesspool). Understanding of PFAS compounds and their many uses continues to evolve.

It is also possible that an upgradient source of PFAS may be present. Installation of additional monitoring wells southwest of the former manufacturing areas would be necessary to demonstrate attainment of a background standard.

Prospective Purchaser Agreement

My other issue was the fact that DEP gave the constitutional guide partner and Brian O’Neil a covenant not to sue when they bought this land and that is highly disturbing to me. (Comment 24)

has left out a lot of details such as the CDP agreements and the department’s breaches in procedure. (Comment 28)

This may be due to several agreements made with the developer that are undisclosed to the community. Or it may be due to a prior incident that the developer’s contractor had at the site where remediation equipment had been broken. (Comment 29)

3. Why isn't the owner of the land required to do whatever cleanup is required under state and federal law? (Comment 52)

The proposal fails to discuss the true history of this site, including with regards to proposed development. The multiple Prospective Purchaser Agreements (PPA) with the proposed developer, the damage to equipment installed to begin to address site contamination that was so detrimental it resulted in PADEP voiding key aspects of the PPA agreement, the changed/changing proposed (and now township approved) end use from commercial to residential, and the process and reason for the sweetheart deal struck with the proposed developer, are among the key historic facts not included in the proposed PADEP documentation. PADEP needs to provide full and fair information on the history and current proposal regarding site development. (*Paraphrase of Comments 30, 43, 48, 82*)

DEP’s response to comments regarding the Prospective Purchaser Agreement.

A Prospective Purchaser Agreement (“PPA”) is a tool commonly used by DEP to support the redevelopment and reuse of otherwise dormant and contaminated sites by persons who are not legally responsible for the contamination but wish to bring sites back into productive use and could become potentially responsible once they acquire the site property.

The 2005 PPA between DEP and Constitution Drive Partners L.P. (“CDP”) is discussed in the Site History Section (Section II.B.) of the Analysis of Alternatives and Proposed Response (“AOA”). On April 9, 2005, DEP published notice of the PPA, in accordance with Section 1113 of the Hazardous Sites Cleanup Act (“HSCA”) and opened a 60-day public comment period on the PPA. DEP received no comments on the PPA, during the public comment period. The PPA became final when DEP notified CDP that no comments had been received.

The two amendments (2007 and 2010) to the 2005 PPA are not discussed in the AOA, as the Environmental Hearing Board determined them to be null and void because DEP inadvertently failed to provide timely public notice in accordance with HSCA. The 2005 PPA remains in effect.

The change in zoning is acknowledged in the Site location and Description (Section II. A.) of the AOA.

CDP's potential non-compliance with the terms and conditions of the 2005 PPA and the voided PPA amendments, including, but not limited to, CDP's damage to the Air Sparge/Soil Vapor Extraction System and any effect of DEP's January 28, 2014 letter to CDP is not discussed in the AOA, as the purpose of the AOA is to present DEP's decision-making process and description of the proposed response.

Who is conducting the cleanup?

the site should be cleaned up by the companies that contaminated the ground, or the DEP should conduct the cleanup and charge the companies. (Comment 2)

As to Act 2.....nor is it able to bring the PRPs inline to do the work , (Comment 18)

There needs to be assurances that the decision regarding remediation include the requirement for all responsible parties to fund the completed remediation. (Comment 22)

How will you hold responsible parties accountable for this cleanup action that is not state tax money is being used. (Comment 25)

Is it DEP that will be implementing and overseeing the remedial response? If the answer is yes, why should we the public have any confidence in that after two decades of no cleanup? There appears to be divided responsibility as to who is responsible for what. I would like to know what exactly are DEPs responsibilities? What are CDPs responsibilities? And what about the other responsible parties, individually and collectively and what are they responsible for? And who gets to pay for this? What does DEP say about payment and what do responsible parties say about payment? Under your proposal who is responsible for pushing the plan through to completion? Who pays for it and what if they don't? (Comment 28)

I want the Bishop Tube site in the Malvern/Frazer PA contaminated site fully remediated ...by all responsible parties, (Comment 40)

the DEP must hold the responsible parties financially accountable. (Comment 62)

The responsible parties are tasked to clean up this site. It is the DEP's duty to see that these parties are held responsible. (Comments 71, 78)

The DEP should inform the public, regarding how remediation will be financed and whether this may limit remedial activities. (Comments 75, 100)

There needs to be assurances that the decisions regarding remediation include the requirement for all Responsible Parties to fund the completed remediation. (Comment 91)

9) Who will be responsible for completing soil delineation?

24) Is it expected that the integrated remediation of soil and groundwater, as described in the Analysis of Alternatives and Proposed Response, will be undertaken by the responsible parties?

25) Are the responsible parties capable of funding the remediation within the time frame outlined; and if not, is the PADEP willing to move forward with the remedial action regardless of responsible party involvement in funding the remediation?

36) How will responsibility for development and implementation of these controls [Institutional and engineering controls] be divided among the various parties involved (e.g., responsible parties vs a future developer)?

40) Who will be responsible for final design, construction, and long-term operation and maintenance of best management practices incorporated into the remediation?

43) What party will retain financial responsibility for operations and maintenance of vapor intrusion mitigation systems? (Comment 93)

4. What are CDP's responsibilities with regard to the clean up?

5. What are Johnson Matthey, Inc. and Whittaker Corporation's responsibilities with regard to the clean up? Individually? Collectively?....

8. The writer is assuming that DEP has the ultimate responsibility to construct a remedial action plan. Is that correct?

a. If correct, then we need answers to the following questions to include 1) who or what entity is responsible for performing the task, 2) who will actually be performing the task, 3) who will be supervising the performance of the task, 4) who will be performing assessments of the progress and completion and finally 5) who is paying for the task and will that funding be adequate to fully fund the task?

b. Who is responsible for evaluation of emerging contaminants, delineation of soils to residential standards, and completion of horizontal and vertical delineation of ground water impacts, particularly with respect to deep bedrock?

c. Who is to remove the existing crumbling structures?

d. Who is to remove the hot spot contaminated soil?

e. Who is to do the "DEP's proposed remedy which includes In Situ Chemical Oxidation and/or In Situ Chemical Reduction ("ISCO/ISCR"), coupled with soil mixing to address unsaturated and saturated soils impacted by Site COCs; in situ injection of ISCO, ISCR or bioremediation amendments in the two primary chlorinated solvent source areas..."?

g. Once the site is remediated to a standard, who is going to monitor the site and plume for completeness of task and to assure the local community of no further chemical contamination?

(Comment 94)

Places cleanup and technology management, under the responsibility of a real estate developer who is seeking to be absolved from all public accountability, including pursuit of a covenant not to sue in the event of failure, neglect, or mismanagement (Comment 99)

The proposal should inform the public how the remediation will be financed and how additional safety procedures will be financed (Comment 101)

DEP response to comments regarding who is conducting the cleanup.

The Hazardous Sites Cleanup Act (“HSCA”) provides DEP with the authority to implement the selected response action itself with or without using contractors retained under Commonwealth of PA contracting procedures. HSCA also provides DEP with the enforcement authority to require the responsible persons to clean up the Site or to enter into settlements with responsible persons to implement the selected response action, in accordance with HSCA. *DEP v. Whitaker Corporation et al.*, US. District Court, Civil Action No. 08-6010 (E.D. Pa.), was initiated by DEP in the United States District Court for the Eastern District of PA against four Potentially Responsible Persons (“PRPs”) to declare the PRPs liable for the release and threatened release of hazardous substances and to recover from them both current and future costs, incurred by DEP from responding to the releases and threatened releases of hazardous substances at the Site. This action also involves cross-claims and counterclaims between some of the PRPs and the current owner of the Site, Constitution Drive Partners, L.P. This litigation is ongoing but under stay pending Court-ordered mediation/settlement discussions among the parties. DEP does not comment on ongoing litigation. Any settlement agreement would be subject to a 60-day public comment period in accordance with HSCA.

Any remediation work performed under a settlement agreement with one or more PRP, would be overseen by DEP.

Property owners of the Source Property would be required to comply with institutional controls implemented on the Source Property, as well as any conditions imposed upon them by East Whiteland Township.

Costs

The responsible parties are tasked to clean up this site..... It is not the DEP nor the community’s obligation to save them money. (Comments 71, 78)

23) Will cost limit the scope of remedial activities, or will the PADEP commit to the most effective remedial approaches for the community and environment regardless of the cost?

26) Given the technical challenges presented by the Site, and the possibility of deep bedrock remediation, which might equal or exceed the cost of the currently proposed remedy, how will the PADEP manage the potential for increased remedial cost during implementation, both with respect to the responsible parties and internally within the PADEP? (Comment 93)

PA DEP estimated that the costs of the in-situ remediation alternatives were less expensive than actual clean up of the soil and water. However, these unknown and unspecified chemical processes, unknown areas of contamination still at the incompletely assessed site, could result in complications that balloon costs to become much greater than originally estimated. Little is currently known about the final testing results, what chemicals will be used, their effectiveness, new exposure pathways that could be found, and the final results (Comment 91)

how DEP is going to manage the financial challenges of the Plan? (Comment 95)

DEP response to comments regarding cost.

In accordance with Section 504(a) of the Hazardous Sites Cleanup Act (“HSCA”), final remedial responses under this act shall be cost effective. As such, the alternative response actions were analyzed to determine the relative cost effectiveness of each alternative.

Estimated costs for each alternative listed in the Analysis of Alternatives and Proposed Response (“AOA”) were derived from the following documents:

- the 2021 Feasibility Study, completed by Roux Associates Inc (“Roux”), on behalf of Johnson Matthey, Inc. and Whitaker Corporation;
- a 2020 Remedial Alternatives Analysis prepared by Groundwater & Environmental Services, Inc. (“GES”) on behalf of DEP;
- a November 2020 Technology Assessment Memo (“2020 Tech Memo”), prepared by GES; and
- 2020 FS addendum completed by Roux.

The 2021 Feasibility Study (“2021 FS”) included a single contingency of 20% for each alternative capital cost for *“both bid and scope changes. The bid contingency accounts for factors that tend to increase costs associated with constructing a given project scope, such as economic/bidding climate, contractor’s uncertainty regarding liability and insurance on environmental cleanup sites, adverse weather, strikes by material suppliers, and geotechnical unknowns. The bid contingency also covers changes during final design and implementation. Scope contingencies include provisions for inherent uncertainties such as expansion of the remedial system and regulatory or policy changes that may affect the initial assumptions.”* (page 110 of the 2021 FS).

The 2020 Tech Memo included 30% contingency for each alternative considered.

Resolution of future costs is a factor of the ongoing litigation.

The proposed remedy does not directly address “deep bedrock” contamination because it acknowledges that some residual contamination cannot be practicably removed with currently available technologies. The 2021 Remedial Investigation Report (“2021 RIR”) concludes that these deep bedrock zones are not functioning as significant migration pathways based on results of hydraulic measurements performed during the RI. The proposed remedy is aimed at addressing shallower sources of contamination and dissolved Contaminants of Concern (“COCs”) which contribute to and migrate from the Source Property and toward Little Valley Creek. Injected amendments in the drum storage and Plant 8 degreaser areas are expected to follow similar migration pathways followed by the initial COC releases (i.e., downward and to the northeast), addressing dissolved contaminants in these directions. Deep bedrock characterization and remediation is further discussed in the response to technical comments, below.

Remediation Oversight

Is it DEP that will be implementing and overseeing the remedial response? If the answer is yes, why should we the public have any confidence in that after two decades of no cleanup?Who oversees this? (Comment 28)

The cost of this oversight should not be placed on East Whiteland Township. (Comment 70)

There is a need for timely and rigorous oversight by the DEP and the Township should not have the role of managing environmental risk. (Comments 77, 100)

27. Who will be performing site inspections and construction oversight during the implementation phase of the remediation plan? Will this task be done by PA DEP staff, Township staff, other agencies, or third-party consultants hired by DEP or the responsible parties? If a third-party consultant is the inspector, will the results of all site inspections be promptly reported to PA DEP and the Township? Who will determine, if implementation of the remediation plan needs to be revised based on the performance monitoring results or site inspections – PA DEP, the contracted remediators, or the responsible parties of the contamination?

28. Who will the implementers of the remediation plan be directed and supervised by – the responsible parties for the contamination, the technical consultants for the responsible parties, consultants for the PA DEP, or DEP staff? (Comment 92)

34) How will the PADEP provide oversight of measures to control exposure during remediation..?

38) How will the PADEP ensure that remedial action progresses as rapidly as possible and in accordance with the time frame outlined in the Analysis of Alternatives and Proposed Response? (Comment 93)

3. Who has the responsibility to oversee, design and effect the Bishop Tube clean up?....

f. Who will be the entity that will oversee and pushes the plan to successful conclusion? (Comment 94)

you have alluded to East Whiteland Township being responsible for oversight of the cleanup when – as mentioned above – the township that completely lacks the budget, knowledge, resources, manpower, expertise, and capacity to assume these responsibilities (Comment 99)

DEP response to comments regarding Remediation Oversight.

DEP staff will be responsible for overseeing remedy implementation and evaluating performance of the response actions regardless of who conducts the remediation (whether a contractor for DEP or a contractor for the Potentially Responsible Persons (“PRPs”)). Prior to activities being performed on Site, DEP would continue to review any work plans, sampling and analysis plans, health and safety plans, etc. During the implementation of remedial activities, DEP will be on-site to observe the work, as it has done in the past. DEP may continue to use a contractor to assist with oversight, as necessary, during various stages of the project.

Why has it taken so long?

1. Why did it take so long to list the Bishop Tube site on the Pennsylvania Priority list of Hazardous Sites (PAPL)?
2. Why has it taken so long to get a proposed Remediation Plan? (Comment 94)

DEP response to comments regarding Why has it taken so long for DEP to propose a response action?

From 2000 through 2008, DEP performed surface water, groundwater and soil investigations at the Site. Under the terms of the 2005 Prospective Purchaser Agreement (“PPA”) between DEP and the current Site owner, Constitution Drive Partners L.P. (“CDP”), CDP was responsible for cleaning up unsaturated soils to an Act 2 standard appropriate for its proposed commercial development. DEP selected a prompt interim response action that called for the design, installation, and operation of an air sparging/soil vapor extraction system (“AS/SVE System”) to address chlorinated volatile organic compounds (“CVOC”) contamination in soil in three source areas at the Site. The AS/SVE System was able to extract an estimated 680 pounds of CVOC contamination from the subsurface at the Site property, but complex hydrogeologic conditions at the Site led to operational difficulties. DEP then determined that additional response actions would be required to address contaminated media. The additional response actions were anticipated to cost more than \$2M and take over a year to implement, which would qualify as a remedial response under the Hazardous Sites Cleanup Act (“HSCA”). Under HSCA, a site must be listed on the Pennsylvania Priority List of Hazardous Sites for Remedial Response (“PAPL”) before a remedial response can be implemented or ordered to be implemented by DEP. In 2010, DEP listed the Site on the PAPL, during the remedial investigation (“RI”) phase. Listing on the PAPL did not delay completion of the RI.

A key requirement established by DEP and agreed to by the Johnson Matthey, Inc. (“JMI”) and Whittaker Corporation (“Whittaker”), former Site owners/operators, involved characterizing the downgradient extent of groundwater contamination at the Site. DEP had determined that the RI Reports submitted in 2010 and 2015 failed to adequately characterize the downgradient extent of contamination, as required by Act 2 and its regulations. This characterization took several phases to complete, over several years, due to the complex geology at the Site and protracted access negotiations with many property owners necessary to install additional monitoring wells and complete data collection for the RI. To facilitate completion of the RI and avoid additional delays associated with gaining access and installing and sampling additional perimeter monitoring wells, DEP requested use of a mathematical model to determine the downgradient extent of the contaminant plume. The delay in finalizing the RI slowed the preparation of the Feasibility Study (“FS”) and DEP’s consideration of remedial response options. DEP prepared and issued the Analysis of Alternatives and Proposed Response after accepting the RI and FS, prepared by Roux Associates on behalf of JMI and Whittaker.

Little Valley Creek Designation

Little Valley Creek has been designated as “Exceptional Value” under Pennsylvania state law. Exceptional Value designation entitles Little Valley Creek and associated wetlands to a higher legal standard of protection. The proposed remediation fails to meet DEP’s legal obligation, or that of the responsible parties, to meet the applicable Exceptional Value legal standards and protections that apply to the Little Valley Creek and associated wetlands. Rather than consider these as mandatory legal standards to be achieved, the DEP considers them as standards simply “to be considered.” This is a violation of state law. (Comments 43, 44, 48, 82, 95)

Rather than consider these antidegradation protections as mandatory ARARs, PADEP treated these standards and this EV protection as something simply “To Be Considered.” As a result, PADEP neither mandated nor recommended a plan that will achieve the appropriate exceptional value regulatory standards applicable to Little Valley Creek and its wetlands. (Comments 45, 98)

Consider that the affected watershed is Little Valley Creek, which is a designated Exceptional Value stream, and as a matter of State Law, DEP must go beyond mere 'consideration' of standards (Comment 51)

Given the TCE and other COCs detected in seeps and surface water samples from Little Valley Creek downstream of the property, and the lack of containment or treatment of these chemicals off the property; the AOA fails to meet anti-degradation protections required for Little Valley Creek and associated wetlands. (Comment 64)

that Little Valley Creek is classified as a stream of Exceptional Value and enjoys the lawful protection from pollution. This designation makes it incumbent on PA DEP to implement rapid measures to remove chemicals with potential toxicity to aquatic organisms within the entire food chain. One could argue that this would include human beings eating the fish caught in Little Valley Creek (Comment 84)

Would like to see that the recommendations are followed through to its fullest application from the sounding community and to clean up of all pollution that have encroached to all our water (tributaries) ways and environmental life of our freshwater communities and to have guide lines that will be set for water ways to have for years to come. Make this a prime example for all water ways to be required and regulated for years to come. (Comment 87)

DEP response to comments regarding the designation of Little Valley Creek.

The applicable, or relevant and appropriate, requirements (“ARARs”) Table in Appendix B of the Analysis of Alternatives and Proposed Response (“AOA”) identifies the following clean water regulations, as applicable:

- 25 Pa. Code § 91.1 et seq.
- 25 Pa. Code § 92a.1 et seq., specifically § 92a.54: Discharges not authorized include discharges to surface waters classified as Exceptional Value (“EV”) waters under 25 Pa. Code Chapter 93 or discharges containing toxic or hazardous pollutants.
- 25 Pa. Code § 93.1 et seq. Establishes specific standards for the quality of PA’s waters and includes specific water quality criteria and designated water use protection for each stream in PA. Any discharge of treated groundwater to surface water during the remedial action will abide by the Water Quality Criteria including Table 5 and will not impair the

designated uses of surface waters at the Site. All the water uses listed in §93.3 are protected for existing uses.

