



Stantec Consulting Services Inc.  
1060 Andrew Drive, Suite 140  
West Chester PA 19380

July 19, 2022  
File: 213403364

VIA OnBase Electronic Forms Upload

**Attention: Lisa Strobridge, P.G.**  
Pennsylvania Department of Environmental Protection  
2 East Main Street  
Norristown, Pennsylvania 19401

Dear Ms. Strobridge,

**Reference: Response to Public Comments**  
**Sitewide Remedial Investigation Report Addendum,**  
**Sitewide PADEP Facility ID No. 780190**  
**Former Philadelphia Refinery**  
**3144 Passyunk Avenue**  
**City of Philadelphia**  
**Philadelphia County**

## 1.0 INTRODUCTION

On May 20, 2022, Evergreen submitted a Sitewide Remedial Investigation Report (RIR) Addendum for the Former Philadelphia Refinery (facility). As outlined in Evergreen's 2019 Public Involvement Plan for the Act 2 Remediation Process at the Former Sunoco Philadelphia Refinery, Evergreen accepted public comments for a 30-day period following the submission of the Sitewide RIR Addendum. The purpose of this letter is to provide the comments received from the public and Evergreen's responses to these comments for Pennsylvania Department of Environmental Protection (PADEP) and US Environmental Protection Agency (EPA) consideration of the Sitewide RIR Addendum. This response letter amends the previously submitted Sitewide RIR Addendum and completes the submission. This response letter and attachments will be posted to Evergreen's website upon submission to the PADEP in the posted location of the Sitewide RIR Addendum.

## 2.0 RESPONSE TO PUBLIC COMMENTS

This section presents the comments received from the public via email ([phillyrefinerycleanup@ghd.com](mailto:phillyrefinerycleanup@ghd.com)), the website (<https://phillyrefinerycleanup.info/>), and United States Postal Service mail (PO Box 7275, Wilmington, Delaware, 19803). Evergreen received two sets of comments for the Sitewide RIR Addendum, one directly from the Clean Air Council (CAC) and one from Brickhouse Environmental (Brickhouse) via email and website submission (**Attachment A**). One of the sets of emailed comments is not related to the content of the Sitewide RIR Addendum; however, it was received during the comment period and will be addressed herein. Comments received were technical in nature when considered in full; therefore, the responses provided herein are also technical and not "plain language" so that the comments could adequately be addressed and evaluated by PADEP as part of the Sitewide RIR Addendum review.

**Reference:** Response to Public Comments Sitewide Remedial Investigation Report Addendum, Former Philadelphia Refinery

Note that previously published Evergreen documents referenced in this letter have not been included as attachments but can be found on the website (<https://phillyrefinerycleanup.info/>).

## **RESPONSES TO CAC COMMENTS**

### **Comment 1**

Evergreen should delineate lead contamination according to the soil-to-groundwater numeric value (450 mg/kg) and the direct contact numeric value (1000 mg/kg), as appropriate, rather than according to an outdated and erroneous site-specific standard (2240 mg/kg).

### **Response to Comment 1**

Regarding the application of the soil to groundwater numeric value for lead, CAC states that Evergreen should apply this value for soils that are within the soil buffer distance for lead of 10 feet. CAC refers to the soil buffer distance as established in § 250.308. It is one of the considerations to use when applying the soil to groundwater MSCs under the Statewide Health Standard (SHS). Evergreen has not selected the SHS as its selected standard for lead in soil or groundwater and is therefore not bound by the specific requirements of this route to demonstrate attainment. Evergreen is also not required to delineate to a standard that it has not selected as its remediation standard.

Regarding the direct contact numeric value, as described in Section 2.3 and shown on Figures 2-1 and 2-2 of the Sitewide RIR Addendum, Evergreen has delineated lead concentrations in surface soil to the direct contact numeric value of 1,000 milligrams per kilogram (mg/kg) at the property boundary. Also as described in Section 2.3, Evergreen plans to recalculate its current site-specific standard (SSS) for lead in surface soil or select the new direct contact numeric value as its selected standard for lead in surface soil once the value has been promulgated. Due to the current uncertainty of the exact numeric value, Evergreen has not changed its selected standard yet and is therefore not required to delineate to the current direct contact numeric value. However, Evergreen has delineated to the current direct contact numeric value of its own accord. The exception to this, as described in additional detail in Section 3.4, is in one area of Area of Interest (AOI) 9. Data is presented in the Sitewide RIR Addendum demonstrating surface soil lead impacts in this area are due to historic placement of fill as part of regional development within the City of Philadelphia.

### **Comment 1a**

The site-specific standard of 2240 mg/kg is based on an outdated blood lead level that is harmful to human health.

### **Response to Comment 1a**

CAC has made clear that it disagrees with the use of the current SSS for lead in surface soil of 2,240 mg/kg. The response to Comment 1 reiterates Evergreen's intention with respect to the current SSS for lead in surface soil. Although PADEP has not formalized changes with respect to Evergreen's current SSS or its own direct contact numeric value, the Sitewide RIR Addendum described the steps Evergreen has taken to prepare for a future change.

**Reference:** Response to Public Comments Sitewide Remedial Investigation Report Addendum, Former Philadelphia Refinery

### **Comment 1b**

The Department and Evergreen should abandon altogether the notion of a site-specific standard for lead, as it is based on the Adult Lead Model, which does not address the propensity of lead to migrate from soil to groundwater.

### **Response to Comment 1b**

In its description of options that CAC presents as alternatives to the current SSS for lead in surface soil of 2,240 mg/kg, CAC omits the pathway elimination option which is clearly permitted under Act 2. In this comment CAC emphasizes the use of the soil to groundwater numeric value. This value must be used if the selected remediation standard for the site is the SHS. However, it is not required to be used as the method to evaluate the soil to groundwater pathway under the SSS. In previous AOI-specific RIRs such as Section 1.6.1 of the December 21, 2017 AOI 8 RIR and the March 27, 2017 AOI 4 RIR, Evergreen presented that the soil-to-groundwater pathway will be addressed in the groundwater investigation and remedial measures and, PADEP has concurred with this approach. The Sitewide Fate and Transport RIR, submitted on June 30, 2022 provides a detailed evaluation of the projected movement of lead in groundwater and surface water using Evergreen's large groundwater dataset (several decades of data). Additionally, the main sources for lead in soil and groundwater are releases from processes associated with leaded gasoline and placement of historic fill, which are not recent sources.

### **Comment 1c**

Evergreen has not properly delineated lead contamination across the site according to the 1000 mg/kg direct contact numeric value.

### **Response to Comment 1c**

CAC uses a specific example to assert that "Evergreen has failed to identify a large number of lead exceedances". The figure used as an example on page 13 of the CAC's comment document was included in the Sitewide RIR Addendum as an attachment to an appendix of the report that included previous documentation for completeness. The attachment was included for a different purpose, namely, to show previous investigation information for AOI 5 in support of the additional cumene investigation. The figure is from a response to PADEP comments on the 2017 AOI 5 RIR, and CAC has misinterpreted the meaning of the symbols on the figure. This misinterpretation is understandable considering the explanation of the symbols in the legend was ambiguous and there was no text to accompany the figure to provide clarification. To clarify, the symbols on the Figure 13 of the 2017 PADEP comment response letter were assigned the following colors with respect to exceedances: green to indicate "Surface Soil Boring Location with No Exceedance of Sitewide MSCs" and orange to indicate "Surface Soil Boring Location with Exceedance of the Sitewide MSCs". The term "Sitewide MSCs" was not defined on the figure. However, it was a term used by Evergreen consultants to indicate the endpoint of the soil screening process as described in the AOI-specific RIRs (the SSS for lead and the non-residential direct contact MSC for the remainder of compounds). This figure was not attempting to compare lead results to 1,000 mg/kg or 450 mg/kg as CAC has assumed. For comparisons of lead in surface soil to these values, CAC is referred to the figures that were more recently prepared for this express purpose (Sitewide RIR Addendum Figures 2-1 and 2-2). Detailed figures were also provided in Attachment 4 to the August 28, 2021 response to PADEP comments on the March 2021 RIR. On page 15 of CAC's comments, it is suggested that there are errors to these Attachment 4 figures, but CAC does not elaborate.

Reference: Response to Public Comments Sitewide Remedial Investigation Report Addendum, Former Philadelphia Refinery

### **Comment 1d**

Evergreen should not limit its delineation of lead contamination according to the 1000 mg/kg direct contact numeric value to only the site perimeter, but should do this throughout the site.

### **Response to Comment 1d**

As Evergreen has stated in previous response to CAC comments, such as in the November 29, 2021 response to CAC comments on the Second RIR Addendum for AOI 9 (Comment 2a), it is true that Evergreen has not tightly delineated to a value lower than the current SSS within the property boundary. However, Evergreen is not required to do so. Delineation to the current selected standard has been achieved. The intention of additional sampling was to collect more data near the property boundary to evaluate conditions closer to potential offsite receptors. Additionally, Hilco Redevelopment Partners (HRP) has collected and will collect many more samples that include lead analysis, and once placed in their final locations, plans to cap soils at the facility with concentrations of COCs detected above the direct contact standards, pursuant to the *Soil Management Plan* dated June 15, 2020 (an attachment to the Buyer/Seller Amendment) and approved by the PADEP and USEPA in a letter dated June 18, 2020. Capping is anticipated to demonstrate that the direct contact exposure pathway is incomplete, and attainment of the SSS through pathway elimination is anticipated to be the selected standard.

### **Comment 1e**

Evergreen should delineate lead according to the soil to groundwater numeric value of 450 mg/kg throughout most of the site.

### **Response to Comment 1e**

As discussed in the response to Comment 1 and Comment 1b, CAC is suggesting that Evergreen must delineate using rules for the SHS and goes through the details of the SHS selection process including the application of the soil buffer distance. Evergreen has not selected the SHS as its selected standard for lead in soil or groundwater and is therefore not bound by the specific requirements of this route to demonstrate attainment. Evergreen is also not required to delineate to a standard that it has not selected as its remediation standard.

As detailed in the response to Comment 1b, Evergreen has been clear in its previous AOI-specific RIRs that the soil to groundwater pathway will be addressed in the groundwater investigation and remedial measures.

### **Comment 1f**

Evergreen may not refuse to delineate contamination in AOI-9 according to the direct contact numeric value of 1000 mg/kg under the rationale that it is attributable to “historical fill” or “possibly vehicle emissions.”

### **Response to Comment 1f**

In this case, Evergreen has presented evidence that lead impacts in surface soil along Essington Avenue near the AOI 9 property boundary are not related to site operation, but rather regional infrastructure development including filling of the general area to mitigate flooding and the construction of Essington Avenue. Evergreen does not maintain the liability for regional historic filling practices unrelated to refinery operations that were conducted on property that neither Sunoco nor its predecessors ever owned.

**Reference:** Response to Public Comments Sitewide Remedial Investigation Report Addendum, Former Philadelphia Refinery

Evergreen intends to remediate impacts falling within the property boundary, and does not have an obligation to do so offsite in the referenced area as the impacts are not related to a release or Sunoco refinery operations.

The example of vehicle emissions was used as it is a specific example cited by PADEP as a potential source for background concentrations of lead. It is potentially applicable, but not critical to, the argument made about impacts from sources other than those Evergreen is responsible for. More relevant is the fact that regional filling was conducted in the area and has been documented at nearby properties. This is not Evergreen's responsibility to remediate.

## **Comment 2**

In its investigation of cumene in AOI-5, Evergreen inappropriately relied solely on the direct contact numeric value of 10,000 mg/kg, and failed to delineate contamination according to the soil to groundwater numeric value of 2500 mg/kg, where required by the regulations.

## **Response to Comment 2**

This comment is similar to Comment 1, Comment 1b, and Comment 1e but with respect to cumene instead of lead. Evergreen has not selected the SHS as its remediation standard for cumene in soil and is therefore not required to delineate to the SHS. Evergreen has selected the SSS via pathway elimination. For the direct contact pathway, the direct contact standard is used a threshold, and delineation of the direct contact standard was achieved. Evaluation of the soil to groundwater pathway is conducted through the groundwater evaluation. The Sitewide RIR Addendum presents groundwater data in addition to data included in the approved 2017 AOI 5 RIR.

Appendix C of the Sitewide RIR Addendum does discuss soil results with respect to the soil to groundwater value in text Section 4.1, text Section 5.3, Table 3, and Figure 2.

Typically, Evergreen does show soil data compared to the soil to groundwater value on its figures by using different symbol colors. The formatting of this information was different Figure 2 of the Appendix C, and instead showed this information by using color coding for the sample results in text boxes. An updated visual representation of this comparison is provided as **Attachment B** of this response to public comments to provide additional documentation of the comparison to the soil to groundwater value. Additionally, on page 25 of CAC's comments, Table 3 of Appendix C is reproduced with the comment that two samples were not identified as being in exceedance of the soil to groundwater value. However, CAC did not reproduce the notes that were presented on Table 3 in the original document. Note six states that "Orange-shaded values exceed the Soil-to-Groundwater MSC". The two values that CAC references are displayed as orange-shaded values, thereby noting them as exceedances of the soil to groundwater MSC.

