REDACTED VERSION

SECOND FIVE-YEAR REVIEW REPORT FOR JONES ROAD GROUNDWATER PLUME SUPERFUND SITE HARRIS COUNTY, TEXAS

September 2022

Photos taken in December 2021

Prepared by

U.S. Environmental Protection Agency
Region 6
Dallas, Texas

SECOND FIVE-YEAR REVIEW REPORT
JONES ROAD GROUNDWATER PLUME SUPERFUND SITE
HARRIS COUNTY, TEXAS
EPA ID#: TXN000605460

This Memorandum documents the U.S. Environmental Protection Agency's performance, determinations, and approval of the second five-year review for the Jones Road Groundwater Plume Superfund site (Site) under Section 121 (c) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S. Code Section 9621 (c), as provided in the attached second Five-Year Review Report.

Summary of the second Five-Year Review Report

From 1984 to 2002, Bell Dry Cleaners operated at the Cypress Shopping Center at 11600 Jones Road in Harris County, Texas. Improper disposal of dry-cleaning solvents from this former dry-cleaning facility contaminated the soil and groundwater with volatile organic compounds. The Site's original remedy, as selected in the Site's 2010 Record of Decision (ROD), included groundwater extraction and treatment, in-situ treatment of source area soil and groundwater, institutional controls, plugging and abandonment of private water wells after connection of properties to the public water supply, groundwater monitoring, indoor air sampling, and provision of another opportunity for people in the site vicinity to connect to the public water supply. In 2017, EPA added soil vapor extraction (SVE) to the source area soils remedy in ROD Amendment #1. In 2019, EPA began operating the SVE system for the shallow source area soil and the deep unsaturated Chicot Sand. The SVE system is operating as expected and will continue to operate until the performance cleanup levels are met.

In 2011, EPA plugged the private wells for the property owners connected to the public water supply in 2008 as part of a time-critical removal action. EPA also completed an updated well survey in 2019 and conducted private well sampling during semi-annual monitoring at the Site. A potential for exposure to contaminants in the residential areas may still exist through the use of private water wells where property owners have not provided access or did not chose to connect to the public water supply. As summarized in the 2021 Five-Year Review Addendum, the February 2020 well sampling event demonstrated exceedances of drinking water standards in four of the private water wells at four separate properties.

EPA addressed contaminant migration from soil to shallow groundwater by implementing the in-situ bioremediation remedial action in 2016 and 2018. EPA continues to sample the shallow and deep groundwater and evaluate the results to ensure contaminant levels continue to decrease and to determine if more actions are needed.

Since April 2019, EPA has actively pursued and provided several opportunities for the community to sign-up to have their wells sampled and/or express their interest in connecting to the waterline. EPA is taking steps to finalize the list of residents to be connected to the waterline and provide the final list to the White Oak Bend Municipal Utility District (WOB MUD) to move forward on providing additional the waterline connections to the community.

Overlapping types of institutional controls are in place to prevent the installation of new groundwater wells at the Site. EPA and the Texas Commission on Environmental Quality (TCEQ) will determine the institutional controls needed where contaminants of concern (COCs) concentrations are above remedial goals in the groundwater beneath properties not currently covered by existing institutional controls.

EPA assessed the vulnerability to the effects of climate and weather hazards as part of this FYR. The Site does not lie within a 100-year flood plain and is not considered at increased risk or impact from drought and wildfire. The SVE system was installed in 2019. During the winter storms Uri and Viola in February 2021, the system lost power and sustained damage to some of the equipment and piping in the shallow SVE system. This resulted in the shallow SVE system being shut down for a couple of months. Once the equipment and piping of the shallow SVE system was repaired, it recommenced normal operations. No off-site releases or impacts on the environment,

including water systems, were reported. The SVE system continues to operate as expected with ongoing remote monitoring.

The EJScreen report (Appendix L) identifies EJ Indexes that exceed the 80th percentile at the national and state average level. Public input on the FYR was solicited through a public notice in the *Houston Chronicle* on February 23, 2022.

Actions Needed

The following actions must be taken for the Site's selected remedy to be protective over the long term:

- Where private water wells are still in use within the affected area, consider and implement appropriate actions to prevent human exposure to contaminated groundwater via private water wells.
- For potable wells with COC concentrations exceeding cleanup goals, evaluation of the vapor intrusion exposure pathway is recommended.

Determine if institutional controls are needed where COC concentrations are above remedial goals in the groundwater beneath the properties and facilitate implementation of the institutional controls.

Determination

I have determined that the remedy for the Jones Road Groundwater Plume Superfund site is not protective. This Five-Year Review Report specifies the actions that need to be taken for the selected remedy to be protective over the long term.

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John Meyer, Acting Director
Superfund and Emergency Management Division
U.S. Environmental Protection Agency, Region 6

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ISSUES/RECOMMENDATIONS

SECOND FIVE-YEAR REVIEW REPORT
JONES ROAD GROUNDWATER PLUME SUPERFUND SITE
HARRIS COUNTY, TEXAS
EPA ID#: TXN000605460

Issues and Recommendations Identified in the FYR:

OU(s): Sitewide	Issue Category: Remedy Performance			
	Issue: Recent sampling results from both monitoring and private water wells, west and south of the immediate source area, verify contaminant concentrations above drinking water standards in parts of the deep WBZ, historically used for private water wells. A potential for exposure to contaminants in the residential areas may still exist through the use of private water wells.			
	Recommendation: Where private water wells are still in use within the affected area, consider and implement appropriate actions to prevent human exposure to contaminated groundwater via private water wells.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/Support Agency**	**Milestone Date**
Yes	Yes	EPA	EPA/State	12/31/2024

OU(s): Sitewide	Issue Category: Remedy Performance			
	Issue: Recent sampling results from both monitoring and private water wells, west and south of the immediate source area, verify contaminant concentrations above drinking water standards in parts of the deep WBZ, historically used for private water wells. A potential for exposure to contaminants in the residential areas may still exist, via vapor intrusion from use of groundwater in these private wells.			
	Recommendation: For private potable wells with COC concentrations exceeding groundwater cleanup goals, evaluation of the vapor intrusion exposure pathway is recommended.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/Support Agency**	**Milestone Date**
Yes	Yes	EPA	EPA/State	12/31/2024

OU(s): Sitewide	Issue Category: Remedy Performance			
	Issue: Institutional controls, such as restrictive covenants or deed notices, are not in place for the properties where underlying groundwater contains COCs at concentrations exceeding protective levels for unrestricted use.			
	Recommendation: Determine if institutional controls are needed where COC concentrations are above remedial goals in the groundwater beneath the properties and facilitate implementation of the institutional controls. .			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/Support Agency**	**Milestone Date**
Yes	Yes	EPA/State	EPA/State	8/31/2026

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LIST OF ABBREVIATIONS AND ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
DCE	Dichloroethylene
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FYR	Five-Year Review
ISB	In-situ Bioremediation
IC	Institutional Control
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
µg/L	Micrograms per Liter
MW	Monitoring Well
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethylene
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SVE	Soil Vapor Extraction
TCE	Trichloroethylene
TCEQ	Texas Commission on Environmental Quality
TDLR	Texas Department of Licensing and Regulation
TRRP	Texas Risk Reduction Program
UU/UE	Unlimited Use and Unrestricted Exposure
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound
WBZ	Water Bearing Zone
WOB MUD	White Oak Bend Municipal Utility District

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, 42 U.S.C. §9621, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the second FYR for the Jones Road Groundwater Plume Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR issued in 2017. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE). EPA completed a 2021 FYR Addendum to the 2017 FYR Report to address the deferred protectiveness finding in the 2017 FYR Report.

The Site consists of one operable unit (OU-1). OU-1 addresses soil and groundwater contamination. The FYR was led by EPA remedial project manager (RPM) Rajalakshmi Josiam. Participants included Diane Britt with the Texas Commission on Environmental Quality (TCEQ), and Ryan Burdge and Claire Marcussen from Skeo (EPA contractor support). The review began on November 10, 2021. Appendix A lists the resources referenced during the development of this FYR Report. Appendix B, (Table B-1) provides a chronology of major site events.

Site Background

The Site is located in northwest Harris County, Texas, just outside of Houston's city limits (Figure 1). The source of site contamination is the former Bell Dry Cleaners facility, located in the northwest corner of the Cypress Shopping Centre at 11600 Jones Road. The Site consists of the 2.1-acre Cypress Shopping Centre property and plumes of shallow and deep contaminated groundwater emanating from the source area. From 1988 to 2002, Bell Dry Cleaners used tetrachloroethylene (PCE) as a dry-cleaning solvent. As indicated by the operator of the dry-cleaning facility, the waste stream from dry-cleaning operations was believed to be disposed in the facility's septic system or in the storm sewer located immediately behind the shopping center. These operations resulted in the contamination of soil, soil vapor and groundwater with PCE and related breakdown products trichloroethylene (TCE), 1,2-dichloroethylene (DCE) and vinyl chloride.

Surrounding land uses include residential, commercial, and light industrial areas. Homes and businesses in the area historically relied on private water wells and septic systems.

Groundwater occurs in two main zones, the uppermost Chicot Aquifer followed by the Evangeline Aquifer. The Chicot Aquifer is unconfined and therefore the overlying shallow soils and sediments are a source of recharge for the aquifer. The Evangeline Aquifer at the Site acts as a confined aquifer. The depth to the bottom of the Chicot Aquifer/top of the Evangeline Aquifer has been estimated to be about 400 feet below ground surface (bgs). At the Site, five major water bearing zones (WBZs) have been identified in the Chicot Aquifer and at least seven major WBZs have been identified in the Evangeline Aquifer.[1] Site contamination appears to be limited to the shallow and deep WBZs of the Chicot Aquifer (Appendix C, Figure C-1). The Chicot Aquifer provides water for local residential and agricultural use.

The flow direction in the shallow WBZ (less than 50 feet bgs) flows primarily to the south/southwest. The flow direction in the deeper WBZ (screened within depths from about 233 feet bgs to 296 feet bgs) is to the southeast. Appendix C, Figures C-2 and C-3 show the approximate extent of contamination.

[1] Referred to as water-bearing units in the 2010 ROD.

Surface water drainage is managed primarily through open roadside bar ditches. Drainage at the Site generally flows into the ditches and then south to White Oak Bayou and southeast into downtown Houston, where it enters Buffalo Bayou and ultimately goes through the Houston Ship Channel toward Galveston.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Jones Road Groundwater Plume		
EPA ID: TXN000605460		
Region: 6	**State:** Texas	**City/County:** Houston/Harris

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the Site achieved construction completion?** No

REVIEW STATUS
Lead agency: EPA
Author name: Rajalakshmi Josiam, with additional support provided by Skeo
Author affiliation: EPA Region 6
Review period: 11/10/2021 - 7/5/2022
Date of site inspection: 12/10/2021
Type of review: Statutory
Review number: 2
Triggering action date: 9/29/2017
Due date *(five years after triggering action date)*: 9/29/2022

Figure 1: Site Vicinity

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In August 2003, TCEQ initiated a remedial investigation (RI) to determine the full nature and extent of contamination. Based on the initial RI results, EPA placed the Site on the Superfund program's National Priorities List (NPL) in September 2003.

As part of the RI, TCEQ completed a baseline risk assessment in 2008. It showed that potential use of groundwater and inhalation of indoor air are potential exposure pathways that could contribute to human health risk. It found that PCE and its breakdown products in groundwater presented an unacceptable risk to human health if consumed. It also found that the vapor intrusion pathway exists at the dry-cleaning facility, though at the time the volatile organic compounds (VOCs) measured in indoor air did not pose an unacceptable health risk to workers.

The final 2009 RI Report identified PCE-impacted soil and groundwater at the former Bell Dry Cleaners facility as the source of a dissolved-phase groundwater plume that has affected the Chicot Aquifer below the Site and into the adjacent neighborhood, primarily west and southwest of the former Bell facility. The dissolved groundwater plume is present in both the shallow and deep Chicot WBZs. The Chicot Aquifer is a source of drinking water for the area.

Response Actions

In January 2003, at TCEQ's request, the Texas Department of Licensing and Regulation (TDLR) designated a restricted water well drilling area around the Cypress Shopping Center. The restriction was required due to the discovery of PCE in site soil and groundwater during a limited site assessment in support of the underwriting of a proposed mortgage loan of the property. The restriction requires that any new well installed in the restricted area must be drilled according to specific construction methods to prevent cross-contamination.

During the RI, in 2003, TCEQ provided filtration systems for several private wells where TCEQ had discovered groundwater contamination at concentrations above drinking water criteria.

From January to November 2008, EPA led a time-critical removal action at the Site to address immediate threats to human health and the environment from exposure to contaminated groundwater. EPA's action provided for the construction of a water supply line serviced by White Oak Bend Municipal Utility District (WOB MUD). EPA replaced a total of 144 water wells from residences and businesses with connections to the waterline. Connection to the public water supply was voluntary. Following completion of the waterline and water connections in November 2008, TCEQ discontinued maintenance and removed the filtration systems from all properties, including those properties whose owners elected to not participate in the government-funded water connection program. About 51% of the on-site private well owners agreed to discontinue use of their water wells and begin using water from the waterline. The remaining 49% of the well owners declined to participate in the waterline project and continued to use their private water supply wells.