- 25 Pa. Code § 95 et seq., specifically § 95.2: Discharges of treated groundwater to the surface water during the remedial action will meet pH requirements.

25 Pa. Code § 96 et seq. was listed as Relevant & Appropriate. Existing and designated surface water uses shall be protected. § 96.6: Discharges of treated groundwater to the surface water during the remedial action will meet requirements related to thermal discharges.

25 Pa. Code § 105.1 et seq. was listed as Relevant & Appropriate. § 105.17 defines exceptional value wetlands that deserve special protections. § 105.18a. Permitting of structures and activities in wetlands. Additional steps may be needed to ensure remedial activities do not impact nearby wetlands.

A Water Quality Antidegradation Implementation Guidance, November 29, 2003, Document Number: 391-0300-002 which aides with the implementation of the Antidegradation Program in PA was evaluated as “to be considered.” As stated in the AOA, non-promulgated or non-regulatory documents (health advisories, guidance, proposed regulations), issued by the state or Federal government, are not considered ARARs and are referred to as “to be considered” requirements or TBCs. TBCs are evaluated along with ARARs and are considered appropriate in the absence of a specific ARAR or where ARARs are not sufficiently protective in developing cleanup goals. A TBC identified for the action must be complied with to the same degree as if it were applicable.

Access via Village Way in General Warren Village

The community is concerned that access via Village Way in General Warren Village will be required for the equipment needed to complete the cleanup and therefore an access road will be constructed that cuts through our community for this purpose.....(Comments 43, 48, 82)

What has not been addressed in the remediation plan; will Village Way become an access road for the heavy equipment required for clean-up (Comment 54)

DEP response to comments regarding Access via Village Way in General Warren Village.

An access road via Village Way in General Warren Village was not considered as part of any of the remediation alternatives considered for the Site. Limited access to the Source Property via Village Way will likely be required for sampling and monitoring well installation/maintenance activities.

Refer to EPA

I recommend that the Site be turned over to US EPA Region 3 in the hope that the residents may finally find some protection that they can count on. (Comment 18)

Plain and simple the Bishop Tube property should be a super fund site. (Comment 27)

30. What role, if any, does the U. S. Environmental Protection Agency (EPA) have for cleanup of the hazardous contaminants at the Bishop Tube site? The EPA Region 3 has assigned this site the identification number PAD081868309. Do they perform a review of the DEP RRA and provide technical assistance to PA DEP? Do they assist DEP with the public participation process? Do they provide any funding for contaminant cleanup or post remediation monitoring of the site if the responsible parties are unwilling or unable to pay the entire cost? The One Cleanup Program Memorandum of Agreement signed by PA DEP and EPA Region 3 on April 21, 2004 appears to provide opportunities for collaboration between the two agencies that has not been evidently exercised for the Bishop Tube site remediation. (Comment 92)

DEP response to comments regarding referring the Site to EPA.

EPA maintains a list of potential sites on the Federal Comprehensive Environmental Response, Compensation, and Liability Information System (“CERCLIS”). Bishop Tube was listed in CERCLIS in the early 1980s, but EPA has not listed the Site on the National Priorities List (“NPL”) and plays no active role in the cleanup of the Site. DEP has the discretion to refer sites to EPA, and EPA has the discretion to accept such referrals. DEP maintains sole oversight over many hazardous site cleanups in the Commonwealth. DEP exercised its discretion not to refer this Site to EPA. EPA has not sought to exercise its authority over the Site. DEP provides routine updates to EPA’s Federal Facilities & Site Assessment Branch of the Superfund and Emergency Management Division.

Bishop Tube is not eligible for the One Cleanup Program because it is not an EPA Resource Conservation and Recovery Act (“RCRA”) Corrective Action Site.

The Site is on the Pennsylvania Priority List of Hazardous Sites for Remedial Response (“PAPL”). The proposed response is consistent with EPA’s responses at Federal Superfund Sites. At nearby Chester County Superfund Sites, soil mixing was used at Foote Mineral and William Dick Lagoons and in situ amendment injections have been used at AIW Frank and Malvern TCE.

Timeline

9)..... completing soil delineation, on what timeline

37) When are remediation activities at the Site expected to commence?

39) The PADEP should provide a timeline of specific tasks, projected start dates, completion dates, and responsible parties for pre-remedial design investigations and remedial activities to assist the Township and public in understanding the remedial process. The PADEP should update this timeline with an increasing level of detail as work proceeds. When can the PADEP provide an initial timeline? (Comment 93)

5. When will DEP have a Final Plan? (Comment 94)

Is there a time line for when a remediation plan must be implemented? (Comment 94)

There is no time line (Comment 95)

The DEP needs to provide a timeline by which the community can evaluate the progress. (Comment 101)

DEP response to comments regarding a timeline.

In winter 2022, DEP added a timeline to the website for Bishop Tube, to include project milestones and estimated dates. As dates for the remedial design and response actions become available, the timeline will be expanded and updated as necessary moving forward.

Administrative Record

32. In both the Roux Associates Remedial Investigation Report (RIR) and the Feasibility Study (FS) there is a foundational premise agreed to between PA DEP and Roux that the Bishop Tube site will not be used for residential purposes. Within the Remedial Investigation Report (Volume 1, pages 3-4, under 2.0 Scope of Remedial Investigation) there is discussion about this land use premise that includes the following statement: “as agreed with DEP, both the RIR and the FS assume that present and future use of the Site will be non-residential only.” Similar language appears within the FS on page 2, Section 1.2 Clarification of FS Scope. Both documents include footnotes referencing Roux’s letter dated December 16, 2016 and DEP’s response dated January 11, 2017 that further clarify this premise for mutual agreement. However, neither of these two letters is included within the PA DEP Administrative Record Docket. Both letters need to be added to the Administrative Record. (Comment 92)

1) Is the PADEP aware of any documents within its files, or in the possession of others, which are not included in the Administrative Record? (Comment 93)

GC14The AOA states that a PADER inspection report, performed under the RCRA on June 15, 1988, indicated that RCRA closure actions had been completed. This report documents that the inspection included the DSA and that Christiana Metals implemented a Closure Plan. There is no documentation in the Administrative Record of: 1) the closure actions taken by Christiana Metals, 2) the results of the soil sampling requested by PADER to document closure (or support soil removal), or 3) DSA Clean Closure approval by PADER prior to the June 15, 1988 inspection. This information should be placed in the Administrative Record, if it exists.

GC15 – Documents Should Be Added for a Complete Administrative Record for this Site. DEP has provided a select set of documents in its Administrative Record for this Site³³. This list of documents should be supplemented in order for the administrative record for this Site to be complete.

Supplemental documents to be added to the Administrative Record are described below.

- o All documents included in DEP’s Administrative Record related to its Notice of Listing, PA Bulletin September 11, 2010 should be included in the current Administrative Record.
- o All documents previously identified by Roux in a letter dated October 12, 2010 entitled Comments on Notice of Listing, PA Bulletin September 11, 2010 should be included in the current Administrative Record. While the October 12, 2010 letter itself is listed in the current Administrative Record, the index attached to this letter identified documents necessary to supplement the 2010 Administrative Record. These indexed documents should be included in the current Administrative Record. These documents were previously provided as a CD attachment to the letter.
- o In addition to the above, other relevant current and historical documents need to be added to the Administrative Record. Attachment A includes an index of documents (Tables 1 and 2) for inclusion in

the Administrative Record. These documents were previously obtained from or submitted to DEP. Should DEP identify any documents that the BT Team has proposed for addition to the Administrative Record that DEP does not have or cannot readily locate, please feel free to notify the undersigned and the BT Team will coordinate with DEP to provide electronic copies.

- o Likewise, we request that DEP add to the Administrative Record any documents it may have regarding the closure of the Drum Storage Area, as referred to in the AOA. (Comment 97)

DEP response to comments regarding the Administrative Record.

The Administrative Record contains the information that forms the basis and documents the selection of the proposed response action. DEP's regional files as well as East Whiteland Township's records include additional documentation not incorporated in the Administrative Record. Documents that did not form the basis for DEP's proposed response were not incorporated into the record. Documents not incorporated in the Administrative Record include but are not limited to

- monthly progress reports;
- work plan communications; and
- individual sample results and related correspondence, which were later summarized in a technical report.

Roux Associates' letter (which is actually dated December 15, 2016 not December 16, 2016) and DEP's response dated January 11, 2017 did not form the basis for DEP's proposed response and, therefore, were not incorporated into the record. These letters are available in DEP's regional files.

DEP's files do not contain the following requested records: 1) the closure actions taken by Christiana Metals; 2) the results of the soil sampling requested by PA Department of Environmental Resources ("PADER") to document closure (or support soil removal); or 3) DSA Clean Closure approval by PADER prior to the June 15, 1988 inspection.

Regarding the September 11, 2010 Notice of Listing and CD attachments to the October 12, 2010 letter – the documents provided on the CDs were already incorporated in the Administrative Record when it opened. The CDs provided by Roux Associates and Environmental Alliance are separately hyperlinked.

Soil Delineation

The video discussed treatment in very limited areas on the property. What about contamination of the rest of the property (Comment 26)

How far down into the soil does the contamination go? What are the EPA standards for soil removal? (Comment 52)

based on records of the activities at Bishop Tube that were collected by prior employees of Bishop Tube, indicate that there are other areas of contamination that have not yet been tested by DEP (Comment 91)

8) Will the PADEP require delineation of all soil contamination, excluding only adequately demonstrated and documented natural background conditions, to the most restrictive residential MSCs, across the entire site? (Comment 93)

The proposal does not include adequate information concerning ... delineation of soils to residential standards, (Comments 72, 74, 100)

GC1.... Chromium in Soil - An August 24, 2021 technical memorandum previously submitted to the DEP (and in the Administrative Record) assessed whether certain inorganic constituents (most significantly total chromium and hexavalent chromium) are present in soil at relevant locations where historical samples previously indicated concentrations exceeding or potentially exceeding 5 DEP's Residential Used Aquifer ("RUA") Soil-to-Groundwater ("SGW") Medium-Specific Concentrations ("MSCs"). The supplemental data demonstrated that there are no total or hexavalent chromium soil areas of concern ("AOCs") that require remediation for chromium. Soils AOCs 2, 3, 7, 8, and 10 described in the AOA should be eliminated as AOCs requiring soil remediation for chromium, since no remedial action is necessary.⁶ The cost to implement remedial actions for these AOCs should be subtracted from the total cost estimate.⁷ (Comment 97)

DEP response to comments regarding soil delineation.

Since DEP initiated the Hazardous Sites Cleanup Act ("HSCA") investigation, 19 different areas of concern ("AOCs") have been investigated by various parties including, DEP, Baker Environmental, Inc. ("Baker") for DEP, Roux Associates, Inc. ("Roux") for the Bishop Tube Project Team (Johnson Matthey Inc. and Whittaker Corporation) and Environmental Standards, Inc. for Constitution Drive Partners, L.P. The AOCs are shown on Figure 2 of Roux's January 13, 2021 Remedial Investigation Report ("2021 RIR") and were identified by the former workers of Bishop Tube. Soil samples were collected from approximately 260 soil borings. In some areas soil contamination extends to the top of bedrock which varies from 3 feet to 24 feet in depth. Other soil investigation activities included active soil vapor sampling, screening for non-aqueous phase liquids, surface geophysical investigations, a membrane interphase probe survey, and a passive soil gas survey.

Based on the screening evaluations and analytical results, DEP narrowed down the potential AOCs into three defined "hot-spot" areas for chlorinated volatile organic compounds ("CVOCs") on the property that are the source of the groundwater plume. Three Metals/Fluoride Source Areas were also identified. Among other reports in the Administrative Record, the AOCs are discussed in the August 5, 2020: Final Remedial Alternatives Analysis, prepared by Groundwater & Environmental Services, Inc. ("GES") for DEP and Roux's 2021 RIR. Section 7.1 of the 2021 RIR provides compilations of historical and recent soil data, collected by Roux and others from the 1980s to present. *"The soil data are compared to SHSs [Statewide health standards], both residential and non-residential direct contact as well as soil to groundwater MSCs [Medium-Specific Concentrations], as benchmarks for DEP to assess the nature and extent of soil contamination on the Property."*

In May 2021, Roux installed 20 borings within 5 AOCs identified in the 2020 Technology Assessment Memorandum prepared by GES on behalf of DEP. The results are summarized in Roux's Soil Investigation for Certain Inorganic Constituents, Groundwater Investigation for VOCs and Certain Inorganic Constituents Memorandum, dated August 24, 2021, which

was incorporated in the Administrative Record. While hexavalent chromium was not detected above the most stringent applicable MSCs in soil, fluoride was detected above its soil to groundwater MSC in 10 of the borings located within 4 AOCs identified by GES. Therefore, fluoride has been identified as a contaminant of concern (“COC”) in soil. Fluoride in soil, which is also considered a COC in groundwater and surface water, will be addressed using the soil mixing approach proposed in the Analysis of Alternatives and Proposed Response. The precise area of soil impact will be defined during pre-design investigation and an appropriate amendment selection will be based on bench scale testing performed during the remedial design.

Upon completion of soil remediation, attainment sampling and analysis will be performed to demonstrate attainment of a combination of cleanup standards under Act 2 or background demonstration consistent with the planned residential use of the property.

RESPONSE TO TECHNICAL COMMENTS

DEP compiled a representative list of technical comments to be answered by Groundwater & Environmental Services, Inc (“GES”). Additional technical explanations are provided in GES’s response to technical comments presented in Appendix N. DEP’s general responses are below.

Hydrogeologic Study – Extent of Contamination

No thorough hydrogeology study has been done by PADEP. Since the area is Karst, it lends itself to the seepage of the contaminants further and further which is why we have so many sinkholes in the area and an increased risk of further contamination....(Comment 41)

A true hydro-geological study of the area is necessary, Much of the Valley is Karst and sandstone permitting contaminants to continue migration. Failure to do a hydrogeological assessment may be why the sparging failed.....(Paraphrase of Comments 18, 32, 41)

Previously the composition of the 13.5 acres was considered basalt but after reviewing recent studies it appears to be gneiss which better fits the media of a previous shallow sea. In the case of PFAS which are surfactants and used in hydraulic drilling, it's likely that they have increased the migration of the TCE through fractures in the gneiss allowing greater contamination of the stream which is a High Quality Stream and flows into Valley Creek....(Comments 32, 41)

topography and hydrogeology, no extent of contamination has been determined either as to depth or distance (Comment 18)

significant additional investigation of downgradient groundwater/aquifer quality is warranted. (Comment 80)

While the plan assumes a clear boundary for the pollution plume, there is a lack of monitoring wells to support this assertion/assumption.

Mapping fails to clearly articulate the differences in the pollution plume between the overburden soils and the bedrock aquifers. (Comments 45, 98)

The contaminated drinking water well on Conestoga Road should be used to monitor depth of the TCE and migration. (Comments 32, 41)

Two supply wells utilized by Aqua America to provide water supplies to Malvern and the surrounding area are located within 1.4 miles of the Bishop Tube site; one is located 0.7 miles northwest of the site and could well be impacted by ongoing and historic releases from soils and onsite groundwater. TCE has been found in a well located near Rt 29 and US 202 which may well have migrated from the Bishop Tube site.

In summary, TCE and other chlorinated hydrocarbons can travel great distances over a relatively short time. Using 1970 as an initial release date (a conservative estimate) and a median migration rate of 312 feet per year, evidence indicates the TCE plume can be estimated as of 2021 to have traveled 15,912 feet, or over three miles to date. This would place the leading edge of the TCE plume past Devault and into Valley Forge National Park, well on its way to the borough of Phoenixville located 7 miles to the northeast. It is imperative that additional groundwater studies be performed to attempt to locate the leading edge of the plume and consider off-site remediation of groundwater/aquifer supplies. (What is the possibility of TCE from the Site impacting these areas? (Comment 80)

Topographical map with lat and long showing the locations of samples collected, their relationship to the site and their depth. (Comments 18, 31, 32)

2. A determination of the extent in order to determine the Site.
3. To determine the migration path and extent of the contamination. (Comments 32, 41)

What about ... the plume off the property? The extent of which is not known at this time. (Comment 26)

DEP has not determined the extent of the contamination (Comment 27)

it is evident to me that you have still failed to identify the extent of the pollution plume and further identify all of the toxic chemicals on site (Comment 28)

repeatedly calls for additional data and study in order to determine the extent of contamination
(*Paraphrase of* Comments 30, 43, 48, 82)

I advocate for a more comprehensive response which includes additional analysis / study of the extent of the contamination (Comment 86)

2. When will DEP know the extent of the contamination plume?
3. How will you determine the extent of the plume?
4. Will you make the extent of the plume public knowledge? (Comment 94)

GC2 – The RI Is Complete for this Site. The DEP’s repeated reference to RI “data gaps” in the AOA and in its video presentation has created doubt and uncertainty regarding whether the RI is complete, and has led some community members to suggest that the Site hasn’t been studied sufficiently to allow selection of a remedy. That simply isn’t true. The BT Team alone has studied it for more than 12 years, submitting four RI reports over time (each time to perform additional investigations that were requested by DEP). Delaying the selection and implementation of a remedy, in order to conduct even more studies, would be pointless and unwise. The DEP should make clear that the “data gaps” it

referred to are normal at the conclusion of an extensive investigation, are minor in nature, do not influence selection of the overall remedial approach for the Site, and will be resolved in the pre-design data collection phase (discussed in GC3, below).¹⁶ The overall remedial approach can be selected at this time, based on existing data. (Comment 97)

DEP response to comments regarding Hydrogeologic Study – Extent of Contamination.

Please refer to GES’s responses #1 through #3 for detailed technical responses.

Characterization is to be performed using properly constructed monitoring wells or modeling in accordance with Chapter 250. Potable wells are receptors and could only be considered as a means to inform where monitoring wells are required. The 2021 Remedial Investigation Report (“2021 RIR”) reported analytical results from more than 120 discreet groundwater monitoring points. The downgradient extent of contamination has been characterized through a combination of empirical data and modeling. The trichloroethene plume appears to extend approximately 0.8 miles. Refer to the following figures:

- Figure 17 for the Monitoring Well Location Map;
- Figure 30A - TCE Distribution in Groundwater (Overburden and Shallow Bedrock);
- Figure 30B - TCE Distribution in Groundwater (Intermediate and Deep Bedrock);
and
- Figure 48 - Site Boundary Map

The 2021 RIR states “*In summary, the Site is defined as the Property for soil and the extent of TCE as established through empirical data and fate and transport modeling and the Property for groundwater. This definition of the Site is supported by the data contained in this 2021 RIR and an outline of the Site is depicted on **Figure 48.***” (page 145). The Site boundary is also presented in Figure 4 of the Analysis of Alternatives and Proposed Response (“AOA”).

