

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC 2 Righter Parkway, Suite 120 Wilmington, DE 19803

October 17, 2022

Via OnBase and Electronic Mail

Lisa Strobridge, PG Licensed Professional Geologist Pennsylvania Department of Environmental Protection Southeast Regional Office 2 East Main Street, Norristown, PA 19401

RE: Sitewide Remedial Investigation Report Addendum Former Philadelphia Refinery PADEP eFACTS Primary Facility ID # 780190 (Sitewide) EPA PAD 002 28 9700 3144 Passyunk Ave, Philadelphia, PA, 19145

Dear Ms. Strobridge:

This letter is in response to the August 18, 2022 Pennsylvania Department of Environmental Protection (PADEP) Technical Deficiency Letter for the Sitewide Remedial Investigation Report (RIR) Addendum and the August 18, 2022 Act 2 Technical Memo Summary for the Sitewide Remedial Investigation Report Addendum, which include comments from both PADEP and US Environmental Protection Agency (USEPA).

As the two technical deficiencies related to the Appendix C Eastern Tank Farm Cumene Investigation of the Sitewide Remedial Investigation Report, the comments have been addressed by Sanborn Head & Associates, Inc. (Sanborn Head) in the attached memo. The memo also addresses the request for additional information in the PADEP letter (A.) relating to the cumene investigation area as well as any comments relating to the cumene investigation from the technical memo.

Please note that Evergreen acknowledges the statements in letters B. and C. in the PADEP correspondence which discuss resolution on release areas and lead standards, both relative to future reporting.

Page 2 October 17, 2022

We appreciate the continued work with PADEP and USEPA to address environmental conditions at the Site under One Cleanup Program.

Regards,

Evergreen Resources Management Operations

Tiffani L. Doerr, PG

Attachments: A – PADEP August 18, 2022 Correspondence (letter and memo) B – Sanborn Head October 17, 2022 Technical Memorandum

cc: Kevin Bilash, USEPA Scott Cullinan, PE, Evergreen Resources Management Operations Colleen Costello, PG, Sanborn Head & Associates, Inc. Jenny Kachel, PG, Stantec Consulting Juliana Connolly, LSP, Hilco



August 18, 2022

Ms. Tiffani L. Doerr, PG Evergreen Resource Management Operations 2 Righter Parkway, Suite 120 Wilmington, DE 19083

Re: Letter of Technical Deficiency PESRM - Evergreen eFACTS PF No. 780190 3144 Passyunk Avenue City of Philadelphia Philadelphia County

Dear Ms. Doerr:

The Department of Environmental Protection (DEP) has received and reviewed the May 20, 2022 document titled "Sitewide Remedial Investigation Report Addendum (report), received on May 20, 2022 for the property referenced above. The report was prepared by Stantec Consulting Services, Inc. (Stantec) submitted to DEP in accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2), and it constitutes a Remedial Investigation Report as defined in Chapter 3.

The procedures and regulations set forth in Act 2 must be followed in order for your site to qualify for the liability protection provided by the Act. Upon initial review, DEP finds the submission is technically deficient and the following items are needed to complete your submission:

- The lateral and vertical extent of contamination above the selected standard (SSS) was not adequately evaluated in accordance with 25 Pa. Code Sections 250.402(b) and 250.408 (a), (b), (d), and (e). Cumene soil and groundwater results were incorrectly compared to Statewide health standard medium specific concentrations (SHS MSCs) and should have been compared to regional screening levels (RSLs), or a calculated site-specific standard for cumene.
- 2. Insufficient data was presented in the report to support the conclusions that groundwater was characterized in accordance with 25 Pa. Code Section 250.408(a), (b), and (e). A groundwater flow map was included for one sampling event that included only the new wells from the former Eastern Tank Farm. Groundwater flow maps for multiple sampling events, and in the context of the larger AOI 5 area are needed to support the conclusions in the report.

In addition to the above deficiencies, additional explanation is needed for the following items:

- A. AOI 5 Eastern Tank Farm Area Cumene Investigation
 - Since the locations with the highest field response were not sampled for cumene, the forensic LNAPL results potentially do not reflect overall site conditions in AOI 5 Eastern Tank Farm Area. Additional justification is needed to explain why soil intervals with the highest field response were not also sampled for cumene analysis.
 - Additional information is needed to justify the use of a vacuum truck for well development as this is an unconventional well development method.

- Historical groundwater monitoring results for AOI 5 wells should be included to evaluate the new well data in the overall delineation framework.
- B. LNAPL Forensic Sampling
 - There are several areas of the site in which it is unclear if Evergreen and Hilco concur on responsibility for a release. Please be advised that DEP may not be in a position to approve certain future reports without resolution of this issue.
 - AOI 1/Belmont Terminal: S-77 and S-203 including a discussion of the potential source area(s).
 - AOI 4: S-104 and S-368
 - AOI 9: S-122SRTF, MW-1SRTF, RW-B
 - DEP understands the lines of evidence presented to date indicate a new release in AOI 9 and is awaiting submittal of a NIR from Hilco.
- C. Surface Soil Sampling for lead
 - DEP's review of this report is based on the current approved SSS for lead. The following comments are solely for consideration for future reporting if and when the SSS changes and/or a revised Human Health Risk Assessment is submitted.
 - It should be noted that a review of the historical lead data with respect to date and release history should be conducted. A figure depicting the sample identifiers and historical data table was not included for each AOI. If the historical samples that depicted concentrations greater than 1,000 ug/kg were more recent samples than surrounding delineation samples, additional delineation samples should be considered.
 - Additional delineation may be needed in AOI 2 and AOI 9 to delineate to 1,000 ug/kg.
 - Additional explanation is needed to understand if Evergreen visually screened soil from soil borings along Essington Avenue for leaded tank bottoms as an indication of potential facility impacts.
 - An explanation is needed of the use of fate and transport, engineering, or institutional controls, and/or pathway evaluation to further address the lead impacts in the Essington Avenue right-of-way.

Please address the above summarized technical deficiencies within 60 days. If the deficiencies noted above are corrected and a report resubmitted to DEP within 60 days, it will not be necessary to resubmit report review fees, resend the municipal notice, or republish the public notice. Please include a copy of this correspondence with any resubmission to confirm to DEP staff that an administrative completeness check is not necessary. If the corrected report is resubmitted later than 60 days from the date of this letter, the resubmitted report will need to include the appropriate fees and proofs of municipal and public notices.

We look forward to assisting you in the remediation of this property and encourage you to contact us throughout this process. If you have any questions or need further information regarding this matter, please contact Lisa Strobridge by email at lstrobridge@pa.gov or by telephone at 484.250.5796.

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board Rachel Carson State Office Building, Second Floor 400 Market Street P.O. Box 8457 Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800.654.5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at http://ehb.courtapps.com or by contacting the Secretary to the Board at 717.787.3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717.787.3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

Sincerely,

Ragesh R. Patel

Ragesh R. Patel Regional Manager Environmental Cleanup and Brownfields

cc: Mr. Cullinan, PE (Evergreen) Ms. Jennifer Menges (Stantec) Mr. Andrew Klingbeil (Stantec) Mr. Joseph Jeray (Hilco) City of Philadelphia Department of Public Health Mr. Bilash, U.S. EPA Mr. Brown Mr. Staron Ms. Strobridge Mr. Glass, Esq. Mr. Juan Serrat Ms. Bass



MEMO

- TO Ragesh R. Patel Regional Manager Environmental Cleanup and Brownfields
- FROM Lisa Strobridge, P.G. Stobidge Professional Geologist
- **THROUGH** Richard M. Staron, P.G Professional Geologist Manager
- DATE August 18, 2022
- REECB Land Recycling Program
Act 2 Technical Memo Summary
Sitewide Remedial Investigation Report Addendum
Philadelphia Refinery
eFACTS PF No. 780190
Sunoco Inc Phila Ref Sitewide
PESRM Evergreen
3144 West Passyunk Avenue
City of Philadelphia
Philadelphia County

Property Owner:

Hilco Redevelopment Partners 99 Summer Street, Suite 1110, Boston, MA 02110

Remediator:

Evergreen Resources Management Operations 2 Righter Parkway, Suite 120 Wilmington, DE 19083

Site Address:

3144 West Passyunk Avenue Philadelphia, PA 19145

Act 2 Standard(s) Sought: non-residential site-specific standard for soil and groundwater

Property Size: ~1300 acres

Project Site History: Petroleum refining began at the Philadelphia Refinery circa 1870. The facility consisted of two refineries, Point Breeze operated by Atlantic Petroleum Corporation

(formerly ARCO) and Girard Point by Chevron (formerly Gulf). Sunoco purchased these two refineries in 1988 and 1994 and consolidated them into a single facility. In 2012, Sunoco sold the refinery to the Carlyle Group and entered a joint venture to operate it as Philadelphia Energy Solutions (PES). Sunoco, Inc. is now a subsidiary of Energy Transfer Partners, L.P., and Evergreen is a Sunoco affiliate that is responsible for legacy environmental remediation. In 2020, PES was acquired by Hilco Redevelopment Partners (HRP).

The Philadelphia Refinery processed up to 330,000 barrels a day of crude oil. It produced gasoline, diesel, jet fuel, kerosene, home heating oil, and other petroleum liquids. The facility consisted of multiple process units, above-ground storage tanks, pipelines, as well as truck, railcar, and barge transfer equipment. The facility has been divided into eleven areas of interest (AOI 1–11) for purposes of characterizing contamination. The first ten are geographical areas of the facility, and AOI 11 represents the deep groundwater aquifer. From 2012 through 2021 Remedial Investigation Reports have been submitted and approved for AOI-1 through AOI-10 for the site.

DEP and EPA discussed the review of this report and this memo reflects comments from both agencies consistent with the goals of the One Cleanup Program.

Sitewide Remedial Investigation Report Overview:

- The Sitewide Remedial Investigation Report presents supplemental site investigation data that has been collected at the site since the time the applicable AOIs have been approved.
- The types of additional data collected and applicable AOIs include:
 - Cumene Area Investigation AOI 5
 - Light non-aqueous phase liquids (LNAPL) forensic sampling AOI 1/Belmont Terminal, AOI 2, AOI 4, AOI 6, AOI 9
 - Lead surface soil sampling AOI 8, AOI 9, and AOI 10
 - Natural Source Zone Depletion (NSZD) sampling AOI 1, AOI 2, AOI 3, AOI 4, AOI 8
- The additional investigations were conducted to address comments previously raised or to further investigate in select areas based on site data collected since the Remedial Investigation (RI) reports were approved.

Cumene Investigation Area/Eastern Tank Farm – AOI 5

- On May 4, 2017, DEP noted the following comment in the Technical Memo that accompanied the May 2, 2017 RI approval letter "Seven exceedances of cumene in soil at the eastern tank farm were listed in the report. DEP's direct contact MSCs for cumene are limited by the residual saturation value of 10,000 mg/kg [§250.305(b)]. Evergreen obtained analytical results exceeding this threshold, up to 33,000 mg/kg. Further evaluation or remedial action is required for these exceedances through the storage tanks corrective action process (Ch. 245). The SCR/RACR for these tanks is presently under review."
- On May 3, 2017, PADEP issued technical comments to the SCR/RACR for tank incidents in AOI 5 that stated "The cumene direct contact MSCs are 10,000 mg/kg. This is a value limited by residual saturation in soil (§250.305(b)). When an analytical result exceeds 10,000

mg/kg, this indicates that separate phase liquid may be present. LNAPL was not observed in the soil borings, but residual LNAPL that was not visible may have been in the soil pore spaces. Exposure assessments for these areas should account for the possible presence of LNAPL." The SCR was subsequently approved on June 22, 2017 and in the approval letter it was stated that "DEP recognized that the RAP for these five tanks will be incorporated into an Act 2 cleanup plan to be submitted at a future date".