In May 2018, EPA conducted a time-critical removal action by installing indoor exhaust systems in three of the suites in the Cypress Shopping Center to remove chemical contaminants that migrated into the building from the soils below. Sampling after the installation of the exhaust systems showed the contaminant levels in the indoor air have returned to acceptable levels.

EPA selected the remedial response actions for the Site in a 2010 ROD and the 2017 ROD Amendment #1 (2017 Amendment).

The 2010 ROD established the remedial action objectives (RAOs) for the site remedy (Table 1). The 2017 Amendment did not add any RAOs for the site (Table 1).

Table 1: Summary of Source Soil and Deep Groundwater RAOs

Media	RAO
Source Area Sources	o Prevent future human exposure to contaminated groundwater at unacceptable risk levels. o Prevent or minimize further migration of the contaminant plume (plume containment). o Return groundwater to its expected beneficial uses wherever practicable (aquifer restoration). o Prevent or minimize further migration of contaminants from source materials to groundwater (source control).
Deep Groundwater Plume	o Prevent future human exposure to contaminated groundwater at unacceptable risk levels. o Prevent or minimize further migration of the contaminant plume (plume containment). o Return groundwater to its expected beneficial uses wherever practicable (aquifer restoration).
Source: 2010 ROD, Section 15.1 and Section 15.2.	

The 2017 ROD Amendment redirected the sequencing of the response actions to prioritize source reduction of the shallow source area soil, the shallow WBZ and the deep unsaturated Chicot Sand. This approach targeted the majority of the contaminant mass with the greatest potential for continued contribution of contaminants to the deep groundwater. The 2017 Amendment included delaying the implementation of groundwater extraction for the shallow and deep groundwater until the two soil vapor sources in the shallow source area soil and the deep unsaturated Chicot Sand are addressed. Remediating the two vapor sources is expected to decrease the impacts on underlying groundwater contaminant concentrations over time and will be verified with monitoring.

The remedy components selected in the 2010 ROD that remained unchanged and the SVE remedy components selected in the 2017 Amendment include:

- In-situ enhancements to treat shallow groundwater and bioaugmentation for deeper groundwater.
- Extraction and treatment for shallow and deep groundwater WBZs to (contain and prevent further migration). Groundwater pumping exceptions will be made for periods of in-situ treatment application to allow time for the applied treatments to effectively destroy contaminants.
- The 2017 Amendment notes that as more groundwater monitoring data becomes available and extent of contamination is refined further, the need for the pump-and-treat remedy to contain the migration of groundwater contaminants will be evaluated at that time.
- Groundwater monitoring to determine and establish trends or changes to groundwater conditions.
- Additional offering for private well owners to connect to the municipal water service.
- Institutional controls to prevent potential exposure to contaminated groundwater or contaminated soil underneath pavement or foundation surfaces.
- Indoor air sampling.
- Plugging and abandonment of private water wells where alternative waterline connections are present, with an additional opportunity for residents to sign up for future waterline connections.
- Soil vapor extraction (SVE) for shallow source area soil and deep unsaturated Chicot Sand.[2]

The 2010 ROD established cleanup goals for groundwater that were set equal to the maximum contaminant levels (MCLs) established under the federal Safe Drinking Water Act (Table 2).

[2] The 2017 Amendment updated the in-situ enhancements selected in the 2010 ROD for the Shallow Source Area Soil with SVE for both the shallow source area Soil and the deep unsaturated Chicot Sand.

Table 2: Groundwater COC Cleanup Goals

COC	2010 ROD Cleanup Goal[a] (µg/L)
Tetrachloroethylene (PCE)	5
Trichloroethylene (TCE)	5
cis-1,2-Dichloroethylene (DCE)	70
trans-1,2-DCE	100
Vinyl chloride	2
Notes: a. Obtained from Section 19.4.1 of the 2010 ROD. µg/L = micrograms per liter	

Based on the 2017 ROD Amendment, in order for the SVE remedy to meet the RAO of preventing or minimizing further migration of contaminants from the vadose zone soils to groundwater (source control), these MCLs (Table 2) will need to be achieved for groundwater.

The 2017 ROD Amendment established performance cleanup levels for the deep unsaturated Chicot Sand and the shallow source area soil, which are based on treatment expectations for specific site conditions, including the reduction of contaminant mass and vapor-phase concentrations, and verified by monitoring throughout soil treatment. The attainment of the performance cleanup level and closure of the SVE system will be based on four components considered integral to successful venting application: (1) site characterization; (2) design; (3) performance monitoring; and (4) mass flux to and from groundwater. Each component is interrelated and requires continuous evaluation during the operating period for the remedy component. The evaluation is provided in the SVE System Performance Summary for the period July 2019 – April 2022 in Appendix G.

Status of Implementation

EPA began the remedial design for the 2010 ROD remedy in March 2011 to fill data gaps identified in the Site's remedial investigation and feasibility study (RI/FS). Based on field work through March 2012, EPA identified significant vapor-phase concentrations in the deep unsaturated zone and determined that a SVE approach would effectively reduce the vapor mass. EPA prepared an initial design document for the containment pump-and-treat system for the shallow WBZ and the deep Chicot WBZ but had concerns about the implementation and effectiveness of two separate extraction systems (east and west of Jones Road). EPA referred the design project for an independent remedy optimization review by technical experts from EPA Region 6, the national Superfund program, TCEQ and a third-party optimization review team. The optimization team recommendations were finalized in August 2014.[3] They included:

- Identify data gaps that would further define the extent of contamination for both the shallow and deep WBZs.
- Prioritize source reduction by focusing on areas of highest contaminant mass, to include shallow source soils (highest contaminant mass), the shallow WBZ and the deep unsaturated Chicot Sand, while monitoring the dissolved-phase groundwater plumes. This will include in-situ bioremediation (ISB) implementation in the shallow WBZ and SVE implementation in the shallow source area soil and deep unsaturated Chicot Sand.
- Depending on the dissolved-phase monitoring results, implement a limited groundwater extraction for the shallow WBZ and the deep WBZ on a much smaller footprint.

The remedy optimization review was key to reevaluating the remedy selected in the 2010 ROD. Work on the remedial design was discontinued to address the review recommendations. After the 2014 remedy optimization review, EPA completed work on a supplemental RI/FS in 2017. It:

- Further defined the extent of contamination for the shallow WBZ and deep WBZ, the shallow soil vapor source, and the deeper soil vapor phase not identified in the 2010 ROD.

[3] Remedy Optimization Review, Jones Road Superfund Site, Harris County, Texas, EPA 542-R-14-006, August 2014.

- Characterized deep groundwater characterization south and east of the Site.
- Provided more monitoring of both indoor air and the sub-slab contaminants.

Private Wells
Between October and November 2011, EPA plugged and abandoned 93 private water wells that were located at homes and businesses connected to the public water supply in 2008. As it concerns other private water wells, eight wells were not plugged that could not be located or were previously plugged; permission to access four wells was obtained too late in the process; property owners either never responded to the request to access their properties and plug their wells; and some owners decided to keep their private wells (23 wells). EPA conducts semi-annual groundwater sampling that includes sampling of private wells. EPA also conducts community outreach to residents through mailings, public meetings and door-to-door visits to residents who elected not to be connected to the water supply.

EPA has offered an additional opportunity for residents to connect to the waterline for those within the waterline area, especially, if their wells are found to be contaminated above drinking water standards (see Section III: Progress Since the Previous Review for additional information). After the completion of a door-to-door water well survey in 2019, EPA identified all well users in the affected area. In 2020, EPA followed up with people who had initially expressed interest in November 2019 in connecting to the waterline. Nine of them expressed continued interest in being connected to the waterline. EPA is working with the WOB MUD to provide more waterline connections to the area.

Source Control
EPA completed a pilot test in 2012 confirming that SVE would effectively reduce the vapor mass in the deep unsaturated Chicot Sand. Also in 2012, EPA completed an ISB pilot test in the shallow groundwater. EPA's 2014 remedy optimization review recommended that the remedial action prioritize the source mitigation of two zones of soil vapor-phase contaminants (shallow source area and deep unsaturated Chicot Sand) contributing to the deep groundwater contamination. In addition, the review recommended initiating ISB for shallow groundwater, the third source contributing to the deeper migration of contaminants.

EPA implemented the ISB remedial action for shallow groundwater in January 2016. Post-injection groundwater monitoring was evaluated to determine if this remedy component is reducing chemical contaminant levels in the shallow groundwater. EPA samples the shallow and deep groundwater and evaluates the results to ensure contaminant levels are continuing to decrease and determine if additional actions are needed. Based on observed contaminant rebound in September 2017, EPA conducted more hot-spot injections in March 2018.

In July 2019, EPA installed and began operating the 2017 ROD Amendment selected remedial action of SVE for the shallow source area soil and the deep unsaturated Chicot Sand. The deep and shallow SVE System Layouts are provided in Appendix C, Figures C-4 and C-5. The shallow SVE system extracts the vapor from shallow source area soil while the deep SVE system extracts vapors from the deep unsaturated Chicot Sand. The SVE system extracts the vapor, mitigates the source, and prevents further migration of COCs into underlying groundwater. In addition, the SVE system also prevents indoor air contamination by extracting chemical contaminants from the source area soil. EPA continues to monitor the groundwater and compares the results to the MCLs. The RAO for preventing or minimizing further migration of contaminants from source materials to groundwater (source control) will be deemed to be achieved when groundwater achieves the MCLs. The SVE system continues to operate as expected and is anticipated to continue operating until the performance cleanup levels are met. The SVE System Performance Summary for the period of July 2019 - April 2022 is provided in Appendix G.

Indoor Air Vapor Mitigation
In May 2017, EPA detected site COCs above industrial health-based indoor air screening levels in three of the shopping center suites. In May 2018, EPA completed a time-critical removal action and installed indoor exhaust systems to remove contaminants that migrated into the building from the soils below. Ongoing indoor air

sampling, after the installation of the exhaust systems, showed the contaminant levels in the indoor air are within acceptable levels.

Institutional Control (IC) Review

The 2010 ROD requires institutional controls to prevent human exposure to contaminated site soil through ingestion or direct contact, to prevent disturbance of contaminated site soil, and to prevent the use of the contaminated groundwater for drinking, farming or irrigation of crops. The ROD requires that the institutional controls include land use restrictions to prohibit any intrusive activities that could compromise the integrity or alter, damage, destroy or interfere with the effectiveness of the soil and groundwater remediation and monitoring systems, associated equipment and other engineering controls in place or placed at the Site. No additional institutional controls were selected in the 2017 ROD Amendment.

Overlapping types of institutional controls are in place to prevent the installation of new groundwater wells at the Site. In Harris County, the Harris County Subsidence District requires permits for the installation of new public water supply wells and larger wells that could contribute to subsidence. In 2003, TDLR designated a restricted water well drilling area around the Site at TCEQ's request. Any new well installed in the restricted area must meet depth and well construction requirements to prevent cross-contamination. In May 2006, Harris County promulgated a rule that delineated a "No New Wells" area. The entire Site and known groundwater contamination is located in the Harris County "No New Wells" area. Figure 2 shows the Harris County "No New Wells" area and the TDLR well drilling restriction area.

Over the long-term, the remedial action is expected to achieve restoration of the aquifer as a drinking water source. In the interim, EPA is providing notice to new landowners and reminders to existing landowners of the presence of COCs above remedial goals in the groundwater beneath the property. For the long term, EPA will coordinate with TCEQ to identify which properties may require institutional controls for the properties where groundwater contamination exceed the remedial goals. EPA will work with TCEQ and the property owners to place either deed notices or restrictive covenants on the affected property to serve as the institutional control. The institutional controls will be maintained until the concentration of contaminants in the groundwater are below levels that allow for UU/UE.