The depth of the plume is discussed below in the Hydrogeologic Study – Deep Bedrock Section of this document.

Statistical analysis of data collected from the extensive monitoring network strongly suggests that the contaminant concentrations within the contaminant plume and at the downgradient edge of the contaminant plume are decreasing over time. Evidence of chlorinated solvent degradation is bolstered by stable isotope analysis presented in the 2021 RIR. While additional monitoring of all portions of the plume is needed to fully demonstrate these trends, the active remedial measures proposed in the AOA are intended to reduce migration from the source areas and discharge to Little Valley Creek.

Over time the active remediation is intended to expedite the reduction in offsite contaminant concentrations and contaminant plume size.

DEP is unaware of the occurrence of hydraulic drilling or hydraulic fracturing, which can be used to increase fracture connectivity, within the Site area. Monitoring wells were drilled using air rotary and/or sonic drilling technology. It is unlikely that Per- and polyfluoroalkyl substances (“PFAS”) were introduced to the Site during drilling activities. As described by

GES in response #2, the groundwater concentration data collected over time from the Site groundwater monitoring well network suggest that the constituent plume is stable (i.e., not expanding) and possibly decreasing.

Hydrogeologic Study – Modeling

The plume of contaminants has not been fully determined. Your plan gives a modeling estimate of how far contaminants may have traveled but no testing has confirmed the outer limits. Why have you not insisted that testing wells be installed to confirm the outer edge? (Comment 21)

The reports relied upon to create the plan use a modeling approach that is not adequate to evaluate the movement of TCE and therefore cannot be used to inform or support the plan put forth by PADEP for consideration. (Comments 45, 98)

Underlying modeling, amongst other things, fails to account for variation in quantities and timings of TCE releases and thereby invalidates the methodology used for estimating TCE decay half-lives. It also assumes no continuing source of TCE present at the site, despite acknowledging the presence of DNAPL in deep bedrock, thereby invalidating the effects of the predicted future plume behavior so that the modeling applied is inaccurate. The model itself is contradicted by the earlier, more complex model used at the site. (*Paraphrase of* Comments 43, 45, 48, 82, 94, 98)

DEP response to comments regarding Hydrogeologic Study – Modeling.

Please refer to GES's response #4 for a detailed technical response

A key requirement established by DEP and agreed to by the Johnson Matthey, Inc. (“JMI”) and Whittaker Corporation (“Whittaker”), involved characterizing the downgradient extent of groundwater contamination at the Site. DEP had determined that the Remedial Investigation Reports (“RIRs”) submitted in 2010 and 2015 failed to adequately characterize the downgradient extent of contamination as required by 25 Pa Code Chapter 250 § 250.408. This characterization took several phases to complete over several years due to the complex geology at the Site and protracted access negotiations with many property owners necessary to install additional monitoring wells and complete data collection for the RI. To facilitate completion of the RI and avoid additional delays associated with gaining access and installing and sampling additional perimeter monitoring wells, DEP requested that JMI and Whittaker undertake the use of a mathematical model to show the current edge of the contaminant plume, based on the concentration of trichloroethene (“TCE”). TCE was selected based upon an evaluation of groundwater analytical data and comparison with Statewide health standards and vapor intrusion screening criteria for Site contaminants of concern (“COCs”). The model was calibrated using offsite groundwater analytical results, from over 80 monitoring wells installed throughout the plume area. The model was not intended to depict the plume in the future, although, based on statistical analysis of empirical sample results, the plume appears to be receding. Collection of additional empirical data will be necessary to demonstrate that the contaminant plume is, in fact, receding.

The wells used to calibrate the model documented in the 2021 RIR did not exist when the original 3-D groundwater model was generated by Baker Environmental, Inc. as part of the July 2004 Phase III Supplemental Groundwater Investigation Report.

The conceptual site model which is based upon published literature and empirical data from the RI and prior investigations, indicates that groundwater moves northeast from the Source Property, before turning east, similar to the direction of Little Valley Creek. Monitoring wells sampled northwest of the Source Property, near the intersection of Malin Road and Lancaster Avenue did not contain detectable concentrations of chlorinated volatile organic compounds (“CVOCs”). MW-50A/B and MW-60 shown in Figure 17 of the 2021 RIR were installed northeast of the Source Property to evaluate migration toward the north-northeast and CVOCs were not detected.

Hydrogeologic Study – Deep Bedrock

completion of horizontal and vertical delineation of groundwater impacts, particularly with respect to deep bedrock. (Comments 72, 74, 100)

There is not enough monitoring in the area northeast of the site in the bedrock. While PADEP acknowledges a substantial amount of TCE in the overburden and shallow bedrock groundwater, it has relatively few wells in the intermediate and deep bedrock. MW-44C has quite high concentrations of TCE in deep bedrock. As a result, TCE in bedrock is not adequately characterized. If there is a substantial amount of TCE there, additional groundwater alternatives could be necessary. (Comments: 45, 98)

Your plan only deals with the first 120 feet of contamination on the Bishop Tube site. What about the contamination that is found at greater depths within the bedrock? What about the contamination that has already migrated off site? (Comment 21)

The proposed Analysis of Alternatives and Remedial Response (AOA) fails to address known presence of DNAPL in the bedrock at the site and DNAPL suspected off the property (Comment 64)

The proposal does not appear to have information on how it intends to evaluate and address the presence of DNAPL within the deep bedrock. We know from testing wells that TCE has traveled to at least 400 feet deep. Your plan only deals with the first 120ft of contamination...(Comment 72)

The DEP must provide the public additional information on how it intends to evaluate and address the presence of DNAPL within the deep bedrock aquifer. (Comments 75, 100)

10) When will the PADEP require additional delineation of deep bedrock impacts?

19) Why does the proposed remedy not include remediation of deep bedrock?

20) Does the absence of remedial measures for deep bedrock indicate that the PADEP is in concurrence with the Bishop Tube Project Team's assertion that remediation of deep bedrock is technically impracticable?

21) In what manner, and by what metrics, will the PADEP evaluate the impracticability of deep bedrock remediation? How will impracticability be distinguished from remedial measures which are practicable but costly? (Comment 93)

What of the presence of dense nonaqueous phase liquids (DNAPL) in deep bedrock? (Comment 94)

How is DEP going to handle the presence of residual DNAPL in the deep bed rock? (Comment 95)

GC7 – DEP Should Acknowledge that Certain Remedial Approaches Are Infeasible (i.e., Deep Bedrock Remediation) for Groundwater. The FS completed for this Site included a thorough assessment of remedial approaches for groundwater, including a forthright discussion of the strengths and limitations of certain remedial technologies. As described in the FS Report, for example, remediation of deep bedrock (both dense non-aqueous phase liquid [“DNAPL”] and related deep groundwater) is not technically feasible. This should be acknowledged by DEP and explained to the EWT Community in response to their comments. As explained in the 2021 RIR and FS Report, due to a specific gravity higher than water, DNAPL has migrated down the near vertical structural fabric of the bedrock. Further downward movement of DNAPL and migration of contaminants in deep bedrock fractures are restricted by: a) the reduced frequency and connectivity of water-bearing fractures with increasing depth; b) decreasing fracture transmissivity with increasing depth in the bedrock; and c) matrix diffusion in the bedrock. The current absence of any measurable DNAPL in Site monitoring wells is attributed to the limited volume of DNAPL in the subsurface and its presence predominantly in a state of residual saturation. Since the suspected DNAPL present in bedrock is a) below the water table, b) contained in rock, and c) at depth, there is no direct exposure pathway from DNAPL in bedrock (Comment 97)

DEP response to comments regarding Hydrogeologic Study – Deep Bedrock

Please refer to GES’s responses #5 and #6 for detailed technical responses.

Deep bedrock is monitored at 16 locations within the plume. No additional delineation is needed as part of pre-design investigation activities. Groundwater within deep bedrock will be included in performance and long-term monitoring plans to evaluate the effects of amendment injection and ongoing natural attenuation processes.

As described in Section VI of the Analysis of Alternatives and Proposed Response (“AOA”) the Remedial Action Objectives (“RAO”) for operable unit 2 groundwater include: 1) assuring that potential future exposure pathways resulting from groundwater contamination remain closed in accordance with Act 2; 2) reducing contaminant migration across the Source Property Boundary; 3) reducing contaminants of concern (“COCs”) discharge to Little Valley Creek; and 4) hastening retraction of the groundwater contaminant plume. DEP believes that the RAOs 2 through 4 will be achieved by the OU2 injection proposal which is targeted at the original contaminant source areas and intended to rely on amendment migration via similar pathways including the steeply dipping bedrock structure to these deeper intervals (i.e., below 120 ft.). Some indications of this effect were observed and reported in the Treatability Study completed by Roux Associates on behalf of Johnson Matthey Inc. and Whittaker Corporation in 2015, which was primarily directed at groundwater present above the fractured bedrock.

Groundwater flow within the deep bedrock intervals is minimal, based on empirical data compiled in the January 2021 Remedial Investigation Report (“2021 RIR”). As described on page 13 in Section 4.5, Geology and Hydrogeology of the 2021 RIR: “...*fractured bedrock. RI data for the Site have demonstrated that the fracture density, fracture connectivity and*

hydraulic permeability of the bedrock hydrostratigraphic unit decrease with increasing depth.” Consequently, while dense non-aqueous phase liquid (“DNAPL”) likely migrated to the deep bedrock, based upon the minimal transmissivity of the deep bedrock, DEP feels that this DNAPL within the deep bedrock does not contribute significantly to contaminant migration. As noted in Section 11.1.5 of the 2021 Feasibility Study, remediation of DNAPL trapped within the deep bedrock aquifer (i.e. >120 feet below ground surface) may be technically impracticable. Determination of technical impracticability (“TI”) is discussed in a USEPA document titled “Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration” (9/1993). In order to create permeability in the deep bedrock sufficient to release recoverable volumes of DNAPL, technologies such as hydrofracturing (commonly referred to as fracking) would need to be employed in multiple wells across the site. This would release DNAPL local to each hydrofractured well location. Based on an evaluation of costs and risks of such a technology at the Site, DEP has determined that the use of hydrofracturing for the remediation of the deep bedrock zone should be avoided. Future monitoring will be necessary to determine migration and long-term effects resulting from active remediation in the source areas and if natural attenuation processes are occurring.

DEP’s first RAO for OU2 groundwater involves achieving a site-specific standard in accordance with Act 2. The site-specific standard will be applied to COCs, including TCE, where DEP has determined that achieving a Statewide health standard or maximum contaminant level may not be feasible or cost effective. By selecting a site-specific standard for OU2 to achieve the first RAO described above, a TI waiver will not be required. Although EPA issues TI waivers at Federal Superfund Sites when site data demonstrates the technical impracticability of achieving applicable or relevant and appropriate requirements (“ARARs”), such as maximum contaminant levels, DEP is not required to issue such waivers.

Vinyl Chloride, other VOCs, PAHS, and PCBs

The contaminated groundwater plume is growing and will continue. (Comment 50)

There is no evidence of natural attenuation of these compounds due to the low rates of degradation, generally related to the lack of sufficient substrate for microbial growth. while much of the focus of this project involved the remediation of trichloroethene (TCE), the history of the site and subsequent analyses show that multiple other harmful, toxic, and carcinogenic chemicals like Vinyl Chloride are also present. (Comment 80)

Health impacts of vinyl chloride and its release of dioxins are a major concern at this location... Several aquatic experts have expressed major concerns about the effects of the ongoing levels of vinyl chloride in Little Valley Creek related to Bishop Tube. (Comment 91)

In evaluating the growing and future pollution plume, PADEP conveniently fails to evaluate VOCs other than TCE, even though they are present and have different subsurface transport behaviors. Amongst our many concerns in this regard, is the failure to consider vinyl chloride, a confirmed, and potent, cause of cancer in humans and other animals that may be carried by groundwater four times faster than TCE. (Comments 45, 98)

You have not given a full accounting of all the contaminants and how they will be remediated. In addition to TCEs there are PCBs, PAHs, These contaminants continue to spread off site through the Little Valley Creek. What is your plan for these contaminants? (Comment 21)

How are we expected to make informed comments on a plan involving mixing chemicals with contaminated earth on site when one, we don't know - you don't know, or have not definitively told us what all the contaminants are (Comment 28)

What other contaminants exist at the site other than TCE? (Comment 52)

immediate investigations into the presence and risks of other chemicals must begin and measures taken for their eventual removal or decontamination (Comment 84)

1. What are the chemical contaminants on the Bishop Tube site? Is it not true that there are several contaminants that exist on site that are of concern and need to be remediated or removed before the site is safe for human habitation – a residential standard?

b. What about the potentially dangerous Volatile Organic Compounds (VOCs) known to be present in the plume and on site?

c. Vinyl chloride - What is the plan supposed to do with this carcinogen? (Comment 94)

DEP must ensure that the best remedy is selected to address protecting our soil and water from all toxic contaminants of concern identified including, but not limited to, Trichloroethene (TCE), Vinyl Chloride, and Hexavalent Chromium. (*Paraphrase of* Comments 40, 43, 46, 48, 51, 59, 82, 89, 95)

... the RI and FS fail to consider other potentially hazardous VOCs that are known to be present in the pollution plume and of environmental and human health concern...(*Paraphrase of* Comments 43, 44, 45, 48, 54, 82, 98)

DEP's evaluation of the growing pollution plume ignores the presence of vinyl chloride, a confirmed and potent cause of cancer in humans and other animals which has been found onsite, may be carried by groundwater, and spreads faster than TCE. (Comments 43, 48, 82)

The constant production of vinyl chloride that results from the breakdown of TCE in the groundwater, continuous discharges from the site into surface water, and continuous leaching of contaminants from the soil into the creek is not addressed in the cleanup plan. (Comments 43, 48, 82)

GC1.... Extensive VC monitoring in groundwater has been completed for this Site as described in the 2021 RIR, and the previous and supplemental CVOC data, inclusive of VC, is provided in Attachment D of the technical memorandum.

GC9 – Certain COCs Have Been Found Infrequently and/or at Low Concentrations and Do Not Affect Remedy Selection for the Site. As described in detail in the 2021 RIR, there are certain constituents detected at the Site (soil and groundwater) that have been found infrequently and/or at low concentrations and do not affect remedy selection for the Site. These data have caused some to suggest that the Site hasn't been studied sufficiently to allow the selection of a remedy. This is not correct. The most obvious example to illustrate this situation is VOCs in groundwater, as discussed in the RIR and summarized below.

In all groundwater data for the Site, 77 individual VOCs were tested for and 59 had no exceedances of the most stringent residential groundwater MSCs. These 59 VOCs are not COCs for the Site. Of the 18 remaining VOCs with at least one current exceedance of the most stringent RUA MSCs in groundwater, 11 VOCs a) have two or fewer monitoring wells with exceedances, b) are thought to be related to background conditions (i.e., methyl tertiary butyl ether [“MTBE”] from upgradient bulk petroleum storage facility), or c) are thought to be related to common laboratory contamination (i.e., methylene chloride).¹⁹ These constituents are low in concentration, localized in area, and co-located with CVOCs that are the primary COCs for the Site. (Comment 97)

DEP response to comments regarding Vinyl Chloride, other VOCs, PAHS, and PCBs.

Please refer to GES’s responses #7 through #9 for detailed technical responses.

Vinyl Chloride, other Volatile Organic Compounds (“VOCs”)

Laboratory analysis of samples collected at the Site has been conducted for a suite of Volatile Organic Compounds (“VOC”) using EPA Method: SW846 8260C for groundwater samples which includes over 50 compounds. The Release of Hazardous Substance Section of DEP’s Analysis of Alternatives and Proposed Response (“AOA”) (Section II.C.) discusses all contaminants of concern (“COCs”) related to the Site, which includes vinyl chloride, cis-1,2-dichloroethene, and 1,1-dichloroethene that are breakdown products of trichloroethene (“TCE”), tetrachloroethene, and 1,1,1-trichloroethane, which were used in operations at the Source Property. These COCs are considered chlorinated VOCs (“CVOCs”), which are a subset of the VOC category. The presence of these breakdown products is evidence that biotic degradation is occurring. These compounds are primarily detected on and near the Source Property, suggesting that complete breakdown to ethene and chloride is occurring.

Vinyl chloride data for samples collected from Little Valley Creek (“LVC”) is reported in Table 20 of the 2021 Remedial Investigation Report (“2021 RIR”). Vinyl chloride was not detected in any of the samples from LVC. In surface water, vinyl chloride is expected to volatilize rapidly due to its vapor pressure. In air, vinyl chloride photo-degrades quickly into other compounds. Dioxins are not listed among vinyl chloride breakdown products. Information regarding the fate of vinyl chloride after it has been released or formed in the environment is referenced in Part VI of the Administrative Record (ATSDR Toxicological Profiles A-Z).

The AOA explained that TCE is considered the primary Site-related COC because its concentrations within soil, groundwater, and surface water are generally higher than other CVOCs. The proposed remedial response action is intended to address all CVOCs released at the Site.

Selection of an amendment for more rapidly addressing the source areas will be based on bench-scale and pilot testing to assure that complete breakdown of CVOCs is maintained. A full VOC laboratory analysis will continue to be performed throughout implementation of the remedial approach.

Polychlorinated biphenyls (“PCBs”)

Investigation activities into PCBs were reported in the January 2002, Phase I Site Characterization Report prepared by Baker Environmental, Inc. (“Baker”) for DEP. In that

report, Baker concluded that, based on the sample results, PCBs did not appear to be an environmental concern in soils or groundwater at the Site. On page 41 of the 2021 RIR, Roux Associates summarized the PCB investigations in soils as they relate to Act 2 Medium Specific Concentrations (“MSCs”), as follows:

“7 individual PCB aroclors were tested for and 6 had no exceedances of the most stringent soil MSCs. These 6 are not considered COCs for the Site and are not assessed further in this 2021 RIR.... The soil results for Aroclor 1260 are de minimis in terms of frequency of detection and concentration.”

PCBs, specifically Aroclor 1260 and Aroclor 1254, were detected by Baker and Roux Associates above screening levels in sediment samples. While Act 2 does not establish MSCs for sediment, it does provide for evaluation of COCs in sediment through a risk assessment. PCBs were evaluated as part of the ecological risk assessment documented in the 2021 RIR. No unacceptable risk was determined. As noted by GES in response #20 to Ecological Risk Assessment comments, additional ecological risk evaluation may be warranted to evaluate progress toward meeting remedial action objectives (“RAOs”).