## **Comment 3**

Evergreen may not refuse to investigate its pre-2012 contamination where a post-2012 release overlaps with it.

**Reference:** Response to Public Comments Sitewide Remedial Investigation Report Addendum, Former Philadelphia Refinery

### **Response to Comment 3**

This section of the Sitewide RIR was meant to provide additional information in areas where Evergreen has collected additional data to help determine whether a post-2012 release has occurred. For releases that HRP is responsible for remediating, Evergreen is stating that it is not responsible for reporting on or remediating post-2012 impacts. Evergreen will continue to report on these areas insofar as they relate to pre-2012 impacts. An example of this is the former Unit 136 area. HRP is responsible for the recent naphtha release and will report on its investigation and remediation with respect to that release. Evergreen is not responsible for investigation and reporting with respect to the PES release. However, Evergreen is responsible for pre-existing drums and LNAPL in that area and is in the process of completing an RIR solely for the area related to the drums and LNAPL to describe recent investigation and remediation activities related to the pre-2012 impacts. Evergreen believes that it and CAC are not in disagreement on the points made in this comment but perhaps there was misunderstanding by CAC of the intent of this section of the Sitewide RIR Addendum.

## **RESPONSE TO BRICKHOUSE COMMENTS**

### **Comment from Brickhouse**

PES should incorporate PFAS into the ongoing Act 2 process to allow for public participation and to understand the full extent of all environmental impacts the Site may be having on receptors, including but not limited to, drinking water receptors in New Jersey and ecological receptors in and along the Delaware River. The levels of PFOA and PFOS detected at the PES site in both shallow and deep groundwater are orders of magnitude higher than EPA's new Health Advisory Levels of 0.004 ppt for PFOA and 0.02 ppt for PFOS.

### **Response to Comment from Brickhouse**

This comment is not related to the content of the Sitewide RIR Addendum; however, it was received during the comment period and is addressed herein.

One of the commenter's main concerns is that since per- and polyfluoroalkyl substances (PFAS) are not one of Evergreen's Act 2 constituents of concern, the summary reports that have been completed to present the results of groundwater sampling for PFAS have not been subject to the formal 30-day public comment period. However, Evergreen has been providing response to any and all comments received regarding PFAS and clearly the public has the opportunity to review and comment on PFAS results as exemplified by submittal of the comments by Brickhouse Environmental. Evergreen will continue to receive and address comments, even if the comments are not specifically part of a 30-day public comment period for a formal Act 2 report, as has been conducted historically. It appears that the commenter is aware of the PFAS work that Evergreen has performed at the site so far, but for completeness, general PFAS information and site sampling results are available on Evergreen's website for the facility at <https://phillyrefinerycleanup.info/pfas/>. The commenter also continues to reference New Jersey drinking water as a concern for impacts from the facility. The concern has been addressed in the past and is reiterated here for completeness. The following is an excerpt from Evergreen's August 27, 2021 correspondence to PADEP that included response to technical deficiencies of the March 31, 2021 Public Comment Remedial Investigation Report:

Reference: Response to Public Comments Sitewide Remedial Investigation Report Addendum, Former Philadelphia Refinery

- “On May 14, 2021, the PADEP received the information below from Mr. Jeffrey Hoffman, NJ State Geologist, from the NJ DEP’s Geological & Water Survey in response to their questions about potential impacts from the former Philadelphia Refinery’s groundwater contamination on New Jersey water supplies (emphasis added):

*‘At this time NJDEP does not consider PFAS contamination at the former Philadelphia Refinery to be a threat to NJ via a flow path through the lower PRM aquifer. This is based on several lines of reasoning:*

*1) The lower PRM is the water table aquifer at the site and is very shallow under the Delaware River. We consider the Delaware River to be recharging this aquifer. As such, it is likely a recharge boundary to any contaminants that might be entering it on the Pa side. Studies conducted in the PRM aquifer system within New Jersey indicate that the Delaware River acts as a significant hydraulic flow boundary limiting any groundwater source area from extending to the Pennsylvania side of the Delaware River. More information is in Pope and Watt, 2005 (<https://pubs.er.usgs.gov/publication/sir20045101>) and Navoy and Carleton, 1995 (<https://www.state.nj.us/dep/njgs/pricelst/greport/gsr38.pdf>).*

*2) That the Delaware River acts as a recharge boundary is supported by aquifer tests in NJ conducted in the lower PRM close to the river. These tests show significant leakage which would not occur if the Delaware River was not a recharge boundary.*

*3) NJDEP delineated well head protection areas for unconfined wells within the Potomac using the methods detailed in Spayd and Johnson, 2003, available at <https://www.state.nj.us/dep/njgs/pricelst/ofreport/ofr03-1.pdf>. These calculated areas represent the source areas to wells based on three time of travel intervals of 2, 5 and 12 years. The delineated source areas indicate that no wells completed within the Potomac Formation in NJ have well head protection areas which extend into Pennsylvania.*

*4) Reported water quality data ([https://www9.state.nj.us/DEP\\_WaterWatch\\_public/](https://www9.state.nj.us/DEP_WaterWatch_public/)) indicate no contamination is present in supply wells for the National Park Water Department, which are the closest NJ supply wells to the Philadelphia Energy Solutions refinery. The refinery has been in operation for more than 100 years and it appears that no measurable contamination has migrated to these wells. All public supply wells in New Jersey are required to monitor and report water quality data quarterly therefore any potential contaminants would be identified.*

***At this time NJDEP believes the existing hydrogeologic, geologic and water quality data indicate any contaminants that may be in the subsurface at the PES refinery in Philadelphia do not pose a threat to water supply wells in the PRM aquifer system in NJ. ‘***

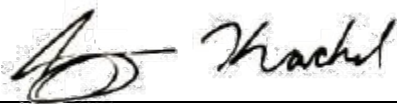
- On May 7, 2021 the PADEP had a conference call with Steve Maybury of the NJ DEP’s Site Remediation Program who shared the following information with the PADEP (emphasis added):

Reference: Response to Public Comments Sitewide Remedial Investigation Report Addendum, Former Philadelphia Refinery

- There were significant sources of PFAS along the Delaware River in northern Gloucester County, including the Solvay and former Dupont facilities.
- NJ DEP has inferred that PFAS discharged to surface water was pulled by reverse flow into the aquifer by pumping of supply wells in the area.
- Public supply wells in the area are tested for contaminants, including PFAS.
- Public and private supply wells impacted by PFAS in the area are treated.
- **NJ DEP has not attributed this contamination to Pennsylvania sources.**
- Further information on wellhead protection zones is available on NJ DEP's GIS page.
- Additional information on public supply well testing is available on the Drinking Water Watch website."

Regards,

**Stantec Consulting Services Inc**



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**Jenny Kachel, P.G.**  
Geologist



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**Andrew Klingbeil, P.G.**  
Associate Geologist

Enclosures: Attachment A – Public Comments  
Attachment B– Revised Appendix C, Figure 2- 2021 Cumene Investigation

- c. Tiffani Doerr (Evergreen)  
Scott Cullinan (Evergreen)  
Kevin Bilash (USEPA)  
India McGhee (City of Philadelphia)  
Jennifer Menges (Stantec)



**ATTACHMENT A**  
**Public Comments**



**Pennsylvania Department of Environmental Protection**

**Philadelphia Refinery Operations, a series of Evergreen  
Resources Group, LLC**

**a series of Evergreen Resources Group, LLC**

**On behalf of Sunoco, Inc. (R&M), now known as Sunoco (R&M), LLC**

**Sitewide Remedial Investigation Report Addendum**

**Stantec Consulting Services Inc.**

**May 20, 2022**

**Former Philadelphia Refinery**

**3144 Passyunk Avenue**

**Philadelphia, Pennsylvania**

**Sitewide PADEP Facility ID No. 780190**

**Written Comments by Clean Air Council**

**June 19, 2022**

Clean Air Council (“the Council”) appreciates the opportunity to provide comments on Philadelphia Refinery Operations’ (“Evergreen’s”) Sitewide Remedial Investigation Report Addendum at the former Philadelphia refinery. The report was prepared by Evergreen on behalf of Sunoco, Inc. (R&M), now known as Sunoco (R&M), LLC (“Sunoco”). Sunoco is the party legally responsible for contamination prior to its sale of the property in 2012. The remedial investigation is subject to review by the Department of Environmental Protection (“the Department”). The report is located here: [Sitewide RIR Addendum\\_2022](#).

The Council is a non-profit environmental organization headquartered at 135 South 19th Street, Suite 300, Philadelphia, Pennsylvania, 19103. For 50 years, the Council has worked to improve air quality across Pennsylvania. The Council has members throughout the Commonwealth who support its mission to protect everyone’s right to breathe clean air, including members in Allegheny County.

Evergreen prepared the report for submission to the Pennsylvania Department of Environmental Protection (“the Department”) under Act 2 of 1995. *See* Evergreen, [Act 2 Documents](#). The report was prepared pursuant to the [2003 Consent Order and Agreement](#) (2003 consent order), [Buyer-Seller Agreement](#) (2012 consent order), and [First Amendment to Consent Order and Agreement](#) (2020 revised consent order).

The comments are submitted in response to this notice:



## Submittal of an Act 2 Report

Pursuant to the Land Recycling and Environmental Remediation Standards Act, the act of May 19, 1995, P.L. 4, No. 1995-2., notice is hereby given that Evergreen is submitting a **Sitewide Remedial Investigation Report Addendum** (note: this is not the Fate & Transport Report) to the Pennsylvania Department of Environmental Protection for the former Philadelphia Refinery located at 3144 Passyunk Avenue, City of Philadelphia, Philadelphia County, Pennsylvania on May 20, 2022. The report is being submitted in accordance with the site-specific remediation standards. The Act 2 public comment period associated with the report will be 30 days in duration following the report submittal on May 20, 2022, extending through June 19, 2022. Comments can be sent to Evergreen via the website <https://phillyrefinerycleanup.info/comment-submission-form>, via email at [phillyrefinerycleanup@ghd.com](mailto:phillyrefinerycleanup@ghd.com), or via US Postal Service to PO Box 7275, Wilmington, DE 19803. All comments and questions pertinent to the report which are submitted within the 30-day review period, will be addressed by Evergreen and will be submitted to the PADEP/EPA as part of the official report submission. The report will not be considered Final by PADEP/EPA until Evergreen has submitted public comments along with an appropriate response/action to be considered by PADEP/EPA in their review of the report.

The report can be accessed and downloaded from Evergreen's website starting May 20, 2022 <https://phillyrefinerycleanup.info/act-2-documents/> and are also available at two local Free Library of Philadelphia branches: Thomas F. Donatucci, Sr. Library at 1935 Shunk St. and Eastwick Library at 2851 Island Avenue.

## Reminder - Evergreen's Next Public Meeting

Join us for our upcoming virtual public meeting at **6 PM on Tuesday, May 24, 2022**. [Registration is now open](#). During the meeting, we will be covering:

- **Fate and Transport**

All documents cited in these comments are hyperlinked or attached. The colored highlighting or underscoring in the quoted and snipped passages was added by the Council for emphasis.