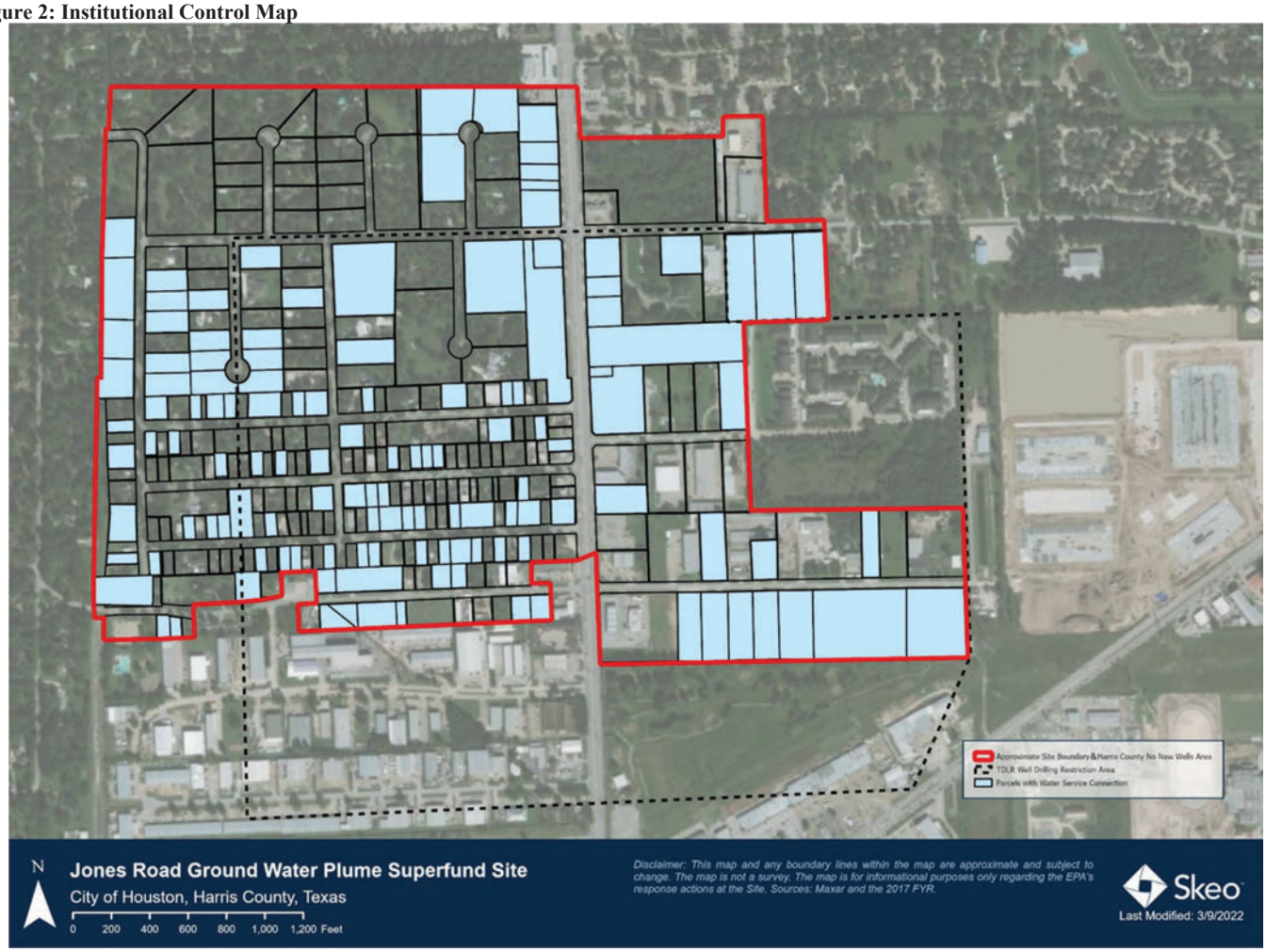
Table 3 provides a summary of implemented and planned institutional controls.

Table 3: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Identified in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Source Area Soil	Yes	Yes	0451550000044	Prevent disturbance of and direct exposure to contaminated soil ensure the integrity of remedial components.	Planned for after implementation of the SVE remedy. Institutional controls will be put in place, as required by decision documents.
	Yes	No	0451550000044	Notify current and future property owners of the potential for vapor intrusion risk and require installation of vapor mitigation systems in new	Planned for after implementation of the SVE remedy. Appropriate institutional controls will be implemented as needed.

Media That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Identified in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
				source area buildings.	
Groundwater	Yes	Yes	All parcels located above the impacted groundwater plume	Prevent the installation of new groundwater wells.	Harris County "No New Wells" area May 2006
					TDLR drilling restriction area 2003
					Harris County Subsidence District Permit requirements for public water supply wells and larger wells that could contribute to subsidence, establishment date unknown.
				Prevent the use of contaminated groundwater for drinking, farming or irrigation of crops.	In the short-term, notifications and communications are currently being sent to property owners with groundwater exceedances in their private wells.
					Long-term institutional controls are not in place but are planned to be implemented once the parcels with contaminated groundwater are determined.

Figure 2: Institutional Control Map



Systems Operations/Operation and Maintenance (O&M)

Site SVE operations are performed by an EPA contractor and reported monthly to EPA. The SVE System Performance Summary for the period July 2019 – April 2022, is provided in Appendix G. Groundwater sampling is being conducted semi-annually and results are provided in Appendix H. Regular on-site O&M activities take place one day each week and there is a continuous remote monitoring of the SVE system monitoring and control system, which is used for remotely restarting the system after certain alarms. Non-routine visits are performed as needed, to address more significant alarm conditions, breakdowns or troubleshooting.

Although the SVE system is successfully addressing source area vapors, an unanticipated complication has occurred where the shallow SVE well lines are clogged by fine silts during times of heavy precipitation. EPA contractor cleans and repairs the shallow SVE system lines as needed so that the shallow SVE system continues to operate as intended.

III. PROGRESS SINCE THE PREVIOUS REVIEW

EPA completed a 2021 FYR Addendum to the 2017 FYR Report to address the deferred protectiveness finding in the 2017 FYR Report. This section includes the protectiveness determinations and statements from the 2017 FYR Report and the 2021 FYR Addendum (Tables 4 and 6) as well as the recommendations from both reports (Tables 5 and 7).

Table 4: Protectiveness Determinations/Statements from the 2017 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
1	Protectiveness Deferred	A protectiveness determination of the remedy for the Jones Road Groundwater Plume Superfund Site cannot be made at this time until further information is obtained. The protectiveness determination for the Site is deferred until further evaluation of water well use, within the area of impacted groundwater, can be completed. There are remaining private wells potentially with access to groundwater with site-related contaminants at concentrations exceeding the Remedial Goals for drinking water. This Five-Year Review Report specifies the actions that need to be taken for the remedy to be protective.

Table 5: Status of Recommendations from the 2017 FYR Report for the Sitewide OU

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
Recent sampling results from monitoring and private wells west and south of the immediate source area verify contaminant concentrations above drinking water standards (MCLs) in parts of the deep WBZ, historically used for private wells. A potential for exposure to contaminants in those areas may still exist through the use of private wells.	Perform a well/groundwater use survey to update the status of all properties in the area of affected groundwater. Verify where private wells are still in use in the affected area and identify their purpose. Sample those wells. Based on the results, consider appropriate actions to prevent human exposure to contaminated groundwater.	Ongoing	See discussion below for details on activities conducted since the previous FYR.	Not applicable

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
Institutional controls, as restrictive covenants or deed notices are not in place for those properties where underlying groundwater contains COCs at concentrations exceeding protective levels (as MCLs) for unrestricted use.	Evaluate the extent of institutional controls needed and implement these institutional controls to notify area residents of the presence of COCs above remedial goals in the groundwater beneath their properties.	Ongoing	EPA continues to assess groundwater contamination on a parcel basis. Once parcels with contaminated groundwater are determined, institutional controls can be put in place for individual parcels.	Not applicable

Activities conducted to address Recommendation #1 in the 2017 FYR Report

Below is a summary of the activities including community outreach and sampling conducted to address Recommendation #1 in the 2017 FYR Report.

- February 2018 – EPA contacted WOB MUD to obtain updated information regarding the status of private water wells and waterline connections for properties in the waterline area adjacent to the Site. EPA reviewed the information to determine the status of waterline connections in the area and future steps to be taken.

- January-March 2019 – EPA planned to have a community meeting on January 22, 2019, at Bleyl Middle School but the meeting was postponed to April 2019 due to the government shutdown in January 2019. EPA reached out to the community in different ways to invite the community members to the April 2019 community meeting. EPA mailed out postcards to the community members, posted a notice in the Cypress Creek Mirror, posted the information on the EPA Jones Road Ground Water Plume Superfund Site website, and emailed information to contacts in the community.

- April 2019 – EPA conducted a community update meeting on April 8, 2019, at Bleyl Middle School and provided the community members an opportunity to have their private water wells sampled and/or express their interest to be connected to the WOB MUD waterline. Eleven property owners were interested in their wells being sampled. EPA followed up with these interested property owners and obtained signed access agreements from them for EPA to sample their wells. EPA sampled these wells in June 2019. Results of the sampling were mailed to the residents.

- July 2019 – EPA reached out to the WOB MUD to continue discussions regarding providing additional waterline connections to the residents.

- November 2019 – EPA conducted door-to-door visits for over 100 private properties in the waterline area adjacent to the Site to identify property owners who were interested in having their wells sampled and/or connect to the waterline. EPA followed the door-to-door visits with a community meeting on November 7, 2019, at Bleyl Middle School to provide another opportunity for the community members to have their private water wells sampled and/or express their interest to be connected to the waterline. Following this meeting, EPA was able to follow-up and obtain signed access agreements from 21 property owners to sample their wells in February 2020. Five of these wells were already sampled in June 2019. Several

residents wanted to see the sampling results before deciding whether they wanted to be connected to the waterline.

EPA invited WOB MUD representatives to the community update meeting. WOB MUD representatives attended the meeting and answered questions during the meeting. WOB MUD indicated that each resident interested in connecting to the waterline must fill out an agreement form and allow plugging of their private wells. WOB MUD requested EPA to provide a list of the residents that want to connect to the waterline.

- February 2020 – EPA sampled 21 private water wells, where access was granted, along with site monitoring wells. Results of the February 2020 sampling were mailed to the residents.
-
    - PCE was the only COC detected in four of the private wells above the MCL of 5 micrograms per liter (µg/L) (Appendix H, Figure H-1).
    - One property is connected to the waterline.
    - One property has a carbon filtration system.
    - One is an electric shop that uses the well water for washing only.
    - One property owner uses well water for laundry and showering only and gets bottled water for drinking.

    The sampling results were sent to the property owners, and they were notified not to use their wells for drinking purposes. EPA contacted them via phone and discussed their results with them. EPA also informed the property owners that EPA was coordinating with the WOB MUD to provide more waterline connections in the area. One of the four properties with PCE contamination above the MCL is connected to the waterline. Of the remaining three properties with PCE exceedances not connected to the waterline, one property owner was interested in connecting to the waterline; a second property owner was not interested; and a third property owner was undecided.

- May 2020 – EPA was planning a community meeting on May 7th at Bleyl Middle School to provide updates to the community, however due to the pandemic, the meeting was cancelled. Instead, EPA mailed out a fact sheet to the community with links to EPA's Site website. The fact sheet provided an update on the remedial work and provided the community members a third opportunity to have their private water wells sampled and/or be connected to the waterline. EPA followed up with property owners that requested to have their private wells sampled and/or be connected to the waterline, and obtained signed access agreements for those who wanted their private wells sampled

- June 2020 – EPA sampled seven private water wells immediately west of the Site where property owners gave access.
    - Three of the wells had not been sampled before, and they did not show exceedances.
    - Four of the wells had previous PCE exceedances and showed PCE exceedances again (Appendix H, Figure H-2). The sampling results were sent to the property owners, and they were notified to not use their wells for drinking purposes. EPA also informed the property owners that EPA will work with the WOB MUD to provide more waterline connections in the area.

- August 2020 – Several residents wanted to see sampling results before deciding whether they wanted to be connected to the waterline. EPA called and followed up with the residents who initially expressed interest in connecting to the waterline in November 2019, and nine of them expressed interest in being connected to the waterline.

- January 2021, July 2021, February 2022 – EPA sampled private water wells during the site semi-annual monitoring event. Sampling again showed PCE exceedances in the same four private water wells as the June 2020 sampling. EPA continues to notify these property owners of the sampling results, advise against the use of well water for drinking purposes, and offer connection to the waterline. Appendix H,

Figures H-3 and H-4 show the distribution of PCE and TCE and includes the values found in private wells from the June 2020, January 2021, July 2021.

- February 2022 – EPA contacted WOB MUD to resume conversations regarding providing additional waterline connections to the community. WOB MUD requested a list and number of residents that may require connection to the waterline. EPA provided preliminary information to the WOB MUD. EPA has actively pursued finalization of the list of residents that want to be connected to the waterline. However, EPA has been unable to finalize the list for various reasons as some of the residents wanted to wait until they received their sampling results and then decide; others were not sure if they want to be connected; some who previously expressed an interest in connecting to the waterline changed their position after seeing their sample results; and others changed their position for undisclosed reasons.

  EPA is in the process of securing contract support to assist in contacting community members. With contractor support EPA will request property owners to fill out the WOB MUD agreement form, and then finalize a list of owners that want to be connected to the waterline. Upon finalization of the list, EPA will provide the list to WOB MUD to move forward with the waterline connections.

Based on the information above, the 2021 FYR Addendum found that the site remedy is not protective because exposure to contaminants in groundwater in the residential areas exists through the use of private water wells (Table 6). As provided below, the status of the two issues identified in the 2017 FYR Report as ongoing was slightly modified based on additional information collected in support of the 2021 FYR Addendum (Table 7).