- The following activities were conducted to address the above comments:
 - Review of groundwater gauging data for wells located within the former Eastern Tank Farm portion of AOI 5 to identify saturated and unsaturated soil depths.
 - The saturated depth to water in the former Eastern Tank Farm was historically approximately 4-7 ft below grade.
 - In June 2021, 5 soil borings were installed at locations adjacent to locations where the highest historical cumene results were detected in soil. Soil samples from the five supplemental locations were analyzed for cumene in soil at the depths where the highest historical results were observed.
 - Two of the locations were advanced via hand augers to 12 ft below grade as they were inaccessible by a direct push rig.
 - The remaining three locations were advanced until either field screening indicated no evidence of impact or to 25 ft terminal depth.
 - It is understood that 2021 soil samples were collected from sample intervals consistent with historical samples; however, field screening indicates that these intervals were not consistently from the highest field screening interval. An explanation is needed as to why the intervals with the highest field response were not also sampled.
 - Site specific standards (SSS) have been selected for soil and groundwater at the site. Cumene results in this Addendum were incorrectly compared to Statewide health standard medium specific concentrations (SHS MSCs) and should have been compared to regional screening levels (RSLs), or a calculated site specific standard for cumene. The lateral and vertical extent of contamination above the selected standard (SSS) is required to be characterized.
 - The three locations with the highest 2021 cumene results were also analyzed for synthetic precipitation leaching procedure (SPLP).
 - The SPLP results guided the need for the installation of monitoring wells in this area. Even though the highest soil screening interval may not have been utilized to select SPLP locations, the result of needing to install monitoring wells in the former Eastern Tank Farm was realized.
 - Soil with the highest two 2021 detections of cumene were also assessed for potential LNAPL saturation and mobility. The two selected soil cores were screened using ultraviolet (UV) light core photography and then select intervals from each core were analyzed for:
 - pore fluid saturation (Dean Stark Method, API R 40) to determine the percentage of LNAPL saturation

- air-water capillarity analysis (ASTM D425M) to evaluate the potential LNAPL saturation and mobility
- grain size analysis (ASTM D422/ASTM D446M) to also evaluate the potential for LNAPL saturation and mobility
- Since the locations with the highest field response were not sampled, the LNAPL investigation results potentially do not reflect overall site conditions.
- Three monitoring wells were installed in the three (out of 5 locations) that had the highest potential for the occurrence of LNAPL. A fourth monitoring well was installed downgradient of the three new wells, along the downgradient property boundary of the former Eastern Tank Farm.
 - It is unclear why A-192 was not installed at SH01 where historically higher cumene soil concentrations were detected.
 - Following well installation, the wells were developed using a vacuum truck. Additional information is needed to justify the use of unconventional well development methods, including well gauging data, LNAPL observations during the vacuum extraction event and following settlement of the recovered liquids, and 2022 gauging results from these wells regarding presence/absence of LNAPL.
 - A groundwater flow map is included for one sampling event that includes only the new wells from the former Eastern Tank Farm, and the groundwater flow appears divergent. Groundwater flow maps for multiple sampling events, and in the context of the larger AOI 5 area are needed.
 - Groundwater results in the former Eastern Tank Farm during the November 3, 2021 sampling event ranged from not detected concentrations to 18,000 ug/L.
 - Groundwater results were incorrectly compared to the SHS MSCs and should be compared to RSLs or calculated SSS.
 - Historical groundwater monitoring results for AOI 5 wells were not included to evaluate the new well data in the overall delineation framework.

Light non-aqueous phase liquids (LNAPL) forensic sampling – AOI 1/Belmont Terminal, AOI 2, AOI 4, AOI 6, AOI 9

- LNAPL sampling was conducted in 11 wells in 2019 and 2020 where post 2012 releases were suspected based on historical gauging data. The locations include:
 - AOI 1/Belmont Terminal: S-77, S-203, MW-29
 - AOI 2: S-349
 - AOI 4: S-104, S-96, S-368
 - AOI 6: B-150
 - AOI 9: S-122SRTF, MW-1SRTF, RW-B
- LNAPL samples were collected and analyzed using various environmental forensics tests, and the results were interpreted by a petroleum forensics expert (ChemQuants). A summary of findings is included below.
 - o AOI 1/Belmont Terminal: S-77, S-203, MW-29

- LNAPL samples collected from S-77 in 2005 and 2019 show a change in LNAPL types. The additional LNAPL sample collected in 2020 estimates the LNAPL to be from gasoline released between 2010 and 2014.
 - It is not clear if Evergreen and Hilco concur on responsibility for LNAPL in this area.
- The 2019 and 2020 LNAPL sample collected from S-203 was estimated to have been released in 2014 +/- 2 years
 - It is not clear if Evergreen and Hilco concur on responsibility for LNAPL in this area.
- A discussion of the potential source(s) of LNAPL observed in S-77 and S-203 is requested for these areas.
- The LNAPL sample collected from MW-29 coincides with historical documents indicating a release from leaded gasoline before 1990.
- AOI 2: S-349
 - LNAPL samples collected from S-349 showed evidence of a release of historical gasoline with an unusual pattern of C5-C8 naphthalene and leaded gasoline enrichment.
 - Analysis of LNAPL in this well does not indicate a new release.
- AOI 4: S-104, S-96, S-368
 - LNAPL samples collected from S-104 exhibit different fuel signatures in samples collected in 2004 and 2019. In addition, the May 2020 LNAPL sample was estimated to be from a release that was 4-8 years from 2020.
 - It is not clear if Evergreen and Hilco concur on responsibility for LNAPL in this area.
 - 2016 LNAPL samples from S-368 (located adjacent to S-104) were identified as a middle distillate and as a weathered light to middle distillate fuel oil and kerosene in 2020 suggesting evidence of a new release.
 - It is not clear if Evergreen and Hilco concur on responsibility for LNAPL in this area.
 - LNAPL in S-96 was determined to have been released in 2003 +/- 2 years and is not indicative of a new release.
- AOI 6: B-150 sample could not be evaluated for the release date due to the "intrinsic relative enrichments of benzene and toluene in the suspected reformate intermediate source type". This interpretation suggests a potential of a mixed plume but is not indicative of a new release.
- AOI 9: S-122SRTF, MW-1SRTF, RW-B
 - LNAPL samples from S-122SRTF are indicative of a release after 2013 and before 2019, and the 2021 sample of LNAPL collected "was likely related to a November 8, 2016 petroleum occurrence event in the well".
 - There were multiple lines of evidence presented in the September 2021 AOI 9 RI Addendum indicting LNAPL in this well was associated with a post 2012 release.
 - ChemQuants analysis of S-122SRTF support the previous findings.
 - Post 2012 releases are the responsibility of Hilco to remediate.

- It is not clear if Evergreen and Hilco concur on responsibility for LNAPL in this area, as a NIR for this release area has not been submitted by Hilco to date.
- Dissolved concentrations from S-122SRTF were not included in the June 2022 Fate and Transport Remedial Investigation Report.
- LNAPL samples from MW-1SRTF and RW-B have a different gasoline signature than what was expressed in S-122SRTF.
 - ChemQuants concluded that LNAPL from MW-1SRTF and RW-B "likely is re-emergence of a less evaporated form of gasoline occurring in the well since 2004".
 - Previous interpretations indicated similar results and suggest that the influx of new source material in this area impacted the mobility of historical LNAPL that was present in the area.
 - It is not clear if Evergreen and Hilco concur on responsibility for LNAPL in this area.
- Evergreen included dissolved impacts from these LNAPL bearing wells in the 2022 Fate and Transport remedial Investigation Report, except for S-122SRTF. Evergreen states "Data presented in this Sitewide RIR Addendum, the AOI 4 RIR Addendum, and AOI 9 Second RIR Addendum support that there may have been recent (post 2012) releases of petroleum at the facility. However, regardless of timing of releases, Evergreen does not intend to exclude all or portions of contamination in the areas discussed that may be attributable to PESRM in the upcoming Sitewide Fate and Transport RIR simulations except for areas where PESRM has acknowledged environmental liability as listed in Section 3.5.1 or areas under review for responsibility."
 - Hilco (PESRM) has acknowledged environmental liability for 1) the UDEX release Area in AOI 3; 2) the 136 Naphtha Release Area in AOI 7; and 3) No. 3 Separator Release Area in AOI 7, and these three areas will not be addressed in the future fate and transport model.
 - DEP is awaiting Hilco's (PESRM's) acknowledgement of environmental liability for the recent release associated with S-122SRTF and surrounding area in AOI-9.
 - Dissolved concentrations associated with S-122SRTF are not incorporated in the Fate and Transport Remedial Investigation report.
 - DEP understands that additional areas are under investigation and negotiation for environmental liability and are being managed by Evergreen until the investigations and negotiations are complete.

Lead surface soil sampling - AOI 8, AOI 9, and AOI 10

- The current SSS calculated for lead is 2,240 mg/kg as presented in the 2015 Human Health Risk Assessment that was approved by PADEP. This risk assessment used a target blood lead level of 10 micrograms per deciliter (ug/dL).
- PADEP is currently considering decreasing the target blood lead level to 5 ug/dL, which would result in a "new" calculated SSS to be closer to a value of 1,000 ug/kg.
- Since the SSS has not changed at this time, nor has a revised Human Health Risk Assessment been submitted, DEP's review of this report is based on the current approved

SSS for lead. The following comments are solely for consideration for future reporting if and when the SSS changes and/or a revised Human Health Risk Assessment is submitted.

- In 2021 and 2022, 34 surface soil samples were collected to further delineate surface soil impacts to 1,000 mg/kg in AOI 8, AOI 9, and AOI 10.
 - A review of Figure 2-1 suggests that the surface lead could be laterally delineated to 1,000 ug/kg in AOI 8 and AOI 10.
 - It should be noted that a review of the historical lead data with respect to date and release history should be conducted. A figure depicting the sample identifiers and historical data table was not included for each AOI. If the historical samples that depicted concentrations > 1,000 ug/kg were more recent samples than surrounding delineation samples, additional delineation samples should be considered.
 - A review of Figure 2-1 also suggests that additional delineation may be needed around S-354 to the west, north, and east in AOI 2, limited surface soil was conducted for lead at Belmont Terminal or was not reported on this figure, west of AOI7BH12-47, and south of AOI5-BH-13-39, to delineate to 1,000 ug/kg.
 - A review of Figure 2-2 lead sampling results for AOI-9 suggests additional delineation is needed north and east of AOI 9 BH-22-07; west of AOI 9 BH-15-115; south of S-118SRTF; west, south, and east of AOI 9-BH-15-67 (Blender Building SR19); north of AOI 9-BH-21-10 and AOI 9-BH-21-11, and east of AOI 9-BH-21-06.
 - DEP understands the potential for offsite fill to contribute to offsite lead impacts. Additional information is needed from Evergreen to support that additional future delineation will not be needed beyond AOI 9-BH-21-16 or AOI 9-BH-21-17.
 - Additional explanation is needed to understand if Evergreen visually screened soil from soil borings along Essington Avenue for leaded tank bottoms as an indication of potential facility impacts.
 - An explanation is needed of the use of fate and transport, engineering, or institutional controls, and/or pathway evaluation to further address the lead impacts in the Essington Avenue right-ofway.

Natural Source Zone Depletion (NSZD) Sampling – AOI 1, AOI 2, AOI 3, AOI 4, AOI 8

- NSZD is the natural loss of LNAPL due to natural processes, including biodegradation. The LNAPL is transformed into carbon dioxide (CO₂) and NSZD is monitored by measuring field CO₂ levels.
- On April 26, 2021 and October 6, 2021, 10 CO₂ samplers were installed across the site to measure CO₂ fluxes.
 - Five locations were sampled during both sampling events, and the other 5 locations were adjusted after the first sampling event.

- The measured rates of NSZD ranged from below the detection limit to 7,255 gallons per acre per year (gal/ac yr) during the April 2021 event and from 47 to 26,162 gal/ac yr during the October 2021 event.
- These results indicate that NSZD is occurring in areas of the site.
- NSZD may be taken into consideration in the development of the future cleanup plan for the site.
- On July 19, 2022, DEP received Evergreen's Response to public comments for the present Sitewide remedial Investigation Report Addendum.
 - Evergreen reported receipt of public comments from Brickhouse Environmental and two sets of comments from Clean Air Council.
 - DEP received, reviewed, and took into consideration the received public comments as part of the review.
 - DEP reviewed the responses to public comments and was satisfied with the responses.

DEP Final Action: The Sitewide Remedial Investigation Report Addendum is recommended for technical deficiency due to:

- The lateral and vertical extent of contamination above the selected standard (SSS) was not adequately evaluated in accordance with 25 Pa. Code Sections 250.402(b) and 250.408 (a), (b), (d), and (e). Cumene soil and groundwater results were incorrectly compared to Statewide health standard medium specific concentrations (SHS MSCs) and should have been compared to regional screening levels (RSLs), or a calculated site specific standard for cumene.
- Insufficient data was presented in the report to support the conclusions that groundwater was characterized in accordance with 25 Pa. Code Section 250.408(a), (b), and (e). A groundwater flow map was included for one sampling event that included only the new wells from the former Eastern Tank Farm. Groundwater flow maps for multiple sampling events, and in the context of the larger AOI 5 area are needed to support the conclusions in the report.