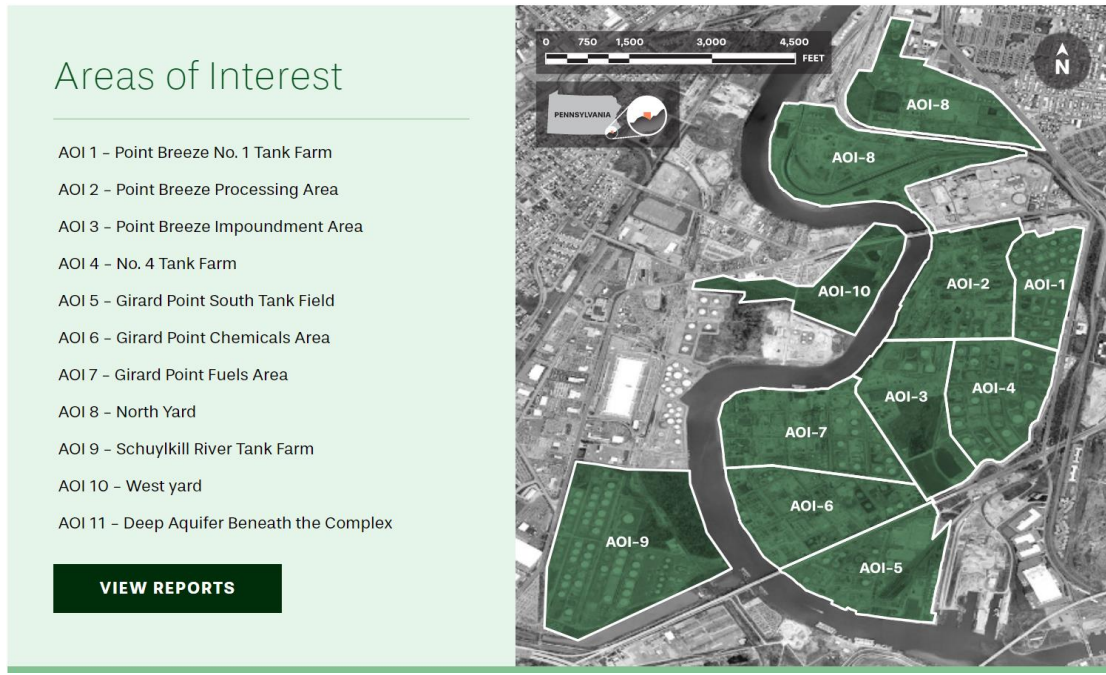
## Index to Comments

1. Evergreen should delineate lead contamination according to the soil-to-groundwater numeric value (450 mg/kg) and the direct contact numeric value (1000 mg/kg), as appropriate, rather than according to an outdated and erroneous site-specific standard (2240 mg/kg).
  - a. The site-specific standard of 2240 mg/kg is based on an outdated blood lead level that is harmful to human health.
  - b. The Department and Evergreen should abandon altogether the notion of a site-specific standard for lead, as it is based on the Adult Lead Model, which does not address the propensity of lead to migrate from soil to groundwater.
  - c. Evergreen has not properly delineated lead contamination across the site according to the 1000 mg/kg direct contact numeric value.
  - d. Evergreen should not limit its delineation of lead contamination according to the 1000 mg/kg direct contract numeric value to only the site perimeter, but should do this throughout the site.
  - e. Evergreen should delineate lead according to the soil-to-groundwater numeric value of 450 mg/kg throughout most of the site.
  - f. Evergreen may not refuse to delineate contamination in AOI-9 according to the direct contact numeric value of 1000 mg/kg under the rationale that it is attributable to "historical fill" or "possibly vehicle emissions."
2. In its investigation of cumene in AOI-5, Evergreen inappropriately relied solely on the direct contact numeric value of 10,000 mg/kg, and failed to delineate contamination according to the soil-to-groundwater numeric value of 2500 mg/kg, where required by the regulations.
3. Evergreen may not refuse to investigate its pre-2012 contamination where a post-2012 release overlaps with it.

**Table of Attachments**

Attachment 1	AOI-5 Lead samples in excess of NRDC, soil-to-groundwater numeric value, or groundwater MSC (compiled by Clean Air Council)
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## Areas of Interest



Source: Evergreen, [Home - PRLR](#)

## Summary of Comments

The Council is providing comments on Evergreen's 2022 Sitewide Remedial Investigation Report regarding the nature and extent of contamination in the soil and groundwater at the former Philadelphia refinery. Evergreen made the report dated May 20, 2022 available on its website. For convenience, this report will be referred to as "Proposed Addendum."

The site specific standard for lead of 2,240 mg/kg approved for Evergreen in 2015 is outdated and harmful to both human health and the environment. Instead, Evergreen should delineate lead in surface soil according to the direct contact numeric value of 1000 mg/kg in areas where the soil buffer depth (as defined by the Chapter 250 regulations) is more than 10ft. In areas where groundwater is closer to the surface than this buffer depth, Evergreen should apply the soil-to-groundwater numeric value of 450 mg/kg. In these comments, Figures for AOI-5 are used to demonstrate the erroneous delineation of lead, but this problem affects a number of areas of interest where groundwater is close to the surface (for example, AOI-9). Finally, Evergreen cannot avoid responsibility to investigate pre-2012 contamination under the rationale that it consists of historical fill or "potential vehicle emissions." This is a false distinction that Evergreen is attempting to use to avoid responsibility for properly delineating lead contamination in AOI-9.

Evergreen has failed to accurately delineate cumene contamination in AOI-5. The chapter 250 regulations set the buffer depth for cumene at 15 ft. In AOI-5, groundwater is much closer to the surface. Evergreen erroneously delineated according to the direct contact numeric value of 10,000 mg/kg, instead of the soil-to-groundwater numeric value of 2500 mg/kg. The importance of using the soil-to-groundwater numeric value is underscored by the presence of high cumene concentrations in groundwater on the site, which indicates leaching from soil. As a result, the delineation of cumene does not comply with the regulations.

The Department should be cautious about Evergreen's assertion that some contamination is due to recent releases. Even if a release has occurred after 2012 Evergreen is still responsible for pre-existing contamination where they converge. In such a heavily contaminated site as the former Philadelphia refinery, such a convergence is to be expected. Therefore, it should not stop an investigation for its own contamination simply because there might be other post-2012 releases.

## Comments

1. **Evergreen should delineate lead contamination according to the soil-to-groundwater numeric value (450 mg/kg) and the direct contact numeric value (1000 mg/kg), as appropriate, rather than according to an outdated and erroneous site-specific standard (2240 mg/kg).**

In 2015, the Department approved a site-specific standard of 2,240 mg/kg for lead in surface soil for the entire site. That site-specific standard was less stringent than the nonresidential direct contact numeric value of 1000 mg/kg (Evergreen uses the term NRDC) and the soil-to-groundwater numeric value of 450 mg/kg. Because this site-specific standard is based on outdated data and its application would cause harm to people onsite and the environment, it should be rescinded. (The Department still has not rescinded it).

Evergreen anticipates that the site-specific standard will be rescinded:

*currently used in the PADEP's NRDC MSC calculations and Evergreen's SSS calculations. PADEP is currently considering decreasing the target blood lead level in its NRDC MSC calculations to 5 µg/dL, which would result in a value close to the current surface soil NRDC MSC for lead of 1,000 mg/kg. Although Evergreen has not yet changed its selection of the SSS for lead of 2,240 mg/kg as previously approved by the PADEP, it anticipates either recalculating the value to be consistent with future changes made to the PADEP calculations or using the anticipated updated NRDC MSC. Although it would be calculated using a different model and altered inputs, the potential future 0 to 2 ft bgs NRDC MSC is anticipated to be close in magnitude to the current value of 1,000 mg/kg.*

In anticipation of these potentially forthcoming changes, Evergreen identified areas near the perimeter of the former Philadelphia Refinery where lead concentrations exceeded 1,000 mg/kg as these areas will likely eventually require delineation to the "new" lead NRDC MSC in surface soil for future Act 2 activities beyond remedial investigations. On several dates in 2021 and in January 2022, Stantec used a stainless-steel hand auger to collect shallow (0 to 2 ft bgs) soil samples near the property boundaries. A total of 34 samples were collected and submitted to Eurofins Lancaster Laboratories or SGS North America, Inc. for lead analysis via USEPA Method 6010. Analytical results and a comparison to the non-residential soil to groundwater (S to GW) MSC, the current SSS, and the current NRDC MSC as a stand-in for the potential "new" MSC, can be found in Table 2-1 and are also depicted on Figure 2-1 (AOIs 1-8 and AOI 10) and Figure 2-2 (AOI 9). Delineation to 1,000 mg/kg was achieved in all sampling areas except for the northwest corner of AOI 9, which is discussed further in this report.

See Proposed Addendum, page 5 (emphasis added).

In addition to rescinding the site-specific standard, the Department should abandon entirely the notion that it can develop a site-specific standard for lead, because it would not be protective of the environment. The model on which it is based – the Adult Lead Model – does not contemplate the migration of lead in soil to groundwater, which is a particularly sensitive question where there is a high water table, as there is at the former refinery.

According to the chapter 250 regulations for lead, Evergreen should apply the direct contract numeric value of 1000 mg/kg in areas where groundwater is more than 10 ft below the surface, and the soil-to-groundwater numeric value of 450 mg/kg in areas where groundwater is within the 10 ft buffer. This would also follow what Evergreen says it does for contaminants generally.



- a. The site-specific standard of 2240 mg/kg is based on an outdated blood lead level that is harmful to human health.

In 2015, the Department approved a site-specific standard for lead of 2,240 mg/kg. *See* Pennsylvania Department of Environmental Protection, Letter dated May 6, 2015, [PADEP Letter Lead HHRA 20150506](#). This value was based on a target lead blood level of 10 ug/dL using the EPA's Adult Lead Model. *See* Langan Human Health Risk Assessment Report, February 24, 2015, [Philadelphia Refinery Lead HHRA 02-24-15](#).

However, the model used outdated inputs. In 2017, the EPA published an update to the model using as a default a target lead blood level of 5 ug/dL. *See* U.S. EPA, [OLEM Directive 9285.6-56, Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters](#) (May 17, 2017). It should be noted that the Centers for Disease Control and Prevention have recently lowered their blood lead reference value to 3.5 ug/dL. *See* Centers for Disease Control and Prevention, [Blood Lead Reference Value](#), ("CDC uses a blood lead reference value (BLRV) of 3.5 micrograms per deciliter (µg/dL) to identify children with blood lead levels that are higher than most children's levels") (Page last reviewed: October 27, 2021) (visited June 18, 2022).

The Department should rescind the site-specific standard of 2,240 mg/kg. It is not protective of human health because it is based on an outdated target lead blood level that is too high and that is harmful to health. *see also*

- b. The Department and Evergreen should abandon altogether the notion of a site-specific standard for lead, as it is based on the Adult Lead Model, which does not address the propensity of lead to migrate from soil to groundwater.

Because the site-specific standard of 2,240 mg/kg is not valid, Evergreen has one of two options: (1) apply the direct contact numeric value (NRDC) or the soil-to-groundwater numeric value (where appropriate), or (2) submit a new request for a site-specific standard. In the Proposed Addendum, Evergreen indicates it may pursue either option. *See* Proposed Addendum, page 5 (emphasis added).

Under both options, the direct contact numeric value and the site-specific standard should numerically be the same, as they would be based on the running of the Adult Lead Model with the same, current, input values. This number would be approximately 1000 mg/kg.

But there is one significant difference in these options. Without a site-specific standard, Evergreen would have to apply the soil-to-groundwater numeric value of 450 mg/kg to areas where the soil buffer depth is less than 10 ft:

**Table 4—Medium-Specific Concentrations (MSCs) for Inorganic Regulated Substances in Soil**  
**B. Soil to Groundwater Numeric Values<sup>1</sup>**

REGULATED SUBSTANCE	CASRN	Used Aquifers								Nonuse Aquifers				Soil Buffer Distance (feet)
		TDS <= 2500				TDS > 2500				R		NR		
		R		NR		R		NR		R		NR		
		100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	100 X GW MSC	Generic Value	
ALUMINUM	7429-90-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	7440-36-0	0.6	27	0.6	27	60	2,700	60	2,700	600	27,000	600	27,000	15
ARSENIC	7440-38-2	1	29	1	29	100	2,900	100	2,900	1,000	29,000	1,000	29,000	15
BARIUM AND COMPOUNDS	7440-39-3	200	8,200	200	8,200	20,000	190,000	20,000	190,000	190,000	190,000	190,000	190,000	15
BERYLLIUM	7440-41-7	0.4	320	0.4	320	40	32,000	40	32,000	400	190,000	400	190,000	10
BORON AND COMPOUNDS	7440-42-8	600	1,900	600	1,900	60,000	190,000	60,000	190,000	190,000	190,000	190,000	190,000	30
CADMIUM	7440-43-9	0.5	38	0.5	38	50	3,800	50	3,800	500	38,000	500	38,000	15
CHROMIUM (III)	16065-83-1	10	190,000	10	190,000	1,000	190,000	1,000	190,000	10,000	190,000	10,000	190,000	5
CHROMIUM (VI)	18540-29-9	10	190	10	190	1,000	19,000	1,000	19,000	10,000	190,000	10,000	190,000	15
COBALT	7440-48-4	1	59	4	160	130	5,900	350	16,000	1,300	59,000	3,500	160,000	15
COPPER	7440-50-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CYANIDE, FREE	57-12-5	20	200	20	200	2,000	20,000	2,000	20,000	20,000	190,000	20,000	190,000	20
FLUORIDE	16984-48-8	400	44	400	44	40,000	4,400	40,000	4,400	190,000	44,000	190,000	44,000	NA
IRON	7439-89-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>LEAD</b>	<b>7439-92-1</b>	<b>0.5</b>	<b>450</b>	<b>0.5</b>	<b>450</b>	<b>50</b>	<b>45,000</b>	<b>50</b>	<b>45,000</b>	<b>500</b>	<b>190,000</b>	<b>500</b>	<b>190,000</b>	<b>30</b>
LITHIUM	7439-93-2	8	2,500	23	6,900	830	190,000	2,300	190,000	8,300	190,000	23,000	190,000	10
MANGANESE	7439-96-5	30	2,000	30	2,000	3,000	190,000	3,000	190,000	30,000	190,000	30,000	190,000	15
MERCURY	7439-97-6	0.2	10	0.2	10	20	1,000	20	1,000	200	10,000	200	10,000	15
MOLYBDENUM	7439-98-7	4	650	4	650	400	65,000	400	65,000	4,000	190,000	4,000	190,000	15
NICKEL	7440-02-0	10	650	10	650	1,000	65,000	1,000	65,000	10,000	190,000	10,000	190,000	15
PERCHLORATE	7790-98-9	1.5	0.17	1.5	0.17	150	17	150	17	1,500	170	1,500	170	NA
SELENIUM	7782-49-2	5	26	5	26	500	2,600	500	2,600	5,000	26,000	5,000	26,000	20
SILVER	7440-22-4	10	84	10	84	1,000	8,400	1,000	8,400	10,000	84,000	10,000	84,000	20
STRONTIUM	7440-24-6	400	44	400	44	40,000	4,400	40,000	4,400	190,000	44,000	190,000	44,000	NA
THALLIUM	7440-28-0	0.2	14	0.2	14	20	1,400	20	1,400	200	14,000	200	14,000	15
TIN	7440-31-5	2,500	190,000	7,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	190,000	10
VANADIUM	7440-62-2	0.29	290	0.82	820	29	29,000	82	82,000	290	190,000	820	190,000	5
ZINC	7440-66-6	200	12,000	200	12,000	20,000	190,000	20,000	190,000	190,000	190,000	190,000	190,000	15

<sup>1</sup>For other options see Section 250.308  
All concentrations in mg/kg  
R—Residential  
NR—Non-Residential  
NA—Not Applicable

See 25 Pa. Code, chapter 250, Table 4B (emphasis added).