Table 6: Protectiveness Determinations/Statements from the 2021 FYR Addendum

OU #	Protectiveness Determination	Protectiveness Statement
1	Not Protective	The remedy at the site is not protective because exposure to contaminants in groundwater in the residential areas exists through the use of private water wells. The following actions need to be taken to ensure protectiveness: delineate and evaluate extent of groundwater plume, implement appropriate actions to prevent human exposure to contaminated groundwater and any potential vapor intrusion, and develop and implement institutional controls.

Table 7: Status of Recommendations from the 2021 FYR Addendum for the Sitewide OU

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
More recent sampling results from both monitoring wells and private water wells, west and south of the immediate source area, do verify contaminant concentrations above drinking water standards (as MCLs) in parts of the deep WBZ, historically used for private water wells. The potential for exposure to contaminants in the residential areas may still remain via the use of private water wells.	Delineate and evaluate the extent of the groundwater plume. Where private water wells are still in use, within the affected area, consider and implement appropriate actions to prevent human exposure to contaminated groundwater and any potential vapor intrusion.	Ongoing	EPA continues to reach out to property owners with private wells that are not connected to the WOB MUD to see if they are interested in their private water wells being sampled and/or being connected to the WOB MUD.	Not applicable
Institutional controls, such as restrictive covenants or deed notices, are not in place for the properties where underlying groundwater contains COCs at concentrations	Determine the institutional controls needed and implement these institutional controls where there is the presence of COCs above remedial goals	Ongoing	Once parcels with contaminated groundwater are determined, institutional controls needed can be	Not applicable

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
exceeding protective levels (as MCLs) for unrestricted use.	in the groundwater beneath the properties. EPA will evaluate and determine the need for institutional controls and will work with TCEQ and property owners to place institutional controls on affected properties. TCEQ will file and enforce those institutional controls.		determined and implemented.	

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by newspaper posting in the local edition of the *Houston Chronicle* on February 23, 2022 (Appendix D). It stated that the FYR was underway and invited the public to submit any comments to EPA. The results of the review and the report will be made available at the Site's information repository, the Northwest Branch of Harris County Library, located at 11355 Regency Green Drive, in Cypress, Texas.

EPA conducted a community update meeting in April 2019 and provided a status update regarding the construction of the SVE system to remove vapors from the shallow source area soil and deep unsaturated Chicot sand. At this meeting, EPA also provided community members with private wells an opportunity to sign up to have their private water wells sampled and/or be connected to the WOB MUD waterline.

EPA conducted door-to-door visits in November 2019, visiting over 100 private properties in the waterline area adjacent to the Site. The purpose of the door-to-door visits was to contact the property owners/tenants to provide them with an update on site activities and obtain information about the status of their private wells, if any, and their waterline connections. EPA followed up these door-to-door visits with a community update meeting in November 2019. During the door-to door visits and community update meeting, property owners received an update on the SVE system's operation and were given a second opportunity to sign up if they were interested in their private water wells sampled and/or be connected to the waterline.

During the 2022 FYR process, interviews were conducted to document any perceived problems or successes with the remedy (plugging and abandonment of private wells in the waterline connection area; ISB for the shallow WBZ and SVE in the shallow and deep WBZ) implemented to date. Interview questionnaires were emailed to TCEQ, Harris County, EPA contractor, Cypress Shopping Center caretaker, a couple of business property owners, and seven residents. EPA sent reminders to the recipients to complete and send in their completed interview questionnaires. Of all the interview questionnaires that were sent, four were filled out and received by EPA. The results of these interviews are summarized below and included in Appendix K.

Luis Vega is the project manager for EPA contractor EA Engineering, Science, and Technology, Inc. The contractor reports the SVE system has been effective, but that performance has lessened over time and may be reaching a point where it will not provide significant benefit without additional measures. The contractor has observed modest improvements in contaminant concentrations in the shallow groundwater.

Dr. Latrice Babin is the executive director of the Harris County Pollution Control Services (PCS). Harris County PCS is aware of environmental issues and cleanup activities through publicly available documents and has

requested to be informed by EPA about future site-related communications. Harris County PCS is generally concerned that the community does not fully understand site conditions and that more outreach is needed. Specific recommendations are included in the Harris County PCS interview response in Appendix K.

Diane Britt is the project manager for TCEQ for the Site. The TCEQ encourages more community outreach to disseminate information on the existing ICs and drilling restrictions for the area. TCEQ recommends an additional IC in the form of a restrictive covenant should be placed on the source area property at 11600 Jones Road to restrict land use for commercial purposes only (no residential use) and to prohibit the use of groundwater and activities that create an exposure pathway to the contaminated soil. The TCEQ also recommends re-evaluating the historical and current land use in the area to determine if any new water wells have been drilled in the area that were not previously reported and to determine if other sources areas of contamination may exist.

John Armon is a resident near the Site. He indicated that his overall impression of the project is good. He is not aware of any effects of this Site on the surrounding community nor any unusual or unexpected activities at the Site. He indicated that he gets information occasionally from EPA and does not recall any news of ongoing activity. He has a private well which is used for garden watering only.

Data Review

Two elements of the 2010 ROD remedy were implemented – the plugging and abandonment of private wells and implementation of the shallow groundwater ISB system. In addition, in July 2019 EPA began operating the 2017 ROD Amendment SVE remedy for shallow source area soil and the deep unsaturated Chicot Sand. EPA reviewed data collected from monitoring wells and SVE wells for this FYR. Figure 3 shows the monitoring well network. Appendix C, Figures C-2 and C-3 show the approximate extent of contamination as of 2019.

Shallow Groundwater ISB Remedy

Table 8 shows that the concentrations have generally declined in the wells that contained elevated PCE prior to the ISB remedial action. However, PCE and associated degradation products remain at the source area wells above the cleanup goal for groundwater which is an MCL of 5 µg/L.

Table 8: Shallow WBZ Pre-Injection and Post-Injection PCE Results (µg/L)

Wells	Pre-ISB Injection	Post-ISB Injection (Jan. and Feb. 2016)				Post-ISB Hot Spot Injection (Mar. 2018)							
	Dec. 2015	Apr. 2016	Sept. 2016	Feb. 2017	Sept. 2017	May 2018	Nov. 2018	Jun. 2019	Jan. 2020	Jun. 2020	Jan. 2021	Jul. 2021	Feb. 2022
MW-01	**14,500**	**61**	2 U	1 U	1 U	1 U	3	1 U	1U	1.1	5 U	**20**	5 U
MW-02	**599**	**13**	2 U	1 U	1 U	2	**508**	**228**	**47.8**	**30**	**120**	**130**	250
MW-03	**12.7**	2	**29**	**12**	1	3	3	**19**	**8.2**	2.5	**4.3**	0.3J	6.6
MW-06	**3,890**	**9**	2 U	1 U	1 U	1 U	1 U	1 U	1U	0.6	5 U	5 U	5 U
MW-20	**5,550**	**4,140**	**475**	**135**	**228**	7	**21**	1 U	**5,700**	**8,900**	**680**	**160**	120
MW-22	**7,510**	**639**	2 U	1 U	1 U	1 U	**11**	1 U	2.8	0.25	1.7	3 J	9.7

Notes:
Bold = bold value exceeds the MCL of 5µg/L for PCE.
U = below detection limit
J = estimated value
Sources:
EPA Jones Road Groundwater Plume, Superfund Site Update, May 2020.
Annual Technical Memorandum on the Soil Vapor Extraction System Operation and Maintenance - August 2020 to July 2021. Jones Road Groundwater Plume, Superfund Site Remedial action. Prepared by EA Engineering, Science, and Technology, Inc., PBC. October 2021.

Figure 3. Monitoring Wells

Deep SVE Influent
PCE and TCE concentrations at the deep SVE system influent (pre-GAC) have continuously trended down (Appendix G). When comparing startup sampling in July 2019 and the sampling in July 2020, concentrations of all COCs have decreased. The deep SVE system was turned off for approximately two months in August and September 2020, after a long period of diminishing contaminant concentrations. EPA restarted the system at the end of September 2020, and air samples were collected the same day. PCE and TCE concentrations in the deep SVE system influent trended upward after the system restarted. However, the influent concentrations trended downward and have leveled off from September 2021 to April 2022. The deep SVE system was turned off in April 2022. The shallow SVE system performance and groundwater monitoring results from deep SVE wells will be evaluated to determine when the deep SVE system needs to be restarted again.

Shallow SVE Influent
PCE and TCE concentrations in the shallow SVE system influent were variable, trending up and down since the SVE system startup in July 2019 (Appendix G). Extended downtime occurred from February to March 2021 when the shallow SVE system was shut down due to the damaged equipment and piping from the winter storms Uri and Viola in February 2021 and the repairs that were conducted. Once the system was turned back on, there was increase in concentrations in April 2021 and a subsequent downward trend from May to June 2021. The concentrations in August 2021 trended upward, possibly due to clearing of two well conveyance pipelines that previously had limited airflow due to fine silts buildup. Despite these short-term, up and down trends, comparison of sample results from the SVE system startup time in July 2019 to the most recent sampling results from April 2022, show an overall decreasing trend in influent concentrations.

SVE Groundwater
PCE was non-detectable in groundwater collected from several shallow wells sampled in June 2020, January 2021, and July 2021 (Appendix H, Table H-1). PCE exceeds the MCL of 5 µg/L in MW-01, MW-02, and MW-20 shallow wells near the source area. MW-20, located near the center of the parking lot and the center of the estimated contaminant plume area, had a PCE concentration of 8,900 µg/L in June 2020. In July 2021, the concentration in this well was 160 µg/L, a decrease of 98% from June 2020.

PCE concentrations in groundwater decreased in nine of 11 deep SVE wells from June 2020 to July 2021 (Appendix H, Table H-1). The average decrease in PCE concentration from all wells was 23%. The decreasing trends in the groundwater results show that the SVE system is effective in removing the contaminants from the shallow source area soil and deep unsaturated Chicot Sand, which have been acting as a source to the shallow and deep wells.

Private Wells
As discussed in section III, Progress since the Previous Five-Year Review, EPA sampled 21 private water wells along with the site monitoring wells in February 2020.

- PCE was the only COC detected in four of the private wells above the MCL of 5 micrograms per liter (µg/L) (Appendix H, Figure H-1).
- Of these four properties
    - One property is connected to the waterline.
    - One property has a carbon filtration system.
    - One is an electric shop that uses the well water for washing only.
    - One property owner uses well water for laundry and showering only and gets bottled water for drinking.

EPA sampled private water wells during the site semi-annual monitoring event in June 2020, January 2021, July 2021, and February 2022. Appendix H, Figures H-3 and H-4 show the distribution of PCE and TCE sample results in wells, including private wells, from the June 2020, January 2021, July 2021 sampling. Sampling showed PCE exceedances in the four private water wells that previously had hits. EPA continues to notify these property owners. As a result of these exceedances, the selected remedy at the site is not protective due to potential

exposure to contaminated groundwater via active use of private water wells and the potential for vapor intrusion exposure. Additional information is provided in Appendix J.

Indoor Mitigation Systems
In May 2018, EPA installed indoor exhaust systems in three of the suites in the Cypress Shopping Center to remove chemical contaminants that migrated into the building from the soils below. Sampling after the installation of the exhaust systems showed the contaminant levels in the indoor air have returned to acceptable levels. EPA continues to sample these three suites in the shopping center to ensure that the indoor air quality remains at acceptable levels. The sampling of the indoor air conducted after the operation of the vapor mitigation systems shows there are no exceedances of the industrial health-based screening levels. The sub-slab soil gas results under the shopping center show 2-3 orders of magnitude reductions in contaminant levels, which is as expected, given the operation of the SVE system (Appendix H, Table H-2).

Evangeline Aquifer
No contamination has been detected in groundwater samples from the Lower Chicot/Evangeline Aquifer interface (MW-17, screened between 410 feet bgs and 430 feet bgs) to date, with the sampling dating from June 2020, January 2021 and July 2021 (Appendix H, Table H-1). The February 2022 MW-17 sample results also show no detection of contamination. At this time, no information is available that suggests that the Evangeline Aquifer, located below the deep WBZ, is affected. Currently, area municipal water supply wells are screened in the deeper Evangeline unit.

Site Inspection
The site inspection took place on December 10, 2021. Participants included EPA RPM Rajalakshmi Josiam, TCEQ project manager Diane Britt, Brian Taylor from EPA remedial contractor EA Engineering, Science, and Technology, Inc., and Ryan Burdge and Anthony Li from EPA support contractor Skeo. The purpose of the inspection was to assess the protectiveness of the remedy. The completed site inspection checklist and photographs taken during the site inspection are included in Appendix E and Appendix F, respectively.