In addition to the above deficiencies, additional explanation is needed for the following items:

- AOI 5 Eastern Tank Farm Area Cumene Investigation
 - Since the locations with the highest field response were not sampled for cumene, the forensic LNAPL results potentially do not reflect overall site conditions in AOI 5 Eastern Tank Farm Area. Additional justification is needed to explain why soil intervals with the highest field response were not also sampled for cumene analysis.
 - Additional information is needed to justify the use of a vacuum truck for well development as this is an unconventional well development method.
 - Historical groundwater monitoring results for AOI 5 wells should be included to evaluate the new well data in the overall delineation framework.
- LNAPL Forensic Sampling

- There are several areas of the site in which it is unclear if Evergreen and Hilco concur on responsibility for a release. Please be advised that DEP may not be in a position to approve certain future reports without resolution of this issue.
 - AOI 1/Belmont Terminal: S-77 and S-203 including a discussion of the potential source area(s).
 - AOI 4: S-104 and S-368
 - AOI 9: S-122SRTF, MW-1SRTF, RW-B
 - DEP understands the lines of evidence presented to date indicate a new release in AOI 9 and is awaiting submittal of a NIR from Hilco.
- Surface Soil Sampling for lead
 - DEP's review of this report is based on the current approved SSS for lead. The following comments are solely for consideration for future reporting if and when the SSS changes and/or a revised Human Health Risk Assessment is submitted.
 - It should be noted that a review of the historical lead data with respect to date and release history should be conducted. A figure depicting the sample identifiers and historical data table was not included for each AOI. If the historical samples that depicted concentrations > 1,000 ug/kg were more recent samples than surrounding delineation samples, additional delineation samples should be considered.
 - Additional delineation may be needed in AOI 2 and AOI 9 to delineate to 1,000 ug/kg.
 - Additional explanation is needed to understand if Evergreen visually screened soil from soil borings along Essington Avenue for leaded tank bottoms as an indication of potential facility impacts.
 - An explanation is needed of the use of fate and transport, engineering, or institutional controls, and/or pathway evaluation to further address the lead impacts in the Essington Avenue right-of-way.

The technical deficiencies and comments were reviewed with Evergreen and Stantec on August 15, 2022 and it was communicated during the call that this technical memo would be provided following the issuance of the decision letter.

DEP Contact:	Lisa Strobridge, P.G.	Phone:	484-250-5796
Site Contact:	Tiffani Doerr, P.G., Evergreen	Phone:	302-477-1305
Site Consultant:	Jennifer Menges, Stantec	Phone:	610-840-2540
One Cleanup Pro EPA Contact:Ke	ogram vin Bilash, USEPA Region III	Phone:	215-814-2796



Memorandum

To: Tiffani Doerr, P.G. – Evergreen Resources Management Operations
 From: Andrew Buchy and Colleen Costello, P.G. – Sanborn Head & Associates, Inc.
 File: 4796.00
 Date: October 17, 2022
 Re: Evergreen Response to August 18, 2022 Pennsylvania Department of Environmental Protection (PADEP) Technical Deficiency Letter and Technical Memo Summary for the Site Wide Remedial Investigation Report Addendum – Appendix C – Eastern Tank Farm Cumene Investigation

This memorandum contains responses to the August 18, 2022 Pennsylvania Department of Environmental Protection (PADEP) Technical Deficiency Letter for the Sitewide Remedial Investigation Report (RIR) Addendum and the August 18, 2022 Act 2 Technical Memo Summary for the Sitewide Remedial Investigation Report Addendum, which include comments from both PADEP and US Environmental Protection Agency (EPA). This memo addresses the two deficiencies noted in the letter as well as any comments relating to the cumene investigation from the technical memo.

Comment 1 (Technical Deficiency Letter):

The lateral and vertical extent of contamination above the selected standard (SSS) was not adequately evaluated in accordance with 25 Pa. Code Sections 250.402(b) and 250.408 (a), (b), (d), and (e). Cumene soil and groundwater results were incorrectly compared to Statewide health medium specific concentrations (SHS MSCs) and should have been compared to regional screening levels (RSLs), or a calculated site-specific standard for cumene.

Evergreen Response:

Cumene results were compared to SHS MSCs to mimic the previously approved RIRs at the facility. However, to address Comment 1, the following revisions were completed in response to this comment, **Tables 1** and **2** and **Figures 1** and **2** are included in **Attachment 1**:

- **Table 1** was created to compare the cumene soil analytical results to the Regional Screening Level (RSL) for Industrial Soil.
- **Figure 1** has been created comparing cumene soil results to the RSL for Industrial Soil. As shown on this figure, soil cumene results were delineated to the RSL for Industrial Soil within AOI 5.
- **Table 2** was created to compare the cumene groundwater analytical results to the RSL for Tap Water.
- **Figure 2** was created to compare the cumene groundwater analytical results to the RSL for Tap Water. As shown on this figure, cumene groundwater results were delineated to the RSL for Tap Water within AOI 5.

Comment 2 (Technical Deficiency Letter):

Insufficient data was presented in the report to support the conclusions that groundwater was characterized in accordance with 25 PA. Code Section 250.408(a), (b), and (e). A groundwater flow map was included for one sampling event that included only the new wells from the former Eastern Tank Farm. Groundwater flow maps for multiple sampling events, and in the context of the larger AOI 5 area are needed to support the conclusions in the report.

Evergreen Response:

Since the new monitoring wells (A-190, A-191, A-192, and A-193) were installed in December 2021, only one site wide gauging event (March 2022) and one site wide groundwater sampling event was completed in AOI 5 which included the new wells by the date of the Sitewide RIR Addendum submittal. The groundwater contours from March 2022 are included on Stantec's Figure 4 from the First Half 2022 Semi Annual Remediation Status Report which are included as **Attachment 2** to this response. Also included in **Attachment 2** is Figure 4 from Stantec's First half 2021 Semi Annual Remediation Status Report, which shows that the groundwater flow direction shown from the March 2022 groundwater gauging event is consistent with the 2021 groundwater flow direction. Also included in **Attachment 2** is the groundwater flow map from the Eastern Tank Farm investigation, which is also consistent with the site-wide groundwater contours from 2021 and 2022. There are monitoring wells to the north, south, east, and west of the investigated area, providing adequate delineation/characterization of the larger AOI-5 area.

Comment 3 (Technical Deficiency Letter):

Since the locations with the highest field response were not sampled for cumene, the forensic LNAPL results potentially do not reflect overall site conditions in AOI 5 Eastern Tank Farm Area. Additional justification is needed to explain why soil intervals with the highest field response were not also sampled for cumene analysis.

Evergreen Response:

As stated in Section 3.0, the five soil borings (BH-SH01, BH-SH02, BH-SH03, BH-SH04, BH-SH05) were completed at the locations from the AOI 5 RIR with the highest reported cumene concentrations in soil to respond to the PADEP's comment, "Seven exceedances of cumene in soil at the eastern tank farm were listed in the report. DEP's direct contact MSCs for cumene are limited by the residual saturation value of 10,000 mg/kg [§250.305(b)]. Evergreen obtained analytical results exceeding this threshold, up to 33,000 mg/kg. Further evaluation or remedial action is required for these exceedances through the storage tanks corrective action process (Ch. 245). The SCR/RACR for these tanks is presently under review." Soil samples were collected at depth intervals requested by the PADEP comment above.

To provide additional context, the sample collection depths from borings SH-02, SH-03, and SH-04 which were selected to coincide with the sample depths requested by the PADEP, were also the depth intervals with the highest observed PID readings in these borings. The soil sample from boring SH-01 was collected at a depth of 2.6 to 3 feet bgs, which had a PID result of 310.6 ppm, which was similar to the highest PID reading in that boring which was observed at 1.0 to 1.5 feet bgs (390.5 ppm). The soil sample from boring SH-05 was collected at depth of 2.9 to 3.4 feet bgs (PID result of 812.6 ppm), and the highest PID reading was observed at 6 to 10 feet bgs (2,273).

ppm). The log from SH-05 did not indicate any evidence of LNAPL in SH-05 and the highest PID reading in SH-05 was below the highest PID readings in SH-02, SH-03 and SH-04 which corresponded to the interval where the soil samples were collected in these borings. Since LNAPL was not determined to be present in in SH-02, SH-03 or SH-04 and there were no significant differences in soil type that would indicate different conditions in SH-01 from these other borings, LNAPL is not expected to be present in SH-05. In addition, the goal of the sampling was to do further investigation with respect to the possible presence of LNAPL. The soil samples were collected at approximate locations of groundwater surface (approximately three to four feet below ground surface within the tank dike wells). The 6'-10' interval in SH-05 is below the water table. Groundwater concentrations in this area are represented by nearby well, A-190.

Comment 4 (Technical Deficiency Letter):

Additional information is needed to justify the use of a vacuum truck for well development as this is an unconventional well development method.

Evergreen Response:

The vacuum truck was utilized to better navigate around overhead piping and existing structures and to better contain purged liquids and potential LNAPL. This is often the preferred method at the facility. Surging of the well was conducted during the development as well to remove sediment from the well screen. Subsequent to development, low-flow groundwater sampling techniques were utilized to ensure collection of formation water.

Comment 5 (Technical Deficiency Letter):

Historical groundwater monitoring results for AOI 5 wells should be included to evaluate the new well data in the overall delineation framework.

Evergreen Response:

Table 2 and **Figure 2** in **Attachment 1** compare historical cumene groundwater monitoring results in comparison to the RSL for Tap Water. As shown on **Figure 2**, cumene groundwater results were delineated to the RSL for Tap Water within AOI 5. It should be noted that the correct RSL for water has not been determined; therefore, the most conservative value for Tap Water has been utilized for this response.

Comment 6 (Technical Memo Summary):

It is understood that 2021 soil samples were collected from sample intervals consistent with historical samples; however, field screening indicates that these intervals were not consistently from the highest field screening interval. An explanation is needed as to why the intervals with the highest field response were not also sampled.

Evergreen Response:

See response to PADEP Comment #3 above.

Comment 7 (Technical Memo Summary):

Site specific standards (SSS) have been selected for soil and groundwater at the site. Cumene results in this Addendum were incorrectly compared to Statewide health standard medium

specific concentrations (SHS MSCs) and should have been compared to regional screening levels (RSLs), or a calculated site-specific standard for cumene. The lateral and vertical extent of contamination above the SSS is required to be characterized.

Evergreen Response:

See response to PADEP Comment #1 above.

Comment 8 (Technical Memo Summary):

It is unclear why A-192 was not installed at SH01 where historically higher cumene soil concentrations were detected.

Evergreen Response:

The location of monitoring well A-192 was initially selected to be in close proximity to SH-01, but the final location of well A-192 was influenced by access issues due to aboveground piping utilities and walkway structures existing around the area of investigation. A-192 is only approximately 30 feet from SH-01 location and in a hydraulically down to side-gradient position. In addition, there are seven monitoring wells within the relatively small tank dike area providing adequate coverage for both determination of presence of LNAPL and groundwater characterization.

Comment 9 (Technical Memo Summary):

Following well installation, the wells were developed using a vacuum truck. Additional information is needed to justify the use of unconventional well development methods, including well gauging data, LNAPL observations during the vacuum extraction event and following settlement of the recovered liquids, and 2022 gauging results from these wells regarding presence/absence of LNAPL.

Evergreen Response:

The vacuum truck was utilized to better contain purged liquids and potential LNAPL and to better navigate around overhead piping and existing structures. No LNAPL was observed before, during, or after the development of the monitoring wells. **Table 3** is included in **Attachment 3** which summarizes that LNAPL has not been observed in A-190 through A-193 during the December 2021, February 2022, March 2022, and April 2022 well gauging events.

Comment 10 (Technical Memo Summary):

A groundwater flow map is included for one sampling event that includes only the new wells from the former Eastern Tank Farm, and the groundwater flow appears divergent. Groundwater flow maps for multiple sampling events, and in the context of the larger AOI 5 area are needed.

Evergreen Response:

Please refer to the response for PADEP Comment #2.

Comment 12 (Technical Memo Summary):

Groundwater results were incorrectly compared to the SHS MSCs and should be compared to RSLs or calculated SSS. Historical groundwater monitoring results for AOI 5 wells were not included to

evaluate the new well data in the overall delineation framework.

Evergreen Response:

See response to PADEP comment #1 in relation to the comparison to the RSLs. Figure 2 in Attachment 2 includes the historical cumene data in AOI 5 as well as the new data, supporting the delineation framework.

Enclosures.