Because the soil buffer depth is less than 10 ft throughout much of the entire site of the former Philadelphia refinery, lead exceedances should be determined primarily by the 450 mg/kg value.

Approving a site-specific standard for lead that is higher than the soil-to-groundwater numeric value would violate Act 2, which only allows the use of a site-specific standard if it would be protective of both human health and the environment:

Section 301. Remediation standards.

(a) Standards.--Any person who proposes or is required to respond to the release of a regulated substance at a site and who wants to be eligible for the cleanup liability protection under Chapter 5 shall select and attain compliance with one or more of the following environmental standards when conducting remediation activities:

(1) a background standard which achieves background as further specified in section 302;

(2) a Statewide health standard adopted by the Environmental Quality Board which achieves a uniform Statewide health-based level so that any substantial present or probable future risk to human health and the environment is eliminated as specified in section 303; or

(3) a site-specific standard which achieves remediation levels based on a site-specific risk assessment so that any substantial present or probable future risk to human health and the environment is eliminated or reduced to protective levels based upon the present or currently planned future use of the property comprising the site as specified in section 304.

See Act 2 of 1995, Section 301(a)3) (emphasis added).

Applying a site-specific standard value of 1000 mg/kg for lead, rather than the soil-to-groundwater numeric value 450 mg/kg would pose an environmental risk in areas where groundwater is near the surface. This is due to the very different end-points used to determine these numeric values.

As calculated by the Adult Lead Model, the direct contact numeric value for lead is intended to prevent the blood lead level of fetuses whose mothers have been exposed to the soil from exceeding a specified target value:

To predict blood lead concentration and the probability of a child's blood lead concentration exceeding the target blood lead level based on a given multimedia exposure scenario, one can apply a model which considers lead exposure and toxicokinetics in a receptor – i.e., a child (using the IEUBK model) or fetus (using the Adult Lead Methodology (ALM)) to derive an exposure level that satisfies the risk reduction goal.

See U.S. EPA, Lead at Superfund Sites: Risk Assessment, <https://www.epa.gov/superfund/lead-superfund-sites-risk-assessment>.

Applying the model, a value of 1000-1050 mg/kg would assume that no more than 5% of pregnant women and their fetuses (the target population of the ALM model) would have a lead blood level higher than 5 ug/dL, the value used as default by the EPA. See *id.*, see also U.S. EPA, [OLEM Directive 9285.6-56, Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters](#) (May 17, 2017).

In contrast, the soil-to-groundwater numeric value is set to prevent a given contaminant from leaching into groundwater and causing the water concentration to exceed a groundwater-regulated value:

$\rho_b$  (kg/L) = dry bulk density of soil (default value = 1.8 kg/l)

DF = dilution factor (default value = 100)

(4) For inorganic regulated substances, a generic value determined not to produce a concentration in groundwater in the aquifer in excess of the MSC for groundwater as calculated by the equation in paragraph (5) and listed in Appendix A, Table 4B.

(i) For soil not in the zone of groundwater saturation, the generic value shall be calculated by the equation in paragraph (5).

(ii) For soil in the zone of groundwater saturation, the standard is 1/10th of the generic value calculated by the equation in paragraph (5).

See 25 Pa. Code §250.308(a)(4) (emphasis added). In determining the soil-to-groundwater numeric value, the Department considers a buffer depth that is protective of migration to groundwater, as defined in the regulations:

(2) The buffer distances listed for regulated substances in Tables 3B and 4B were determined by the Department using these equations to model the distance that the regulated substance travels from the bottom of the first 4 feet of contaminated soil through the soil column in 30 years at a concentration at or above 1  $\mu$ G/L in the water infiltrating the soil.

See *id.*, 25 Pa. Code §250.308(c)(2) (emphasis added).

Clearly, the direct contact numeric value and the soil-to-groundwater numeric value have different purposes. The first is to protect the specified human population, and the second is to prevent lead leaching into groundwater and causing environmental harm. To protect the environment and groundwater contamination as required by Act 2, the soil-to-groundwater numeric value should be used where applicable, as defined by the soil buffer requirement.

It should be noted that Evergreen claims to apply the soil-to-groundwater numeric value for contaminants generally, as part of a screening process:

Evergreen does use the soil to groundwater value as part of its screening process for concentrations of constituents of concern in soil. Although the reports for AOI 9 did not fully explain the selection process as was done in other AOI RIRs, the same screening process was conducted. The screening rationale has not changed, as noted in Evergreen's response to PADEP's comments to previous RIRs that is quoted by the commenter. An example of where the soil screening process is detailed is in the 2017 RIR for AOI 8, Section 1.6.1 Selection of Applicable Standards: Soil:

See Evergreen Response to Public Comments (Second Remedial Investigation Report Addendum) (November 29, 2021), page 13 (emphasis added), [https://phillyrefinerycleanup.info/wp-content/uploads/2021/11/AOI9\\_2nd\\_RIR\\_Addendum\\_PC\\_Response\\_11-29-2021.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2021/11/AOI9_2nd_RIR_Addendum_PC_Response_11-29-2021.pdf).

The need for lead delineation based on the soil-to-groundwater numeric value is underscored by evidence of lead leaching into groundwater on site. For example, in the AOI-5 Remedial Investigation Report, sampling shows dozens of soil exceedances above the soil-to-groundwater numeric value. See AOI-5 Report, part 1 (January 16, 2017), Table 4 [https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery\\_AOI-5-](https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery_AOI-5-)

[RIR\\_01-16-17\\_Part1.pdf](#). There are more than 25 corresponding exceedances of the Medium-Specific Concentration for lead in groundwater – 5 ug/L. *See id.* Table 7. *See* Attachment 1 – AOI-5 Lead samples in excess of NRDC, soil-to-groundwater numeric value, or groundwater MSC (compiled by Clean Air Council).

Evergreen has offered no evidence to substantiate a site-specific standard less stringent than the soil-to-groundwater numeric value, given the height of the water table. In the language of the statute, Evergreen cannot show that the risk to the environment “is eliminated or reduced to protective levels” if a direct contact numeric value (or site-specific standard) of 1000 mg/kg is applied uniformly across the site.

Therefore, the Department and Evergreen should abandon altogether the notion of a site-specific standard for lead.

- c. Evergreen has not properly delineated lead contamination across the site according to the 1000 mg/kg direct contact numeric value.

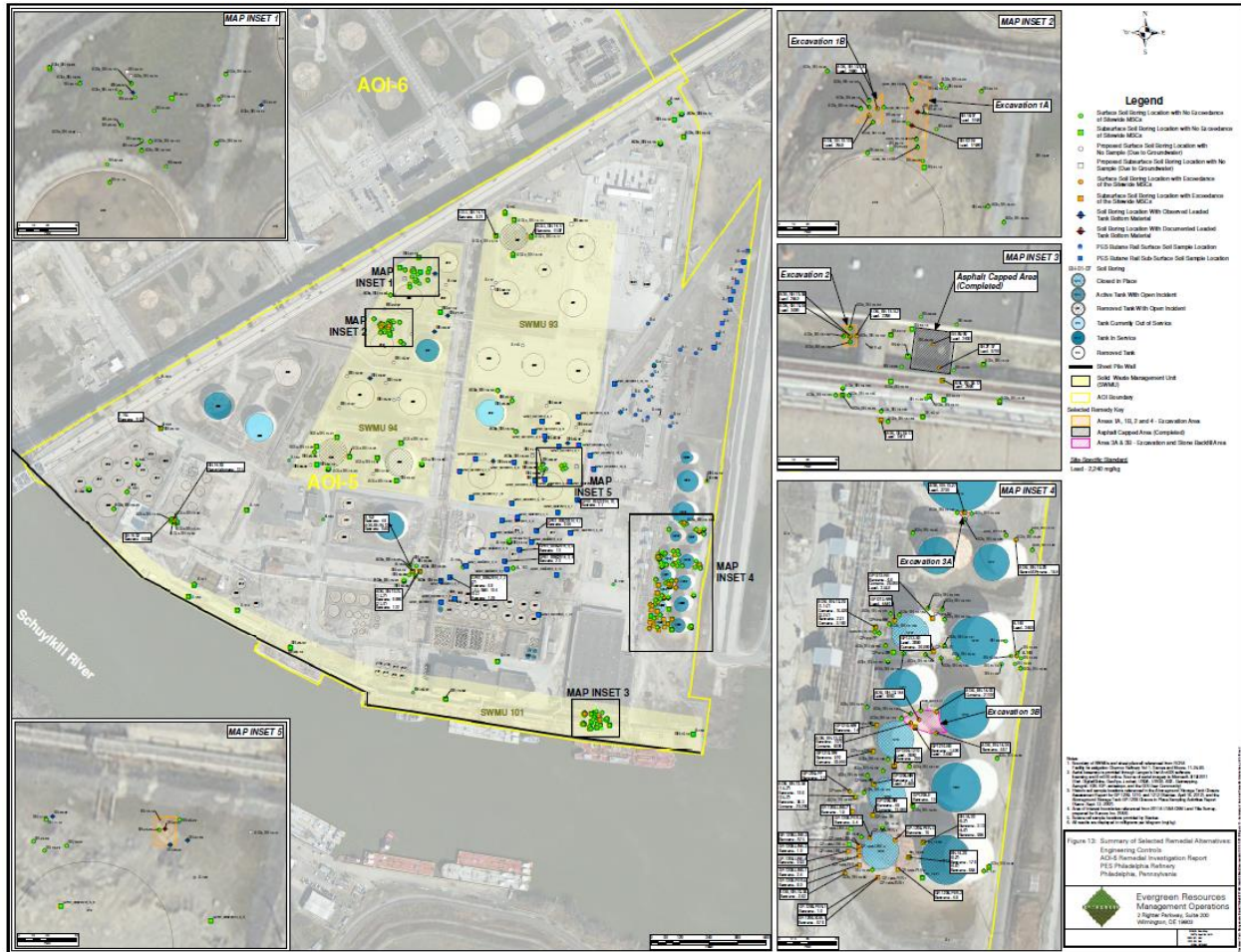
In the Proposed Addendum, Evergreen asserts that lead was delineated in the entire site (except for AOI-9) based on the direct contact numeric value of 1000 mg/kg.

**Lead:** Through the data presented in this Sitewide RIR Addendum, lead in surface soil has been delineated in AOIs 1-8 and AOI 10 to the NRDC MSC of 1,000 mg/kg which is lower than the current selected standard (SSS) of 2,240 mg/kg. In AOI 9, lead in onsite surface soil has been delineated to 1,000 mg/kg except for the northwestern corner of the AOI, which has been delineated to the current SSS. A detailed discussion of lead in soil in AOI 9 including a discussion of the history of the area and potential for sources related to historic fill is presented in Section 3.4.

*See* Proposed Addendum, page 7 (emphasis added). This assertion is erroneous because Evergreen has failed to identify a large number of lead exceedances, even outside AOI-9.

The Council will use AOI-5 as an example of how Evergreen has not identified many lead samples exceeding 1000 mg/kg.