In March 2011, there was a documented release of PCBs, after an electrical transformer was stolen from the Source Property. Constitution Drive Partners, L.P. addressed the localized contamination, through DEP’s Act 2 program, after excavating and disposing of a total of *“208.59 cubic yards of PCB-impacted soils.”*

Polycyclic Aromatic Hydrocarbons (“PAHs”)

According to EPA, PAHs are a group of chemicals that are formed during the incomplete burning of coal, oil, gas, wood, garbage, or other organic substances, such as tobacco and charbroiled meat. PAHs parameters are incorporated in semi-VOC (“SVOC”) laboratory analysis. SVOC investigation activities were also reported in the Phase I Site Characterization Report, prepared by Baker. In the Conclusions Section of the report, Baker concluded that, based on the sample results, SVOC’s did not appear to be an environmental concern in soils or groundwater at the Site. The analytical results showed that the following SVOCs were detected at concentrations that exceeded the screening values in sediments: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and pyrene. These compounds were detected in sediment samples collected from the northern drainage channel and LVC. As noted by GES, additional ecological risk evaluation may be warranted to evaluate progress toward meeting remedial action objectives (“RAOs”).

On page 39 of the 2021 RIR, Roux Associates summarized SVOC results in soils from previous investigations as follows: *“Based on the screening tables in Appendix A, 117 individual SVOCs were tested for and 115 had no exceedances of the most stringent soil MSCs. These 115 are not considered COCs for the Site and are not assessed further in this 2021 RIR.”* Two SVOCs (benzo(a) pyrene and hexachlorobenzene) were described as *“de minimis in terms of frequency of detection and concentration.”*

On page 67 of the 2021 RIR, Roux Associates summarized SVOC results in groundwater as follows:

“73 individual SVOCs were tested for and 72 had no exceedances of the most stringent groundwater MSCs. These 72 are not considered COCs for the Site and are not assessed further in this 2021 RIR...The remaining SVOC is bis(2-ethylhexyl)phthalate found in one well. This is a common laboratory or sample equipment contaminant and is not considered a COC for the Site.”

Heavy Metals

You have not given a full accounting of all the contaminants and how they will be remediated....there are fluorides, metals that are not naturally occurring and a more toxic form of chromium which has not been fully assessed. These contaminants continue to spread off site through the Little Valley Creek. What is your plan for these contaminants? (Comment 21)

while much of the focus of this project involved the remediation of trichloroethene (TCE), the history of the site and subsequent analyses show that multiple other harmful, toxic, and carcinogenic chemicals heavy metals like Arsenic and Hexavalent Chromium are also present. (Comment 80)

This site was manufacturing with heavy metals from 1955 to 1999, and this nearly 45 years of badly managed use of toxic materials is long enough to cause similar distribution of the metals across the site. Some of these heavy metals will dissolve in water and be distributed through the soils and to conditions distant from the original site. It is biased interpretation of the data to attempt to attribute heavy metals to the background forest (naturally occurring background) than to the 45 years of manufacturing.... Because the background condition for this site prior to Bishop Tube is Pennsylvania forest, and while atmospheric deposition could result in heavy metals on the site, it is reasonable that the excessive levels of these heavy metals are the results of the manufacturing and practices used at the Bishop Tube site, affecting water use, chemical dumping, soil absorption, and atmospheric deposition from factory activities. (Comment 91)

g. What about heavy metals? Are they being dealt with at all in your plan? (Comment 94)

GC1.... Inorganics in Groundwater –In the 2021 Remedial Investigation Report (“2021 RIR”), chromium (total and hexavalent), manganese, nickel, and fluoride were retained as COCs in groundwater based on monitoring well results on the Property, but monitoring wells located immediately to the north of the Property (i.e., off-site) did not have exceedances of these three metals or fluoride⁸. Since the inorganic groundwater results documented in the 2021 RIR were not from a contemporaneous sampling event, supplemental inorganic groundwater data were collected. As described in an August 24, 2021 technical memorandum previously submitted to the DEP (and in the Administrative Record), a supplemental groundwater sampling event was completed for certain inorganic constituents (i.e., total chromium, hexavalent chromium, manganese, nickel, and fluoride), and the post-RIR results are consistent with the findings reported in the 2021 RIR: on-Property inorganic groundwater conditions, without further remediation, are not impacting off-Property groundwater for those substances. No active remediation is required on the Property, for inorganics in groundwater. (Comment 97)

DEP response to comments regarding the presence of Heavy Metals.

Please refer to GES’s responses #10 and #11 for detailed technical responses.

Section C of the Analysis of Alternatives and Proposed Response (“AOA”) discusses the metals or inorganic contaminants of concern (“COCs”) and environmental media impacted by each COC. As described in the AOA, some inorganic COCs including total chromium, arsenic, and vanadium are more widespread in soils but are likely attributable to natural occurring conditions. Metals (including many toxic metals) occur naturally in the earth’s crust and, therefore, may be naturally occurring in the environment. Demonstrating that metals are naturally occurring under Act 2 involves performing soil sampling in areas unaffected by releases from the Site and comparing that data with data from the affected area to determine attribution of the substance.

While fluoride and heavy metals identified as groundwater COCs were not detected in offsite monitoring wells during the referenced synoptic groundwater sampling event, they were detected in Little Valley Creek and are believed to be attributable to releases on the Source Property. The remedy proposed in the AOA is intended to meet remedial action objectives pertaining to reducing surface water discharge and address anti-degradation requirements by treating unsaturated and saturated soils where releases occurred and through best management practices/engineering controls. As described in the AOA, some varieties of in situ chemical reduction (“ISCR”) amendments are capable of transforming and precipitating inorganic (e.g., heavy metals) contaminants, reducing mobility and impacts to groundwater via the soil-to-groundwater pathway. Different amendments may be required to remediate inorganic contaminants than the volatile organic compounds. The AOA allows for flexibility to target specific amendments to different areas of concern.

Little Valley Creek

Little Valley Creek is being continuously contaminated by the contamination of Bishop Tube (Comment 94)

DEP response to comments regarding existing impacts to Little Valley Creek.

Please refer to GES’s response #12 for detailed technical responses.

Section C of the Analysis of Alternatives and Proposed Response (“AOA”) summarizes impacts to various media, including surface water (Little Valley Creek) at the Site. Based on data presented in the remedial investigation, trichloroethene (“TCE”) and hexavalent chromium were detected above surface water criteria. Additionally, the following contaminants of concern (“COCs”) increased in the stretch of Little Valley Creek, on the Source Property, where groundwater discharge is occurring: TCE, 1,1,1-trichloroethane, cis-1,2-dichloroethene, fluoride, hexavalent chromium, nickel, and total chromium. While, the screening level ecological risk assessment and human health risk assessment did not identify unacceptable risks attributable to these COCs, DEP considers their detections to be impacts which must be addressed under DEP’s anti-degradation requirements. Additionally, analysis of surface water samples collected in March 2022 revealed an increase in concentrations of perfluorooctanoic acid (“PFOA”) as Little Valley Creek passes through the Source Property. DEP included PFOA as a COC for surface water in the Statement of Decision. As noted by

GES in response #20 to Ecological Risk Assessment comments, additional ecological risk evaluation may be warranted to evaluate progress toward meeting remedial action objectives.

Risk Assessment

The AOA reports limited human health risk assessments involving vapor inhalation and exposure to surface water, but fails to evaluate the potential effects of future modeled concentrations throughout the whole plume. Because the AOA, and the documents on which it is based (i.e., the Roux RIR and FS) fail to model future concentrations of all contaminants, or any contaminants at all in the Little Valley Creek, the AOA could not undertake this necessary evaluation. Also missing are assessments of risk from other potential offsite uses of groundwater, such as irrigation, or commercial and industrial uses. There are downstream business operations such as Uhler seed, for whom this evaluation is important. (Comments 45, 98)

DEP response to comments regarding the Risk Assessment.

Please refer to GES's response #13 for a detailed technical response.

As noted above in the Hydrogeologic Study – Modeling Section of this document, groundwater modeling was intended to help determine the downgradient extent of the groundwater contamination at the Site, not to predict future conditions. Additionally, based on statistical evaluation of empirical data, the contaminant plume appears to be stable or retracting. As explained in the Analysis of Alternatives and Proposed Response, additional data collection will be necessary to verify these trends. Potential future risks associated with the groundwater contaminant plume will be addressed through institutional controls and engineering controls as appropriate.

Human health risks resulting from surface water were evaluated based on empirical sample data from multiple events collected from Little Valley Creek from upstream of the Source Property to downstream of Rt. 29 (Morehall Road). The sample locations are shown on Appendix Q, Figure 1 of the 2021 Remedial Investigation Report. Use of empirical data was preferred compared to model output.

Determining open exposure pathways has been an integral part of each phase of investigation at the Site. After reviewing the comment reporting the use of groundwater at Uhler's Seed & Feed, which is located near the Source Property, DEP contacted the property owner of Uhler's Seed & Feed and confirmed that no water supply well is present on the referenced property. As stated in DEP's response to comments regarding Current Exposure Pathways vs Future Exposure Pathways, if the community believes there are current open exposure pathways to Site contaminants, which have not been identified, please contact DEP so they may be evaluated and addressed.

Human Health Risk Assessment ("HHRA")

The Roux study examines the probability of carcinogenic and other disease risks from the exceedances at Bishop Tube from casual exposure to the contaminants at the site from children and adult

recreational activities and from youth trespassing activity. They conclude that there is no human health risk from these casual exposures, while their data states otherwise. There appears to be a significant and unacceptable long-term risk for cancer and other diseases at Bishop Tube even after housing is built, that exposes especially the residents of the new housing, as well as others who live nearby. (Comment 91)

3. The Human Health Risk Assessment (HHRA) model needs to be run for potential future recreational users including anglers. While the HHRA correctly states that the PFBC currently regulates (Little Valley Creek) LVC as catch-and release fishing, this restriction could be changed in the future.... The omission of recreational use of LVC by recreational anglers under the existing Human Health Risk Assessment Report needs to be corrected by assessing such contaminant exposure risks. (Comment 92)

For non-cancer contaminants: HQ-hazard quotients are summed to result in a Hazard Index - HI, which shall not exceed 1 according to EPA and DEP regulations. For Excess Lifetime Cancer Risk (ELCR), the same standards of probability of excess risk apply. The HI and ELCR are reported for 2011/2014 and 2018 in several site sectors. They defined the PA DEP standard for risk that should not be exceeded: A Hazards Quotient of 1, which they define as 1 in 10,000 (1E-04). However, in the two tables of their findings, all of the values exceed this standard of 1E04. They also state that the levels of intoxicants went down over time, but the assessment tables do not seem to support that assertion. Roux's conclusion that the potential risks to human health and the environment, associated with recreational or trespasser exposures for children and adults, is less than the risk-based goals, appears to be a false conclusion. See tables below from their report of the assessments in 2011 and 2014, and in 2018 – the Human Health Risk Assessment Appendix pages 10-16. (Comment 91)

DEP response to comments regarding the HHRA.

Please refer to GES's responses #14 through #16 for detailed technical responses.

The HHRA conducted by Roux Associates was intended to evaluate current potential risks. The HHRA was performed in accordance with the Act 2 regulations and Technical Guidance Manual. No human health risks were identified exceeding allowable risk screening levels based on carcinogenic (i.e., 1×10^{-4}) or non-cancer (i.e., $HI > 1$). The HHRA did not evaluate potential future risks. These potential future risks are addressed in the Analysis of Alternatives and Proposed Response ("AOA") under the first and second remedial action objectives ("RAOs") for each operable unit. Potential future risks associated with changes in land use will require evaluation as explained in the AOA. Institutional controls will be enacted and maintained to assure protection of human health.

Based on our observations and the size of Little Valley Creek, on the Source Property, DEP disagrees that recreational fishing is a likely route of exposure. However, DEP agrees that the potential future risks associated with fish consumption (on the Source Property and downstream) should be evaluated to ultimately demonstrate attainment of RAOs.

Ecological Risk Assessment ("ERA")

The issues of the long term heavy metals effects on aquatic life is not discussed. (Comments 43, 48, 82, 95)

Fish downstream of the Little Valley Creek headwater, in Valley Creek and the Schuylkill river are at risk of bioaccumulation of heavy metals and their toxicities over 45 years of their presence at Bishop Tube. (Comment 91)

2. The Ecological Risk Assessment is inadequate for multiple reasons including the omission of assessments of the site-specific standards and the remedial alternatives....

5. The area identified for study in the ERA at Figures R-2 and R-3 does not include an assessment of the risks to the biota of LVC a sufficient distance downstream of the site. The reach of the LVC tributary being assessed in the ERA extended from near the Amtrak railroad bridge south of the property to an area just north of the Conrail railroad bridge located to the north of the property.Discharge of groundwater chlorinated volatile organic compounds (CVOC) to LVC is evident in samples collected at locations within approximately 1.0 mile downstream of the Bishop Tube property ... We want to obtain water sampling test results for the metals contaminant concentrations in this section of LVC, and then have the ERA determined for specific fish and aquatic macroinvertebrate species (i.e., wild Brown Trout and Eastern Crayfish).

6. There is a need to perform specific conductivity and temperature monitoring in LVC to locate higher volumes of diffuse groundwater discharge in order to identify sites for additional sampling that will primarily target inorganic contaminants (i.e., metals such as chromium, hexavalent chromium, fluoride, aluminum, manganese, and nickel). Metals contaminants were not adequately tested in the surface water samples collected from LVC downstream of the Bishop Tube source property. The additional water sampling in LVC is recommended for a section of stream extending approximately 0.9 mile downstream of the source property to the confluence with the Morehall Tributary (a.k.a., Warren Run) on the west side of Morehall Road (S.R. 29).

7. Unless the contaminated surface soil (0-2') is being removed, ecological risk analysis is needed for site soil.... Soil invertebrates and birds are sensitive to some metals. Soil invertebrates and an avian vermivore (e.g., American robin) should be evaluated for direct exposure and food chain risks, respectively. Preference should be given to EPA Region 3 screening values and EPA Ecological Soil Screening Levels (Eco-SSLs).

8. Within the ERA, the Marsh Wren should be replaced with Carolina Wren as it is a yearround resident in SE PA and thus, has higher exposure potential. The Seasonal Use Factor in Table C-1 should be 100% and Table C-5 should be deleted. Belted Kingfisher is irrelevant as the site is too small to support this species.

9. The ERA needs to evaluate direct contact of contaminants from soil (stream substrate sediment) and surface water with specific macroinvertebrate, amphibian, and fish species. The ERA is deficient because it does not address all ecological receptors as described further in our comments below. The surface water direct contact pathway for fish and amphibians must be evaluated....Direct contact toxicity reference values (TRVs) for fish and amphibians compiled by Environment Canada and EPA Ecotox are available for many of the contaminants present at the site. Preference should be given to TRVs for the most sensitive life stages - eggs and/or larvae.

As benthic invertebrates are in direct contact with sediment porewater in the small study reach of LVC, surface water direct contact should be evaluated using the groundwater concentrations for COCs (Table R-4) from the site overburden wells in close proximity to the creek. Alternatively, piezometer or passive sampling can be used to determine actual porewater concentrations at the sediment locations adjacent to and immediately downstream of the former facility. This evaluation is necessary to ensure that the selected groundwater remedy will address COCs for aquatic biota as well as human health.

The habitat assessment portion of the ERA was conducted in December 2018. No terrestrial or aquatic species were observed, but this is not surprising given the time of year that the survey was performed.

Wild Brown Trout (*Salmo trutta*) are an inhabitant of LVC and need to be included as an ecological receptor species. Since trout would have direct contact with the contaminants in the surface water and through ingestion of food (both piscivorous and insectivorous ingestion), this omission needs to be corrected.

The existing methodology does not satisfactorily evaluate bioaccumulation of contaminants within the tissue of these receptor species. We disagree with some of the content of Figure R-4 “Ecological Conceptual Site Model” (RIR, Volume 1, page 4090). Specifically, we request that a predatory fish and its common prey fish be included such that the pathway for “uptake by biota” accurately reflects a significant exposure through ingestion. Accordingly, we request that Brown Trout (*Salmo trutta*), which is both piscivorous and insectivorous, and a benthic macroinvertebrate such as Eastern Crayfish (*Cambarus bartonii*; a.k.a. Appalachian Brook Crayfish), which is primarily insectivorous, be used, because these species are known to inhabit LVC. Crayfish are part of the trout diet. Improved representation by crayfish will change the direct contact with sediment to significant because crayfish have such substrate contact from egg, juvenile, to adult life stages.

There is a need to do fish tissue sampling to detect the concentrations of hexavalent chromium in both Brown Trout and Eastern Crayfish collected within LVC at locations within 1.0 mile downstream of the site. If sampling for PFAS, as requested in comment 1 above results in surface water concentrations within LVC, laboratory analysis of fish tissue samples for this contaminant may also be appropriate. Such investigation is needed to determine whether a Fish Consumption Human Health Advisory needs to be considered. Currently, there is no such fish consumption advisory in place to recommend restrictions on the amount or frequency of ingestion of fish from these waters in the human diet. As a follow-up investigation, histopathology of gills from Brown Trout collected within the aforementioned sampling area may be warranted.

For amphibian species, we request that contaminant risks be assessed for the Northern Red Salamander (*Pseudotriton ruber ruber*) and the American Bullfrog (*Lithobates catesbeianus*) as representative biota of LVC, the drainage swale at the north side of the site, and all wetlands. This was not done in the ERA.

10.The Roux “Ecological Risk Assessment” makes no mention of the existence of EV wetlands on the Bishop Tube site, and therefore does not include them as receptors that were assessed. A risk assessment for these ecological receptors needs to be completed.

11. Although the aforementioned “Ecological Receptor Map” depicts the drainage swale conveying surface water flow to LVC at the north end of the property as a receptor, it is not identified as a wetland and is omitted as a receptor habitat for risk assessment. There is a need to evaluate contaminant concentrations in soil, groundwater, and surface water within this drainage swale at the north end of the property. This drainage swale also needs to be evaluated for the presence of wetlands and as habitat for amphibian species that should be assessed as receptors for contaminant ecological risk. Because this drainage swale is hydrologically connected to LVC and likely contains wetland habitat, it needs to be assessed for contaminant ecological risks. A risk assessment for the associated amphibian receptor species also needs to be completed.