The site inspection began with a tour of the SVE system, located behind the shopping center. The system is fenced and secure, with no noted trespassing or vandalism. The building and components were well maintained and labelled. Three intake pipes from the shallow zone were clogged and therefore disconnected from the system. The EPA remedial contractor repaired these pipes in February 2022. During the site inspection, the TCEQ noted that the labels on the SVE conveyance lines outside the containment unit was worn and not legible; and the above ground containers/tanks inside the fenced area did not have descriptive labeling such as contents and volume. The SVE conveyance lines and containers/tanks were labelled in February 2022 by the EPA remedial contractor.

Site inspection participants then walked north around the shopping center, noting monitoring wells MW-03, MW-04 and MW-05 and the vapor mitigation systems. Between the shopping center and a private property to the north, what appeared to be a private water well was observed. It did not seem to have a power source and therefore was not in use. Based on review of historical documents for the Site, the property owner opted to retain their private water well when they were connected to the waterline in 2008. EPA intends to follow up with the property owner to ensure there is no potential use of contaminated water. No other issues were noted.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

The remedial actions implemented to date for source control are functioning as intended by the decision documents. EPA's 2008 removal action which included the connection of 144 homes with impacted private wells to the public water supply and the subsequent remedial action (i.e., plugging of 93 wells in 2011), helped prevent

human exposure to contaminated groundwater. Since then, EPA has conducted semi-annual sampling of private wells. As per the 2010 ROD, in order to provide another opportunity for the property owners to connect to the waterline, EPA contacted the WOB MUD in 2018 to obtain updated information regarding the status of private water wells and waterline connections for private properties in the waterline area adjacent to the Site. EPA also completed a door-to-door private well survey in 2019 and EPA is working with the WOB MUD to provide more waterline connections in the area. EPA continues with routine community outreach to residents to offer those who elected not to be connected to the water line another opportunity to connect. EPA continues to evaluate the current status of those private wells.

Following a remedy optimization review in 2014, EPA implemented the ISB remedial action for the shallow groundwater in January 2016. In March 2018, EPA conducted more ISB injections at hot spots in the shallow groundwater. Post-injection groundwater monitoring to date shows successful reductions in chemical contaminant levels in the shallow groundwater. EPA continues to sample the shallow and deep groundwater and evaluates the results to ensure contaminant levels are continuing to decrease and determine if more actions are needed.

In July 2019, EPA installed and began SVE operations for the shallow source area soil and the deep unsaturated Chicot Sand. The SVE system mitigates the vapor source and prevents further migration of COCs into underlying groundwater. In addition, the SVE system prevents more indoor air contamination by extracting chemical contaminants from the soil. The SVE system continues to operate as expected. EPA will assess if modifications or more measures are warranted.

Overlapping types of institutional controls are in place to prevent the installation of new groundwater wells at the Site. Permits from the Harris County Subsidence District are required for the installation of new public water supply wells and larger wells that could contribute to subsidence. The establishment of the Harris County "No New Wells" area and the TDLR drilling restriction area prevent the installation of new water wells at the Site (Figure 2). These restrictions, which were implemented during the initial RI phase, will remain in place for either the life of the project, or at least until the concentration of contaminants in the groundwater are below levels that allow for UU/UE. It will further protect against the downward migration of contaminants by new wells.

The ROD requires a system of short-term institutional controls to provide notice to new landowners and reminders to existing landowners of the presence of COCs above remedial goals in the groundwater beneath their properties. The ROD requires the provision of another opportunity for people in the site vicinity to connect to the public water supply without having to pay the connection fee. EPA continues to conduct public outreach to extend another opportunity to the community to connect to the public water supply. However, these measures are not yet fully implemented.

Generally, the remedy components for source control are operating as planned, with a few exceptions. Although the SVE system is successfully addressing source area vapors, an unanticipated complication has occurred where the shallow SVE well lines are clogged by fine silts during times of heavy precipitation. EPA contractor cleans and repairs the shallow SVE system lines as needed so that the shallow SVE system continues to operate as intended.

Additionally, as documented in the 2021 FYR addendum, sampling of private wells, most recently in February 2022 showed exceedances of the PCE MCL in four of the private drinking water wells in use in residential properties. The selected remedy at the site is not protective due to potential exposure to contaminated groundwater via active use of private water wells and the potential for vapor intrusion exposure. Over the long-term, EPA will determine if institutional controls are needed where COC concentrations are above remedial goals in the groundwater beneath the properties. EPA will provide the required property information to TCEQ for the placement of institutional controls and will work with TCEQ and the property owners to place either deed notices or restrictive covenants on the affected property to serve as the institutional control. TCEQ has agreed to file and enforce the institutional controls (deed notices or restrictive covenants) that meet Texas Risk Reduction Program (TRRP) rules.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

The exposure assumptions, toxicity data, cleanup levels and RAOs, as defined in the 2010 ROD and 2017 ROD Amendment, remain valid. The standards, MCLs, associated with the Site's groundwater COCs have not changed (Appendix I). The RAOs established by the decision documents have not yet been met. However, it is expected that the recently implemented revised remedy will help meet the RAOs. In support of the RAO to prevent or minimize further migration of the contaminant plume, EPA continues to remediate source areas to prevent contaminant migration to groundwater and EPA continues to delineate groundwater contamination.

Implementation of the ISB injections for the shallow WBZ finished in 2018 and the SVE system started operating in 2019 to optimize groundwater remediation by addressing the shallow and deep soil vapors sourcing the groundwater. The remedial action is performing as expected for source control of contaminants at the point of the release (source area).

In the residential areas west of the Site, the potential exists for a complete exposure pathway through the ingestion of, and possibly dermal contact with, contaminated groundwater and vapor intrusion from subsurface vapors emanating from the groundwater. Additional details are presented in Appendix J. The February 2020, and subsequent well sampling events demonstrated exceedances of drinking water standards in four of the private water wells located at four separate properties. One property is connected to the waterline. One property has a carbon filtration system. One property is an electric shop that uses the well water for washing only. Another property owner uses well water for laundry and showering only and gets bottled water for drinking. EPA notified the property owners of the results and communicated that they should not use their wells for drinking purposes. EPA also informed the property owners that EPA will work with the WOB MUD to provide more waterline connections in the area. Of the properties with exceedances, one property owner is connected to the waterline, the second property owner was interested in connecting to the waterline, a third property owner was not interested, and the fourth property owner is undecided. As a result of these exceedances, the selected remedy at the site is not protective due to potential exposure to contaminated groundwater via active use of private water wells and the potential for vapor intrusion exposure.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

Hurricane Harvey made landfall on the Texas coast as a category 4 hurricane on August 25, 2017. To evaluate the potential effects from Hurricane Harvey, EPA collected groundwater samples on September 13, 2017, for volatile VOC analysis. No VOCs were detected in the groundwater samples indicating that the hurricane did not affect the remedy.

EPA assessed the vulnerability to the effects of climate and weather hazards. The Site does not lie within a 100-year flood plain and is not considered at increased risk or impact from drought and wildfire. The SVE system was installed in 2019. During the winter storms Uri and Viola in February 2021, the system lost power and sustained damage to some of the equipment and piping in the shallow SVE system. This resulted in the shallow SVE system being shut down for a couple of months. Once the equipment and piping of the shallow SVE system was repaired, normal operations recommenced. No off-site releases or impacts on the environment, including water systems, were reported. The SVE system continues to operate as expected with ongoing remote monitoring.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
None

Issues and Recommendations Identified in the FYR:

OU(s): Sitewide	Issue Category: Remedy Performance			
	Issue: Recent sampling results from both monitoring and private water wells, west and south of the immediate source area, verify contaminant concentrations above drinking water standards in parts of the deep WBZ, historically used for private water wells. A potential for exposure to contaminants in the residential areas may still exist, through the use of private water wells.			
	Recommendation: Where private water wells are still in use within the affected area, consider and implement appropriate actions to prevent human exposure to contaminated groundwater.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/Support Agency**	**Milestone Date**
Yes	Yes	EPA	EPA/State	12/31/2024

OU(s): Sitewide	Issue Category: Remedy Performance			
	Issue: Recent sampling results from both monitoring and private water wells, west and south of the immediate source area, verify contaminant concentrations above drinking water standards in parts of the deep WBZ, historically used for private water wells. A potential for exposure to contaminants in the residential areas may still exist, via vapor intrusion from use groundwater in these private wells.			
	Recommendation: For private potable wells with COC concentrations exceeding groundwater cleanup goals, evaluation of the vapor intrusion exposure pathway is recommended.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/Support Agency**	**Milestone Date**
Yes	Yes	EPA	EPA/State	12/31/2024

OU(s): Sitewide	Issue Category: Remedy Performance
	Issue: Institutional controls, such as restrictive covenants or deed notices, are not in place for the properties where underlying groundwater contains COCs at concentrations exceeding protective levels for unrestricted use.

	Recommendation: Determine if institutional controls are needed where COC concentrations are above remedial goals in the groundwater beneath the properties and facilitate implementation of the institutional controls.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party/Support Agency**	**Milestone Date**
Yes	Yes	EPA/State	EPA/State	8/31/2026

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit:	*Protectiveness Determination:* Not Protective
Protectiveness Statement: The selected remedy at the site is not protective due to potential exposure to contaminated groundwater in residential areas via active use of private water wells and the potential for vapor intrusion exposure. The following actions need to be taken to ensure protectiveness: where private water wells are still in use within the affected area, consider and implement appropriate actions to prevent human exposure to contaminated groundwater via private water wells, and assess the potential for vapor intrusion; determine if institutional controls are needed and implement them where COC concentrations are above remedial goals in the groundwater beneath the properties.	

VIII. NEXT REVIEW

The next FYR Report for the Jones Road Groundwater Plume Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Addendum to the First Five-Year Review Report. Jones Road Ground Water Plume Superfund Site. Prepared by EPA. October 2021.

Annual Technical Memorandum on the Soil Vapor Extraction System Operation and Maintenance - August 2020 to July 2021. Jones Road Groundwater Plume, Superfund Site Remedial action. Prepared by EA Engineering, Science, and Technology, Inc., PBC. October 2021.

Data Evaluation Summary Report, Revision 00. Prepared by EA for EPA Region 6. September 2019.

EPA Jones Road Groundwater Plume, Superfund Site Update, May 2020.

First Five-Year Review. Jones Road Ground Water Plume Superfund Site. Prepared by EPA. September 2017.

Focused Human Health Risk Assessment, Revision 01. Jones Road Ground Water Plume Superfund Site. Prepared by EA Engineering, Science, and Technology, Inc., PBC (EA). October 2016.

Supplemental Remedial Investigation Jones Road Ground Water Plume Superfund Site. Prepared by EA for EPA Region 6. May 2017.

Final Remedial Investigation Report, Jones Road Groundwater Plume Superfund Site. Prepared by Shaw Environmental, Inc. for TCEQ. April 2009.

Hurricane Harvey 2017. EPA's On-scene Coordinator Response website. https://response.epa.gov/site/site_profile.aspx?site_id=12353. Accessed December 28, 2021.

Optimization Review, Jones Road Superfund Site, Harris County, Texas. EPA Region 6. August 2014.

Public Health Assessment, Jones Road Groundwater Plume, Harris County, Texas. Texas Department of State Health Services. May 2005.

Record of Decision, Jones Road Ground Water Plume Supe1fund Site, Harris County, Texas. EPA Region 6. September 2010.

Record of Decision Amendment #1, Jones Road Ground Water Plume Supe1fund Site, Harris County, Texas. EPA Region 6. September 2017.

Remedial Action Report (Plugging and Abandoning Wells), Jones Road Groundwater Plume Superfund Site, Houston, Harris County, Texas. January 2012.

Remedial Action Report, Revision 01. Jones Road Ground Water Plume Remedial Action. Prepared by EA for EPA Region 6. June 2019.

Remedial Action Report, Revision 01. Jones Road Ground Water Plume Remedial Action. Prepared by EA for EPA Region 6. August 2019.

Remedial Action Report for the SVE System Installation, Rev 00. Prepared by EA for EPA Region 6. July 2020

Remedy Optimization Review, Jones Road Superfund Site, Harris County, Texas, EPA 542-R-14-006, August 2014.

Request for a Removal Action at the Jones Road Ground Water Plume, Harris County, Texas. Prepared by EPA. March 2018.

Revised Draft Feasibility Study, Jones Road Groundwater Plume Superfund Site, Harris County Texas. Prepared by Shaw Environmental, Inc. for TCEQ. December 2009.

Sampling and Analysis Plan Addendum 02, Revision 00 Jones Road Groundwater Plume. Prepared by EA for EPA Region 6. July 2019.

Soil Vapor Extraction System Update Jones Road Ground Water Plume Superfund Site Houston, Harris County, Texas. November 2019.

Monthly SVE System Performance Summary Report, Jones Road Ground Water Plume Superfund Site. Prepared by EA for EPA Region 6. May 2022.

Supplemental Remedial Investigation, Jones Road Ground Water Plume Superfund Site. Prepared by EA for EPA Region 6. May 2017.