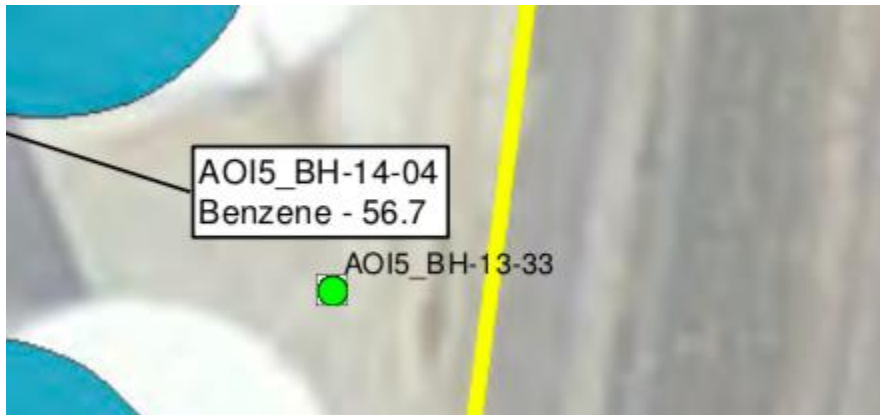
In the following Figure in the Proposed Addendum, Evergreen highlights exceedances of the direct contact numeric value of 1000 mg/kg for lead with orange circles:



See Proposed Addendum, Figure 13 (page 677 of 1435 in the pdf document)

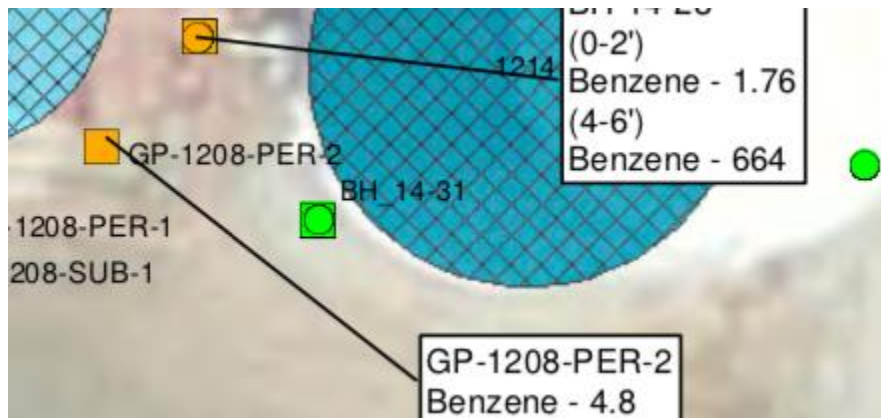
With respect to the AOI-5 remedial investigation report in 2017, the Council has counted more than 50 lead samples with concentrations above 1000 mg/kg. See AOI-5 Report, part 1 (January 16, 2017), Table 4, [https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery\\_AOI-5-RIR\\_01-16-17\\_Part1.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery_AOI-5-RIR_01-16-17_Part1.pdf); see also Attachment 1 – AOI-5 Lead samples in excess of NRDC, soil-to-groundwater numeric value, or groundwater MSC (compiled by Clean Air Council). Evergreen’s map in the Proposed Addendum shows only about half of these exceedances.

For example, Evergreen erroneously highlights sample AOI5\_BH-13-33 in green (see below), indicating that it is below the direct contact numeric value:



*See id.* (magnified). The measurement taken on March 7, 2013 was 1090 mg/kg, which is an exceedance.

Similarly, Evergreen erroneously highlighted sample Bh\_14-31 in green:



*See id.* (magnified). The measurement from June 19, 2014 was 1980 mg/kg.

The mischaracterization cannot be attributed to Evergreen’s claim to (sometimes) delineate only samples “near the perimeter” of the site based on the 1000 mg/kg value, as discussed in section (d) below. For example, Sample Bh\_14-31 is closer to the site boundary than other samples (e.g. GP-1209 SW) that are in the center of this specific site.

Erroneously marking lead sample values above 1000 mg/kg is not an isolated mischaracterization. The figures presented in Evergreen’s response to public comments show similar omissions:



See Evergreen’s Letter Response to Letter of Technical Deficiencies, Attachment 4 – Figure 1k, Figure 1l and Figure 1M, pdf pages 104-106, [https://phillyrefinerycleanup.info/wp-content/uploads/2021/09/Evergreen-Response\\_PC-RIR\\_20210828\\_Part1.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2021/09/Evergreen-Response_PC-RIR_20210828_Part1.pdf) (screenshot compiled by Clean Air Council from two Figures).

Based on AOI-5 data as an example, it is clear that Evergreen has substantially undercounted the number of lead samples in excess of 1000 mg/kg throughout the site.

- d. Evergreen should not limit its delineation of lead contamination according to the 1000 mg/kg direct contract numeric value to only the site perimeter, but should do this throughout the site.

In the Proposed Addendum, Evergreen asserts that lead was delineated in the entire site (except AOI-9) based on the direct contact numeric value of 1000 mg/kg. See e.g., Proposed Addendum, pages 7-8. However, in some places lead was delineated according to this numeric value only near the site perimeter:

In anticipation of these potentially forthcoming changes, Evergreen identified areas near the perimeter of the former Philadelphia Refinery where lead concentrations exceeded 1,000 mg/kg as these areas will likely eventually require delineation to the “new” lead NRDC MSC in surface soil for future Act 2 activities beyond remedial investigations. On several dates in 2021 and in January 2022, Stantec used a stainless-



See Proposed Addendum, page 5 (emphasis added). The implication is that Evergreen will not delineate according to the 1000 mg/kg value at locations other than the perimeter. This is wrong. Evergreen should do this throughout the site. Evergreen cannot pick and choose different standards for different locations on the site.

The planned changes in use of the site and its transition from an operating refinery to a “commercial hub” (see for example <https://www.thebellwetherdistrict.com>) underscore the need to delineate and remediate contamination appropriately throughout the site, and not only at the perimeter. This includes taking new samples in areas throughout the site where high lead concentrations were historically identified.

- e. Evergreen should delineate lead according to the soil-to-groundwater numeric value of 450 mg/kg throughout most of the site.

Evergreen’s delineation of lead throughout the site is severely deficient, as exceedances of the soil-to-groundwater numeric value 450 mg/kg have not been properly marked. Large areas of the refinery site have groundwater present at less than 10 ft below the surface – the soil buffer distance for lead. Therefore, the appropriate Medium-Specific Concentration is the soil-to-groundwater numeric value of 450 mg/kg throughout much of the site.

The following is the regulatory definition for Medium-Specific Concentrations in soil:

(d) For the nonresidential standard, the MSC for regulated substances contained in soil throughout the soil column to a depth of 2 feet from the existing ground surface is one of the following:

(1) The lowest of the following:

(i) The ingestion numeric value as determined by the methodology in § 250.306, using the appropriate default nonresidential exposure assumptions contained in § 250.306(e).

(ii) The inhalation numeric value which is the lower of the values for volatilization into the outdoor air and the inhalation of particulates, as determined by the methodology in § 250.307, using the appropriate default non-residential exposure assumptions contained in § 250.307(d).

(iii) The soil-to-groundwater pathway numeric value throughout the entire soil column as determined by the methodology in § 250.308.

(2) The lowest of paragraph (1)(i) or (ii) and, in addition, one of the following:

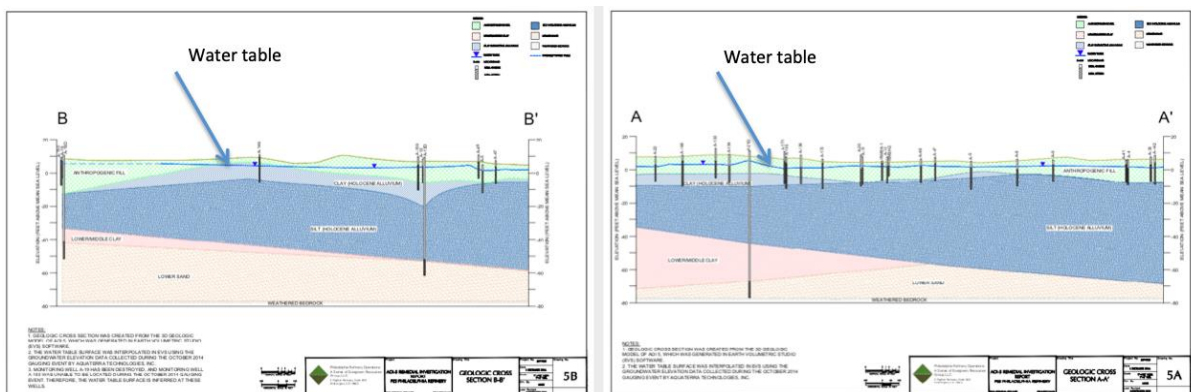
(i) A demonstration of the soil-to-groundwater pathway soil buffer as identified in § 250.308(b), if applicable.

(ii) A soil-to-groundwater pathway equivalency demonstration as identified in § 250.308(d).

(emphasis added). For purposes of these rules, the buffer depth for lead is 10 ft, as given in 25 Pa. Code, chapter 250, Table 4B.

Large areas of the refinery site have groundwater present at less than 10 ft below the surface. Therefore, the appropriate MSC is the soil-to-groundwater numeric value of 450 mg/kg throughout much of the site.

Using AOI-5 as an example, groundwater levels are very near the surface:



See AOI-5 Report, part 1 (January 16, 2017), [https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery\\_AOI-5-RIR\\_01-16-17\\_Part1.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery_AOI-5-RIR_01-16-17_Part1.pdf) (arrow designating “Water table” added by the Council); see also Table 2 for well data and Tables 3a and Table 3b for groundwater height in the same report.

The Council has identified at least 25 samples with lead above the soil-to-groundwater numeric value of 450 mg/kg but below the direct contact value of 1000 mg/kg. See Attachment 1 – AOI-5 Lead samples in excess of NRDC, soil-to-groundwater numeric value, or groundwater MSC (compiled by Clean Air Council). In contrast, the Figure presented in Evergreen’s response to public comments depicts only 13 such instances (marked in yellow), as can be seen in Figure 13 of the Proposed Addendum.

An accurate representation of the extent of lead contamination, as defined by the soil-to-groundwater numeric value, is important for protecting against the leaching of lead into groundwater at concentrations harmful to the environment. Again using AOI-5 as an example, the Council has counted more than 25 exceedances of the lead in groundwater MSC of 5 ug/L. See *id.*, see also AOI-5 Report, part 1 (January 16, 2017), Table 7, [https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery\\_AOI-5-RIR\\_01-16-17\\_Part1.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery_AOI-5-RIR_01-16-17_Part1.pdf). This indicates that exceedances of the soil-to-groundwater numeric value translate into exceedances of the groundwater standard for lead.

Evergreen should be incorporating the soil buffer distance of 10 feet for groundwater into its soil investigation, and properly delineating according to the soil-to-groundwater numeric value of 450 mg/kg, where appropriate.

- f. Evergreen may not refuse to delineate contamination in AOI-9 according to the direct contact numeric value of 1000 mg/kg under the rationale that it is attributable to “historical fill” or “possibly vehicle emissions.”

Evergreen attempts to delineate lead contamination in some areas of AOI-9 only according to the outdated site-specific standard of 2240 mg/kg, and not according to the direct contact numeric value or the soil-to-groundwater numeric value. It suggests that some of this contamination is attributable to “historical fill” and “possibly vehicle emissions,” and that this limits its responsibility. Evergreen’s assertion is flawed legally and factually.

Under the buyer-seller agreement, Evergreen is responsible for pre-2012 contamination onsite. That agreement does not carve out an exception for historical fill, which is an onsite problem rather than an offsite problem. Moreover, Evergreen and Sunoco cannot avoid responsibility for lead by asserting that it comes from “possibly vehicle emissions.” Evergreen has not shown that the contamination comes from an offsite source that is unrelated to onsite activities. It should be noted that the refinery was in the business of manufacturing leaded gasoline – which Evergreen suggests was the fault of consumers, rather than the refinery.

In the Proposed Addendum, Evergreen admits it has not delineated lead contamination in parts of AOI-9 according to the direct contact numeric value of 1,000 mg/kg:

**Lead:** Through the data presented in this Sitewide RIR Addendum, lead in surface soil has been delineated in AOIs 1-8 and AOI 10 to the NRDC MSC of 1,000 mg/kg which is lower than the current selected standard (SSS) of 2,240 mg/kg. In AOI 9, lead in onsite surface soil has been delineated to 1,000 mg/kg except for the northwestern corner of the AOI, which has been delineated to the current SSS. A detailed discussion of lead in soil in AOI 9 including a discussion of the history of the area and potential for sources related to historic fill is presented in **Section 3.4**.

*See id.*, page 7 (emphasis added).

Evergreen attempts to justify this by asserting that lead contamination is due to “historical fill” or “possibly vehicle emissions”:

*highways have been found to have elevated levels of lead.”* These lines of evidence lead to the conclusion that the elevated concentrations of lead in surface soil detected offsite near Essington Avenue are not related to potential onsite releases of lead-containing refinery materials, but instead from fill and/or possibly vehicle emissions. Lead that may have been related to onsite sources has been delineated to the current selected standard.