12. The ERA has at Figure R-4 an “Ecological Conceptual Site Model” (RIR, Volume 1, page 4090) that does not address several of the previously identified receptors that need to be evaluated. This site model was used to develop the Roux ERA, so the omission of specific fish and amphibian species and EV wetlands as receptors was continued within the risk assessment narrative. As a result, the “Assessment and Measurement Endpoints” described in Section 5.3 need to be expanded to include these additional receptors. This section also contains the statement: “in this ERA the results of the benthic invertebrate risk characterization are employed as a surrogate for an assessment of fish communities.” We disagree with this approach and request that fishes be evaluated for contaminant risk. Some of the constituents of potential ecological concern (COPECs), such as hexavalent chromium and aluminum, that fish are

particularly sensitive to due to potentially lethal gill damage at low concentrations are not adequately assessed for risks to fish using macroinvertebrates as representative surrogates.

13. The PA Natural Diversity Inventory (PNDI) review is now outdated, unreliable, and invalid because the presence of wetlands was omitted from the initial submittal and it was not submitted to jurisdictional agencies for review. The PNDI search needs to be resubmitted for review and must specify that EV wetlands are present in the project search area. There needs to be a legible signature on the PNDI search document indicating the name of the person who submitted the search request. In addition, the PNDI search indicated a potential impact risk to the Bog Turtle (*Glyptemys muhlenbergii*) and required submittal of additional information and further consultation with the U. S. Fish and Wildlife Service (USFWS). There is no documentation from the USFWS included to confirm that the potential impact to the Bog Turtle was satisfactorily resolved based on a Phase I survey to characterize the suitability of the habitat for this species that is federally listed as threatened and Pennsylvania listed as endangered. The only habitat assessment for any wildlife species that is documented in the ERA was conducted in December 2018, and this time frame is inappropriate for completion of a Phase I survey for the Bog Turtle, and there is no indication that any such survey was performed at an appropriate time.

14. With regard to the hazard quotients (HQ) discussed in the Roux ERA, there is a statement that HQ values between 1 and 10 are considered to be indicative of “acceptable risk.” However, contaminant toxicity curves are not linear, but are likely exponential. To rely on an HQ, one would need to develop a dose response curve for each constituent of potential ecological concern (COPEC) and each receptor species. Otherwise, there is no way to know what level of mortality is likely from an HQ for a specific species. Without such additional study, an HQ cannot be used to claim that the ecological risk is acceptable. The HQ values >1.0 require further evaluation. The existing claim that there is no unacceptable ecological risk is not warranted.

15. In ERA Table C-3 Sediment-Invertebrate Direct Contact Exposure Estimate, under the Hazard Quotient columns, there are “No Direct Contacts TRV” for boron, hexavalent chromium, thallium, and vanadium. In the ERA at “Section 5.5.1 Evaluation of Potential Ecological Risk to Benthic Invertebrate Communities” is the following statement: “Boron, hexavalent chromium, thallium and vanadium did not have toxicity reference values (TRVs) that could be located in the published literature commonly used to conduct ecological risk assessments, therefore the potential for ecological risk to benthic invertebrates cannot be estimated” [for these Constituents of Potential Ecological Concern (COPECs)]. The following statement appears a few sentences later: “Based on the above information, it is concluded that the COPECs present in surface water and sediment for the assessed area of the LVC tributary do not pose an ecological risk to benthic invertebrates at the Site.” Note the disconnect between the two statements and the fact that the conclusion that there is no risk to the aquatic benthic invertebrates is not based on evidence, because the risk cannot be estimated. (Comment 92)

It is notable that concentrations of hexavalent chromium in Little Valley Creek were found to have exceeded the PADEP Fish and Aquatic Life criteria in 2018 when it was measured under low flow conditions, yet the Ecological Risk Assessment fails to consider hexavalent chromium. Additional data should have been collected and ecological risk assessment evaluations undertaken. The failure to pursue this threat based on a lack of existing data cannot be legally justified. (Comments 45, 98)

DEP response to comments regarding the ERA.

Please refer to GES’s responses #17 through #34 for detailed technical responses.

A screening level ecological risk assessment was performed and presented in the 2021 Remedial Investigation Report (“2021 RIR”). The area of focus for the ecological risk assessment was the area where the highest contaminants of concern (“COC”) concentrations

were anticipated and observed. The ERA considered the habitats present in this area and followed applicable DEP and EPA guidance documents which are listed in the Reference Section of GES's response to technical comments. To ensure a sufficiently conservative evaluation, food chain effects were considered for the Marsh Wren and Belted Kingfisher (despite the lack of habitat for larger fish). These species were selected to provide the best analogues for the evaluation in consideration of toxicity data availability.

Roux Associates evaluated Little Valley Creek ("LVC") for indications of gaining or losing flow by measuring stream discharge. This information is presented in Figure 9 of the 2015 RIR. DEP is aware of the lack of regular metals and fluoride analysis downstream from the Source Property and intends to incorporate inorganics analysis into the evaluation of the northeast boundary area of the Source Property and into a routine surface water monitoring program.

The PA Natural Diversity Inventory will need to be updated prior to initiating remedial action. If any work is planned that may impact identified habitat, a survey would need to be performed.

DEP has determined that active measures are necessary to address the discharge of COCs to LVC, independent of Roux Associates' conclusions regarding ecological risk. DEP has established remedial action objectives ("RAOs") to address impacts to surface water. Additional risk assessment will be required to evaluate attainment of the RAOs. Recommendations provided during the public comment period will be considered in future ecological risk evaluations.

In response to the statement "*unless the contaminated surface soil (0-2') is being removed, ecological risk analysis is needed for site soil,*" Most of the soils sampled at the Site are currently under asphalt parking areas or the building slab. Upon completion of remediation efforts, soils will be required to attain an appropriate Act 2 standard based on Site conditions and could involve completing additional risk assessment.

Remedy Selection

The reports are based on the assumption that soil on the site will be removed, when that is not in fact being proposed (*Paraphrase of Comments 43, 44, 45, 48, 54, 82, 94, 98*)

....PADEP's chosen options would leave substantial TCE in place by failing to treat a number of known areas of contamination and by failing to fully treat/remove TCE in the locations that are treated. Leaving TCE on site ensures that there will continue to be ongoing contamination, and fails to provide the remediation or protection required by law or needed by the community and our environment. (Comments 45, 98)

The RIR and FS assume that contaminated unsaturated soils above the water table will be removed, thereby removing one of the contaminant sources that will leach into the groundwater long term. This assumption, which directly impacts the entire analysis and remediation proposal, is fundamentally incorrect because the proposal for soils remediation would leave substantial COCs in the soil.

Additionally, there are significant sources of TCE in the bedrock on the site which dissolve and desorb from fractures into the groundwater that will not be addressed by the proposal... The TCE plume exceeds 3,000 feet in length and has been found to be greater than 400 feet deep into the earth, including in bedrock. Yet, the remediation plan focuses only on shallow groundwater contamination, less than 120 feet deep. In fact, most of the source contamination is in the bedrock and deeper soils. That means there will continue to be TCE source material that will feed into the environment, completely undermining any proposed remediation.....

The failure of PADEP to consider a combination of alternatives is an obvious failing of the analysis and proposal. For example,

- for groundwater cleanup and protection there should be consideration of the environmental benefits of combining AOA Alternatives 3 and 5, with an emphasis on Alternative 3. By themselves, neither of these approaches is sufficient to address contamination. Alternative 3 is the only alternative that could, if properly implemented, affect deep bedrock and the DNAPL that is present. Complimenting this approach with hydraulic control in the overburden and shallow bedrock aquifer to prevent constituents from reaching Little Valley Creek would be beneficial.
- for the soils, PADEP should have considered combining Alternative 5, a rapid development of a vegetation cover to limit infiltration, and doing it while hydraulic control in the groundwater on the property (not mentioned in any of the proposed alternatives) is working to capture any released constituent or treatment chemicals before they reach Little Valley Creek....

...At present PADEP plans to use MNA in that area regardless of the choice for clean-up at the site. Doing nothing but monitoring is not an acceptable solution given the high degree of contamination, impact, and the years communities and the natural environment have been harmed by site contamination. Active treatment is essential to address all contamination at, and emanating from, this site.....(Comments 45, 98)

22) Why was Remedial Alternative #8 selected for evaluation within the Analysis of Alternatives and Proposed Response rather than more extensive remedial activities utilizing broadly similar technology as described in Remedial Alternatives #3 and #5? (Comment 93)

24. There are two approaches commonly used to perform hydraulic containment: the use of pumping wells to change the hydraulic gradient and the excavation of trenches or installation of drains to intercept the contaminant plume. This technology requires a simple operation system. Targeted contaminants could include non-aqueous phase liquid (NAPL) and a wide range of dissolved contaminants. Several applications of hydraulic containment need to be further considered for treatment of the CVOC's and inorganic contaminants degrading LVC through diffuse discharge of contaminated groundwater.

- a. Pumping Wells: When using pumping wells, the goal is to modify the groundwater gradient to slow down or stop the migration of the contaminated plume. The pumped groundwater is either treated or disposed of in an appropriate manner. A row of pumping wells could be installed parallel to LVC to intercept, remove, and treat contaminated groundwater moving toward this stream prior to discharging to it. Treatment of the pumped groundwater could be done onsite with potential use of the cleaned water for injection with other treatment chemicals used for in situ remediation of contaminated groundwater at other locations on the site. Alternatively, the treated groundwater could be evaluated for reinjection on the site in areas upgradient from the locations of known contamination.
- b. Trenches and Drains: Trenches and drains could be used to intercept shallow contaminated groundwater that is migrating towards LVC. Trenches and drains could be installed upgradient of the contamination to prevent the non-contaminated groundwater from entering a contaminated plume,

or downgradient of the contamination to prevent the contaminated water from migrating to LVC and its associated exceptional value wetlands. The contaminated water that is intercepted could be pumped from trenches or drainage systems, and then directed into an on-site treatment system or sent off-site to an authorized disposal facility. Alternatively, a Permeable Reactive Barrier (PRB) could be installed downgradient of the metals and VOC contaminated groundwater in a trench parallel to the LVC. The PRB could be constructed with Zero Valent Iron (potentially mixed with clean sand to improve permeability and bentonite to improve removal of metals) to treat both metals and TCE prior to the groundwater flow reaching LVC. The use of a PRB is not proposed as a replacement to in situ treatment of soils and groundwater, but as a supplemental treatment method.

26. Although not proposed in the Bishop Tube site remediation plan, hydraulic containment is often used to control the migration of dissolved contaminants. PA DEP should consider the use of hydraulic control by pump dewatering of drilled wells upgradient of the contaminant hot spots in the groundwater to keep clean water clean. Such pump dewatering could slow the spread of clean groundwater down gradient into the areas of existing soil and groundwater contamination. The water pumped from the upgradient wells could then be used in the injection of treatment amendments for the in situ remediation of contaminants in both soil and groundwater. (Comment 92)

How can you be sure that removing onsite soil will solve the environmental issues? Isn't it in the water too? (Comment 52).

you agreed with Brian's soil excavation plan at the time a few years ago so I'm wondering what made you change your mind now, and it raises the question for me that if you changed course once will you do it a few years from now? (Comment 26)

If removal of the contaminated soil was approved/preferred during earlier versions of this plan why has it been eliminated in this one? (Comments 71, 78)

And why just two areas when CDP was to remove soil from three hot spot areas in a prior plan? (Comment 94)

I advocate for a more comprehensive response which includes removal of all contaminated material, acknowledgment that there are aspects of the PA DEP proposal that are flawed or not based on sound science, (Comment 86)

Ground water contaminants must be removed or rendered inert or immobile including soil and bedrock on and off of the site. In locations where this is impossible, the remedy must prevent any contaminant of concern from becoming or continuing to be a contamination source and continue to reduce its concentration. (*Paraphrase of* Comments 43, 48, 51, 82, 89, 94, 95)

the removal of all long term sources of contamination. (Comment 40)

Reflects a partial cleanup of contaminated soil on only a portion of the property, and neglects other contaminated parts of the landsite.

Completely neglects cleanup of highly contaminated saturated soils and bedrock, and would effectively allow for highly toxic carcinogens to remain on the property and contaminate groundwater and neighboring residential areas in perpetuity (Comment 99)

Removal of contaminated soil from the site for treatment is an essential component of an effective solution, (Comments 45, 98)

DEP must require that all contaminated soil be removed from the site to eliminate a long-term source of contamination. (*Paraphrase of* Comments 43, 48, 51, 67, 82, 89, 94, 95)

the most polluted sites need to be immediately cleared of contaminated soil as deeply as the identified contaminants exist. The most friable of the known contaminants must be given highest priority to stop their leaching into the groundwater and their subsequent appearance in the waters flowing into Little Valley Creek. (Comment 84)

Unfortunately, the shallow depth of the water table, when combined with known fractured bedrock, presents a high probability that additional CVOCs will migrate from the soils to groundwater, including the deep-water aquifer serving a large swath of central Chester County. While more expensive and intrusive, active excavation of soils to bedrock in the contaminated areas would both help to eliminate ongoing migration to groundwater and allow the property to be restored more readily to useful function, it would also provide greater protection of human health and reduce long-term operation and maintenance costs.

OU2/Site Groundwater - DEP-recommended Alternative 3 – In Situ Injection (ISCO/ISCR/Bioremediation) This may be the preferable option as presented though there are severe limitations to all proposed alternatives. It is difficult to address DNAPLs in groundwater because of the low solubility in water (<1%) and the high specific gravity of CVOCs such as TCE (1.4 specific gravity). Nonetheless, this alternative does address contamination in source areas of the site that are contributing to off-site contamination. (Comment 80)

DEP's assessment in the AOA suggests that its preferred alternative for OU2 groundwater (i.e., AOA Alternative 3 – In Situ Injection [ISCO/ISCR/Bioremediation], page 31 of 66 of AOA) was favored by DEP because it would further hasten remediation of groundwater when compared to AOA Alternative 2 for OU2.3 The BT Team believes the perceived benefit of an unquantifiable "hastening of the remediation of groundwater" (i.e., the "Short-Term COC Mass Reduction" supplemental criteria from the FS Report) is overvalued by DEP when the potential challenges posed by active injection(s) are considered (e.g., potential impacts on the currently stable and decreasing CVOC groundwater plume, and diffusive effects of groundwater on the LVC tributary). The reasons for this are described in detail in the FS and are discussed in the following comments. It should be noted that the BT Team also agrees with DEP that AOA Alternatives 4 and 5 for OU2 similarly would not hasten the retraction of the plume and would present similar or more significant potential implementation challenges for this Site.

While the above analysis [referring to tables summarizing the results of the Comparative Analysis of Remedial Alternatives] shows that both remedial alternatives for groundwater (i.e., OU2 AOA Alternatives #2 & #3, which correlate with RA #2 in the FS Report and RA #8 in the RA #8 BOD Memo, respectively) would be protective of human health and the environment, it is equally clear that the OU2: AOA Alternative #2 (MNA) is more sustainable and cost-effective, and does not have the implementability challenges associated with OU2 AOA Alternative #3. The BT Team therefore requests that DEP reconsider its proposed remedial alternative for groundwater and select OU2: AOA Alternative #2 – MNA for groundwater.

GC1.... CVOCs in Groundwater - An August 24, 2021 technical memorandum previously submitted to the DEP (and in the Administrative Record) reported on supplemental groundwater sampling of 54 monitoring wells to confirm temporal trends for CVOCs across the Site. The updated trend charts in the technical memorandum bolster the 2021 RIR conclusion that parent CVOCs (trichloroethene ["TCE"]) and

1,1,1-trichloroethane [“TCA”]) are decreasing and so-called daughter products (e.g., cis-1,2-dichloroethene [“cDCE”], vinyl chloride [“VC”] and 1,1-dichloroethane [“1,1-DCA”]) are being reduced over time via natural attenuation processes. Updated Mann-Kendall statistical tests bolster the 2021 RIR (and earlier) conclusions that CVOC concentrations in groundwater are stable or decreasing. These supplemental CVOC groundwater data support a determination that MNA is effectively reducing CVOC contaminant concentrations at this Site, even in the absence of active remediation.

GC1.... CVOCs in Building 5 - A December 16, 2020 technical memorandum previously submitted to the DEP (and in the Administrative Record) assessed the horizontal and vertical extent of CVOCs in DEP’s AOC-6 (i.e., the Plant 5 “Large Degreaser Area”). The supplemental soil data demonstrated that a) both the horizontal and vertical extent of CVOCs in AOC-6 in Building 5 have been refined (reduced) based on the supplemental data, b) the extent of the remedial area designated AOC-6 in the AOA is overly conservative and not supported by the supplemental data, and c) vertical delineation of CVOCs in soil in the vicinity of AOC-6 was achieved entirely within the unsaturated zone, i.e., the deepest samples did not exceed the RUA/Non-Residential Used Aquifer (“NRUA”) SGW MSCs, indicating that soil impact in this area is not reaching the water table. DEP acknowledges in the AOA that the saturated soil and bedrock in AOC-6 do not significantly contribute to the dissolved CVOC plume. These findings support a determination that MNA is sufficient for CVOCs in groundwater in the vicinity of Building 5. To the extent that remediation of soils is contemplated in AOC-6, the scope of soil remediation should be reduced (or potentially, eliminated) in light of the supplemental data. (Comment 97)

9....Multiple contaminants of concern (COCs) were identified in surface water, including TCE concentrations as high as 7.3 g/L and hexavalent chromium of 22 ug/L. And yet none of the chosen remedies adequately address the current contamination in the surface water. (Comment 92)

GC10– The Primary COCs at the Site Are CVOCs, Not Inorganics. The CVOCs at the Site are primarily sourced from the former Building 8 Vapor Degreaser Area (“VDA”)²⁰ and the former Drum Storage Area 3 (“DSA 3”). In the FS Report, the areas of Building 8 VDA and DSA 3 were expected to require soil source mitigation to reduce the residual source mass of CVOCs in the soil column. As discussed in GC1, the available soil and groundwater data supports a determination that soil source mitigation for CVOCs in the vicinity of Building 5 is not necessary to sustain MNA in groundwater on this portion of the Property.²¹ In sum, CVOCs a) are sourced, in part, from the Property, b) are found in groundwater beneath the Property and off-Property, and c) are the primary COCs at the Site. By contrast, inorganic COCs a) are not present in soil to an extent requiring proposed remedial action (see GC1, above)²², b) are found in groundwater beneath the Property

GC13– DEP Correctly Dismissed Hydraulic Control (“HC”) as a Viable Remedial Approach for the Site. Some community members have suggested that DEP should consider the use of HC, possibly supplemental to other remedial approaches. For example, it has been suggested that HC should be employed as an anti-degradation measure for the tributary of LVC. This suggestion was made despite a recognition that it could significantly reduce base flow to the LVC tributary; it was then suggested that treated water could be discharged into the creek to replenish the base flow. In fact, the handling of treated groundwater would be difficult and costly, because neither discharge to a publicly owned treatment works (“POTW”) nor discharge to the LVC tributary is likely to be approved, and reinjection could also cause further dispersion of COCs. Additionally, treated water discharge to LVC could upset the natural ecosystem of LVC (e.g., due to changes in water temperature, pH, treatment byproducts).²⁷ The only other option would be transport of groundwater for offsite disposal via approximately 58 tanker trucks every day, for the next 30+ years.²⁸ As described more fully in the FS Report, the extraction, treatment, and discharge of recovered groundwater would be complex, energy-intensive and costly, and provide limited additional benefit (see potential limitations in footnote below)²⁹.