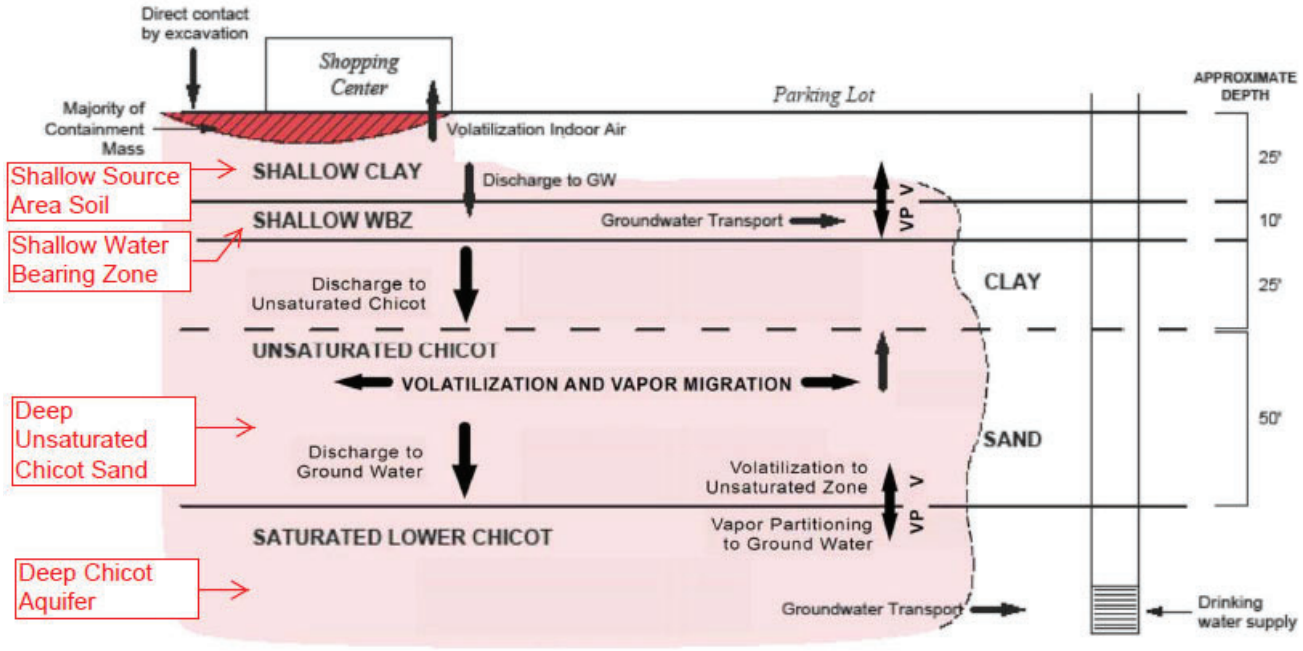
APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
Bell Dry Cleaners began operating at the Cypress Shopping Centre	1988
Phase I environmental site assessment by Geo-Tech Environmental, Inc. found contamination in soil and groundwater associated with former dry-cleaning operations	June 2001
Site owners ceased dry-cleaning operations	May 2002
TDLR designated a boundary of a restricted water well drilling area around the Cypress Shopping Centre	January 2003
TCEQ initiated the Site's RI/FS	August 18, 2003
EPA proposed listing the Site on the NPL	April 30, 2003
EPA finalized the Site's listing on the NPL	September 29, 2003
Harris County established the Site as a "No New Wells" area, preventing the drilling of domestic wells into the contaminated groundwater plume or aquifer	May 2006
EPA initiated a time-critical removal action to construct a water supply line and connect area residents and businesses to the public water supply	March 15, 2007
EPA completed the time-critical removal action	November 26, 2008
EPA finalized a Settlement Agreement with the site owner	September 24, 2009
EPA completed the RI/FS and signed the sitewide Record of Decision (ROD)	September 23, 2010
EPA began remedial design of the ISB portion of the 2010 ROD remedy	March 4, 2011
EPA began remedial action by plugging and abandoning private water wells of local residences and businesses connected to the waterline in 2008	September 17, 2011
EPA completed the Site's Remedial Action Report (Plugging and Abandoning Wells)	January 9, 2012
EPA completed plugging and abandoning private water wells	January 31, 2012
EPA began the remedial design for the 2010 ROD pump-and-treat remedy	February 10, 2012
EPA completed a remedy optimization review	August 20, 2014
EPA completed the remedial design of the ISB portion of the 2010 ROD remedy and began the remedial action for the WBZ	September 29, 2015
EPA began ISB injections at the source area to address shallow soil and groundwater contamination	January 2016
EPA completed a focused human health risk assessment	October 2016
EPA completed a supplemental RI and a soil vapor extraction pilot test	May 2017
EPA completed a focused FS	June 2017
EPA completed remedial action of the WBZ	September 20, 2017
EPA signed the Site's first FYR Report and issued the 2017 Amendment	September 29, 2017
EPA began the remedial design for the 2017 Amendment SVE remedy	February 2, 2018
EPA completed the ISB portion of the 2010 ROD remedy with hot-spot treatments in source areas	March 2018
EPA initiated a second removal action to install indoor exhaust systems in three of the suites in the Cypress Shopping Center	May 14, 2018
EPA completed the second time-critical removal action	May 27, 2018
EPA began the SVE remedial action	September 21, 2018
EPA approved the remedial design for the 2017 Amendment remedy	September 28, 2018
EPA began operating the shallow and deep SVE system	July 24, 2019
EPA signed the Site's Addendum to the 2017 FYR Report	October 25, 2021

APPENDIX C – SUPPLEMENTAL SITE FIGURES

Figure C-1: Site Conceptual Layout



NOTE: Model from "Jones Road Conceptual Site Model", GSI Environmental, August 2013