*See id.* p. 11 (emphasis added). Evergreen argues that the historical fill in AOI-9 predates the construction of the tank farm:

#### 3.4.2.3 Discussion of Distribution of Lead and Fill in AOI 9

The background information presented in **Section 3.4.2.2** provides multiple lines-of-evidence to support that significant thickness of historic fill was placed near Essington Avenue as well as in the eastern portion of AOI 9 prior to the construction of the tank farm. At least some of that fill, particularly in the east, consisted of dredge spoils placed by the City. Historical refinery consultant reports and online resources support that lowland along the Schuylkill River was used for trash dumping and possibly incinerator ash disposal that could have included the AOI 9 area. Any of these sources of fill could have contained lead. The

See Proposed Addendum, page 10 (emphasis added). Evergreen suggests that this is a cause of lead contamination in the area:

### 3.4.2 AOI 9

#### 3.4.2.1 Discussion of Soil Sampling Results

As previously mentioned, Section 4.4 of the AOI 9 Second RIR Addendum described the distribution of lead in surface soil in AOI 9 in detail. Since the submission of the AOI 9 Second RIR Addendum, 8 additional samples were collected in December 2021 and January 2022 to further characterize the northwestern portion of the Schuylkill River Tank Farm (SRTF) and areas immediately adjacent as April and August 2021 delineation samples AOI9-BH-21-03, AOI9-BH-21-04 and AOI9-BH-21-14 had concentrations of lead greater than the NRDC MSC (Figure 2-2). The delineation sampling could not be conducted prior to the Second RIR Addendum submission because of heavy vegetation making the area inaccessible. In December 2021, three samples were collected adjacent to Essington Avenue (AOI9-BH-21-15, AOI9-BH-21-16, and AOI9-BH-21-17) and two showed elevated concentrations of lead (AOI9-BH-21-16 at 5,500 mg/kg and AOI9-BH-21-17 at 2,100 mg/kg). As discussed in the Second RIR Addendum, this general area of Philadelphia is known to have experienced widespread historical filling. Evergreen decided to sample in between the AOI 9 boundary and Essington Avenue to investigate whether there was a pattern to the data that would suggest separation from lead onsite that may have potentially been associated with site activities from lead offsite that is likely associated with historic filling activities. The in between samples AOI9-BH-22-02 and AOI9-BH-22-05 show lower lead concentrations than the samples

See Proposed Addendum, Section 3.4.2.1, page 8 (emphasis added). Evergreen implies that Sunoco is not responsible for the onsite disposal of historical fill on the property:

highways have been found to have elevated levels of lead." These lines of evidence lead to the conclusion that the elevated concentrations of lead in surface soil detected offsite near Essington Avenue are not related to potential onsite releases of lead-containing refinery materials, but instead from fill and/or possibly vehicle emissions. Lead that may have been related to onsite sources has been delineated to the current selected standard.

See *id.*, Section 3.4.2.3, page 11 (emphasis added). But that is not the law and the facts do not support the suggestion.

Evergreen draws a meaningless distinction between historical fill and “potentially vehicle emissions” on the one hand, and “lead-containing refinery materials,” on the other, implying that it is liable for the latter but not the former. See *id.* Evergreen does not cite any provisions of the buyer-seller agreement as a basis for its implication that it does not have a responsibility to delineate contamination according to the direct contact numeric value in the manner it suggests. See Proposed Addendum, Sections 3.4.2.1, 3.4.2.2, and 3.4.2.3, pages 8-11.

In fact, this is not a distinction drawn by the buyer-seller agreement, and it is not a distinction that the Department should accept. The relevant definitions in the buyer-seller agreement are broad, and they encompass contamination arising out of the placement of historical fill on the ground or even “potentially vehicle emissions”:

e. “Hazardous Substance” shall mean any material, substance or waste that is: (i) listed, classified or regulated as a “hazardous waste,” “hazardous substance,” “contaminant,” “pollutant,” “toxic substance,” or terms of similar meaning or import as defined pursuant to any Applicable Environmental Law, or (ii) any petroleum product or by-product including all degradation compounds, friable asbestos, radioactive materials, urea formaldehyde

insulation or polychlorinated biphenyls, with respect to which liability or standards of conduct are imposed under any Applicable Environmental Law.

f. “Identified Contamination” shall mean all contamination currently known by the Parties to exist on the Property as reflected in the various studies and analyses performed on behalf of Sunoco, Inc. and as referenced in the reports referenced earlier in this Agreement, paragraph G, and as is reflected in other submissions by Sunoco to DEP regarding the Property.

i. “Pre-Existing Contamination” shall mean any Identified Contamination and any Releases on, under, to, or from the Site of Hazardous Substances associated with or from the Refinery Business or related operations on or before the Effective Date of this Agreement.

j. “Refinery Business” means the business conducted by any of Sunoco, its predecessors-in-interest and their subsidiaries at the Refinery, including the ownership and operation of the Refinery and the related chemical, energy and other commercial operations conducted by any of Sunoco, its predecessors-in-interest and their Affiliates in connection with the Refinery including the purchasing of upstream inventory and selling of downstream inventory, excluding (x) Sunoco’s retail and branded marketing business and wholesale rack gasoline and distillate business (even to the extent previously conducted in connection with the Refinery) and (y) any business of Sunoco or any of its Affiliates other than the ownership or operation of the Refinery or the Property.

k. “Release” shall mean any release, spill, emission, leaking, dumping, injection, pouring, pumping, placing, discarding, abandoning, deposit, disposal, discharge, migrating, or dispersal into, on, under, or through the environment (including ambient air, surface water, groundwater, land surface or subsurface strata).

Sunoco is legally responsible for the Identified Contamination and Pre-Existing Contamination (pre-dating the 2012 agreement):

#### **The Remediation Plan**

L. Seller intends to remediate the Identified and Pre-Existing Contamination. Seller signed a consent order with the Department in December 2003. The Cleanup Plans (“Plans”) will propose remediation of the Property to meet a Site-Specific Standard based on non-residential use of the Property, as those terms are used in Act 2. The Plans may be changed in the future, with the approval of the Department. Because the remedial standard is based on non-residential use of the Property, any other use, or any change in the exposure patterns on which the Plan is based, may require additional remediation of contamination remaining on the Property. Seller represents that it will have adequate financial resources to perform its obligations under this Agreement.

See [September 2012 Buyer-Seller Agreement](#), pages 4. This picks up the definitions of “Hazardous Substance,” “Refinery Business,” and “Release,” quoted above. See *id.*, pages 4-5 (Definitions).

The definition of “Refinery Business” is broad enough to encompass not only Evergreen’s narrow conception of refinery operations, but also related commercial operations of Sunoco on the property. This would include the dumping of fill on the property. This definition explicitly includes the operations of “predecessors-in-interest,” which would include owners before Sunoco at the time of the disposal of any historical fill.

In addition, the definition also includes the “selling of downstream inventory,” which would encompass the selling of leaded gasoline manufactured by the refinery that Evergreen implies has contributed to lead contamination on the property.

Sunoco is responsible for pre-2012 contamination. Sunoco and Evergreen may not avoid responsibility by selectively picking and choosing the pre-2012 contamination they want to investigate and remediate. Under the Buyer-Seller agreement, potential allocation of liability to a third party does not affect the obligation of Sunoco and Evergreen to investigate and remediate pre-2012 contamination now, and to properly apply the relevant cleanup standards.

All that Evergreen achieves by ticking off a summary of historical fill before 2012 is to underscore Sunoco’s liability for pre-2012 contamination. *See* Proposed Addendum, Sections 3.4.2.1, 3.4.2.2, and 3.4.2.3, pages 8-11.

Second, Evergreen has erroneously limited its delineation of this contamination to the outdated site-specific standard of 2240 mg/kg. *See id.*, pages 7, 15. It has not delineated this contamination to the direct contact numeric value and the soil-to-groundwater numeric value. *See id.* This is legally wrong because the regulations do not consider a responsible party’s consideration of its relevant fault for contamination, in the application of these numeric values. *See* Pa. Code § 250.308 (Soil to groundwater pathway numeric values), § 250.306(e) (Ingestion numeric values) (lead). As mentioned above, the outdated site-specific standard of 2240 mg/kg should not apply, regardless of questions of relative fault.

**2. In its investigation of cumene in AOI-5, Evergreen inappropriately relied solely on the direct contact numeric value of 10,000 mg/kg, and failed to delineate contamination according to the soil-to-groundwater numeric value of 2500 mg/kg, where required by the regulations.**

Evergreen has incorrectly delineated cumene in surface soil in AOI-5 using only the direct contact numeric value, and not using the soil-to-groundwater numeric value. As noted above, based on Section 250.305, the soil-to-groundwater numeric value applies if it is lower than the direct contact numeric value, and groundwater is within the buffer depth from the surface. Indeed, Evergreen claims to follow this regulatory requirement for all contaminants except lead. It made such a statement in its response to the Council's comments in the AOI-9 second remedial investigation report addendum dated November 29, 2021:

The more stringent of the soil to groundwater numeric value and the direct contact value was selected as the SHS for initial comparison of soil sample results.

See Evergreen Response to Public Comments (Second Remedial Investigation Report Addendum) (November 29, 2021), page 14 (emphasis added), [https://phillyrefinerycleanup.info/wp-content/uploads/2021/11/AOI9\\_2nd\\_RIR\\_Addendum\\_PC\\_Response\\_11-29-2021.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2021/11/AOI9_2nd_RIR_Addendum_PC_Response_11-29-2021.pdf). As noted, the water table is high throughout much of AOI-5, making the soil-to-groundwater numeric value relevant to the investigation in this area.

At the request of the Department, Evergreen conducted further investigation to delineate cumene contamination (a petroleum compound) in the East Tank area of AOI5. Cumene sampling was conducted primarily in the Eastern Tank Farm because of the past storage of cumene in tanks:

Petrochemical storage tanks in the Eastern Tank Farm were built in approximately 1960 and were used to store benzene and cumene. The names and locations of storage tanks in the former Eastern Tank Farm are shown on **Figure 2**. Multiple tanks may have stored cumene, including 1210, 1211, 1212, 1213, 1215, 1216, 1217, 1218, 1219, and 1220, according to facility tank reports, available PADEP tank closure reports, the 2017 SCR, and the 2012 Permeability Testing Results Letter for tanks 1215-1220.

See Proposed Addendum, page 131 of the PDF (emphasis added). Specifically, Evergreen stated that it delineated only according to the direct contact numeric value (which is 10,000 mg/kg):

- The horizontal extent of the elevated cumene detections were delineated to the east, north and south to the non-residential direct contact MSC, within the former Eastern Tank Farm. The cumene detection in GP1210-SW was not delineated to the west within the former Eastern Tank Farm but was delineated to the west by A-143 within AOI 5, as documented in the AOI 5 RIR and shown on **Figure 2**.

See *id.*, page 132 of the PDF (emphasis added). This was represented visually in the following Figure:





**Post-Excavation Cumene Concentrations Above Non-Residential Direct Contact MSC (10,000 mg/kg)**

<b>Sample</b>	<b>Cumene Concentration (mg/kg)</b>	<b>Interval (ft)</b>
<b>PE-3B-14-5</b>	12,400	2-2.5
<b>PE-3B-14-2</b>	12,200	2-2.5

**Historic Cumene Concentrations Above Non-Residential Direct Contact MSC (10,000 mg/kg)**

<b>Sample</b>	<b>Cumene Concentration (mg/kg)</b>	<b>Interval (ft)</b>
<b>AOI5_BH-13-29</b>	15,500	1-1.5
<b>AOI5_BH-14-03</b>	21,100	0-2
<b>GP1212-NE</b>	28,000	2.9-3.4
<b>GP1212-SE</b>	30,000	2.9-3.4
<b>GP1210-SW</b>	33,000	3.3-3.8
<b>AOI5_BH-13-34</b>	23,200	2.5-3
<b>GP1209-SW</b>	13,000	3-3.5

See Proposed Addendum, pages 148 and 149 of the PDF (emphasis added).

In the historical samples, there is one sample where the value exceeded the soil-to-groundwater numeric value that is not included in the Table. For AOI5\_BH-13-32\_1.5-2\_30613, cumene was measured at 9330 mg/kg.

In addition, the 2021 sampling results show at least two cases where the soil-to-groundwater numeric value was exceeded that were not identified in the summary table:

**TABLE 3  
2021 Cumene Investigation Results**

Location	Depth	Collection Date	Cumene in Soil (mg/kg)	Cumene SPLP (ug/l)
<b>Non-Residential Act 2 MSCs</b>			Direct Contact	10,000 mg/kg
			Soil to GW	2,500 mg/kg (unsaturated soil) 350 mg/kg (saturated soil)
			Groundwater	3,500 ug/l
BH-SH01	2.6-3	6/9/2021	<b>21,000</b>	<b>13,000</b>
	10-12	6/10/2021	180	-
BH-SH02	3.3-3.8	6/9/2021	5,000	-
	18-19	6/10/2021	Non-Detect	-
BH-SH03	0-2	6/10/2021	<b>47,000</b>	<b>42,000</b>
	24-25	6/9/2021	Non-detect	-
BH-SH04	2.9-3.4	6/9/2021	<b>14,000</b>	<b>59,000</b>
	2.9-3.4 DUP	6/9/2021	10,000	-
	14-15	6/9/2021	3.1	-
BH-SH05	2.9-3.4	6/9/2021	120	-
	14-15	6/9/2021	2	-

*See id.*, page 150 of the PDF. The two samples at 5,000 mg/kg and 10,000 mg/kg were not identified as exceedances in the table above.