In addition, and as described in GC6 above, BMPs were developed for this Site (with soil source control measures), in part at the direction of DEP, as an approach to address the anti-degradation ARAR for the LVC tributary and hasten remediation by minimizing offsite transport of COCs. These BMPs were included in all remedial alternatives in the FS Report.

More importantly from a long-term remediation standpoint, the RIR identified additional off-Property source(s), unrelated to prior manufacturing operations on the Property, that are contributing CVOCs to the conditions identified at the Site.²⁴ The nature and extent of the additional source(s) are neither characterized nor the subject of any active DEP investigation. While they may not initially appear significant in terms of concentrations relative to other areas of the Site, it is important to note that a) more substantial concentrations not identified by this investigation as well as ongoing source(s) may be present, and b) the CVOCs from additional source(s) that are present in the downgradient portions of the Site may hinder a future demonstration of MNA in this area of the Site. (Comment 97)

The bottom line is that pollutants follow the path of heat and water. If toxins, carcinogens, etc. are not removed and /or they are disturbed without encapsulation then they get dispersed by air currents (Heat driven) or by being dispersed through water. This causes significant environmental impact that is nearly impossible to control once it is dispersed. (Comment 60)

DEP response to comments regarding Remedy Selection

Please refer to GES's responses #35 through #45 for detailed technical responses.

In Section VI of the Analysis of Alternatives and Proposed Response (“AOA”), DEP evaluated the remedial alternatives to determine: 1) the extent to which each alternative protects the public health and the environment; 2) the extent to which each alternative complies with or otherwise addresses Applicable, or Relevant and Appropriate Requirements (“ARARs”); 3) the extent to which each alternative is feasible, effective, implementable, permanent; and 4) the relative cost effectiveness of each alternative.

The proposed alternative to address soils OU1: Alternative 5 - In Situ Chemical Oxidation/In Situ Chemical Reduction (“ISCO/ISCR”), Coupled with Soil Mixing is intended to address the Soils Source areas presented in Figure 3 of the AOA. For groundwater OU2: Alternative 3 – In Situ Injection (“ISCO/ISCR/Bioremediation”) would be focused on limited hot spot areas of the Source Property, which continue to act as ongoing sources of groundwater contamination migrating beneath downgradient properties and resulting in the diffuse discharge of contaminated groundwater to Little Valley Creek (“LVC”). Based on the most recent surface water VOC analysis, presented in the 2021 Remedial Investigation Report (“2021 RIR”), TCE resulting from the diffuse discharge was detected in LVC at a concentration of 7.3 µg/l (not 7.3 g/l, as stated in Comment #92). These hot spot areas include the former vapor degreaser in Plant 8 and the drum storage area, where groundwater within the shallow bedrock interval (i.e., less than 120 ft. deep) contains the highest chlorinated volatile organic compound (“CVOC”) concentrations. As stated in the Hydrogeologic Study – Deep Bedrock Section response to comments it is considered technically impracticable to recover and/or remove dense non-aqueous phase liquid (“DNAPL”) from deep bedrock fractures. Monitored Natural Attenuation (“MNA”) was evaluated as OU2: Alternative 2. MNA was not proposed on its own because it is expected to take many decades and would not achieve remedial action objectives (“RAOs”) which

include reducing contaminants of concern (“COC”) discharge to the LVC and hastening retraction of the groundwater contaminant plume.

The active measures proposed to remediate source area soil and groundwater include addition of ISCO or ISCR amendments, which rapidly break down CVOCs. The addition of an ISCR amendment, which is considered the most likely outcome of the remedial design phase, could also enhance the ongoing biotic transformation (biologic breakdown) of CVOCs in groundwater. Addition of a bioremediation amendment could further enhance biological breakdown of the primary COCs in groundwater, shortening the timeframe required to achieve RAOs.

Most active remediation measures considered could pose some potential risk to the LVC. For example, any earth disturbance (if improperly implemented) could result in sedimentation; hydraulic control could result in dewatering of LVC and the adjacent riparian exceptional value wetlands.

Soil Removal

Although the Source Property owner proposed soil removal, as part of a grant application, for which DEP suspended its review activities in 2017, DEP is not proposing soil excavation for its response action. As noted in the AOA, soil mixing with ISCO and/or ISCR amendments was determined to be more cost-effective than excavation. The preferred remedy would also avoid implementability issues associated with excavation below the water table, which would require pumping and disposal of contaminated groundwater. The offsite disposal alternative would require staging of soils prior to transport for offsite disposal in dump trucks. The soil mixing alternative was proposed because it would destroy and/or sequester COCs in the treatment areas (mitigating contaminant migration and further impacts to groundwater) and also provides benefits by complimenting the proposed groundwater remedy (Injection of ISCO/ISCR, and/or Bioremediation Amendments).

Hydraulic Control

Hydraulic control, particularly pumping would potentially have a negative effect on the flow within LVC. Additionally, hydraulic control is not considered effective for removing COCs from the environment due to the likely presence of isolated, residual DNAPL, and COCs sorbed into the rock and soil matrices. Hydraulic control would also require discharge of treated water. DEP has determined that a discharge of treated water to LVC would not be a viable option due to antidegradation requirements. Additionally, East Whiteland Township has informed DEP that the local publicly owned treatment facility (Valley Forge Municipal Authority) will not accept such a discharge. Treated groundwater reinjection is considered impractical due to the size of the Source Property and complex geology.

Hydraulic control, particularly near LVC, where it may be the most effective, would likely be more difficult to maintain at an effective pumping rate without negative impacts to stream flow and the wetlands. Soil mixing in Area #3 shown in the 2020 GES Technical Memo is intended to treat or sequester COCs, which are currently contributing to diffuse discharge to LVC. This treated area may also be designed to function as a hydraulic barrier. Engineering controls/best management practices are more passive approaches included in the planned

response action, which can provide for reduction of stream impacts over time, even if the remedial design demonstrates that unacceptable impacts from remediation are unavoidable.

ISCO/ISCR Amendments

You wrote in vague terms about mixing soils with chemicals and ground water injections but you failed to mention the additives you are referring to. If you have a game plan, why have you kept it secret? (Comment 21)

What chemicals are being added to the soil... How many injections are there and over what time period? (Comment 26)

How are we expected to make informed comments on a plan involving mixing chemicals with contaminated earth on site when you are mixing chemicals to be determined later after more testing which today are unknown. (Comment 28)

At no point does the DEP's plan specify what chemicals will be injected, how often they will be injected (Comment 33)

The DEP remedial response plan proposes injecting the soil and ground water with chemicals that might breakdown or transform the contaminants, not eradicate them. So the best plan DEP can come up with for fighting dangerous toxic chemicals is more chemicals? And the DEP doesn't specify which one will be used? Or if they will be effective? (Comment 27)

GC1.... the in-situ injection amendment (i.e., the actual material to be injected) is not identified in the AOA because that would have been premature, in that the predesign investigation ("PDI") will be used to assess several amendments and identify the optimal choice for this Site. One of the criteria for selection of an amendment will be a demonstrated ability to produce complete dechlorination (i.e., mineralization) of the parent CVOCs.¹⁰

GC4 - ISCR, Possibly Supplemented with Enhanced Bioremediation, Would Be the Preferred Remedial Approach for this Site; ISCO Should Be Eliminated. Proposing the injection of ISCR, ISCO, and/or bioremediation amendments as the overall remedial approach as outlined in the AOA signals indecision as well as uncertainty as to the viability of the proposed remedial approach. As described in the FS Report, a) an ISCR remedial approach is preferred over ISCO for groundwater conditions observed at this Site, and b) the chemistry of the remedial approaches selected for both soil and groundwater OUs must be compatible. The BT Team recommends strongly that DEP eliminate ISCO as a treatment alternative for soil and groundwater. ISCR would be consistent with the ongoing degradation of CVOCs. (Comment 97)

it is challenging, if not impossible, to offer informed feedback on the recommended alternatives proposed for operable units (OU) 1 and 2 without knowing what amendments and doses would be utilized in Situ Chemical Oxidation and/or In Situ Chemical Reduction (ISCO/ISCR). (Comment 80)

What chemicals do you propose to inject into the soil to combat the existing contaminants? What case studies support this as a solution? (Comment 52)

You plan to use soil intrusions, the mixing of soils with chemicals does not indicate the chemicals to be used and the potential byproducts or reactions these intrusions may cause. (Comment 72)

it is not clear what chemicals would be used, nor was there the needed consideration of the discharge of new/additional contaminants that could result from this approach, and how the chemicals break down and/or react with other contaminants (Comments 45, 98)

DEP response to comments regarding ISCO/ISCR Amendments.

Please refer to GES’s responses #46 through #48 for detailed technical responses.

DEP considered specifying a particular amendment type in its proposed remedy but determined that maintaining flexibility to design and optimize remedy implementation was necessary to achieve the best outcome. Based on the circumstances at the Site, selection of In Situ Chemical Reduction (“ISCR”) (as described in the 2021 Feasibility Study prepared by Roux Associates) to address groundwater) is most likely. However, DEP determined that ruling out other amendment types such as In Situ Chemical Oxidation (“ISCO”) (for chemical destruction of contaminants of concern (“COCs”)) or electron donors and/or bacteria (to induce biological transformation of COCs) was unnecessary and potentially counterproductive in the Analysis of Alternatives and Proposed Response (“AOA”) stage of remedy development. This is consistent with EPA’s approach to Proposed Remedial Action Plans and Records of Decision. At nearby Chester County Superfund Sites soil mixing was used at Foote Mineral and William Dick Lagoons and in situ amendment injections have been used at AIW Frank and Malvern TCE.

Amendments that will be considered for use are commercially available and have been formulated for soil and groundwater remediation. These amendments are nonhazardous but could have negative or positive effects on the biotic degradation of COCs that will be evaluated during the design phase.

The remedial design plans will list the specific amendments, as well as the amount to be used (dosing), timing, and specific locations of the injections. DEP will make these plans available to the public on DEP’s website for the Bishop Tube Site.

ISCO/ISCR Risks

The environmental ramifications of this have not been assessed as part of the proposed remedial action plan. (Comments 45, 98)

Regarding ISCO/ISCR, it should also be noted that the Remedial Response Action and recommended alternatives lack information on the potential for further contamination associated with byproducts resulting from these unknown parent compounds. (Comment 80)

16.There is no indication what specific remediation chemicals will be used, nor is there an assessment of the human or ecological risks associated with these chemicals. The chemicals and other amendments that will be used to treat the contaminants needs to be specified and evaluated for human health and ecological risks. (Comment 92)

We are concerned that the PADEP, in its cleanup proposal, mentioned unnamed chemicals would be used to break down toxins at the Bishop Tube site but have failed to consider, let alone expose, the health and environmental effects of these yet to be determined and/or unnamed chemicals. (Comments 43, 48, 53, 82)

this proposal includes the injection of as-of-yet unknown chemicals that could themselves become problematic or react with contamination on site that will result in additional releases of contamination. (Comments 45, 98)

The chemicals used, not specified today, that would be used to decontaminate soils could affect the environmental biota at the Bishop Tube site and downstream. This concern has received no attention from the DEP analysis and response reports that I've seen. (Comment 22)

what are the hazards and risks associated with those chemicals? (Comment 26)

DEP to not fully evaluate all dangerous toxins and the implications of any proposed remediation on their presence or spread (Comments 43, 48, 82)

There is deep concern that the proposed remediation plan has many 'holes' in it and will exacerbate the pathways of the contaminants at the site including allowing toxins to become airborne as well as contaminating Little Valley Creek, growing the pollution groundwater plume and affecting our neighbors downstream. (Comments 43, 48, 82)

How will the 'unnamed' chemicals used to breakdown the TCE and other contaminants effect the aquifer finding its way to public drinking water. (*Paraphrase of Comments 25, 54*)

Specifically, what potential impacts to surface water could result from ISCO/ISCR amendments, what would the risks be, and how does DEP plan to mitigate them? (Comment 80)

Although oxy/redux might work well in different hydrogeological settings, here you have no absolutely no guarantee that it will work here nor that it will not produce a worse chemical. (Comment 41)

There is a lack of information on the risks to the biota (plantlife, wildlife and aquatic life) at this site, in and around Little Valley Creek and downstream, including in the receiving streams of Valley Creek and the Schuylkill River. The municipality's technical expert stated that the chemicals, not specified to date, to be used to decontaminate the soils through chemical oxidation and/or in situ chemical reduction, coupled with soil mixing, could affect the environmental biota at the Bishop Tube site and downstream. (*Paraphrase of Comments 43, 48, 82, 91, 95*)

What about the potential for production of daughter compounds?Where is your analysis of what the impacts of the chemicals on site and those proposed to be used on site are and will be on the flora, fauna and aquatic life of Bishop Tube and its plume. (Comment 94)

Vinyl Chloride and other chemicals, which damage the aquatic habitats and biota, are 'daughter' chemicals resulting from the degradation of TCE flowing through Little Valley Creek and a plume last measured as at least a mile. According to the East Whiteland assessment by the environmental engineering firm, BSTI, daughter chemicals can also result from the chemical treatments of soil and

groundwater that PA DEP proposes. The daughter chemicals, some of which might not be considered hazardous by EPA standards, in sufficient quantities can harm and imbalance the water and sediment, possibly damaging the aquatic habitat and causing permanent damage to this DEP-designed Exceptional Value stream at Bishop Tube. As DEP knows, the Valley Creek watershed is in the path of several Superfund and hazardous waste sites including high heat and salt impacts from the surrounding roads and highways. While aquatic life has been partially protected perhaps by the limestone geology of the stream, macroinvertebrate indices are already very poor or absent there, and biota might not survive more contamination. (Comment 91)

4. There is a need to evaluate the human health and ecological risk associated with secondary by-products and/or metabolites of the proposed in situ treatment chemicals and the targeted contaminants in both soil and groundwater. Reductive de-chlorination of certain chlorinated volatile organic compounds could produce daughter metabolites of greater concern than the parent compounds being treated. No such risk assessment has been done. The formation of chloroethane or vinyl chloride by-products of treatment may warrant the use of an aerobic bioremediation step. Bench scale and/or pilot testing, as well as strict quality control for injected materials needs to be required.

17. ...If metals exceed ecological benchmarks in soil or groundwater near LVC, then additional amendments will need to be added to bind metals. The VCTC requests information demonstrating that the in situ treatments for both soil and groundwater will address any metals that pose ecological risk. (Comment 92)

GC1.... The generation of daughter products is to be expected as part of the MNA remedial process. In fact, it is desirable to observe the generation and then subsequent degradation of these daughter products; observing and detecting the sequential dechlorination of the original parent products helps demonstrate that MNA is effective and occurring at the Site. The presence, concentrations and trends of the daughter products will be monitored over time, just like the parent products, to ensure the daughter products are not producing unacceptable conditions. (Comment 97)

DEP response to comments regarding ISCO/ISCR Risks.

Please refer to GES's responses #49 through #53 for detailed technical responses.

DEP agrees that pilot and bench-scale testing will need to be performed as part of the remedial design activities, as indicated in the Analysis of Alternatives and Proposed Response ("AOA"). Site investigations suggest that biotic (biological) transformation of chlorinated volatile organic compounds ("CVOCs"), which relies on bacteria, is currently occurring at the Site. However, vinyl chloride and chloroethane, which are known degradation products of trichloroethene and 1,1,1-trichloroethane, are not widespread at the Site. Bench-scale testing will be used to determine if specific amendments or bacteria may be needed to ensure that unacceptable concentrations of these compounds do not result from remedy implementation.

In Situ Chemical Reduction ("ISCR")/In Situ Chemical Oxidation ("ISCO") uses chemical reactions to destroy contaminants. ISCO can quickly destroy CVOCs and is more cost effective than ISCR under certain conditions but may interact with other contaminants, such as per- and polyfluoroalkyl substances ("PFAS") or chromium to form more toxic byproducts. Therefore, it is more likely that ISCR will be used to address CVOCs. ISCR can also transform hexavalent chromium into trivalent chromium which is less toxic and less

mobile. As stated by GES in response # 49, ISCR risks “*include the potential to mobilize metals (e.g., arsenic), the formation of methane, or the production of daughter products (e.g., vinyl chloride; a natural degradation product of TCE.*” Adjustments to the amendment formulation are available to address these concerns. The appropriate amendment(s) will be identified during remedial design phase bench scale testing, treatability studies and/or field pilot studies.

Other risks could include daylighting of amendments. Daylighting occurs when amendments resurface and discharge at the ground surface. Please see GES Response #52 for more information regarding implementation procedures to mitigate risks.

Provided in the Reference Section of this document are links to safety data sheets from some amendment options as well as EPA Community Guides for ISCO, ISCR and bioremediation. Safe implementation methodologies are discussed in detail below in the Community Safety during Implementation Section and the Proposed Remedy Implementation Sections.

According to EPA’s Community Guide on ISCR “*The use of ISCR poses little risk to the surrounding community. Workers wear protective clothing while handling reducing agents, and when handled properly, these chemicals are not harmful to the environment or to people. Because contaminated soil and groundwater are cleaned up underground, ISCR does not expose workers or others at the site to contamination.*”

According to EPA’s Community Guide on ISCO “*The use of ISCO poses little risk to the surrounding community. Workers wear protective clothing when handling oxidants, and when handled properly, these chemicals are not harmful to the environment or people. Because contaminated soil and groundwater are cleaned up underground, ISCO does not expose workers or others at the site to contamination. Workers test soil and groundwater regularly to make sure ISCO is working.*”

Bioremediation uses microorganisms (bacteria) to break down contaminants by using them as an energy source or cometabolizing them with an energy source. According to EPA’s Community Guide on Bioremediation “*Microbes added for bioaugmentation typically die off once contaminants and proper conditions are gone. The chemicals added to stimulate bioremediation also are safe. For example, the nutrients added to make microbes grow are commonly used on lawns and gardens. To ensure that bioremediation is working and to measure progress, samples of soil and groundwater are tested regularly*”.