Attachment 1

Table 1 – Historical AOI 5 Cumene in Soil Against Industrial Soil RSL Table 2 – Historical AOI 5 Cumene in Groundwater Against Tap Water RSL Figure 1 – RSL Cumene in Soil Exceedances in AOI 5 Figure 2 – RSL Cumene in Groundwater Exceedances in AOI 5

Attachment 2

Stantec 2021 First Half Remediation Status Report – Figure 4 Stantec 2022 First Half Remediation Status Report – Figure 4 Figure 5 from AOI 5 Former Eastern Tanks Farm, Cumene Investigation

Attachment 3

Table 3 – LNAPL Observations

Attachment 1

	_						_			_				
Sample Location			A-139	A-140	A-140	A-141	A-143	A-144	A-150	A-151	A-152	A-153	A-155	A-156
Sample Date			12-Jul-07	6-Apr-09	12-Jul-07	6-Apr-09	12-Jul-07	6-Apr-09	7-Apr-09	12-Jul-07	12-Jul-07	8-Apr-09	7-Apr-09	9-Nov-12
Sample ID			A-139_071207_1.5-2.0	A-140	A-140_071207_1.5-2.0	A-141	A-143_0712_1.5-2.0	A-144	A-150	A-151_071207_1.5-2.0	A-152_071207_1.5-2.0	A-153	A-155	A-156-2'
Sample Depth			1.5 - 2 ft	0.5 - 2 ft	1.5 - 2 ft	0.5 - 2 ft	1.5 - 2 ft	0 - 2 ft	0 - 2 ft	1.5 - 2 ft	1.5 - 2 ft	0 - 2 ft	0 - 2 ft	1 - 2 ft
Soil Type			Not Reported	NA	Not Reported	NA	Not Reported	Soil samples from wells with LNAPL	Soil samples from wells with LNAPL	Not Reported	Not Reported	NA	Soil samples from wells with LNAPL	NA
Sampling Company			UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Sample Type	Units	Α	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compoun	ds													
	ma/ka	000	ND (0.0053)	ND (0.240)	ND (0.0038)	ND (0.280)	ND (0.0035)	ND (0.270)	12	ND (0.0035)	ND (0.0031)	ND (0 380)	7.2	6.63
SOF NOF TEDENZENE (COMENE)	mg/kg	990	ND (0.0033)	ND (0.240)	ND (0.0030)	ND (0.200)	ND (0.0000)	100 (0.270)	1.2	ND (0.0000)	110 (0.0001)	140 (0.000)	1.2	0.00

Sample Location Sample Date			A-159 1-Nov-12	A-160 2-Nov-12	A-161 9-Nov-12 A 161 0 1	A-169 17-Jun-14	A-169 17-Jun-14	A-170 24-Jun-14 A 170 0 2'	A-170 24-Jun-14 A 170 4 61	A-171 25-Jun-14	A-171 25-Jun-14	A-172 17-Jun-14	A-172 17-Jun-14 BH AOI5 A 172 2 2 06172014	A-173 25-Jun-14
Sample Depth Soil Type Sampling Company			1 - 2 ft NA UNKNOWN	1 - 2 ft NA UNKNOWN	0 - 1 ft Soil samples from wells with LNAPL UNKNOWN	0 - 2 ft NA AQUATERRA	2 - 4 ft NA AQUATERRA	0 - 2 ft NA AQUATERRA	4 - 6 ft NA AQUATERRA	0 - 2 ft NA AQUATERRA	4 - 6 ft NA AQUATERRA	0 - 2 ft NA AQUATERRA	2 - 3 ft NA AQUATERRA	0 - 2 ft NA AQUATERRA
Sample Type	Units	Α	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compound	ls													
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	1.27	2.84	0.00080 J	ND (0.0050)	17.3	ND (0.0048)	0.0185	ND (0.0053)	ND (0.0045)	0.175 J	0.0034 J	ND (0.0065)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	A	A-173 25-Jun-14 A-173_4-6' 4 - 6 ft NA AQUATERRA NORMAL	A-174 26-Jun-14 A-174_0-2' 0 - 2 ft NA AQUATERRA NORMAL	A-174 26-Jun-14 A-174_4-6' 4 - 6 ft NA AQUATERRA NORMAL	A-185 24-Jun-14 A-185_0-2' 0 - 2 ft NA AQUATERRA NORMAL	A-185 24-Jun-14 A-185_6-8' 6 - 8 ft NA AQUATERRA NORMAL	A-186 27-Jun-14 A-186_0-2' 0 - 2 ft NA AQUATERRA NORMAL	A-186 27-Jun-14 A-186_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5 BH-01-12 8-Aug-12 BH-01-12_2-2.5 2 - 2.5 ft NA UNKNOWN NORMAL	AOI5 BH-02-12 8-Aug-12 BH-02-12_2.5-3 2.5 - 3 ft NA UNKNOWN NORMAL	AOI5 BH-03-12 7-Aug-12 BH-03-12_2.5-3 2.5 - 3 ft NA UNKNOWN NORMAL	AOI5 BH-04-12 7-Aug-12 BH-04-12_2-2.5 2 - 2.5 ft NA UNKNOWN NORMAL	AOI5 BH-07-12 6-Aug-12 BH-07-12_3-3.5 3 - 3.5 ft NA UNKNOWN NORMAL	AOI5 BH-10-12 9-Aug-12 BH-10-12_4.5-5 4.5 - 5 ft NA UNKNOWN NORMAL	AOI5 BH-15-12 7-Aug-12 BH-15-12_4-4.5 4 - 4.5 ft NA UNKNOWN NORMAL
Volatile Organic Compound	ls															
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	ND (0.0063)	ND (0.0050)	0.0036 J	ND (0.0052)	ND (0.0069)	ND (0.0075)	ND (0.0053)	6.2	ND (0.002)	0.86	ND (0.48)	0.27 J	ND (0.001)	ND (0.002)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units A	AOI5 BH-16-12 7-Aug-12 BH-16-12_3.5-4 3.5 - 4 ft NA UNKNOWN NORMAL	AOI5 BH-17-12 6-Aug-12 BH-17-125-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-19-12 6-Aug-12 BH-19-125-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-20-12 6-Aug-12 BH-20-12_3.5-4 3.5 - 4 ft NA UNKNOWN NORMAL	AOI5 BH-21-12 6-Aug-12 BH-21-12_5-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-21-12 6-Aug-12 BH-21-12_5.5-6 5.5 - 6 ft NA UNKNOWN NORMAL	AOI5 BH-23-12 9-Aug-12 BH-23-125-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-25-12 8-Aug-12 BH-25-125-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-28-12 8-Aug-12 BH-28-12_05 0 - 0.5 ft NA UNKNOWN NORMAL	AOI5 BH-31-12 8-Aug-12 BH-31-12_3-3.5 3 - 3.5 ft NA UNKNOWN NORMAL	AOI5 BH-32-12 8-Aug-12 BH-32-125-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-33-12 8-Aug-12 BH-33-125-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-34-12 7-Aug-12 BH-34-12_5-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-34-12 7-Aug-12 BH-34-12_4-4.5 4 - 4.5 ft NA UNKNOWN NORMAL	AOI5 BH-35-12 8-Aug-12 BH-35-12_2.5-3 2.5 - 3 ft NA UNKNOWN NORMAL
Volatile Organic Compound	ds															
ISOPROPYLBENZENE (CUMENE)	mg/kg 990	ND (0.005)	0.001 J	ND (0.001)	0.003 J	ND (0.001)	0.056	ND (0.001)	ND (0.005)	ND (0.002)	0.002 J	0.22 J	ND (0.002)	ND (0.005)	ND (0.001)	ND (0.005)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	A	AOI5 BH-36-12 7-Aug-12 BH-36-125-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-36-12 7-Aug-12 BH-36-12_3.5-4 3.5 - 4 ft NA UNKNOWN NORMAL	AOI5 BH-37-12 8-Aug-12 BH-37-12_2-2.5 2 - 2.5 ft NA UNKNOWN NORMAL	AOI5 BH-38-12 7-Aug-12 BH-38-12_3-3.5 3 - 3.5 ft NA UNKNOWN NORMAL	AOI5 BH-39-12 7-Aug-12 BH-39-12_2-2.5 2 - 2.5 ft NA UNKNOWN NORMAL	AOI5 BH-40-12 7-Aug-12 BH-40-12_5-1 0.5 - 1 ft NA UNKNOWN NORMAL	AOI5 BH-40-12 7-Aug-12 BH-40-12_3-3.5 3 - 3.5 ft NA UNKNOWN NORMAL	AOI5_BH-13-01 12-Mar-13 AOI5_BH-13-01_1.5-2_031213 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-08 11-Mar-13 AOI5_BH-13-08_1.5-2_031113 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-08 11-Mar-13 AOI5_BH-13-08_3.5-4_031113 3.5 - 4 ft NA UNKNOWN NORMAL	AOI5_BH-13-15 11-Mar-13 AOI5_BH-13-15_1.5-2_031113 1.5 - 2 ft NA UNKNOWN NORMAL
Volatile Organic Compour	ds									1		1	<u> </u>
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	ND (0.005)	ND (0.001)	ND (0.094)	ND (0.002)	ND (0.001)	0.002 J	ND (0.001)	ND (0.0039)	ND (0.0044)	ND (0.0047)	ND (0.0045)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	A	AOI5_BH-13-15 11-Mar-13 AOI5_BH-13-15_4.5-5_031113 4.5 - 5 ft NA UNKNOWN NORMAL	AOI5_BH-13-16 11-Mar-13 AOI5_BH-13-16_1.5-2_031113 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-16 11-Mar-13 AOI5_BH-13-16_3.5-4_031113 3.5 - 4 ft NA UNKNOWN NORMAL	AOI5_BH-13-17 11-Mar-13 AOI5_BH-13-17_1.5-2_031113 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-17 11-Mar-13 AOI5_BH-13-17_5-5.5_031113 5 - 5.5 ft NA UNKNOWN NORMAL	AOI5_BH-13-22 8-Mar-13 AOI5_BH-13-22_1.5-2_030813 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-22 8-Mar-13 AOI5_BH-13-22_2-2.5_030813 2 - 2.5 ft NA UNKNOWN NORMAL	AOI5_BH-13-25 8-Mar-13 AOI5_BH-13-25_1.5-2_030813 1 - 1.5 ft NA UNKNOWN NORMAL	AOI5_BH-13-25 8-Mar-13 AOI5_BH-13-25_2.5-3_030813 2.5 - 3 ft NA UNKNOWN NORMAL	AOI5_BH-13-26 8-Mar-13 AOI5_BH-13-26_1.5-2_030813 1.5 - 2 ft NA UNKNOWN NORMAL
Volatile Organic Compound	ls											
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	ND (0.0050)	ND (0.56)	ND (0.60)	ND (0.0058)	ND (0.0062)	ND (0.0056)	1.72	3.15	3.96	ND (0.0048)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units A	AOI5_BH-13-28 7-Mar-13 AOI5_BH-13-28_1.5-2_30713 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-29 6-Mar-13 AOI5_BH-13-29_1-1.5_30613 1 - 1.5 ft NA UNKNOWN NORMAL	AOI5_BH-13-29 8-Mar-13 AOI5_BH-13-24_2-2.5_030813 2 - 2.5 ft NA UNKNOWN NORMAL	AOI5_BH-13-30 7-Mar-13 AOI5_BH-13-30_1.5-2_30713 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-31 6-Mar-13 AOI5_BH-13-31_1.5-2_30613 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-32 6-Mar-13 AOI5_BH-13-32_1.5-2_30613 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-33 7-Mar-13 AOI5_BH-13-33_1.5-2_30713 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-34 6-Mar-13 AOI5_BH-13-34_1.5-2_30613 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-34 6-Mar-13 AOI5_BH-13-34, 2.5-3,30613 2.5 - 3 ft NA UNKNOWN NORMAL	AOI5_BH-13-35 6-Mar-13 AOI5_BH-13-35_1.5-2_30613 1.5 - 2 ft NA UNKNOWN NORMAL
Volatile Organic Compoun	ds										
ISOPROPYLBENZENE (CUMENE)	mg/kg 990	ND (0.0060)	15,500 ^A	3,160 ^A	ND (0.0045)	0.0093	9,330 ^A	ND (0.37)	1,650 ^A	23,200 ^A	ND (0.0060)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company		AOI5_BH-13-36 6-Mar-13 AOI5_BH-13-36_1.5-2_30613 1.5 - 2 ft NA LINKNOWN	AOI5_BH-13-37 5-Mar-13 AOI5_BH-13-37_1.5-2_030513 1.5 - 2 ft NA LANGAN	AOI5_BH-13-37 5-Mar-13 AOI5_BH-13-37-2.5-3_030513 2.5 - 3 ft NA LANGAN	AOI5_BH-13-38 5-Mar-13 AOI5_BH-13-38_1.5-2_030513 1.5 - 2 ft NA LANGAN	AOI5_BH-13-38 5-Mar-13 AOI5_BH-13-38_3.5-4_030513 3.5 - 4 ft NA LANGAN	AOI5_BH-13-39 5-Mar-13 AOI5_BH-13-39_1.5-2_030513 1.5 - 2 ft NA LANGAN	AOI5_BH-13-39 5-Mar-13 AOI5_BH-13-39_2-2.5_030513 2 - 2.5 ft NA LANGAN	AOI5_BH-13-39 5-Mar-13 AOI5_BH-13-39_2.5-3_030513 2.5 - 3 ft NA LANGAN	AOI5_BH-13-43 5-Mar-13 BH-13-43-1.5-2_030513 1.5 - 2 ft NA LANGAN	AOI5_BH-13-43 5-Mar-13 BH-13-43-2-2.5_030513 2 - 2.5 ft NA LANGAN
Sample Type	Units A	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compound	ds			•	•					•	•
ISOPROPYLBENZENE (CUMENE)	mg/kg 990	881	ND (0.0041)	ND (0.0065)	ND (0.0069)	ND (0.0070)	ND (0.0052)	ND (0.49)	ND (0.0049)	ND (0.0048)	ND (0.0054)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	AOI5_BH-13-44 8-Mar-13 AOI5_BH-13-44_1.5-2_030813 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5_BH-13-116 29-Oct-13 AOI-5_BH-13-116_05_102913 0 - 0.5 ft NA LANGAN NORMAL	AOI5_BH-13-117 29-Oct-13 AOI-5_BH-13-117_05_102913 0 - 0.5 ft NA LANGAN NORMAL	AOI5_BH-13-121 29-Oct-13 AOI-5_BH-13-121_102913_0-0.5 0 - 0.5 ft NA LANGAN NORMAL	AOI5_BH-13-122 29-Oct-13 AOI-5_BH-13-122_05_102913 0 - 0.5 ft NA LANGAN NORMAL	AOI5_BH-13-123 29-Oct-13 AOI-5_BH-13-123_05_102913 0 - 0.5 ft NA LANGAN NORMAL	AOI5_BH-13-124 29-Oct-13 AOI-5_BH-13-124_05_102913 0 - 0.5 ft NA LANGAN NORMAL	AOI5_BH-13-125 29-Oct-13 AOI-5_BH-13-125_05_102913 0 - 0.5 ft NA LANGAN NORMAL	AOI5_BH-13-126 29-Oct-13 AOI-5_BH-13-126_0-0.5_102913 0 - 0.5 ft NA LANGAN NORMAL
Volatile Organic Compound	S									
ISOPROPYLBENZENE (CUMENE)	mg/kg 9	0 0.0044	ND (0.0074)	ND (0.0066)	ND (0.0054)	ND (0.012)	ND (0.011)	ND (0.013)	ND (0.0074)	ND (0.0041)