This is material because Evergreen’s own data show groundwater contaminated with cumene in that area. In fact, the main constituent of concern is cumene:

**3.3.2 Groundwater**

The main constituent of concern (COC) in groundwater in the Eastern Tank Farm area of AOI 5 is cumene. Elevated concentrations of cumene above the SHS were detected in three of the four newly installed wells but are delineated in the downgradient directions. Sampling conducted as a part of this investigation also detected benzene and lead at concentrations above the SHS, and these concentrations

*See id.*, page 7 (emphasis added).

Evergreen should revise its analysis to identify all cumene samples to which the soil-to-groundwater numeric value (2,500 mg/kg) applies, revise the list of cumene exceedances to show all relevant instances where cumene was found at values above 2,500 mg/kg, and re-examine the need to delineate cumene contamination based on the revised list of contaminated locations.

**3. Evergreen may not refuse to investigate its pre-2012 contamination where a post-2012 release overlaps with it.**

In the Proposed Addendum, Evergreen asserts it will not be investigating post-2012 releases. The Department should be very leery about this statement. Soil and groundwater contamination is widespread throughout the site. It is quite possible that a post-2012 release may converge with pre-2012 contamination. Evergreen may not turn off its investigation of its own contamination if it happens to overlap with a post-2012 release. Now, the focus should be on the investigation, which should not be curtailed if there is ambiguity regarding legal responsibility. Later, the responsible parties can allocate their own liability.

Under the [September 2012 Buyer-Seller Agreement](#) signed by Sunoco, Philadelphia Energy Solutions Refining and Marketing, LLC, and the Department, Sunoco is legally responsible for contamination that occurred prior to September 8, 2012.

On behalf of Sunoco, Evergreen has conducted analysis to assess potential releases that occurred after that date. According to Evergreen, the analysis suggested two areas where a release of contaminants may have occurred following 2012:

- S-77, East of Point Breeze Blending Control House (Unleaded gasoline in LNAPL)
- S-203, Tank PB 84 Area (LNAPL light to middle distillate range petroleum signature that may be consistent with a JP-8 or Jet-A fuel)

See Proposed Addendum, Section 3.5. Additionally, Philadelphia Energy Solutions, LLC has acknowledged responsibility for releases in AOI-3 and AOI-7.

As a result, Evergreen states that investigations of post-2012 releases will not be discussed in the Evergreen reports:

**PESRM Acknowledged Releases**

In a discussion of recent releases in the context of the conceptual site model, it is important to mention several releases at the property for which Philadelphia Energy Solutions Refining & Marketing, LLC (PESRM) has acknowledged responsibility. According to their Semi-Annual Remediation Status Report prepared by Terraphase Engineering, Inc. (Terraphase) in February 2022 and consistent with information presented by Hilco Redevelopment Partners (HRP) to the public in meeting settings, PESRM acknowledges liability for the following non-demolition related releases:

- 136 Naphtha Release Area (AOI 7)
- No. 3 Separator Release Area (AOI 7)
- UDEX Release Area (AOI 3)

Therefore, any post-Evergreen RIR investigation activities conducted in these areas in response to these releases will not be discussed in this report nor future Act 2 reports. In each of the release areas that PESRM is remediating, pre-existing contamination (i.e., contamination released prior to September 8, 2012) may also be present. Evergreen remains responsible for pre-existing contamination in these areas and throughout the Site.

*Id.*, page 13 (emphasis added). This is problematic because the relevant areas contain contamination that occurred prior to 2012. In fact, the Proposed Addendum clearly admits this. *See id.*, (emphasis added)

To illustrate, LNAPL was clearly identified in many of the wells on site in the AOI-7 report from 2012:

### 3.6 LNAPL Sampling

During the AOI 7 July 2010 groundwater gauging event, five monitoring wells (C-65, C-97, C-106, C-107 and C-143) in AOI 7 had measurable LNAPL. LNAPL samples from monitoring wells C-65, C-106, and C-107 were previously collected and characterized as part of the 2004 CCR. One new monitoring well (C-143), which was installed as part of the 2010 site characterization activities contained measurable LNAPL. Stantec collected a LNAPL sample from C-143 using direct sampling methods in accordance with the AOI 7 Work Plan.

In January 2012, an additional groundwater gauging event was conducted and 18 monitoring wells (C-106, C-64, C-65, C-97, C-143, WP14-2, C-147, C-148, C-150, C-151, C-152, C-153, C-154, C-161, C-162, C-166, C-167, and C-168) had measurable LNAPL. Aquaterra collected samples via direct sampling methods from the 12 newly installed monitoring wells (C-147, C-148, C-150, C-151, C-152, C-153, C-154, C-161, C-162, C-166, C-167, and C-168) where LNAPL was present.

See AOI-7 Report, February 29, 2012, page 19 (emphasis added), [https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery\\_AOI-7-SCR-RIR\\_02-29-12.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2019/02/Philadelphia-Refinery_AOI-7-SCR-RIR_02-29-12.pdf).

As a result, Evergreen may not omit investigation and reporting related to these areas, since it is responsible for pre-2012 contamination.

If contamination is truly from a post-2012 release and entirely unrelated to pre-2012 contamination, Sunoco and Evergreen presumably would not be liable for it simply because they happened to investigate it:

(b) Assessments.--A person shall not be considered a person responsible for a release or a threatened release of a regulated substance simply by virtue of conducting an environmental assessment or transaction screen on a property. Nothing in this section relieves a person of any liability for failure to exercise due diligence in performing an environmental assessment or transaction screen.

See Act 2 of 1995, Section 501(b) (emphasis added).

It is expected that Evergreen and the current owner would coordinate their investigation efforts. But it is quite conceivable contamination from their separate releases may overlap. Therefore, the Department should carefully scrutinize assertions by Evergreen that it need not investigate contamination in particular areas.

Thank you for your consideration of the comments of the Council.



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**AOI 5 lead samples in excess of the NRDC of 1,000mg/kg**

<b>Date</b>	<b>sample ID</b>	<b>mg/kg</b>
7/12/07	A-139_071207_1.5-2.0	2460
11/9/12	A-161-0-1'	1380
7/13/07	BH-07-07_1-2	1250
7/11/07	BH-23-07_0-0.5	1920
7/12/07	BH-27-07_1.5-2.0	3700
4/7/09	BH-02-09	17900
4/7/09	BH-04-09	1810
4/7/09	BH-09-09	2430
4/6/09	BH-16-09	2030
6/8/09	BH-21-09	1210
6/8/09	BH-22-09	1780
6/8/09	BH-23-09	1220
6/8/09	BH-24-09	1100
4/7/09	BH-25-09	1100
7/9/09	BH-37-09	1310
7/9/09	BH-39-09	1050
8/8/12	BH-28-12_0-.5	1760
8/7/12	BH-40-12_5-1	1360
3/1/13	A015-BH-13-05_0-.5	1020
3/7/13	AOI5_BH-13-27_1.5-2_30713	2730
3/7/13	AOI5_BH-13-28_1.5-2_30713	1590
3/6/13	AOI5_BH-13-32_1.5-2_30613	2020
3/7/13	AOI5_BH-13-33_1.5-2_30713	1090
3/6/13	AOI5_BH-13-35_1.5-2_30613	1500
3/5/13	AOI5_BH-13-38_1.5-2_030513	3600
3/5/13	AOI5_BH-13-39_1.5-2_030513	1120
3/5/13	BH-13-43-1.5-2_030513	1080
10/29/13	AOI-5_BH-13-121_102913_0-0.5	1160
10/29/13	AOI-5_BH-13-122_0-.5_102913	1450
10/29/13	AOI-5_BH-13-123_0-.5_102913	1780
10/29/13	AOI-5_BH-13-124_0-.5_102913	1350
10/29/13	AOI-5_BH-13-125_0-.5_102913	2890
10/29/13	AOI-5_BH-13-126_0-0.5_102913	2950
10/30/13	AOI5-BH-13-144_103013_0-1	4060
10/30/13	AOI5-BH-13-150_103013_0-1	1750
10/30/13	AOI5-BH-13-151_103013_0-1	1020
10/30/13	AOI5-BH-13-152_103013_0-1	2290
10/30/13	AOI5-BH-13-153_103013_0-1	1270
10/29/13	AOI-5_BH-13-154_0-0.5_102913	1840

10/29/13	AOI-5_BH-13-155_0-.5_102913	1690
10/29/13	AOI-5_BH-13-156_0-.5_102913	1350
10/29/13	AOI-5_BH-13-158_0-1_102913	1190
3/17/14	AOI5_BH-14-02	2130
3/14/14	A015_BH-14-06	1570
3/14/14	A015_BH-14-DUP1	1390
3/14/14	A015_BH-14-07	1800
3/14/14	A015_BH-14-08	1670
6/18/14	AOI-5_BH_14-25_0-2'	1200
6/19/14	AOI-5_BH_14-29_0-2'	1330
6/19/14	AOI-5_BH_14-31_0-2'	1980
6/17/14	AOI-5-BH_14-33_0-2'	1520
6/17/14	AOI-5-BH_14-34_0-2'	1140
8/21/14	GPBR_018C_08-21-2014(PH3B)	1020
3/1/13	A015-BH-13-13_0-.25	1310
3/8/13	AOI5_BH-13-26_1.5-2_030813	1190

**AOI 5 lead samples in excess of the soil to groundwater 450mg/kg (and below the NRDC)**

Date	Sample ID	mg/kg
4/6/09	A-141	660
7/13/07	BH-08-07_.75-2	506
4/7/09	BH-01-09	494
4/7/09	BH-07-09	748
4/7/09	BH-08-09_AOI5	563
4/7/09	BH-11-09	613
4/6/09	BH-12-09	806
4/8/09	BH-17-09	790
4/8/09	BH-20-09	453
7/9/09	BH-33-09	790
7/9/09	BH-34-09	485
7/9/09	BH-35-09	772
8/6/12	BH-19-12_5-1	876
8/9/12	BH-23-12_5-1	905
8/8/12	BH-33-12_5-1	545
8/7/12	BH-36-12_5-1	493
3/1/13	A015-BH-13-06_0-.25	485
3/11/13	AOI5_BH-13-17_1.5-2_031113	783
3/6/13	AOI5_BH-13-34_1.5-2_30613	851

3/4/13	BH-13-42-1.5- 2_030413	496
3/8/13	AOI5_BH-13- 44_1.5- 2_030813	950
10/29/13	AOI-5_BH-13- 116_0- .5_102913	724
10/29/13	AOI-5_BH-13- 117_0- .5_102913	704
6/20/14	AOI-5_BH_14- 24_0-2'	641
8/21/14	GPBR_019C_08- 21-2014(PH3B)	816

**AOI 5 lead samples in excess of the groundwater 5ug/L MSC**

7/24/14	WP-E_072414	12.9
10/10/14	WP-8_101014	21.3
12/4/06	WP-4A_1242006	12
7/28/14	WP-8_072814	34.1
7/25/14	wp-14-072514	6.2
5/4/07	WP16-3_050407	12
7/25/14	WP-16-3_072514	24.1
5/3/07	PZ-2_050307	5.8
1/22/16	AOI5_A- 5_012216~JC13164	16.1
10/22/14	A-47-102214	25.5
7/18/14	A-44_071814	7
7/21/14	A-47_072114	8.2
7/17/14	A-4_071714	30.6
10/15/14	A-4_101514	21.8
7/22/14	A-27-072214	5.9
7/21/14	A-24-072114	5.8
3/29/13	A-21D_32913	7.6
3/29/13	A-19D-032913	7.2
8/1/14	A-178-080114	64
11/21/12	A-156_112112	12.2
7/28/14	A-156_072814	6
7/17/14	A-142_071714	8.7
10/21/14	A-139-102114	25.7
5/21/15	A- 139_20150521_1563168	94.6
7/18/14	A-139_071814	5.4



10/13/14	A-134_101314	5.3
7/18/14	A-1_071814	7.1
10/22/14	A-1_102214	9.8



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[Leighanne.rainford@phila.gov](mailto:Leighanne.rainford@phila.gov)

Mr. Ragesh Patel  
Regional Program Manager of  
Environmental Cleanup and Brownfields  
Pennsylvania Department of Environmental  
Protection  
Southeast Regional Office  
2 East Main Street  
Norristown, PA 19401  
[rapatel@pa.gov](mailto:rapatel@pa.gov)

**Re: Public Comments on the Sitewide Remedial Investigation Report (“RIR”) Addendum for the Philadelphia Energy Solutions Refining & Marketing (“PES”) Site; 3144 Passyunk Avenue, Philadelphia, PA, EPA RCRA Corrective ID PAD049791098**

Dear Ms. Doerr, Dr. Brown, Mr. Bilash, Ms. Rainford, and Mr. Patel,

This letter provides comments on the Act 2 Remedial Investigation Report (“RIR”) Addendum of the Philadelphia Energy Solutions Refining & Marketing (“PES”) site located at 3144 Passyunk Avenue, Philadelphia, PA (the “Site”). These comments are being provided within the 30-day public comment period that began on May 20, 2022. We appreciate the opportunity to comment on the Site RIR Addendum.