Figure C-2: DCE Concentrations and Plume, 2019

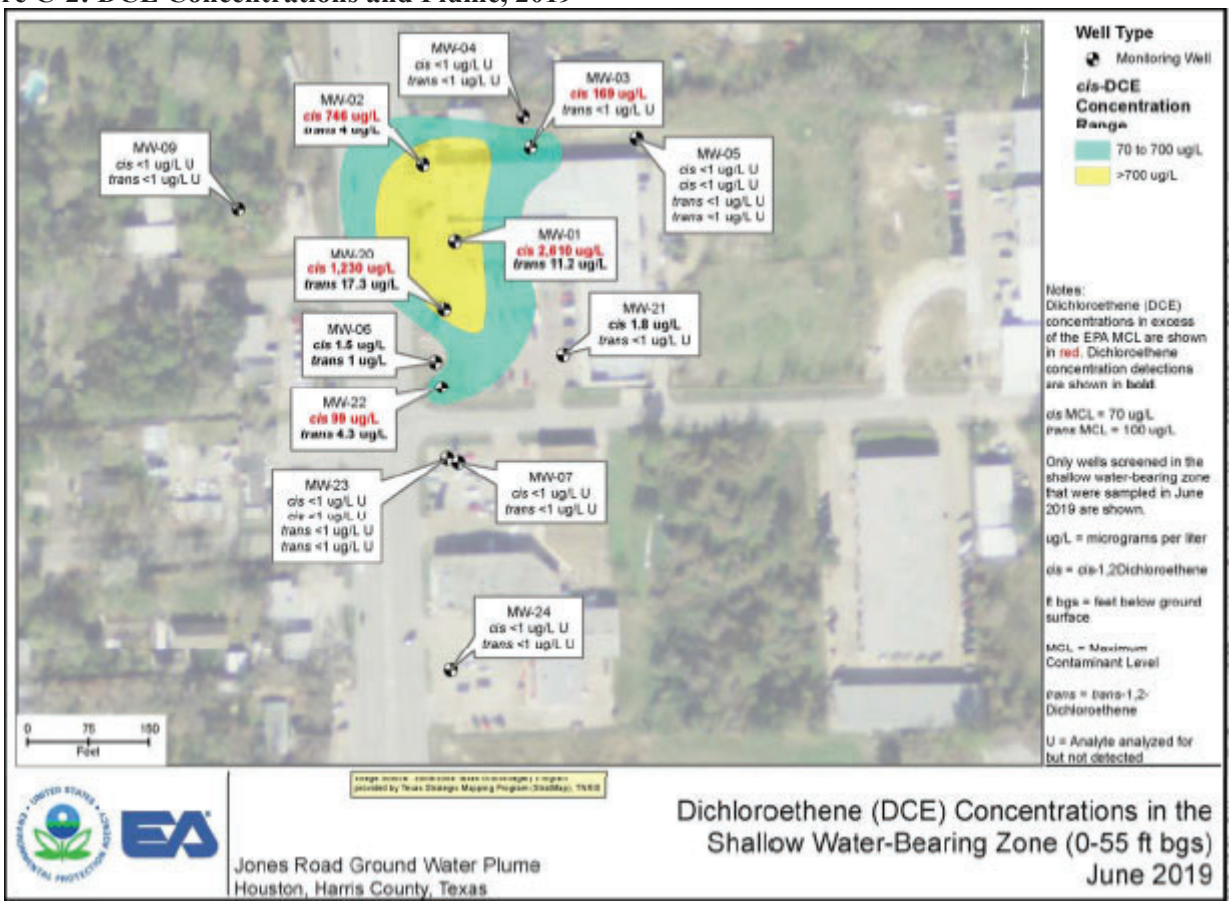


Figure C-3: PCE Concentrations and Plume, 2019

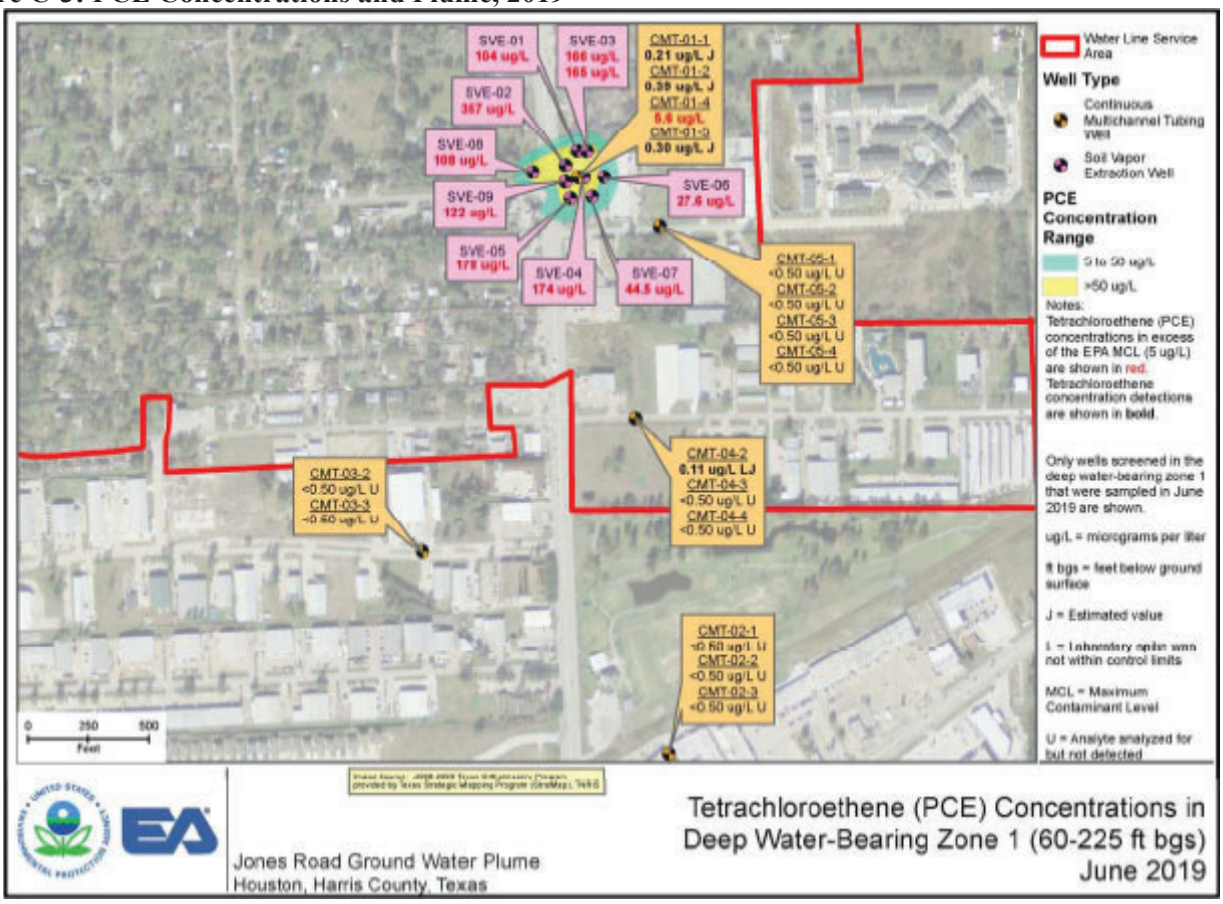
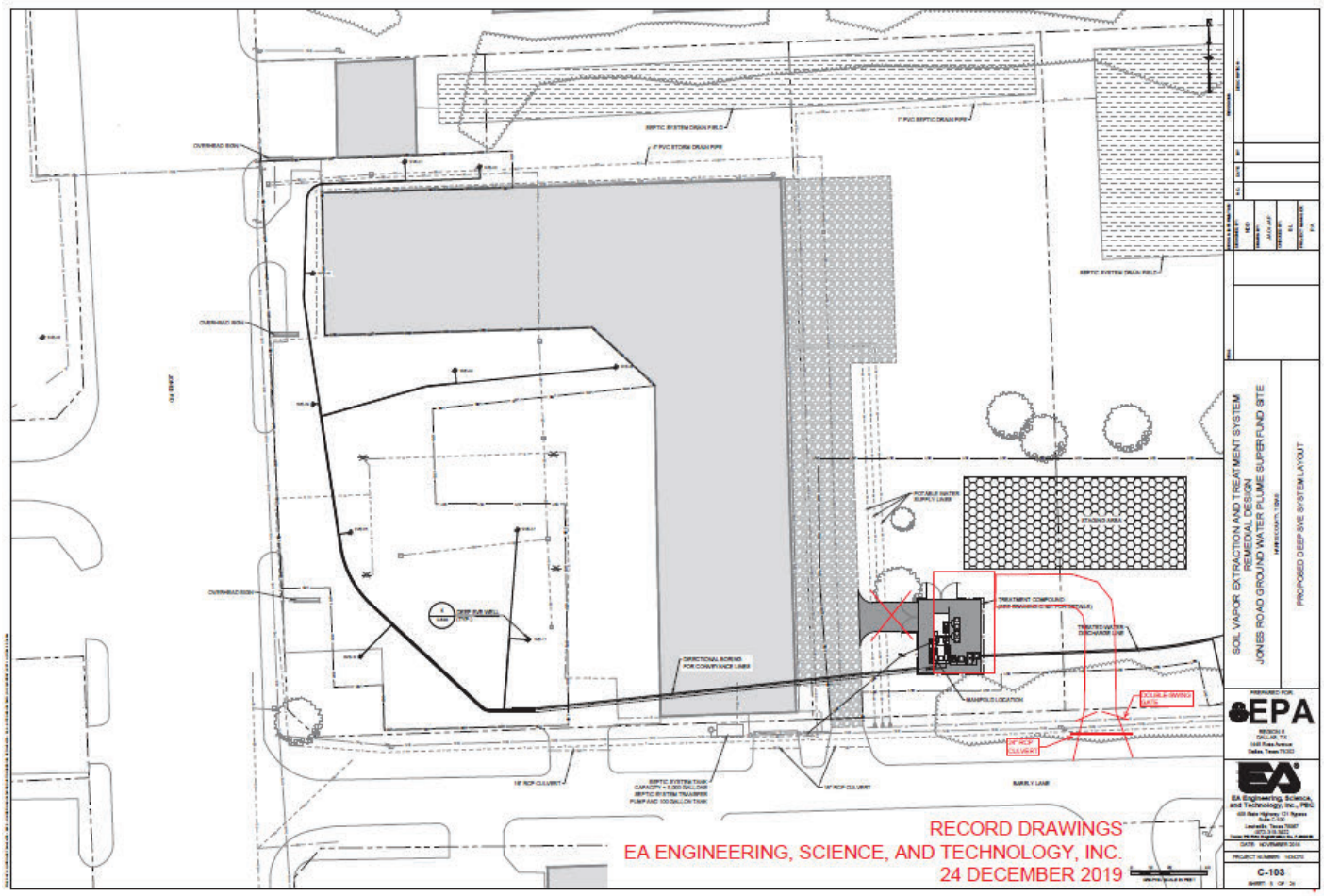
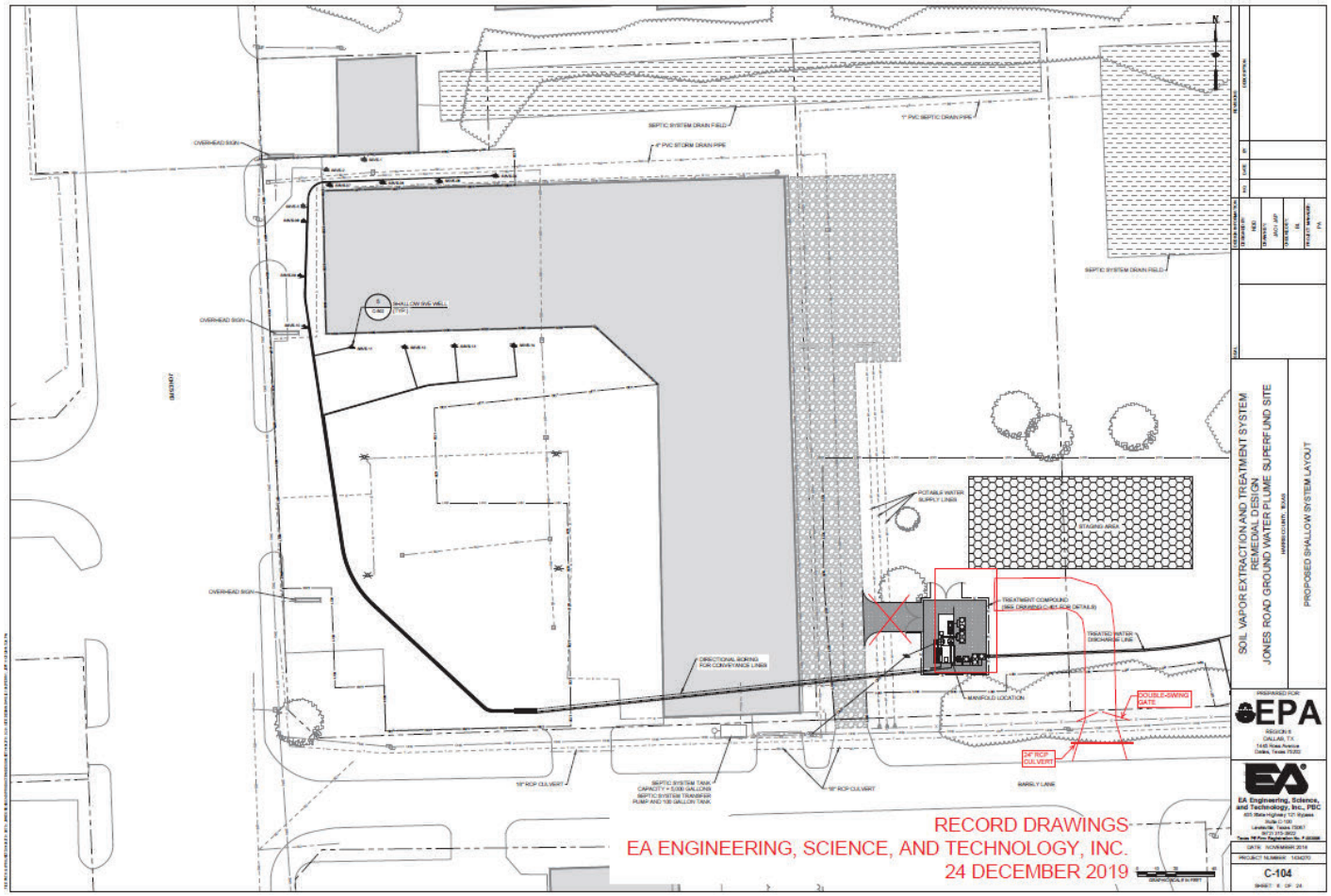


Figure C-4: Deep SVE System Layout



Source: Remedial Action Report for the SVE System Installation, Rev 00, July 2020

Figure C-5: Shallow SVE System Layout



Source: Remedial Action Report for the SVE System Installation, Rev 00, July 2020

APPENDIX D – PRESS NOTICE

Jones Road Groundwater Plume Superfund Site
Public Notice
U. S. Environmental Protection Agency, Region 6
February 2022

The U.S. Environmental Protection Agency Region 6 (EPA) is conducting the second five-year review of remedy implementation and performance at the Jones Road Groundwater Plume Superfund site (Site) in Harris County, Texas. From 1984 to 2002, Bell Dry Cleaners operated at the Cypress Shopping Center at 11600 Jones Road. Improper disposal of dry-cleaning solvents from this former dry-cleaning facility contaminated the soil and groundwater with volatile organic compounds.

In 2008, a time-critical removal action was conducted by the EPA to address immediate threats to human health. It included the installation of a water line and connections to 144 homes and businesses to the public water supply. The EPA selected a remedy in 2010 to address the source area soil and groundwater.

In 2011, the EPA plugged and abandoned water wells of the customers who were connected to the public water supply. In 2016, EPA injected amendments to enhance degradation of Site contaminants and conducted additional hot spot treatments in March 2018. Sampling shows a successful reduction in chemical contaminant levels in the shallow groundwater. In May 2018, EPA installed indoor exhaust systems in three of the suites in the Cypress Shopping Center to remove chemical contaminants that migrated into the building from the soils below. Sampling conducted after the exhaust systems were installed shows the contaminant levels in the indoor air have returned to safe levels.

In September 2017, the EPA amended the remedy selected in 2010 for the shallow source area soil to soil-vapor extraction and added an additional remedy of soil vapor extraction to address the deep vapor-phase zone. The soil vapor extraction system began operations in July 2019.

The five-year review will determine if the remedies are protective of human health and the environment. The five-year review is scheduled for completion in September 2022.

The report will be made available to the public at the following local information repository:

Northwest Branch Harris County Library
11355 Regency Green Drive
Cypress, Texas, 77429
(281) 890-2665

Site status updates are available on the Internet at www.epa.gov/superfund/jones-road

All media inquiries should be directed to the EPA Press Office at (214) 665-2200

For more information about the Site, contact:

Raji Josiam/Remedial Project Manager
(214) 665-8529 or 1-800-533-3508 (toll-free) or
by email at josiam.raji@epa.gov

Jason McKinney/Community Involvement Coordinator
(214) 665-8132 or 1-800-533-3508 (toll-free) or
by email at mckinney.jason@epa.gov

Sitio Superfund Penacho de Aguas Subterraneas de la Calle Jones
Aviso Publico
Region 6 de la Agencia de Proteccion Ambiental de los Estados Unidos
Febrero 2022

La Region 6 de la Agencia de Proteccion Ambiental de los Estados Unidos (EPA, por sus siglas en ingles) llevara a cabo la segunda revision de cinco anos de la implementacion y el rendimiento del plan de limpieza de sitio Superfund Penacho de Aguas Subterraneas de la Calle Jones en el Condado de Harris, Texas. De 1984 a 2002, la tintoreria Bell opero en el centro comercial Cypress en 11600 Jones Road. La eliminacion inadecuada de solventes de limpieza en seco de esta antigua tintoreria contamino el suelo y las aguas subterraneas con compuestos organicos volatiles.

En 2008, la EPA implemento una accion de emergencia de tiempo critico dirigida hacia las amenazas inmediatas para la salud humana. Esta incluyo la instalacion de una linea de suministro de agua y conexiones necesarias en 144 residencias y negocios al suministro publico de agua. La EPA selecciono una accion correctiva para responder a la contaminacion fuente en el suelo y en las aguas subterraneas.

En 2011, la EPA tapo y abandono los antiguos pozos de agua en las 144 propiedades ahora conectadas al suministro de agua publico. En 2016, la EPA inyecto enmiendas al subsuelo para mejorar la degradacion de los contaminantes del sitio y realizo tratamientos adicionales para tratar puntos calientes de contaminacion en marzo de 2018. El muestreo indica una reduccion exitosa en los niveles de contaminantes quimicos en las aguas subterraneas poco profundas. En mayo de 2018, la EPA instalo sistemas de escape para aires interiores a edificios en tres de las suites del centro comercial Cypress para eliminar los contaminantes quimicos que migraron dentro del edificio desde el suelo. El muestreo realizado luego de la instalacion de estos sistemas de escape indica que los niveles de contaminantes en el aire interior han regresado a niveles seguros.

En septiembre 2017, la EPA modifico la accion correctiva seleccionada en 2010 para el area de suelo poco profundo fuente de contaminacion a la extraccion de vapor del suelo y tambien agrego una accion correctiva adicional de extraccion de vapor del suelo para abordar la zona de fase de vapor profunda. El sistema de extraccion de vapores del suelo inicio operaciones en julio de 2019.

La revision de cinco anos determinara si la accion correctiva, tal como se ha implementado hasta la fecha, protege la salud humana y el medio ambiente. Esta programado para completarse en septiembre 2022.