Sample Location Sample Date Sample ID Sample Depth Soil Type			AOI5_BH-13-127 30-Oct-13 AOI-5_BH-13-127-0-1_103013 0 - 1 ft NA	AOI5_BH-13-128 30-Oct-13 AOI-5_BH-13-128-0-1_103013 0 - 1 ft NA	AOI5_BH-13-129 30-Oct-13 AOI-5_BH-13-129-0-1_103013 0 - 1 ft NA	AOI5_BH-13-130 30-Oct-13 AOI-5_BH-13-130_0-1_103013 0 - 1 ft NA	AOI5_BH-13-131 30-Oct-13 AOI-5_BH-13-131_0-1_103013 0 - 1 ft NA	AOI5_BH-13-132 30-Oct-13 AOI-5_BH-13-132_0-1_103013 0 - 1 ft NA	AOI5_BH-13-133 30-Oct-13 AOI-5_BH-13-133_0-1_103013 0 - 1 ft NA	AOI5_BH-13-134 30-Oct-13 AOI-5_BH-13-134_0-1_103013 0 - 1 ft NA	AOI5_BH-13-135 30-Oct-13 AOI-5_BH-13-135-0-1_103013 0 - 1 ft NA
Sampling Company Sample Type	Units	A	LANGAN NORMAL								
Volatile Organic Compound	ls										
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	ND (0.0066)	ND (0.0059)	ND (0.0054)	ND (0.0076)	ND (0.0075)	ND (0.0061)	ND (0.0055)	ND (0.0062)	ND (0.0061)

Sample Location	1		AOI5_BH-13-136	AOI5_BH-13-137	AOI5_BH-13-138	AOI5_BH-13-139	AOI5_BH-13-140	AOI5_BH-13-141	AOI5_BH-13-142	AOI5_BH-13-143	AOI5_BH-13-144	AOI5_BH-13-145
Sample Date			30-Oct-13									
Sample ID			AOI5-BH-13-136_103013_0-1	AOI5-BH-13-137_103013_0-1	AOI5-BH-13-138_103013_0-1	AOI5-BH-13-139_103013_0-1	AOI5-BH-13-140_103013_0-1	AOI5-BH-13-141_103013_0-1	AOI5-BH-13-142_103013_0-1	AOI5-BH-13-143_103013_0-1	AOI5-BH-13-144_103013_0-1	AOI5-BH-13-145_103013_0-1
Sample Depth			0 - 1 ft									
Soil Type			NA									
Sampling Company			LANGAN									
Sample Type	Units	Α	NORMAL									
Volatile Organic Compoun	ds											
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	ND (0.0060)	ND (0.0057)	ND (0.0071)	ND (0.0061)	ND (0.0067)	ND (0.0061)	ND (0.0074)	ND (0.0060)	ND (0.0056)	ND (0.0059)

	1
Sample Location AOI5_BH-13-146 AOI5_BH-13-147 AOI5_BH-13-148 AOI5_BH-13-149 AOI5_BH-13-149 AOI5_BH-13-150 AOI5_BH-13-151 AOI5_BH-13-152 AOI5_BH-13-152	3 AOI5_BH-13-154
Sample Date 30-Oct-13	29-Oct-13
Sample ID AOI5-BH-13-146_103013_0-1 AOI5-BH-13-147_103013_0-1 AOI5-BH-13-147_103013_0-1 AOI5-BH-13-148_103013_0-1 AOI5-BH-13-149_103013_0-1 AOI5-BH-13-150_103013_0-1 AOI5-BH-13-151_103013_0-1 AOI5-BH-13-152_103013_0-1 AOI5-BH-13-152_103013_0-1 AOI5-BH-13-152_103013_0-1 AOI5-BH-13-150_103013_0-1 AOI5-BH-13-150_103013_0-1 AOI5-BH-13-152_103013_0-1 AOI5-BH-13-140_103013_0-1 AOI5-BH-13-150_103013_0-1 AOI5-BH-13-150_100013_0-1 AOI5-BH-13-150_10000_0-1 AOI5-BH-13-150_100_0-	13_0-1 AOI-5_BH-13-154_0-0.5_102913
Sample Depth 0 - 1 ft	0 - 0.5 ft
Soil Type NA NA NA NA NA NA NA NA NA	NA
Sampling Company LANGAN	LANGAN
Sample Type Units A NORMAL NORMAL NORMAL NORMAL NORMAL NORMAL FIELD DUPLICATE SAMPLE NORMAL NORMAL NORMAL NORMAL	NORMAL
Volatile Organic Compounds	
ISOPROPYLBENZENE (CUMENE) mg/kg 99 ND (0.0074) ND (0.0057) ND (0.0061) ND (0.0063) ND (0.0056) ND (0.0056) ND (0.0070) ND (0.0062) ND (0.0062)	ND (0.0075)

Sample Location		AOI5_BH-13-155	AOI5_BH-13-156	AOI5_BH-13-158	AOI5_BH-13-159	AOI-5_BH-13-40	AOI-5_BH-13-41	AOI-5_BH-13-42	AOI-5_BH-13-42	AOI5_BH-14-01	AOI5_BH-14-02	AOI5_BH-14-03	AOI5_BH-14-04
Sample Date		29-Oct-13	29-Oct-13	29-Oct-13	29-Oct-13	4-Mar-13	4-Mar-13	4-Mar-13	4-Mar-13	17-Mar-14	17-Mar-14	17-Mar-14	17-Mar-14
Sample ID		AOI-5_BH-13-155_05_102913	AOI-5_BH-13-156_05_102913	AOI-5_BH-13-158_0-1_102913	AOI-5_BH-13-159_0-1_102913	BH-13-40-2-2.5_030413	BH-13-41-2-2.5_030413	BH-13-42-1.5-2_030413	BH-13-42-2.5-3_030413	AOI5_BH-14-01	AOI5_BH-14-02	AOI5_BH-14-03	AOI5_BH-14-04
Sample Depth		0 - 0.5 ft	0 - 0.5 ft	0 - 1 ft	0 - 1 ft	2 - 2.5 ft	2 - 2.5 ft	1.5 - 2 ft	2.5 - 3 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Soil Type		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Company		LANGAN	LANGAN	LANGAN	LANGAN	LANGAN	LANGAN	LANGAN	LANGAN	LANGAN	LANGAN	LANGAN	LANGAN
Sample Type Units	Α	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compounds													
ISOPROPYLBENZENE (CUMENE) mg/kg	990	ND (0.0062)	ND (0.0076)	ND (0.0072)	ND (0.0052)	ND (0.0059)	ND (0.0046)	ND (0.0042)	ND (0.0037)	ND (0.0070)	ND (0.0095)	21,100 ^A	15.1
		A											

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	AOI5_BH-14-05 18-Mar-14 AOI5_BH-14-05 0 - 2 ft NA LANGAN A NORMAL	AOI5_BH-14-09 18-Mar-14 AOI5_BH-14-09 0 - 2 ft NA LANGAN NORMAL	AOI5_BH-14-10 18-Mar-14 AOI5_BH-14-10 0 - 2 ft NA LANGAN NORMAL	AOI5_BH-14-11 18-Mar-14 AOI5_BH-14-11 0 - 2 ft NA LANGAN NORMAL	AOI5_BH-14-12 18-Mar-14 AOI5_BH-14-12 0 - 2 ft NA LANGAN NORMAL	AOI5_BH-14-12 7-Aug-12 BH-14-12_3.5-4 3.5 - 4 ft NA UNKNOWN NORMAL	AOI5_BH-14-13 18-Mar-14 AOI5_BH-14-13 0 - 2 ft NA LANGAN NORMAL	AOI5_BH-14-14 16-Jun-14 AOI-5_14-14_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-14 16-Jun-14 AOI-5_14-14_8-9' 8 - 9 ft NA AQUATERRA NORMAL	AOI5_BH-14-15 16-Jun-14 AOI-5_14-15_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-15 16-Jun-14 AOI-5_14-15_8.0' 8 ft NA AQUATERRA NORMAL	AOI5_BH-14-17 16-Jun-14 AOI-5_14-17_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-17 16-Jun-14 AOI-5_14-17_8.0' 8 ft NA AQUATERRA NORMAL	AOI5_BH-14-18 16-Jun-14 AOI-5_14-18_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-18 16-Jun-14 AOI-5_14-18_7.0' 7 ft NA AQUATERRA NORMAL
Volatile Organic Compound	ds															
ISOPROPYLBENZENE (CUMENE)	mg/kg	990 ND (0.0057)	ND (0.0058)	ND (0.0068)	ND (0.0064)	ND (0.0047)	0.004 J	ND (0.0053)	0.00023 J	ND (0.0065)	0.00059 J	3.11	ND (0.0067)	1.67	ND (0.0070)	0.878 J

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type Units	А	AOI5_BH-14-19 18-Jun-14 AOI-5_BH_14-19_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-19 18-Jun-14 AOI-5_BH_14-19_6-8' 6 - 8 ft NA AQUATERRA NORMAL	AOI5_BH-14-20 20-Jun-14 AOI-5_BH_14-20 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-20 24-Jun-14 AOI-5_BH_14_20_6-8' 6 - 8 ft NA AQUATERRA NORMAL	AOI5_BH-14-21 18-Jun-14 AOI-5_BH_14-21_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-21 18-Jun-14 AOI-5_BH_14-21_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-22 18-Jun-14 AOI-5_BH_14-22_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-22 18-Jun-14 AOI-5_BH_14-22_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-24 20-Jun-14 AOI-5_BH_14-24_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-24 24-Jun-14 AOI-5_BH_14_24_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-25 18-Jun-14 AOI-5_BH_14-25_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-25 18-Jun-14 AOI-5_BH_14-25_6-8' 6 - 8 ft NA AQUATERRA NORMAL	AOI5_BH-14-26 19-Jun-14 AOI-5_BH_14-26_0-2' 0 - 2 ft NA AQUATERRA NORMAL
Volatile Organic Compounds		·												
ISOPROPYLBENZENE (CUMENE) mg/kg	990	ND (0.0047)	ND (0.0080)	ND (0.0054)	ND (0.0081)	ND (0.0055)	ND (0.0079)	ND (0.0045)	ND (0.0073)	ND (0.0075)	0.0425 J	0.00058 J	ND (0.0064)	ND (0.0077)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units A	AOI5_BH-14-27 19-Jun-14 AOI-5_BH_14-27_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-28 19-Jun-14 AOI-5_BH_14-28_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-28 19-Jun-14 AOI-5_BH_14-28_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-29 19-Jun-14 AOI-5_BH_14-29_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-30 19-Jun-14 AOI-5_BH_14-30_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-30 19-Jun-14 AOI-5_BH_14-30_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-31 19-Jun-14 AOI-5_BH_14-31_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-31 19-Jun-14 AOI-5_BH_14-31_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-32 17-Jun-14 AOI-5-BH_14-32_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-32 17-Jun-14 AOI-5-BH_14-32_4-5' 4 - 5 ft NA AQUATERRA NORMAL	AOI5_BH-14-33 17-Jun-14 AOI-5-BH_14-33_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-33 17-Jun-14 AOI-5-BH_14-33_5-6' 5 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-34 17-Jun-14 AOI-5-BH_14-34_0-2' 0 - 2 ft NA AQUATERRA NORMAL
Volatile Organic Compound	ds													
ISOPROPYLBENZENE (CUMENE)	mg/kg 990	ND (0.0059)	ND (0.0043)	0.0015 J	0.00080 J	0.00027 J	0.0034 J	ND (0.0076)	ND (0.0088)	ND (0.0071)	28.6	59.5	45.1	39.2