The injections of amendments into groundwater through injection wells is regulated by EPA’s Underground Injection Control (“UIC”) Program. EPA authorization will be required before amendment injection begins. Additionally, implementation and performance monitoring plans will be prepared and followed to monitor the active remediation work.

Pre-Remedial Design

The PA DEP must provide additional clarity regarding the pre-remedial investigations that are still required. Additional evaluations are needed which will have a significant impact on the remedial design and outcome. (Comments 74, 100)

16.DEP needs to develop a summary list of all the pre-remedial design investigations that it is requiring for completion prior to the implementation of site cleanup. Such a summary should include a time schedule for completion of each investigation. (Comment 92)

9) completing soil delineation, how will this information be incorporated into the remedial design?

11) Will quantitative evaluation of the deep bedrock source strength and plume mobility be required as part of pre-remedial design activities?

17) What specific assessments will be required to identify the chemistry or chemistries to be used for in-situ remedies for soil and groundwater? (Comment 93)

GC3 – The PDI Is a Normal Next Step After the Remedial Approach Has Been Selected and Does Not Imply a “Data Gap” in the FS. Once the overall remedial approach is selected (following the AOA and public comment process), the next step in the remedial process for the Site is the PDI. The PDI is performed to confirm the safety and efficacy of the preferred remedial approach and produce the data needed to refine the remedial technology to be employed. The principal objective of the PDI is to facilitate the effective design and implementation of the preferred remedies for the Site. Certain “data gaps” mentioned in the AOA refer to data commonly developed after the FS and during the PDI. As explained above, the PDI is a normal sequential step in the remediation of a site, that takes place after the overall remedial approach has been determined. The PDI data a) are not expected to be available now, b) are not needed to select an overall remedial approach for the Site, c) will be collected after the overall remedial action approach has been selected, and d) are not “data gaps”, per se, but simply future data needs to refine remedy application. (Comment 97)

DEP response to comments regarding a pre-remedial design.

Please refer to GES’s responses #54 and #55 for detailed technical responses.

A pre-design investigation work plan and schedule will be developed and posted on DEP’s website for Bishop Tube. GES response #54 provides more details regarding pre-design investigation activities. Pre-design investigation activities may include:

- additional delineation sampling/testing in the areas of concern to test for per- and polyfluoroalkyl substances (“PFAS”) and to determine target treatment areas and depths;
- the collection of baseline data from Little Valley Creek and adjacent wetlands;
- evaluation of background conditions in soil and groundwater;
- further groundwater investigation in the northeast corner of the Source Property; and
- evaluation of the existing buildings, including asbestos surveys, to ensure safe demolition.

As noted in the Analysis of Alternatives and Proposed Response (“AOA”), additional groundwater delineation is planned near the northeast corner of the Source Property to refine areas that will be covered by institutional controls necessary to prevent potential future exposure to Site-related contaminants of concern.

As described in GES response #55, a quantitative evaluation of the deep bedrock source strength and plume mobility will not be required at this time.

Remedial design work may include, among other activities:

- laboratory treatability tests using specific amendments; and
- bench-scale testing to refine amendment selection; and pilot and tracer tests to optimize injection spacing and pressures.

Community Safety during Implementation

Places the residents of East Whiteland Township in direct and imminent danger from exposure to extremely high levels of toxic airborne particles and vaporous contaminants including, but not limited to, trichloroethylene, a chemical substance known by multiple agencies of the United States government to be a likely cancer-causing carcinogen. The levels of trichloroethylene at the Bishop Tube site far exceed an acceptable level of exposure. Further, DEP has not considered or conducted any exploration of wind patterns from the Bishop Tube site, and as such has not considered where toxic soil particles and vapors may land during excavation. Frankly, if contaminated soil or particulate during remediation on nearby lawns, the DEP is directly responsible and negligent after failing to address concerns from the community. (Comment 99)

What could be expected regarding the emissions of dust and vapors during the mixing process, what would the risks be? How does DEP plan to mitigate them and protect neighbors from airborne contaminants during the proposed clean-up? (Comment 80)

While detailed plans for monitoring and mitigation may not be developed until later in the remedial process, the PADEP must outline controls (e.g., dust control and monitoring, vapor suppression, vapor capture, enhanced erosion and sediment controls, or other fence line monitoring during remediation) expected during remediation as well as the process by which necessary steps will be determined...

31) What environmental monitoring and protective measures will be required during remedial construction and active remediation to protect workers, the public, and the environment? If not known at this time, how will these measures be determined?

32) What measures for protection of human health will be required during the active portion of remedial action? If not known at this time, how will these measures be determined? (Comment 93)

If building demolition is required, what risks, besides or in addition to asbestos, could be involved in the 3 demolition of a structure with a legacy of housing hazardous chemicals? And what, if any, additional measures are required for demolition on an HSCA site? (Comment 80)

How do you plan to protect the current residents? I live in the General Warren Village which is located on the eastern edge of the Bishop Tube site. How will you protect me? How do you plan to monitor the

cleanup efforts? Will you hire someone to be on-site? Or will you be making occasional phone calls or just reading their reports? (Comment 21)

I'm not comfortable that when demo starts of the existing buildings and remediation begins that the residents downwind of this site will be properly protected (Comment 25)

what is the risk of vapor intrusion as the buildings are being demolished? (Comment 26)

Not to mention exposing the current neighbors to more contaminants that excavation will release into the environment (Comment 27)

Given the fact that there is a residential neighborhood in immediate proximity to the Bishop Tube site, the DEP's remediation plan does not facilitate a proper outcome for the safety and welfare of the people living so close to the contamination.....

- Information regarding the monitoring of air quality and safety of the surrounding residential community is not readily available. Once pollutants are airborne as a result of earth movement, what structures or mitigating systems are in place to protect neighboring residents within 50-500 yards of the site?
- No studies were completed that address the potential for neighboring structures to inherit vapor intrusion as a result of earth movement at the Bishop Tube site.
- The DEP's recommended plan to inject chemicals (in situ) into the ground as an act of remediation is not forthcoming.nor the potential negative impact they could have on neighboring residents and their properties.

There are many young children in various developmental stages living within feet of this site. We are not against the ultimate remediation of the Bishop Tube site, but it needs to be done properly with the utmost focus on the health and safety of those currently living directly next to it.

No studies or plans were completed that focus on the health and welfare impacts of bordering residential homes. The ATSDR gave safe conduct of site remediation guidelines to PADEP on 4/6/2016. Where is it documented that these protocols or the EPA's Green Remediation BMP's will be followed/enforced for bordering residents? (Comment 33)

The cleanup must include protecting the air from contamination. (Comment 40)

How will the neighbors be protected from airborne contaminants during the proposed clean-up? (Comment 54)

Your plan does not discuss the specifics of how the site will continue to be monitored during the various clean-up phases. It should include the types of machinery, testing, frequency, engineering controls, monitoring off site vapor intrusions, timelines, and specifics concerning the personnel who will be responsible at the DEP.

It is the DEP's responsibility to ensure that the clean up process does not cause additional environmental harm to the nearby residents and communities throughout the affected watershed. (Comment 70)

The DEP needs to address topics including the ongoing monitoring, the evaluation of off-site vapor intrusions

The DEP must make more of an effort to ensure safety of residents and clearly communicate how these efforts will be developed and executed. (Comments 76, 100)

DEP must be responsible to ensure the safety of the public and the environment. (Comment 77)

How will the air plumes be controlled while any action takes place on BT? This will directly effect health concerns on neighboring communities and businesses. (Comment 90)

The community has serious concerns about their safety during the attempts to clean-up the Bishop Tube site. The current proposal offers no indicators of how that safety is to be ensured. The DEP must provide information about the provisions which will be taken to protect the public. The areas addressed should include, but are not limited to, ongoing methods used to monitor air quality, methods used to monitoring for clean up effects on ground water run-off, frequency of safety testing, security plans for the site and equipment (Comment 101)

DEP response to comments regarding Community Safety during Implementation.

Please refer to GES's responses #56 through #58 for detailed technical responses.

Section VI of the Analysis of Alternatives and Proposed Response (“AOA”) describes how each alternative considered would comply with applicable, or relevant and appropriate, requirements (“ARARs”) beneath the title “Compliance with ARARs.” The specific ARARs are outlined in Appendix B.

Under the Compliance with ARARs section for OU1: Alternative 5 - In Situ Chemical Oxidation/In Situ Chemical Reduction (“ISCO/ISCR”), Coupled with Soil Mixing, DEP included: “....*Though less intrusive than excavation remedies, implementation of this alternative would still require stormwater management plans. The subsurface dosing of fluids may be regulated by the Safe Drinking Water Underground Injection Control (“UIC”) Program. Other potential impacts to surface water resulting from amendment injection would need to be assessedPlans would be required for addressing fugitive emissions of dust and vapors during the mixing process. Building demolition would be performed in accordance with asbestos abatement regulations and notification requirements.*”

Under the Compliance with ARARs section for groundwater OU2: Alternative 3 – In Situ Injection (ISCO/ISCR/Bioremediation), DEP included “..... *In addition, action and location specific ARARs, including storm water management plans for any earth disturbance and underground injection controls required under the Safe Drinking Water regulations (40 CFR Parts 144 and 146) and administered by US EPA, must be met during implementation*”

One of the benefits of the proposed remedies ISCR, ISCO and Bioremediation, is that the remediation activities will be conducted in place, either in the soil via mixing or by treating the groundwater beneath the ground surface. This reduces the risks to the community as described in DEP's response to ISCO/ISCR Risks and the referenced EPA Community Guides. Protection of the surrounding community is paramount and protection measures (including air monitoring) will be incorporated into remedial design plans to ensure substantive requirement of ARARs are achieved.

The Agency for Toxic Substances and Disease Registry (“ATSDR”) letter, dated April 6, 2016, is included in the Administrative Record for the proposed remedial response, and DEP

will incorporate the recommendations provided by ATSDR into response implementation. The letter specifically references [Green Remediation Best Management Practices: Bioremediation \(clu-in.org\)](#). Some of the best management practices described in the document are ARARs, which DEP will consider in the development of the remedial design.

In addition to the occurrence of asbestos, the potential for other hazardous substances including dusts and vapors, which could be released during building demolition will be evaluated during the pre-design investigation. Plans for mitigating risks and monitoring during demolition activities will be required before demolition work begins.

Generally, vapor intrusion results from soil or groundwater conditions beneath or near occupied buildings. Although changes in groundwater conditions resulting from remediation that could increase the chance of vapor intrusion are considered unlikely, plans for monitoring groundwater conditions during remediation activities will address the potential for vapor intrusion.

Enhanced site security measures will be implemented during active work to protect the workers and equipment needed to remediate the Site and to avoid injury to trespassers. The neighboring community has assisted DEP by reporting unauthorized activity in the past, and DEP continues to welcome such assistance during active remediation work.

Proposed Remedy Implementation

6) Will additional evaluation of 1,4-Dioxane be conducted at the Site? How will the presence of 1,4-Dioxane affect remedial design? (Comment 93)

GC1.... That assessment used analytical methodologies with low (i.e., sensitive) detection limits, and its results are reflected in the August 24, 2021 technical memorandum noted above. The results confirm the conclusions in the 2021 RIR and in past correspondence with DEP, that 1,4-dioxane concentrations in groundwater are de minimis. The compound was not detected above the default RUA GW MSC (6.4 ug/L) in 21 of 22 monitoring wells; only one on-Property monitoring well exceeded the MSC.11 Notably, 1,4-dioxane was not found in groundwater exceeding its MSC off-Property. (Comment 97)

Your plan does not delineate provisions that will need to be added to prevent additional contamination during the cleanup process. (Comment 21)

how DEP is going to manage the technical challenges of the Plan? (Comment 95)

The DEP must inform the community how technical and management challenges to remediation will be met.... Better management techniques and ongoing ongoing performance assessment should be outlined within the plan (Comments 75, 100)

The DEP should address stormwater management oversight to be put into place during the remedial process. (Comments 77, 100)

The levels of on-site contamination from Chlorinated Volatile Organic Compounds (CVOCs) in soils are significant in several areas of the property. Alternative 5 involves the use of mechanical augers to drill contact points for soil augmentation, presumably in hundreds of locations based on a grid that covers the known areas of contamination. This drilling provides an additional pathway to groundwater since the borings will necessarily allow for rainwater migration. It is well established on this site that fractured bedrock is trapping contaminants that can't be logically impacted by soil mixing...

In essence, the extremely high levels of CVOCs in fractured bedrock hinder any bioremediation, either natural or through injection. However, no efforts to date have been made to determine the impacts stemming from the deep injection of supplements to stimulate abiotic or biotic transformation of these compounds. (Comment 80)

The DEP must clarify how challenges such as duration of remediations effects, potential for production of toxic daughter compounds (Comments 72, 75, 100)

Care needs to be taken in the chemicals used to OXY/REDUX for fear of converting to a form of PFAS due to incomplete reaction. Not cost effective....(Comments 32, 41)

This DNAPL will be a continuing source to the groundwater and Little Valley Creek (Comment 64)

Won't DNAPL be a continual source of contamination affecting the environment in an ongoing manner? (Comment 94)

Project management by both the PADEP and the Bishop Tube Project Team must address challenging site conditions for remediation to be successful. Adaptive site management is a flexible approach to evaluating and adjusting remediation in an iterative fashion. This can include ongoing performance assessment and rapid modification to remedial strategies. Such an approach may assist in addressing the challenges present at the Site (e.g., Interstate Technology Regulatory Council [ITRC] guidance on Remediation Management of Complex Sites).

15) How will the PADEP implement adaptive management techniques, such as rapid adjustments in remedial methods, including the designation of sufficient staff and resources to such management?

16) What approaches will the PADEP require in order to overcome challenges such as effective distribution of chemicals used for remediation, generation of toxic daughter products, and potential for rapid rebound in groundwater concentrations?

18) Should remedial injections fail to achieve the levels consistent with demonstration of residential standards and or other RAOs, will additional rounds of injections, not included in the proposed remedy or cost estimates, be required by the PADEP? (Comment 93)

Will these injections continue to be monitored and their impact on Little Valley Creek and the surrounding neighborhood? (Comment 26)

Ongoing monitoring of the air, bedrock and water should be maintained for years. (Comment 40)

I was expecting a cleanup over all this time, not what sounds like a partial cleanup and dilution of the pollution. (Comment 85)

DEP response to comments regarding Proposed Remedy Implementation

Please refer to GES's responses #59 through #67 for detailed technical responses.

1,4-Dioxane: 1,4-Dioxane is listed in DEP’s Analysis of Alternatives and Proposed Response (“AOA”) as a contaminant of concern. Although, 1,4-Dioxane was detected in a localized area above its Statewide health standard (“SHS”) on the Source Property, it did not exceed the SHS in downgradient monitoring well samples. Additional sampling will be required to demonstrate attainment of the SHS or site-specific standard. As described by GES in response #59, the presence of 1,4-Dioxane will not affect the remedial design.

The proposed remedial actions for soil, OU1: Alternative 5 - In Situ Chemical Oxidation/In Situ Chemical Reduction (“ISCO/ISCR”), Coupled with Soil Mixing, and, for groundwater, OU2: Alternative 3 – In Situ Injection (ISCO/ISCR/Bioremediation), are not considered by DEP to be a partial cleanup or dilution to the pollution. They address the contaminants by breaking them down into less harmful byproducts via chemical or biological processes. For the soil remedy, soil mixing was proposed to overcome problems with distribution of amendments, which were reported in the October 2015 Treatability Study Completion Report prepared by Roux Associates. Soil mixing would also eliminate preferential migration pathways resulting from variations in the soil porosity. The chemical reactions induced by ISCR and ISCO can also address dense non-aqueous phase liquid (“DNAPL”). If ISCR and/or bioremediation amendments are used, enhanced biological transformation would be expected to continue after the direct chemical reactions have diminished, addressing rebound effects. Additional information about soil mixing can be found on the technology description page for Large Diameter Auger Mixing at the Federal Remediation Technologies Roundtable website, please refer to the Reference Section of this document for the link to the website.

In footnote 106, on page 100 of the 2021 Feasibility Study, Roux Associates described potentially deleterious effects related to the ISCR alternative in groundwater:

106 Potential deleterious effects exist for this in-situ injection RA [remedial alternative]. Injecting in-situ amendments in fractured bedrock is complex and injecting large quantities of amendments in immediate proximity to the LVC [Little Valley Creek] tributary also poses significant implementability concerns (e.g., human health and/or ecological risks that do not currently exist). Implementation concerns include a) dissolution of adsorbed-phase COCs [contaminants of concern] and a consequent increase in the rate of discharge or migration of these COCs, b) discharge of the amendments themselves into the adjacent stream, c) injection measures could modify the groundwater flow and COC transport conditions which could cause undesirable conditions such as creation of VI [vapor intrusion] exposure routes that do not currently exist, d) injection measures/amendments could be incompatible with observed natural attenuation mechanisms active at the Site, e) injection measures could cause COCs or the amendments themselves to discharge at land surface (i.e., “day-lighting”) and potentially produce adverse effects on human health and the environment, f) ineffective delivery of the amendment to the desired treatment intervals, g) loss of amendment to less-impacted but more transmissive bedrock fractures (i.e., not the desired fracture network where high CVOCs [chlorinated volatile organic compounds] are located), h) loss of amendment to subsurface infrastructure (e.g., the abandoned AS/SVE [air sparging/soil vapor extraction] piping network), i) rebound effects after treatment including anticipated

matrix back diffusion, and j) amendments to treat inorganic COCs in groundwater will not treat fluoride.

To address these concerns, the design phase of the project, including pre-design investigation and design phase activities such as tracer and pilot tests, will serve to guide planning for implementation including contingency planning to meet the challenges posed by high CVOC concentrations and complex geology. Soil mixing, coupled with amendment delivery, will facilitate better amendment distribution than other amendment delivery approaches such as fixed-point gravity injection, which proved difficult and yielded mixed results during the treatability study for shallow groundwater, performed by Roux Associates. As recommended in one of the comments, above, adaptive management strategies will be used to optimize success as work is performed in phases. This will require performance monitoring to measure success and monitor/mitigate potential negative effects. After active remediation is complete, a long-term monitoring program will continue to track progress toward meeting remedial action objectives, including assuring that exposure pathways remain closed.

Proposed Remedy Implementation – Contaminant Migration Concerns

Remedial design needs to describe adequate protection of LVC. Response needs to be implemented to not “further degrade” LVC. (*Paraphrase of Comments 40, 43, 48, 51, 67, 72, 82, 89, 95*)

How will Little Valley Creek be protected during the remediation process? (Comment 94)

The remediation plan must prevent or minimize any leaching of chemicals to nearby Little Valley Creek, an Exceptional Value stream. (Comment 46)

12) What potential impacts to LVC will be evaluated, what will be the nature of the evaluation, and how will the PADEP determine if risks to LVC require mitigation?