***Comment: PES should incorporate PFAS into the ongoing Act 2 process to allow for public participation and to understand the full extent of all environmental impacts the Site may be having on receptors, including but not limited to, drinking water receptors in New Jersey and ecological receptors in and along the Delaware River. The levels of PFOA and PFOS detected at the PES site in both shallow and deep groundwater are orders of magnitude higher than EPA's new Health Advisory Levels of 0.004 ppt for PFOA and 0.02 ppt for PFOS.***

The PES RIR Addendum, as well as previous versions of the Act 2 RIRs, do not address per- and polyfluoroalkyl substances (“PFAS”). To date, evaluation of PFAS has been conducted outside of the Act 2 process denying the public the right to the public participation requirements associated with the PES Act 2 reports. Specifically, none of the PES PFAS reports were subject to the 30-day public comment period that applies to the PES Act 2 reports. Under the Consent Order and Agreement and Amended Consent Order and Agreement (the “Agreements”) entered into by Sunoco, Philadelphia Energy Solutions, and DEP, PES is required to demonstrate compliance of an Act 2 standard for all “Pre-Existing Contamination.” Based on the PFAS investigation non-Act 2 reports<sup>1</sup> prepared to date, PFOA and PFOS have been detected at the Site in shallow groundwater at 2,800 (PFOA) and 3,300 (PFOS) ng/L and 6,100 ng/L combined, and above 580 ng/L (PFOA) and 280 ng/L (PFOS), respectively, in the lower aquifer<sup>2</sup> – far above DEP’s Act 2 individual and combined groundwater cleanup standard of 70 ng/L.<sup>3</sup> PFNA has also been detected at the Site at 3,100 ng/L in shallow groundwater<sup>4</sup> and at 370 ng/L in the lower aquifer,<sup>5</sup> well above EPA’s recently published tap water Regional Screening Level (“RSL”) of 59 ng/L.<sup>6</sup> As noted above, EPA has issued drinking water health advisory levels (“HALs”) for certain PFAS, including a HAL of 0.004 ppt for PFOA and a HAL of 0.02 ppt for PFOS. The level of PFOA and PFOS detected in shallow and deep groundwater at the PES Site is orders of magnitude higher than the EPA HALs. Consistent with the Agreements, the PFAS contamination at the Site constitutes “Pre-Existing Contamination” that must be investigated and remediated to demonstrate compliance with an Act 2 standard. Incorporating PFAS into the Act 2 process is important to understand the full extent of all environmental impacts the Site may be having or may previously have had on receptors, including but not limited to, drinking water receptors in New Jersey and ecological receptors in and along the Delaware River. PFAS should also be

<sup>1</sup> See [Summary of February 17, 2021 PFAS Sampling Results \(Mar. 22, 2021\)](#), [January 2022 Shallow Aquifer PFAS Sampling Results \(Apr. 7, 2022\)](#), and [July 2021 Lower Aquifer PFAS Sampling Results \(Sept. 30, 2021\)](#), available at <https://phillyrefinerycleanup.info/pfas/>.

<sup>2</sup> See [January 2022 Shallow Aquifer PFAS Sampling Results](#), at Figure 4, B-173, and Table 2, available at [https://phillyrefinerycleanup.info/wp-content/uploads/2022/04/PFAS-Shallow-Aquifer-Sampling-Summary\\_04-08-2022.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2022/04/PFAS-Shallow-Aquifer-Sampling-Summary_04-08-2022.pdf); [July 2021 Lower Aquifer PFAS Sampling Results](#), at Figure 4, S-110DSRTF and S-389D, and Table 2, available at [https://phillyrefinerycleanup.info/wp-content/uploads/2021/09/20210930\\_PFAS-Lower-Aquifer-Sampling-Results.pdf](https://phillyrefinerycleanup.info/wp-content/uploads/2021/09/20210930_PFAS-Lower-Aquifer-Sampling-Results.pdf).

<sup>3</sup> 25 Pa. Code Chapter 250, Appendix A, Table 1.

<sup>4</sup> See [January 2022 Shallow Aquifer PFAS Sampling Results](#), at Figure 4, B-173, and Table 2.

<sup>5</sup> See [July 2021 Lower Aquifer PFAS Sampling Results](#), at Figure 4, A-19D, and Table 2.

<sup>6</sup> <https://semspub.epa.gov/work/HQ/402369.pdf>.



## Brickhouse Environmental

MS. DOERR, MR. BROWN, MR. BILASH,  
MR. PATEL, AND MS. RAINFORD

PUBLIC COMMENTS TO PES SITEWIDE RIR ADDENDUM  
3144 PASSYUNK AVENUE, PHILADELPHIA, PA

fully assessed as part of the PES Act 2 Fate and Transport evaluation not only for current flow conditions, but also for previous flow conditions. As I have previously commented, USGS studies and other investigations demonstrate that the lower aquifer outcrops near PES and travels under the Delaware River to New Jersey. As a result, any PFAS contamination in the lower aquifer currently or previously originating at the PES Site is a potential threat to various New Jersey public drinking water supply wells that are screened in the lower aquifer. Multiple public water supply wells in New Jersey across the river from the PES Site have exceedances for PFAS compounds. Data on the levels of PFAS in New Jersey supply wells is available at [NJDEP-Drinking WaterWatch \(state.nj.us\)](http://NJDEP-Drinking WaterWatch (state.nj.us)).

Sincerely,

David B. Farrington, P.G.  
Principal Geologist

DBF/dbf  
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# **ATTACHMENT B**

**Revised Appendix C, Figure 2- 2021 Cumene Investigation**

Figure 2

# 2021 Cumene Investigation

AOI 5 Cumene Investigation

Evergreen Resources Group

Philadelphia, PA

Drawn By: M. Fuerte  
 Designed By: A. Buchy  
 Reviewed By: C. Costello  
 Project No: 4796.00  
 Date: March, 2022

## Notes

- Aerial imagery provided by Google Earth. (2018). Above-ground storage tank units georeferenced from Langan AOI-5 RIR Figure 13. Analytical data was provided from Stantec's Evergreen Philadelphia data portal. Philadelphia, PA, USA. 39°53'52.72"N, 75°12'03.85"W. Eye alt 932 ft.
- Historical Soil Borings locations sourced from Stantec Data Portal and 2017 AOI 5 Remedial Investigation Report.
- Current tank and monitoring well status sourced from tank reports from Stantec Data Portal.
- SPLP = Synthetic Precipitation Leaching Procedure
- MSC = Medium Specific Concentrations
- Soil samples AOI5\_BH-13-32 and AOI5\_BH-13-144 were removed during the 3B Excavation.

## Legend

### 2021 Boring Locations

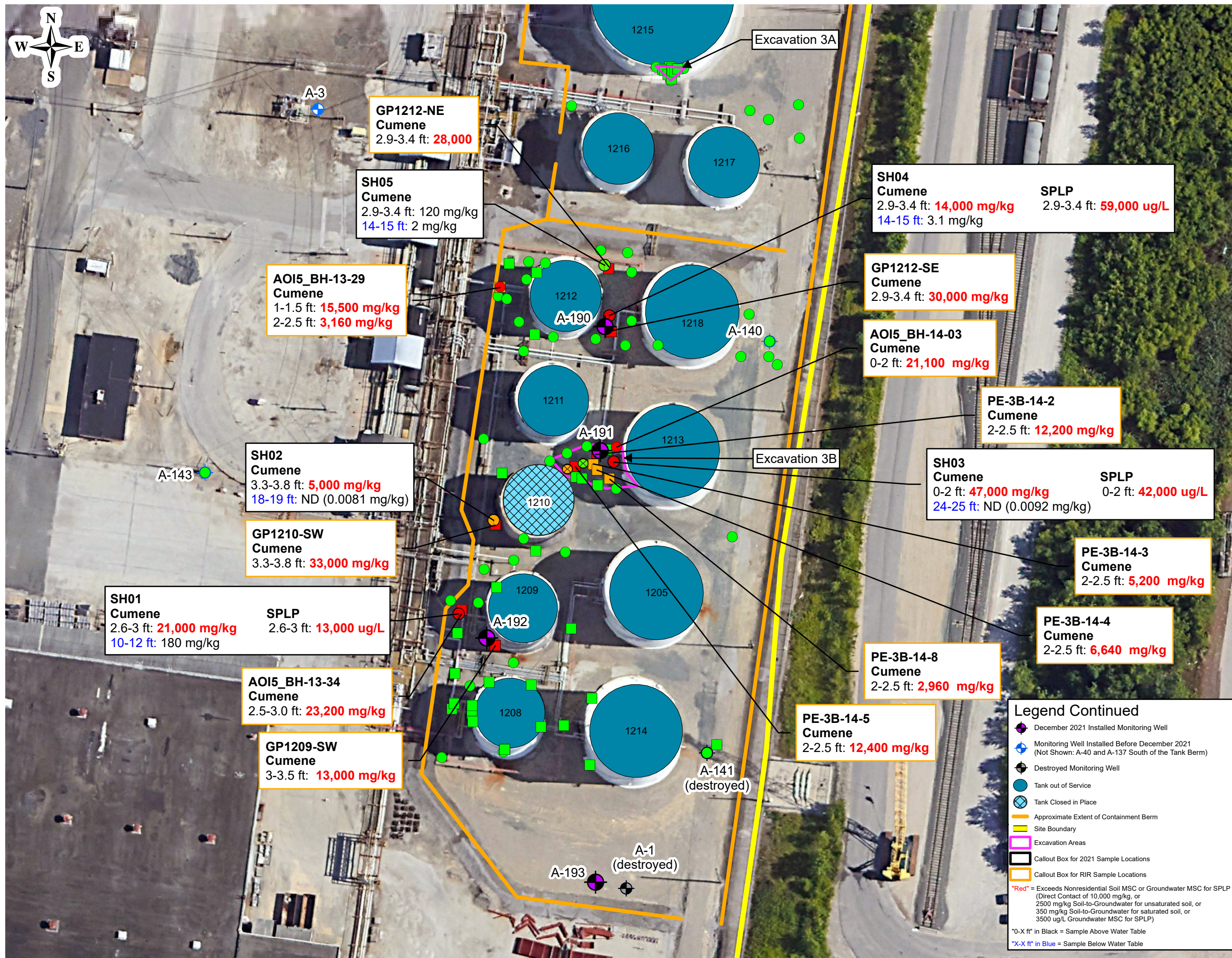
- Exceeds Direct Contact Nonresidential Soil MSC for Cumene of 10,000 mg/kg
- Exceeds Saturated Soil-to-Groundwater Nonresidential Soil MSC for Cumene of 350 mg/kg or Exceeds Unsaturated Soil-to-Groundwater Nonresidential Soil MSC for Cumene of 2,500 mg/kg but below Direct Contact Nonresidential Soil MSC for Cumene of 10,000 mg/kg
- Below Soil-to-Groundwater Nonresidential Soil MSC for Cumene of 2,500 mg/kg

### Historical Boring Locations

- Boring Location > 2 ft (Exceeds Direct Contact Nonresidential Soil MSC for Cumene of 10,000 mg/kg)
- Boring Location < 2 ft (Exceeds Direct Contact Nonresidential Soil MSC for Cumene of 10,000 mg/kg)
- Boring Location > 2 ft (Exceeds Saturated Soil-to-Groundwater Nonresidential Soil MSC for Cumene of 350 mg/kg or Exceeds Unsaturated Soil-to-Groundwater Nonresidential Soil MSC for Cumene of 2,500 mg/kg but below Direct Contact Nonresidential Soil MSC for Cumene of 10,000 mg/kg)
- Boring Location > 2 ft (Below Soil-to-Groundwater Nonresidential Soil MSC for cumene of 2,500 mg/kg)
- Boring Location < 2 ft (Below Soil-to-Groundwater Nonresidential Soil MSC for cumene of 2,500 mg/kg)

### Soil Samples Removed During 3B Excavation

- Boring Location < 2 ft (Exceeds Saturated Soil-to-Groundwater Nonresidential Soil MSC for Cumene of 350 mg/kg or Exceeds Unsaturated Soil-to-Groundwater Nonresidential Soil MSC for Cumene of 2,500 mg/kg but below Direct Contact Nonresidential Soil MSC for Cumene of 10,000 mg/kg)
- Boring Location < 2 ft (Below Soil-to-Groundwater Nonresidential Soil MSC for cumene of 2,500 mg/kg)



### Legend Continued

- December 2021 Installed Monitoring Well
- Monitoring Well Installed Before December 2021 (Not Shown: A-40 and A-137 South of the Tank Berm)
- Destroyed Monitoring Well
- Tank out of Service
- Tank Closed in Place
- Approximate Extent of Containment Berm
- Site Boundary
- Excavation Areas
- Callout Box for 2021 Sample Locations
- Callout Box for RIR Sample Locations

\*"Red" = Exceeds Nonresidential Soil MSC or Groundwater MSC for SPLP (Direct Contact of 10,000 mg/kg, or 2500 mg/kg Soil-to-Groundwater for unsaturated soil, or 350 mg/kg Soil-to-Groundwater for saturated soil, or 3500 ug/L Groundwater MSC for SPLP)

\*"0-X ft" in Black = Sample Above Water Table  
 \*"X-X ft" in Blue = Sample Below Water Table