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	A	AOI5_BH-14-34 17-Jun-14 AOI-5-BH_14-34_5-6' 5 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-35 17-Jun-14 AOI-5-BH_14-35_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-35 17-Jun-14 AOI-5-BH_14-35_5-6' 5 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-36 18-Jun-14 AOI-5_BH_14-36_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-36 18-Jun-14 AOI-5_BH_14-36_4-6' 4 - 6 ft NA AQUATERRA NORMAL	AOI5_BH-14-37 19-Jun-14 AOI-5_BH_14-37_0-2' 0 - 2 ft NA AQUATERRA NORMAL	AOI5_BH-14-37 19-Jun-14 AOI-5_BH_14-37_6-8' 6 - 8 ft NA AQUATERRA NORMAL	AOI5-BH-13-02 1-Mar-13 A015-BH-13-02_05 0 - 0.5 ft NA LANGAN NORMAL	AOI5-BH-13-03 1-Mar-13 A015-BH-13-03_05 0 - 0.5 ft NA LANGAN NORMAL	AOI5-BH-13-05 1-Mar-13 A015-BH-13-05_05 0 - 0.5 ft NA LANGAN NORMAL	AOI5-BH-13-06 1-Mar-13 A015-BH-13-06_025 0 - 0.25 ft NA LANGAN NORMAL	AOI5-BH-13-11 1-Mar-13 A015-BH-13-11_025 0 - 0.25 ft NA LANGAN NORMAL	AOI5-BH-13-13 1-Mar-13 A015-BH-13-13_025 0 - 0.25 ft NA LANGAN NORMAL
Volatile Organic Compound	ls														
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	71.2	ND (0.0071)	33.1	ND (0.0044)	ND (0.0058)	ND (0.0052)	ND (0.0083)	ND (0.0048)	ND (0.0045)	ND (0.0063)	ND (0.0046)	ND (0.0051)	ND (0.0045)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	A	AOI5-BH-13-18 1-Mar-13 A015-BH-13-18_025 0 - 0.25 ft NA LANGAN NORMAL	AOI5-BH-13-19 1-Mar-13 A015-BH-13-195-1 0.5 - 1 ft NA LANGAN NORMAL	AOI5-BH-13-27 7-Mar-13 AOI5_BH-13-27_1.5-2_30713 1.5 - 2 ft NA UNKNOWN NORMAL	AOI5-BH-13-27 7-Mar-13 AO15-BH-13-27-2.5-330713 2.5 - 3 ft NA UNKNOWN NORMAL	AOI5-BH-21-SH01 9-Jun-21 BH-SH01_2.6-3_20210609 2.6 - 3 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH01 10-Jun-21 BH-SH01_10-12_20210610 10 - 12 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH02 9-Jun-21 BH-SH02_3.3-3.8_20210609 3.3 - 3.8 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH02 10-Jun-21 BH-SH02_18-19_20210610 18 - 19 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH03 10-Jun-21 BH-SH03_0-2_20210610 0 - 2 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH03 9-Jun-21 BH-SH03_24-25_20210609 24 - 25 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH04 9-Jun-21 BH-SH04_2.9-3.4_20210609 2.9 - 3.4 ft Not Reported SANBORN HEAD NORMAL
Volatile Organic Compound	s												
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	ND (0.0056)	ND (0.0051)	62.4	0.0445	21,000 ^A	180	5,000 ^A	ND (0.0081)	47,000 ^A	ND (0.0092)	14,000 ^A

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type Units	A	AOI5-BH-21-SH04 9-Jun-21 BH-SH04_2.9-3.4_20210609 DUP 2.9 - 3.4 ft Not Reported SANBORN HEAD FIELD DUPLICATE SAMPLE	AOI5-BH-21-SH04 9-Jun-21 BH-SH04_14-15_20210609 14 - 15 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH05 9-Jun-21 BH-SH05_2.9-3.4_20210609 2.9 - 3.4 ft Not Reported SANBORN HEAD NORMAL	AOI5-BH-21-SH05 9-Jun-21 BH-SH05_14-15_20210609 14 - 15 ft Not Reported SANBORN HEAD NORMAL	AOI5-WC-202106 10-Jun-21 WASTE_CHAR_20210610 Not Reported SANBORN HEAD NORMAL	BH-25-09 7-Apr-09 BH-25-09 0 - 2 ft NA UNKNOWN NORMAL	BH-26-09 7-Apr-09 BH-26-09 0 - 2 ft NA UNKNOWN NORMAL	GP1209-1210 23-Jan-12 GP1209-1210-2.6-3.1 2.6 - 3.1 ft NA UNKNOWN NORMAL	GP1209-E 23-Jan-12 GP1209-E-2.8-3.3 2.8 - 3.3 ft NA UNKNOWN NORMAL	GP1209-NW 23-Jan-12 GP1209-NW-2.8-3.3 2.8 - 3.3 ft NA UNKNOWN NORMAL	GP1209-PP 23-Jan-12 GP1209-PP-0.5 0.5 - 1 ft NA UNKNOWN NORMAL	GP1209-SW 23-Jan-12 GP1209-SW-3.0-3.5 3 - 3.5 ft NA UNKNOWN NORMAL	GP1210-NE 23-Jan-12 GP1210-NE-2.8-3.3 2.8 - 3.3 ft NA UNKNOWN NORMAL
Volatile Organic Compounds														
ISOPROPYLBENZENE (CUMENE) mg/kg S	990	10,000 ^A	3.1	120	2	65	ND (0.360)	ND (0.290)	510	0.23 J	26	4.1	13,000 ^A	2,000 ^A

Sample Location	1 1	GP1210-NW	GP1210-SW	GP1212-NE	GP1212-NW	GP1212-PP	GP1212-SE	GP1212-SW	PE-1A-14-1	PE-1A-14-2	PE-1A-14-3	PE-1A-14-4	PE-1A-14-5	PE-1A-14-6	PE-1A-14-7	PE-1A-14-8	PE-1B-14-1	PE-1B-14-2	PE-1B-14-3
Sample Date		23-Jan-12	23-Jan-12	23-Jan-12	23-Jan-12	23-Jan-12	23-Jan-12	23-Jan-12	26-Mar-14	25-Mar-14	25-Mar-14	25-Mar-14							
Sample ID		GP1210-NW-2.9-3.4	GP1210-SW-3.3-3.8	GP1212-NE-2.9-3.4	GP1212-NW-2.7-3.2	GP1212-PP-0.5	GP1212-SE-2.9-3.4	GP1212-SW-2.7-3.2	PE-1A-14-1	PE-1A-14-2	PE-1A-14-3	PE-1A-14-4	PE-1A-14-5	PE-1A-14-6	PE-1A-14-7	PE-1A-14-8	PE-1B-14-1	PE-1B-14-2	PE-1B-14-3
Sample Depth		2.9 - 3.4 ft	3.3 - 3.8 ft	2.9 - 3.4 ft	2.7 - 3.2 ft	0.5 - 1 ft	2.9 - 3.4 ft	2.7 - 3.2 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft	2 - 2.5 ft
Soil Type		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sampling Company		UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	LANGAN										
Sample Type	Units	A NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compound	ds	·																	
ISOPROPYLBENZENE (CUMENE)	mg/kg	990 1.5	33,000 ^A	28,000 ^A	14	0.033	30,000 ^A	0.011	0.0033 J	0.0606	0.0782	0.0595	0.0528	0.0053 J	0.0547	0.0043 J	0.0268 J	ND (0.77)	ND (0.008)

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	Α	PE-1B-14-4 25-Mar-14 PE-1B-14-4 2 - 2.5 ft NA LANGAN NORMAL	PE-1B-14-5 25-Mar-14 PE-1B-14-5 2 - 2.5 ft NA LANGAN NORMAL	PE-1B-14-6 25-Mar-14 PE-1B-14-6 2 - 2.5 ft NA LANGAN NORMAL	PE-1B-14-7 25-Mar-14 PE-1B-14-7 2 - 2.5 ft NA LANGAN NORMAL	PE-1B-14-8 25-Mar-14 PE-1B-14-8 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-1 7-Apr-14 PE-2-14-1 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-2 7-Apr-14 PE-2-14-2 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-3 7-Apr-14 PE-2-14-3 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-4 7-Apr-14 PE-2-14-4 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-5 7-Apr-14 PE-2-14-5 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-6 7-Apr-14 PE-2-14-6 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-7 7-Apr-14 PE-2-14-7 2 - 2.5 ft NA LANGAN NORMAL	PE-2-14-8 7-Apr-14 PE-2-14-8 2 - 2.5 ft NA LANGAN NORMAL	PE-3A-14-1 31-Mar-14 PE-3A-14-1 2 - 2.5 ft NA LANGAN NORMAL	PE-3A-14-2 31-Mar-14 PE-3A-14-2 2 - 2.5 ft NA LANGAN NORMAL	PE-3A-14-3 31-Mar-14 PE-3A-14-3 2 - 2.5 ft NA LANGAN NORMAL	PE-3A-14-4 31-Mar-14 PE-3A-14-4 2 - 2.5 ft NA LANGAN NORMAL	PE-3A-14-4 31-Mar-14 PE-DUP-33114 2 - 2.5 ft NA LANGAN FIELD DUPLICATE SAMPLE	PE-3A-14-5 31-Mar-14 PE-3A-14-5 2 - 2.5 ft NA LANGAN NORMAL	PE-3A-14-6 31-Mar-14 PE-3A-14-6 2 - 2.5 ft NA LANGAN NORMAL	PE-3A-14-7 31-Mar-14 PE-3A-14-7 2 - 2.5 ft NA LANGAN NORMAL
Volatile Organic Compound	ds				•															•			
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	0.00079 J	0.0106 J	0.0034 J	0.00052 J	0.0011 J	ND (0.0091)	ND (0.0090)	ND (0.0079)	ND (0.0073)	ND (0.0087)	ND (0.0074)	ND (0.0078)	ND (0.0073)	0.00054 J	ND (0.0064)	ND (0.0054)	ND (0.0052)	ND (0.0063)	ND (0.0034)	0.00041 J	0.00033 J

Sample Location Sample Date Sample ID Sample Depth Soil Type Sampling Company Sample Type	Units	Α	PE-3A-14-8 31-Mar-14 PE-3A-14-8 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-1 1-Apr-14 PE-3B-14-1 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-2 1-Apr-14 PE-3B-14-2 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-3 1-Apr-14 PE-3B-14-3 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-4 1-Apr-14 PE-3B-14-4 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-5 1-Apr-14 PE-3B-14-5 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-6 1-Apr-14 PE-3B-14-6 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-7 1-Apr-14 PE-3B-14-7 2 - 2.5 ft NA LANGAN NORMAL	PE-3B-14-8 1-Apr-14 PE-3B-14-8 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-1 1-Apr-14 PE-4-14-1 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-2 1-Apr-14 PE-4-14-2 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-3 1-Apr-14 PE-4-14-3 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-3 1-Apr-14 PE-DUP-040114 2 - 2.5 ft NA LANGAN FIELD DUPLICATE SAMPLE	PE-4-14-4 1-Apr-14 PE-4-14-4 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-5 1-Apr-14 PE-4-14-5 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-6 1-Apr-14 PE-4-14-6 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-7 1-Apr-14 PE-4-14-7 2 - 2.5 ft NA LANGAN NORMAL	PE-4-14-8 1-Apr-14 PE-4-14-8 2 - 2.5 ft NA LANGAN NORMAL
Volatile Organic Compound	S																			
ISOPROPYLBENZENE (CUMENE)	mg/kg	990	0.00047 J	1,610 ^A	12,200 ^A	5,200 ^A	6,640 ^A	12,400 ^A	1,510 ^A	1,930 ^A	2,960^A	10.1	6.27	1.37	6.54	3	5.78	2.13	4.79	1.2

ISOPROPYLBENZENE (CUMENE) mg/kg 990	0.00047 J	1,610 ^A	12,200 ^A	5,200 ^A	6,640 ^A	12,400 ^A	1,510 ^A	1,930 ^A	2,960 ^A	10.1	6.27	1.37	6.54	
														_

Notes:

MSC-PA Pennsylvania Department of Environmental Protection - 2021

- А Medium-Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Surface Soil (0-2 ft).
- в Medium-Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil - Direct Contact - Non-Residential Subsurface Soil (2-15 ft)

С Medium Specific Concentrations (MSCs) for Organic/Inorganic Regulated Substances in Soil – Soil to Groundwater, Higher of the 100x the Groundwater MSC and the Generic Value (Unsaturated) – Non-Residential USEPA RSL United States Environmental Protection Agency Regional Screening Levels (RSLs)

D Industrial Soil Screening Levels (TR=1E-06, THQ=0.1) (May 2022)

6.5^A Concentration exceeds the indicated standard.