13) If mitigation of impacts to the LVC is required, what types of mitigation may be implemented within or outside of the scope of the proposed remedy?

14) Could and under what conditions, would the risks to the LVC outweigh the benefits of remediation in one or more treatment area?

32) What measures for protection of the environment will be required during the active portion of remedial action? If not known at this time, how will these measures be determined? (Comment 93)

While the recommendation notes that Alternative 3 “would be focused on limited hot spot areas of the Source Property, which continue to act as ongoing sources of groundwater contamination migrating beneath downgradient properties and resulting in the diffuse discharge of contaminated groundwater to LVC,” it also notes the potential for negative impacts as a result. Specifically, the Remail Response Action plan states, “In situ injection may not be viable for hot spot areas (i.e., acid rinse spill area) in close proximity to LVC because of potential negative impacts to surface water.” How, specifically does DEP plan to use this option to target and address hotspots without further negatively impacting surface water? (Comment 80)

GC6 – The DEP’s Proposed Remedial Approach Includes BMPs to Protect the Environment. The FS Report includes a complete discussion of BMPs proposed to protect the environment, in particular the LVC

tributary (in addition to soil source remediation measures). These BMPs were developed, in part at the direction of DEP, as an approach to address the anti-degradation Applicable or Relevant and Appropriate Requirement (“ARAR”) for the LVC tributary and hasten remediation by minimizing offsite transport of COCs. These BMPs were included in all remedial alternatives in the FS Report, despite the absence of any current risk to human health or ecologic receptors in LVC as described in the 2021 RIR and recognizing the presumed future reduction of COCs discharged to surface water based on a combination of source reduction measures and MNA for groundwater.

The proposed BMPs include stormwater controls to reduce sediment loading and promote clean water infiltration proximate to LVC, bioretention areas to serve similar functions related to stormwater discharge to LVC, phytotechnology to reduce diffuse groundwater loading to LVC, and impervious surfaces/stormwater controls to minimize new/future infiltration in residual source areas. These BMPs complement the in-situ source control measures.

GC8 – DEP Should Acknowledge that In-Situ Injections Present Significant Challenges. The FS thoroughly assessed the potential challenges associated with the remedial approaches for groundwater, including the strengths and limitations of certain remedial technologies. Injecting amendments in fractured bedrock is a complex process and injecting amendments in immediate proximity to the LVC tributary (and its related wetlands) would pose implementability challenges (including in regard to the potential creation of risks that do not currently exist). These challenges would need to be managed using data collected during the PDI, through pre-design testing, bench-scale testing, and/or pilot testing prior to full implementation. Even then, an injection program should be scaled up carefully to monitor for and mitigate against any problematic effects that may arise and should only be implemented if it can be done safely and effectively. (Comment 97)

18. In the description of the Operational Unit 2 preferred alternative 3 for in situ injection (ISCO/ISCR/Bioremediation) to remediate contaminated groundwater there is the following statement: “In situ injection may not be viable for hot spot areas (i.e., acid rinse spill area) in close proximity to LVC because of potential negative impacts to surface water.” We agree; however, there is no indication of how the determination on what distance is too close will be made. This injection proximity caution also needs to be applied to the drainage swale that drains to LVC at the north end of the property, because there are contaminant hot spots in relatively close proximity to this water feature that is an ecological receptor. The methodology for determining the locations where injection will be avoided needs to be explained. How will LVC be protected?

19. Injection of treatment amendments may result in downward and/or lateral movement of the existing contaminants which could contribute to further spread of the contamination from soil to groundwater and/or from diffuse groundwater discharge to LVC. In the event contaminants and/or treatment amendments migrate via groundwater plume or discharge to LVC, there is no indication in the remediation plan of implementing prevention measures or developing a contingency plan to deal with such an adverse outcome. Although the proposed remediation includes performance monitoring, the frequency for such monitoring is not indicated. The VCTC requests that the closest groundwater wells and the surface water of LVC be sampled on a daily basis during the in situ treatment of both soils and groundwater, and thereafter on at least a monthly frequency to detect contaminant concentrations and the extent of their migration. A contingency plan needs to state that in situ injection treatment will cease immediately upon detection of increased concentrations of contaminant metals or VOCs in monitoring wells and LVC until such time that means can be designed and implemented to prevent such an occurrence.

20. If the proposed in situ treatment of soil and/or groundwater results in undesirable migration of contaminants to LVC or groundwater, it could take months before such an adverse outcome is detected and a means of prevention is designed and implemented to effectively stop the unwanted migration and

treat the areas of increased contamination. Rather than rely on performance monitoring or a contingency plan, it would be more advantageous to implement prevention measures prior to initiating the in situ treatment. A permeable reactive barrier (PRB) could be installed between LVC and the proposed areas for soil and groundwater treatment prior to any injection of treatment amendments. Following laboratory and field trials to determine the most effective treatment amendment to use for the reactive barrier, it could be installed parallel to LVC prior to the injections described for soil and groundwater treatment. Use of zero valent iron mixed with sand (to improve permeability) and bentonite (to improve removal of metals) is one potential material for installation in the PRB that could provide meaningful reduction in the metals entering LVC via groundwater.

22. Treatment chemicals injected as fluids into the ground for in situ treatment of contaminated soils and groundwater may displace (or “push”) contaminated pore water ahead of the injection front, leading to short-lived but dramatic changes in the distribution of groundwater contamination. So, concentrations of the contaminants may increase in some areas and the contaminant plume may spread. Explain the monitoring strategy that will be implemented to detect a spread of the groundwater contaminant plume and increases in the concentration of contaminants in groundwater and to LVC as a result of the in situ injection of treatment chemicals.

23. The Remedial Response Action should include a plan for future sampling to detect contaminant migration and increased concentrations, as well as planned contingency activities if contaminant concentrations leaving the site increase. Such a plan needs to specifically identify the groundwater well and surface water measurement locations which will be tested in the future to verify the expectation that groundwater contamination will not be migrating horizontally or vertically beyond the area of groundwater contamination existing prior to in situ treatment.

25. There is no indication that the remediation plan will maintain and preserve the existing riparian buffer of trees and shrubs along LVC. The “Feasibility Study” includes a site map depicting the application of phytoremediation through the proposed plantings of poplar trees and the installation of a trench filled with wood mulch parallel to the stream channel. The proposed treatment approaches would adversely impact the EV Wetlands adjacent to LVC. The plan to use phytoremediation by planting poplars in the LVC riparian corridor will be more harmful than helpful because there are existing mature trees performing a shallow groundwater uptake function that would likely be removed. The existing mature trees and shrubs are already providing phytoremediation and need to be retained. As illustrated in the Roux Feasibility Study at Figure 22 - Conceptual BMPs for LVC Tributary, it appears that the existing mature trees and shrubs would need to be removed for the placement of new trees and the installation of a mulch trench. Native species of poplars (such as Quaking Aspen and Big-tooth Aspen) could be planted within the riparian corridor to supplement the remediation provided by the existing trees. Removal of existing mature trees and shrubs in the riparian corridor is not recommended. However, the installation of a Permeable Reactive Barrier (PRB) within a trench paralleling LVC could be installed at a location setback further from the forested riparian corridor along LVC, so that removal of existing trees is unnecessary. The use of a PRB is not proposed as a replacement to in situ treatment of soils and groundwater, but as a supplemental treatment method. (Comment 92)

DEP response to comments regarding Proposed Remedy Implementation – Contaminant Migration Concerns.

Please refer to GES’s responses #68 through #73 for detailed technical responses.

As discussed above in the Pre-Remedial Design section, design activities including bench scale, pilot, and possibly tracer tests will be performed to determine the appropriate injection rates, locations and pressures for each area requiring treatment. Injection rates and pressures will be adjusted to avoid amendment migration to Little Valley Creek (“LVC”) and/or

displacement of contaminants of concern (“COCs”). Implementation will need to be conducted carefully and in a phased manner. Performance monitoring and contingency planning (including mitigation measures) will be incorporated into the implementation work plan. If amendment or COC migration outside targeted areas is noted, amendment injection will be halted, and mitigation plans will be implemented.

As discussed above, in the Remedy Selection section regarding comments supporting hydraulic control to prevent contaminant migration, the soil mixing remedy proposed to address OU1 may function as a hydraulic barrier, just west of LVC, where unsaturated and saturated soils are impacted by inorganic COCs and chlorinated volatile organic compounds (“CVOCs”). Use of clay (or bentonite) for decreasing permeability and increasing the contact time between COCs and reactive amendments will be considered during the design phase. It should be noted that the ISCR technology intended to address CVOCs and hexavalent chromium in soils may include use of zero valent iron (“ZVI”) as an amendment component. The technology description, provided by the Federal Remediation Technology Roundtable website for ISCR, listed in the Reference section, provides a more complete description of ISCR addition via soil mixing and injection.

Protection of LVC: The OU2 remedy will address the two significant CVOC source areas (i.e., the drum storage area and Plant #8 vapor degreaser area). Remedial design activities, including hydraulic conductivity evaluation, radius of influence evaluation and/or tracer testing will be necessary to evaluate injection point locations, injection pressures/rates and amendment dosing concentrations to address the contamination and protect LVC. Prior to initiating soil mixing activities, buried utilities will be identified and mapped to assure safety during intrusive work and to avoid undesirable migration of amendments through preferential pathways. Amendment delivery will be designed to address the COC source areas, while minimizing potential negative effects to LVC.

The examples of best management practices (“BMPs”) provided in the 2021 Feasibility Study (“2021 FS”) prepared by Roux Associates were conceptual in nature and would ultimately be subject to site-specific design considerations. Appendix D of the 2021 FS discusses construction of a bioretention area (also commonly called a rain garden) to filter sediment from stormwater runoff and form a clean water infiltration barrier between COC source areas and LVC. According to the Pennsylvania Stormwater Best Management Practices Manual, which was listed as “to be considered” in Appendix B (the Applicable, or Relevant and Appropriate, Requirements (“ARARs”) of the Analysis of Alternatives and Proposed Response (“AOA”), “*Bioretention is a method of treating stormwater by pooling water on the surface and allowing filtering and settling of suspended solids and sediment at the mulch layer, prior to entering the plant/soil/microbe complex media for infiltration and pollutant removal*”. DEP agrees that removal of mature trees on the eastern side of LVC may be counterproductive. However, if mature trees die, institutional controls would require replacement plantings to maintain the service provided by existing mature trees and shrubs. Phyto-remediation plantings on the western side of LVC, which is currently covered by asphalt, may be beneficial. As noted in the FS, the bioretention area would be designed to capture sediment, serve as a hydraulic barrier to COC migration and provide for clean water recharge to LVC.

Proposed Remedy Implementation – Engineering and Institutional Controls

21. For both Operational Unit 1 and 2, the engineering and institutional controls (ECs and ICs) that will or may be used are not specified. Again, such details are currently unknown and will be determined in the future. The variety of engineering and institutional controls that are likely to be used need to be specified in the Remedial Response Action. The need for ECs and ICs indicates that contamination will remain in place after the remedial action. In our experience, most of these controls break human exposure pathways and not exposure pathways to ecological receptors. Any proposed controls need to break the contaminant exposure pathways to ecological receptors. (Comment 92)

Much of the site will have trenches excavated to install utilities. Some of this excavation will be 20 feet deep and more in proximity to known contamination. If the remediation is not adequate, this material will be excavated and there is no requirement or guidance on the approved land development plans of how to protect workers and the public, or keep potentially contaminated materials contained on site. (Comments 45, 98)

28) For which properties, and at what frequency, will the PADEP require ongoing monitoring of indoor air quality and inspection/or changes pertaining to vapor intrusion? If this has not yet been determined, when will the community be informed of the PADEP's decision regarding this matter?

35) Given the uncertain and extended time frame of remediation, at what point in the remedial process will the nature of required institutional and engineering controls be determined?

42) How does PADEP intend to provide oversight of vapor intrusion mitigation systems associated with future development? Will these activities be managed as part of the present remediation or through a separate remediation?

44) Considering the extended timeline of remediation and Site redevelopment, as well as the division of remedial responsibilities and exposure pathways between multiple parties, how will the PADEP ensure that all potential exposure pathways associated with the Site are adequately controlled now and in the future (Comment 93)

DEP response to comments regarding Proposed Remedy Implementation – Engineering and Institutional Controls.

Please refer to GES's responses #74 and #75 for detailed technical responses.

In the Analysis of Alternatives and Proposed Response (“AOA”), engineering and institutional controls for OU1 and OU2 are described as common elements for all alternatives except “No Action”. These measures are also included as a stand alone alternative to address soils (OU1). Engineering controls may include vapor intrusion mitigation for future construction or modification to existing structures, capping, vegetative cover, phytoremediation and stormwater controls to minimize infiltration in source areas, mitigate diffuse discharge of contaminants of concern (“COCs”) via groundwater, and control sediment transport to Little Valley Creek. Institutional controls in the form of activity and use limitations (“AULs”) will be enacted to assure that new exposure pathways are not opened and to protect and ensure maintenance of the engineering controls. AULs will include provisions requiring proper soil management and worker/community protection for excavation activities on the Source Property.

A plan for implementing engineering and institutional controls for properties within 100 ft, of the Site boundary,² as identified on Figure 48 of the 2021 RIR will be incorporated into the remedial design phase of work. A long-term monitoring plan, which will include monitoring of these controls, will be prepared during the remedial design processes and updated as needed moving forward. Implementation of these plans will be overseen by DEP.

² The location of the site boundary, is subject to change, based on results of planned pre-design investigation activities near the northeast corner of the Source Property.

REFERENCES

Below is a list of documents or websites that DEP referenced to compile these responses. Note the list does not include documents previously included in the Administrative Record for the Site.

1. DEP, April 24, 2004, Environmental Justice Public Participation Policy, Document Number: 012-0501-002: [www.depgreenport.state.pa.us/elibrary/GetDocument?docId=7918&DocName=ENVIRONMENTAL JUSTICE PUBLIC PARTICIPATION POLICY.PDF](http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=7918&DocName=ENVIRONMENTAL%20JUSTICE%20PUBLIC%20PARTICIPATION%20POLICY.PDF)
2. Clu-in website for Activated Carbon-Based Technology for In Situ Remediation (Table 1) [https://clu-in.org/techfocus/default.focus/sec/Activated Carbon-Based Technology for In Situ Remediation/cat/Overview/](https://clu-in.org/techfocus/default.focus/sec/Activated_Carbon-Based_Technology_for_In_Situ_Remediation/cat/Overview/): [https://clu-in.org/techfocus/default.focus/sec/Activated Carbon-Based Technology for In Situ Remediation/cat/Overview/](https://clu-in.org/techfocus/default.focus/sec/Activated_Carbon-Based_Technology_for_In_Situ_Remediation/cat/Overview/)
3. Interstate Technology and Regulatory Council (ITRC), December 2021, PFAS Technical and Regulatory Guidance Document: <https://pfas-1.itrcweb.org/2-6-pfas-releases-to-the-environment/>
4. USEPA, September 1993, Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration: <https://semspub.epa.gov/work/06/9351189.pdf>
5. Sloto, R. A., 1990, Geohydrology and Simulation of Groundwater Flow in the Carbonate Rocks of the Valley Creek Basin, Eastern Chester County, Pennsylvania; United States Geological Survey Water Resources Investigations Report. 89-4169.: <https://pubs.usgs.gov/wri/1989/4169/report.pdf>
6. DEP, January 19, 2019, Land Recycling Program Technical Guidance Manual, Document Number: 261-0300-101: <https://www.dep.pa.gov/Business/Land/LandRecycling/Standards-Guidance-Procedures/Guidance-Technical-Tools/Pages/Technical-Guidance-Manual.aspx>
7. EPA, 2021, Community Guide to In Situ Chemical Reduction: <https://semspub.epa.gov/work/HQ/401603.pdf>
8. EPA, 2021, Community Guide to In Situ Chemical Oxidation: <https://semspub.epa.gov/work/HQ/401601.pdf>
9. EPA, 2021, Community Guide to Bioremediation: <https://semspub.epa.gov/work/HQ/401583.pdf>
10. Environmental Solutions, EHC® Reagent, Product Sheet: <https://peroxychem.com/media/191081/peroxychem-ehc-product-sheet.pdf>
11. Environmental Solutions, MetaFix Reagent, Product Sheet: [PeroxyChem-MetaFix-Product-Sheet-64-03-ESD-18.pdf](https://peroxychem.com/media/191081/peroxychem-metafix-product-sheet-64-03-ESD-18.pdf)
12. EVONIK, SAFETY DATA SHEET - EHC® Metals Reagent: https://peroxychem-sds.thewerks.com/private/document.aspx?prd=EHCM-C%7E%7EPDF%7E%7EMTR%7E%7EAGHS%7E%7EEN%7E%7E1/1/0001%2012%3A00%3A00%20AM%7E%7EEHC%AE%20METALS%20REAGENT%7E%7E&page=NewSearch&plant=d_CPG-PXD&language=d_-1&format=d_-1&subformat=d_-1&publisheddate_condition=d_eq&productID_option=d_value~&productName=ehc&productName_option=d_~value~
13. EVONIK, SAFETY DATA SHEET - METAFIX: https://peroxychem-sds.thewerks.com/private/document.aspx?prd=METAFIX3%7E%7EPDF%7E%7EMTR%7E%7EAGHS%7E%7EEN%7E%7E1/1/0001%2012%3A00%3A00%20AM%7E%7EMETAFIX%7CTS%20REAGENT%7E%7E&page=NewSearch&VIEWSTATEGENERATOR=D6323F43&plant=d_-1&language=d_-1&format=d_-1&subformat=d_-1&publisheddate_condition=d_eq&productID_option=d_value~&productName=metafix&productName_option=d_~value~
14. Clu-in website for Green Remediation Best Management Practices: Bioremediation: https://clu-in.org/greenremediation/docs/GR_factsheet_biorem_32410.pdf

15. Federal Remediation Technologies Roundtable – Technology Screening Matrix – Large Diameter Auger Mixing: <https://frtr.gov/matrix/Large-Diameter-Auger-Mixing/>
16. Federal Remediation Technologies Roundtable – Technology Screening Matrix – In Situ Chemical Reduction: <https://frtr.gov/matrix/In-Situ-Chemical-Reduction/>
17. DEP, December 30, 2006 Pennsylvania Stormwater Best Management Practices Manual, Chapter 6, Document Number: 363-0300-002:
https://www.stormwaterpa.org/assets/media/BMP_manual/chapter_6/Chapter_6-4-5.pdf