15.2 Measured concentration did not exceed the indicated standard.

ND (0.03) Analyte was not detected at a concentration greater than the laboratory reporting limit.

J Indicates an estimated value

Sample Location Sample Date Sample ID Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID Sample Type	Units	Α	A-1 22-Oct-14 A-1_102214 AQUATERRA ACTD JB79950 JB79950-5 NORMAL	A-3 20-Oct-14 A-3_102014 AQUATERRA ACTD JB79846 JB79846-7 NORMAL	A- 30-Apr-21 A-4_20210430 STANTEC LANCASTER 410-38134-1 410-38134-5 NORMAL	4 13-Apr-22 A-4_20220413 STANTEC SGSA JD43215 JD43215-4 NORMAL	A-5 22-Jan-16 AOI5_A-5_012216 AQUATERRA ACTD JC13164 JC13164-1 NORMAL	A-6 17-Oct-14 A-6_101714 AQUATERRA ACTD JB79845 JB79845-1 NORMAL	A-8 4-May-07 A-8_050407 UNKNOWN PITB 73491 0705-1216 NORMAL	A-9 13-Oct-14 A-9_101314 AQUATERRA ACTD JB79151 JB79151-1 NORMAL	A-10 13-Oct-14 A-10_101314 AQUATERRA ACTD JB79151 JB79151-2 NORMAL	A-11 9-Oct-14 A-11_100914 AQUATERRA ACTD JB79002 JB79002-7 NORMAL	A-12 10-Oct-14 A-12_101014 AQUATERRA ACTD JB79002 JB79002-4 NORMAL	A-13D 27-Mar-13 A-13D_32713 LANGAN ACCUTEST JB32577 JB32577-4 NORMAL	A-15 19-Jan-16 AOI5_A-15_011916 AQUATERRA ACTD JC12891 JC12891-1 NORMAL	A-16 22-Oct-14 A-16_102214 AQUATERRA ACTD JB79950 JB79950-9 NORMAL	A-17 17-Nov-10 A-17 UNKNOWN UNKNOWN 1985-2013_Hist_GW UNKNOWN NORMAL	A-18 27-Oct-04 A-18 UNKNOWN UNKNOWN 1985-2013_Hist_GW UNKNOWN NORMAL	A-19 27-Oct-04 A-19 UNKNOWN UNKNOWN 1985-2013_Hist_GW UNKNOWN NORMAL	A-19D 29-Apr-21 A-19D_20210429 STANTEC LANCASTER 410-37993-1 410-37993-7 NORMAL
Volatile Organic Compounds																				
ISOPROPYLBENZENE (CUMENE)	µg/L	45	ND (1.0)	30.5	ND (5.0)	ND (1.0)	1.0 SL	ND (10)	ND (5)	ND (1.0)	0.50 J	ND (1.0)	ND (1.0)	ND (2.0)	ND (1.0) SL	ND (1.0)	ND (0.5)	ND (5.0)	ND (5.0)	0.31 J

Sample Location	1	1	Α-	21D	A-22	A-23	A-24	A-25	A-26	A-27	A-39	A-40	A-41	A-43	A-44	A-45	A-47	A-48	A-49	A-91	A-118	A-119
Sample Date			29-Apr-21	8-Apr-22	21-Jan-16	22-Oct-14	8-Oct-14	20-Oct-14	20-Oct-14	22-Oct-14	8-Oct-14	8-Oct-14	8-Oct-14	3-May-07	14-Oct-14	14-Oct-14	22-Oct-14	13-Oct-14	22-Oct-14	9-May-07	20-Oct-14	9-May-07
Sample ID			A-21D_20210429	A-21D_20220408	AOI5_A-22_012116	A-23_102214	A-24_100814	A-25_102014	A-26_102014	A-27_102214	A-39_100814	A-40_100814	A-41_100814	A-43_050307	A-44_101414	A-177_101414	A-47_102214	A-48_101314	A-49_102214	A-91_050907	A-118_102014	A-119_050907
Sampling Company			STANTEC	STANTEC	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	UNKNOWN	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA	UNKNOWN	AQUATERRA	UNKNOWN
Laboratory			LANCASTER	SGSA	ACTD	ACTD	ACTD	ACTD	ACTD	ACTD	ACTD	ACTD	ACTD	PITB	ACTD	ACTD	ACTD	ACTD	ACTD	PITB	ACTD	PITB
Laboratory Work Order			410-37993-1	JD42842	JC13091	JB79950	JB78750	JB79846	JB79846	JB79950	JB78750	JB78750	JB78750	73491	JB79299	JB79299	JB79950	JB79151	JB79950	73593	JB79846	73593
Laboratory Sample ID			410-37993-14	JD42842-15	JC13091-1	JB79950-6	JB78750-4	JB79846-3	JB79846-1	JB79950-1	JB78750-2	JB78750-1	JB78750-3	0705-1208	JB79299-4	JB79299-1	JB79950-7	JB79151-3	JB79950-8	0705-1840	JB79846-5	0705-1839
Sample Type	Units	Α	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compour	nds																					
ISOPROPYLBENZENE (CUMENE) µg/L	45	ND (5.0)	ND (1.0)	1.1 SL	ND (1.0)	15.5	ND (1.0)	ND (1.0)	40.0	ND (1.0)	ND (1.0)	ND (1.0)	ND (5)	ND (1.0)	0.70 J	ND (1.0)	18.4	2.9	ND (5)	ND (1.0)	160 ^A

Sample Location		A-120	A-121	A-122	A-133	A-1	34	A-135	A-136	A-138	A-	139	A-	140	A-141	A-142	A-143	A-145	A-146	A-147
Sample Date		9-May-07	9-May-07	20-Oct-14	27-Jun-18	29-Apr-21	11-Apr-22	17-Oct-14	21-Jan-16	8-Apr-13	28-Apr-21	11-Apr-22	29-Apr-21	11-Apr-22	7-May-07	15-Oct-14	14-Oct-14	3-May-07	9-May-07	9-May-07
Sample ID		A-120_050907	A-121_050907	A-122_102014	A-133_20180627	A-134_20210429	A-134_2022041	1 A-135_101714	AOI5_A-136_012116	A-138_040813	A-139_20210428	A-139_20220411	A-140_20210429	A-140_20220411	A-141_050707	A-142_101514	A-143_101414	A-145_050307	A-146_050907	A-147_050907
Sampling Company		UNKNOWN	UNKNOWN	AQUATERRA	STANTEC	STANTEC	STANTEC	AQUATERRA	AQUATERRA	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	UNKNOWN	AQUATERRA	AQUATERRA	UNKNOWN	UNKNOWN	UNKNOWN
Laboratory		PITB	PITB	ACTD	ESC	LANCASTER	SGSA	ACTD	ACTD	ACCUTEST	LANCASTER	SGSA	LANCASTER	SGSA	PITB	ACTD	ACTD	PITB	PITB	PITB
Laboratory Work Order		73593	73593	JB79846	L1005890	410-37993-1	JD43052	JB79845	JC13091	JB33644	410-37852-1	JD43052	410-37993-1	JD43052	07-3612	JB79372	JB79299	73491	73593	73593
Laboratory Sample ID		0705-1835	0705-1836	JB79846-10	L1005890-06	410-37993-6	JD43052-6	JB79845-3	JC13091-3	JB33644-10	410-37852-7	JD43052-1	410-37993-5	JD43052-2	0705-1960	JB79372-2	JB79299-5	0705-1212	0705-1837	0705-1842
Sample Type	Units	A NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compo	ounds								1											
ISOPROPYLBENZENE (CUME	ENE) µg/L	45 8.6	ND (5)	ND (1.0)	ND (1.00)	60 ^A	ND (1.0)	68.9 ^A	12.6 SL	104 ^A	ND (5.0)	ND (1.0)	ND (5.0)	ND (1.0)	ND (5)	ND (1.0)	ND (1.0)	ND (5)	3.2 J	1.3 J

Sample Location Sample Date Sample ID Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID Sample Type	Units	Α	A-148 22-Oct-14 A-148_102214 AQUATERRA ACTD JB79950 JB79950-10 NORMAL	A-149 22-Oct-14 A-149_102214 AQUATERRA ACTD JB79950 JB79950-11 NORMAL	A-150 20-Oct-14 A-150_102014 AQUATERRA ACTD JB79846 JB79846-9 NORMAL	A-151 20-Oct-14 A-151_102014 AQUATERRA ACTD JB79846 JB79846-8 NORMAL	A-152 21-Oct-14 A-152_102114 AQUATERRA ACTD JB79844 JB79844-3 NORMAL	A-153 9-May-07 A-153_050907 UNKNOWN PITB 73593 0705-1841 NORMAL	A-154 22-Oct-14 A-154_102214 AQUATERRA ACTD JB79950 JB79950-3 NORMAL	A-155 20-Jan-16 AOI5_A-155_012016 AQUATERRA ACTD JC12972 JC12972-1 NORMAL	A-156 6-Oct-14 A-156_100614 AQUATERRA ACTD JB78486 JB78486-5 NORMAL	A-157 15-Oct-14 A-157_101514 AQUATERRA ACTD JB79372 JB79372-4 NORMAL	A-158 15-Oct-14 A-158_101514 AQUATERRA ACTD JB79372 JB79372-5 NORMAL	A-159 21-Nov-12 A-159_112112 UNKNOWN ACCUTEST JB21965 JB21965-4 NORMAL	A-160 21-Nov-12 A-160_112112 UNKNOWN ACCUTEST JB21965 JB21965-5 NORMAL	A-161 31-Jul-14 A-161_073114 AQUATERRA ACCUTEST JB73006 JB73006-1 NORMAL	A-162 13-Oct-14 A-162_101314 AQUATERRA ACTD JB79151 JB79151-5 NORMAL	A-163 6-Oct-14 A-163_100614 AQUATERRA ACTD JB78486 JB78486-1 NORMAL	A-164 6-Oct-14 A-164_100614 AQUATERRA ACTD JB78486 JB78486-2 NORMAL	A-166 31-Jul-15 AOI5_A-166_073115 AQUATERRA ACCUTEST JC522 JC522-2 NORMAL
Sample Type	Units	A	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compound	ds	·																		
ISOPROPYLBENZENE (CUMENE)	µg/L	45	ND (1.0)	0.76 J	9.6	0.36 J	ND (1.0)	3.2 J	0.52 J	0.51 J SL	2.3	0.31 J	52.4 ^A	525 ^A	14.2	83.1 SL ^A	0.48 J	5.1	ND (1.0)	0.47 J

						1				1		1				1	1		
Sample Location			A-167	A-168	A-169	A-170	A-171	A-172	A-173	A-174	A-175	A-178	A-181	A-1	82	A-183	A-184	A-185	A-186
Sample Date			22-Oct-14	22-Oct-14	6-Oct-14	21-Oct-14	29-Jul-14	9-Oct-14	14-Oct-14	25-Jul-14	14-Oct-14	1-Aug-14	10-Oct-14	30-Apr-21	8-Apr-22	28-Jul-14	28-Jul-14	8-Oct-14	20-Oct-14
Sample ID			A-167_102214	A-168_102214	A-169_100614	A-170_102114	A-171_072914	A-172_100914	A-173_101414	A-174_072514	A-175_101414	A-178_080114	A-181_101014	A-182_20210430	A-182_20220408	A-183_072814	A-184_072814	A-185_100814	A-186_102014
Sampling Company			AQUATERRA	STANTEC	STANTEC	AQUATERRA	AQUATERRA	AQUATERRA	AQUATERRA										
Laboratory			ACTD	ACTD	ACTD	ACTD	ACCUTEST	ACTD	ACTD	ACCUTEST	ACTD	ACCUTEST	ACTD	LANCASTER	SGSA	ACCUTEST	ACCUTEST	ACTD	ACTD
Laboratory Work Order			JB79950	JB79950	JB78486	JB79844	JB72810	JB79002	JB79299	JB72605	JB79299	JB73138	JB79002	410-38134-1	JD42842	JB72811	JB72811	JB78750	JB79846
Laboratory Sample ID			JB79950-4	JB79950-2	JB78486-4	JB79844-4	JB72810-7	JB79002-6	JB79299-3	JB72605-1	JB79299-2	JB73138-3	JB79002-2	410-38134-4	JD42842-14	JB72811-3	JB72811-2	JB78750-6	JB79846-4
Sample Type	Units	A	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL											
Volatile Organic Compound	ds																		
ISOPROPYLBENZENE (CUMENE)	µg/L	45	ND (1.0)	3.1	21.7	0.70 J	9.7	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0) SL	ND (1.0)	ND (5.0)	ND (1.0)	11.3	ND (1.0)	ND (1.0)	ND (1.0)

Sample Location			A-'	190	A-1	191	A-	192	A-	193	PZ-2	PZ-3	RW	3H-2	SW-2	SW-3
Sample Date			29-Dec-21	11-Apr-22	29-Dec-21	12-Apr-22	29-Dec-21	12-Apr-22	29-Dec-21	8-Apr-22	3-May-07	3-May-07	10-May-21	9-May-22	7-Oct-14	7-Oct-14
Sample ID			A-190_20211229	A-190_20220411	A-191_20211229	A-191_20220412	A-192_20211229	A-192_20220412	A-193_20211229	A-193_20220408	PZ-2_050307	PZ-3_050307	RWBH-2_SL_20210510	RWBH-2_SL_20220509	SW-2_100714	SW-3_100714
Sampling Company			SANBORN HEAD	STANTEC	SANBORN HEAD	STANTEC	SANBORN HEAD	STANTEC	SANBORN HEAD	STANTEC	UNKNOWN	UNKNOWN	STANTEC	STANTEC	AQUATERRA	AQUATERRA
Laboratory			LANCASTER	SGSA	LANCASTER	SGSA	LANCASTER	SGSA	LANCASTER	SGSA	PITB	PITB	LANCASTER	SGSA	ACTD	ACTD
Laboratory Work Order			410-68394-1	JD43052	410-68394-1	JD43052	410-68394-1	JD43052	410-68394-1	JD42842	73491	73491	410-39343-1	JD44657	JB78735	JB78735
Laboratory Sample ID			410-68394-4	JD43052-7	410-68394-3	JD43052-9	410-68394-5	JD43052-14	410-68394-2	JD42842-17	0705-1223	0705-1224	410-39343-6	JD44657-1	JB78735-1	JB78735-4
Sample Type	Units	Α	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Volatile Organic Compoun	ds															
ISOPROPYLBENZENE (CUMENE)	µg/L	45	8,600 ^A	7,740 ^A	11,000 ^A	9,180 ^A	18,000 ^A	4,420 ^A	ND (5.0)	ND (1.0)	ND (5)	ND (5)	2.3 J SL	ND (1.0) SL	ND (1.0)	ND (1.0)

Sample Location			SWR-1	SWR-2	SWR-3	WP-4A	WP-8	WP-9	WP-14	WP16-3	v	VP-A	WP-B	WP-C	WP-D	WP-E
Sample Date Sample ID Sampling Company Laboratory Laboratory Work Order Laboratory Sample ID Sample Type	Units	A	7-Oct-14 WR-1_100714 AQUATERRA ACTD JB78735 JB78735-2 NORMAL	7-Oct-14 SWR-2_100714 AQUATERRA ACTD JB78735 JB78735-3 NORMAL	6-Oct-14 SWR-3_100614 AQUATERRA ACTD JB78486 JB78486-3 NORMAL	7-May-07 WP-4A_050707 UNKNOWN PITB 07-3612 0705-1951 NORMAL	9-Oct-14 WP-8_100914 AQUATERRA ACTD JB79002 JB79002-5 NORMAL	9-Oct-14 WP-9_100914 AQUATERRA ACTD JB79002 JB79002-9 NORMAL	27-Jun-18 WP-14_20180627 STANTEC ESC L1005890 L1005890-04 NORMAL	20-Oct-14 WP16-3_102014 AQUATERRA ACTD JB79846 JB79846-2 NORMAL	4-May-21 WP-A_20210504 STANTEC LANCASTER 410-38512-1 410-38512-8 NORMAL	20-Apr-22 WP-A_SL_20220420 STANTEC SGSA JD43617 JD43617-1 NORMAL	3-May-07 WP-B_050307 UNKNOWN PITB 73491 0705-1220 NORMAL	15-Nov-19 WP-C_20191115 STANTEC LL 2075960 1208197 NORMAL	8-Oct-14 WP-D_100814 AQUATERRA ACTD JB78750 JB78750-5 NORMAL	7-Oct-14 WP-E_101714 AQUATERRA ACTD JB79845 JB79845-4 NORMAL
Volatile Organic Compound	ds															
ISOPROPYLBENZENE (CUMENE)	µg/L	45	ND (1.0)	ND (1.0)	ND (1.0)	ND (5)	2.6	0.26 J	ND (1.00)	ND (1.0)	ND (5.0)	ND (1.0) SL	1.8 J	2 J	ND (1.0)	7.5

Notes:

USEPA RSL United States Environmental Protection Agency Regional Screening Levels (RSLs)

A Tapwater Screening Levels (TR=1E-06, THQ=0.1) (May 2022)

6.5^A Concentration exceeds the indicated standard.

15.2 Measured concentration did not exceed the indicated standard.

ND (0.03) Analyte was not detected at a concentration greater than the laboratory reporting limit.

J Indicates an estimated value

SL Sample was collected below LNAPL

WI Well Inaccessible



Drown By:	
Diawii by.	n. Laron
Designed By:	A. Buchy
Reviewed By:	C. Costel
Project No:	4796.00
Date:	October 2

- Exceeds Industrial Soil EPA RSL for Cumene



Figure 2

19174 A-190 RSL 29-Dec-21 11-Apr-22 45 **8,600 7,740** Units µg/L A-191 RSL 45 9-Dec-21 12-Apr-22 9.180 A-192 RSL 29-Dec-21 12-Apr-22 45 18,000 4,420

RSL Groundwater Exceedances in AOI 5

AOI 5 Cumene Investigation

Evergreen Resources Group

Philadelphia, PA

- Drawn By: Z. Svoboda Designed By: A. Buchy Reviewed By: A. Buchy Project No: 4796.00 Date: October 2022

Notes

1. Aerial imagery provided by Google Earth. (2018). Philadelphia, PA, USA. 39°53'52.72"N, 75°12'03.85"W. Eye alt 5414 ft.

2. Data shown is most recent groundwater cumene concentrations (ug/L) for all AOI 5 monitoring wells. Analytical data was pulled from Stantec Data Portal on 11/03/2021.

Legend

- Monitoring Well Cumene Concentration Above Tapwater RSL of 45 ug/L
- Monitoring Well Cumene Concentration Above Tapwater RSL of 45 ug/L \oplus
 - Approximate Extent of Tank Farm
 - AOI 5 Boundary



Attachment 2



<u>Legend</u>

- MON
- WATER-TABLE MONITORING WELL
- RECOVERY WELL
- PIEZOMETER
- ----- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- LIMITS OF WATER-TABLE WELL CONTROL
- AREA OF INTEREST (AOI)
- BELMONT TERMINAL
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY PROPERTY
- 4.62 WATER-TABLE ELEVATION (FEET NAVD 88)

- Notes
 1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet, North American Vertical Datum of 1988 (NAVD 88) 2. Source: Stantec

- Source: Stantec
 Callouts denote corrected groundwater elevation in feet. Depth to groundwater was measured in each well to the nearest one-hundredth of a foot using an interface probe. Active groundwater remediation systems were in operation during well gauging.
 Groundwater elevation data was interpolated using block kriging with a linear variogram model in Surfer.
 Wells not measured during the April 2021 event are not displayed and include (but not limited to) damaged wells, destroyed wells, inaccessible wells, wells with pumps, and wells that were gauged but dry.
 Wells gauged during April 2021 but not utilized for water-table contouring include those containing measurable light, non-aqueous phase liquid, wells screened across a fill-supported perched aquifer, wells intersecting more than one water-bearing unit, wells with fouled screens, a subset of the remediation system wells, and wells excluded from contouring in recent Remedial Investigation Reports. Wells not used for contouring are not displayed.
 Contour Interval = 1 foot
 Aerial & Topo Copyright:© 2013 National Geographic Society, i-cubed Pictometry International Corp, Philadelphia Imagery 2018 downloaded from Pennsylvania Spatial Data Access (PASDA)

0 40 1:4,800 (At original do	00 800 Feet ocument size of 36x48)
Figure No.	
4	
Title WATER-TABLE	
GROUNDWATER	ELEVATION MAP
APRIL 2021	
Client/Project	
	PERATIONS, A SERIES OF
FORMER PHILADELPHIA REF	INERY
3144 PASSYUNK AVENUE, P	HILADELPHIA, PA 19145
Project Location	21340336
Project Location City of Philadelphia, Philadelphia County,	21340336 Prepared by GWC on 7/14/20 Technical Review by DPH on 7/16/20



COM

- Notes
 1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet, North American Vertical Datum of 198
 2. Source: Stantec
- Source: Stantec
 Callouts denote corrected groundwater elevation in feet. Depth to groundwater was measured in each well to the nearest one-hundredth of a foot using an interface probe. Groundwater remediation systems were in operation during well gauging.
 Groundwater elevation data was interpolated using block kriging with a linear variogram model in Surfer.
 Wells not measured during the February/March 2022 event are not displayed and include (but are not limited to) damaged wells, destroyed wells, inaccessible wells, wells with pumps, and wells that were gauged but dry.
 Wells gauged during February/March 2022 but not utilized for water-table contouring include those containing measurable light, non-aqueous phase liquid, wells screened across a fill-supported perched aquifer, wells intersecting more than one water-bearing unit, wells with fouled screens, a subset of the remediation system wells, and wells excluded from contouring in recent Remedial Investigation Reports. Wells not used for contouring are not displayed.
 Contour Interval = 1 foot
 Aerial & Topo Copyright:© 2013 National Geographic Society, i-cubed PEMA Philadelphia County 2018 Aerial Imagery

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Legend	Ν
PIEZOMETER	0 400 800 Feet
RECOVERY WELL	1:4,800 (At original document size of 36x48)
WATER TABLE MONITORING WELL	
WATER-TABLE ELEVATION CONTOUR (FEET NAVD 88)	
APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER	Δ
LIMITS OF WATER-TABLE WELL CONTROL	Title
AREA OF INTEREST (AOI)	WATER-TABLE
BELMONT TERMINAL	GROUNDWATER ELEVATION MAP
VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY	FERRILARY/MARCH 2022
PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY PROPERTY BOUNDARY	Client/Project
4.62 WATER-TABLE ELEVATION (FEET NAVD 88)	PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
	EVERGREEN RESOURCES GROUP, LLC
988 (NAVD 88)	3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145
he nearest one-	Project Location 213403363
damaged wells	City of Philadelphia, Prepared by AJW on 7/11/2022 Philadelphia County Technical Poview by JKK on 7/12/2022
	Pennsylvania Independent Review by ADK on 7/14/2022
autor bearing unit wells	

Drawn By:	M. Fuerte
Designed By:	A. Buchy
Reviewed By:	A. Buchy
Project No:	4796.00
Date:	March, 202

Attachment 3

Table 3 Groundwater Monitoring Summary of Recently Installed Monitoring Wells in Former Eastern Tank Farm AOI 5 Cumene Investigation - Former Philadelphia Refinery Philadelphia, Pennsylvania

Well ID	Depth to Water (ft from TOIC) on 12/29/21	Presence of LNAPL	Depth to Water (ft from TOIC) on 2/10/22	Presence of LNAPL	Depth to Water (ft from TOIC) from 3/9/2022	Presence of LNAPL	Depth to Water (ft from TOIC) from 4/8/2022 to 4/12/2022	Presence of LNAPL
A-190	8.15	No	8.11	No	6.98	No	6.13	No
A-191	7.20	No	7.17	No	6.13	No	5.48	No
A-192	8.20	No	8.14	No	7.25	No	6.43	No
A-193	8.28	No	8.05	No	7.75	No	7.19	No

Notes

ft from TOIC = feet from top of inner casing

LNAPL = Light non-aqueous phase liquid