El informe final de la revision de cinco anos se pondra a disposicion del publico en el siguiente repositorio local de informacion:

Biblioteca del Condado de Harris – Sucursal del Noroeste
11355 Regency Green Drive
Cypress, Texas, 77429
(281) 890-2665

Actualizaciones del estado del sitio Superfund estan disponibles en Internet en www.epa.gov/superfund/jones-road

Todas las preguntas de los medios deben dirigirse a la Oficina de la Prensa de la EPA al (214) 665-2200

Para obtener mas informacion sobre el sitio, comuniquese con:

Raji Josiam/ Gerente de Proyecto de Limpieza
(214) 665-8529 o 1-800-533-3508 (numero gratuito
o por correo electronico a josiam.raji@epa.gov

Jason McKinney/ Coordinador de Participacion Comunitaria
(214) 665-8132 o 1-800-533-3508 (numero gratuito)
o por correo electronico a mckinney.jason@epa.gov

APPENDIX E – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Jones Road Groundwater Plume	**Date of Inspection:** 12/10/2021
Location and Region: Houston, Texas, 6	**EPA ID:** TXN000605460
Agency, Office or Company Leading the Five-Year Review: EPA Region 6	**Weather/Temperature:** Clear, 50 degrees

Remedy Includes: (check all that apply)

- ☐ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☒ Other: Soil vapor extraction, in-situ bioremediation, vapor mitigation

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** Luis Vega (Name) | Project Manager (Title) | 03/02/2022 (Date)
   Interviewed ☐ at site ☐ at office ☒ by email Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) | _____ (Title) | _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____Name _____ (Title) _____ (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ _____ _____ _____

	Name	Title	Date	Phone	
	Problems/suggestions ☐ Report attached: _____				
4.	**Other Interviews** (optional) ☐ Report attached: _____				
	III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)				
1.	**O&M Documents**				
	☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A	
	☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A	
	☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
2.	**Site-Specific Health and Safety Plan**	☒ Readily available	☒ Up to date	☐ N/A	
	☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
3.	**O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
4.	**Permits and Service Agreements**				
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
7.	**Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A	
	Remarks: _____				
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
9.	**Discharge Compliance Records**				
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A	
	Remarks: _____				

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☐ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☒ Contractor for EPA

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A

Remarks: _____

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☒ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: EPA is to evaluate the need for additional ICs.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident

Lengths: _____ Widths: _____ Depths: _____

Remarks: _____

3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Area extent: _____
	☐ Ponding	☐ Location shown on site map	Area extent: _____
	☐ Seeps	☐ Location shown on site map	Area extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Area extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Area extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☐ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☐ Applicable	☐ N/A
	(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement
Area extent: _____ Depth: _____
Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type:_____ Area extent: _____
Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Area extent: _____ Depth: _____
Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Area extent: _____ Depth: _____
Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions
☐ Location shown on site map Area extent: _____
Size: _____
Remarks: _____

6. **Excessive Vegetative Growth** Type: _____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Area extent: _____
Remarks: _____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

4. **Extraction Wells Leachate**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☒ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☒ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☒ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

None noted.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The shallow SVE lines regularly clog and are cleaned and repaired as needed

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None noted.

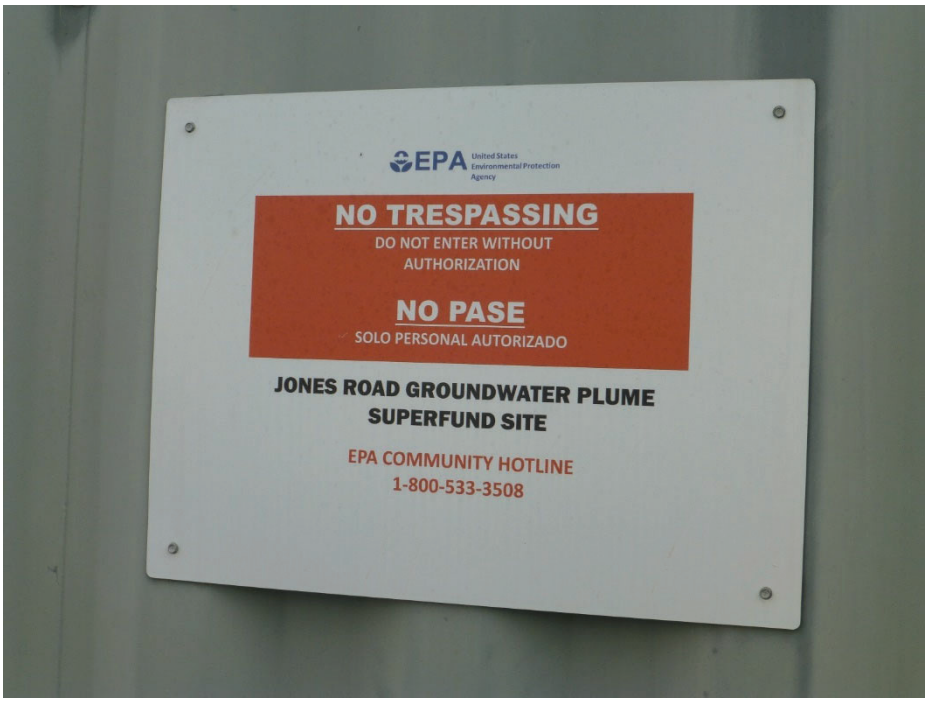
D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None noted.

APPENDIX F – 2021 SITE INSPECTION PHOTOS

Fenced SVE system



Signage at SVE system

Shallow SVE well lines


Deep SVE well lines

SVE input lines


SVE treatment system

Vapor mitigation system

Monitoring wells in Cypress Shopping Centre

APPENDIX G – SVE SYSTEM PERFORMANCE SUMMARY

Jones Road Ground Water Plume Superfund Site
Monthly SVE System Performance Summary
Reporting Period: May 2022

DEEP SOIL VAPOR EXTRACTION AND TREATMENT SYSTEM

Based on diminishing influent concentrations for the primary contaminants of concern and the contracted scope of work for this task order, the Deep SVE System was turned off on 28 April 2022 and will remain off for an indefinite length of time. EA did not collect performance samples from the Deep SVE System during the current reporting period.

Influent contaminant concentrations for perchloroethene (PCE) and trichloroethene (TCE) for all Deep SVE System performance samples are as follows:

Deep SVE System Influent Concentrations

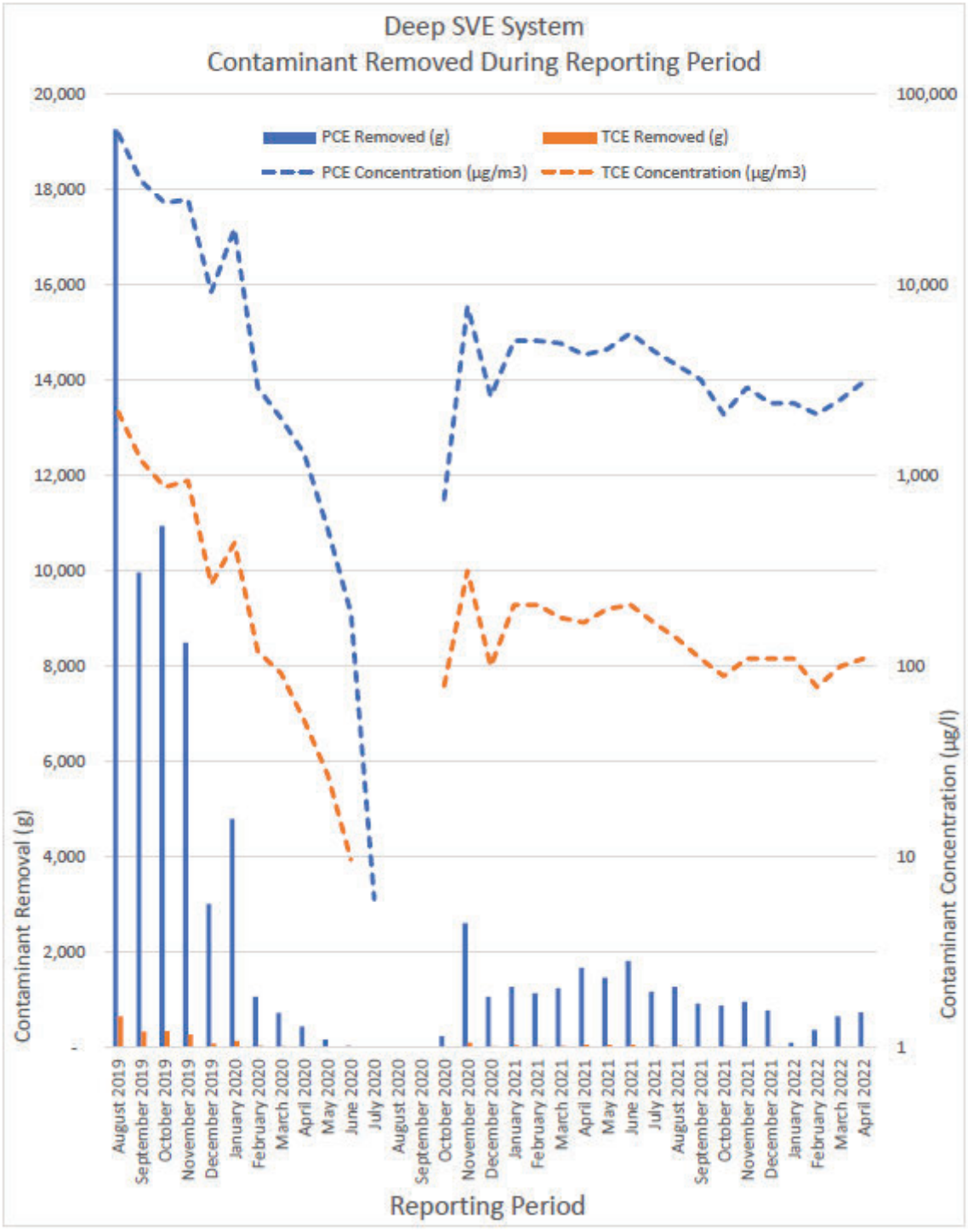
Date	Influent Concentration (µg/m³)		Date	Influent Concentration (µg/m³)	
	PCE	TCE		PCE	TCE
30-Jul-2019	61,000	2,300	29-Oct-2020	9,800	390
7-Aug-2019	97,000	3,200	19-Nov-2020	5,700	240
28-Aug-2019	31,000	1,050	29-Dec-2020	2,700	105
18-Sep-2019	35,000	1,200	14-Feb-2021	5,100	210
10-Oct-2019	27,000	870	15-Mar-2021	4,950	180
24-Oct-2019	28,000	940	23-Apr-2021	4,300	170
4-Dec-2019	17,000	520	21-May-2021	4,600	200
16-Dec-2019	1,400	20	30-June-2021	5,600	210
30-Dec-2019	8,800	380	5-Aug-2021	4,500	170
14-Jan-2020	11,000	510	1-Sep-2021	3,800	140
12-Feb-2020	2,900	120	20-Sep-2021	3,200	110
19-Mar-2020	2,000	92	4-Nov-2021	2,100	89
30-Apr-2020	1,300	52	30-Nov-2021	2,900	110
20-May-2020	525	27	20-Dec-2021	2,450	104
24-June-2020	190	10	24-Feb-2022	2,100	78
22-July-2020	10	BRL	29-Mar-2022	2,500	100
30-Sep-2020	750	79	27-Apr-2022	3,100	110

The Deep SVE System performance by reporting period is summarized below.

Deep SVE System Performance by Reporting Period

Reporting Period	Uptime (%)	Avg. Flow (SCFM)	Volume of Air (cu. ft.)	PCE Concentration ($\mu g/m^3$)	PCE Removed (g)	TCE Concentration ($\mu g/m^3$)	TCE Removed (g)
August 2019	92.9	290	10,857,600	62,667	19,267	2,167	666
September 2019	100.0	250	10,080,000	35,000	9,971	1,200	341
October 2019	100.0	280	14,112,000	27,000	10,948	870	347
November 2019	98.2	280	10,692,000	28,000	8,502	940	279
December 2019	91.4	250	11,520,000	9,200	3,016	270	90
January 2020	88.6	240	8,570,880	19,800	4,805	445	147
February 2020	100.0	325	13,104,000	2,900	1,076	120	45
March 2020	100.0	320	12,902,400	2,000	731	92	34
April 2020	78.6	310	12,276,000	1,300	452	52	18
May 2020	92.9	305	11,419,200	525	170	27	9
June 2020	75.0	305	9,223,200	190	50	10	3
July 2020	61.1	333	10,261,728	6	2	--	--
August 2020	0.0	--	--	--	--	--	--
September 2020	0.0	--	--	--	--	--	--
October 2020	77.1	290	11,275,200	750	239	79	25
November 2020	98.2	302	11,967,120	7,725	2,618	318	108
December 2020	100.0	290	14,593,320	2,600	1,074	100	41
January 2021	62.8	280	8,853,291	5,100	1,279	210	53
February 2021	73.1	270	7,944,117	5,100	1,147	210	47
March 2021	82.9	267	8,926,000	4,950	1,114	180	40
April 2021	99.5	274	13,786,764	4,300	1,679	170	66
May 2021	100.0	280	11,306,717	4,600	1,473	200	64
June 2021	98.5	289	11,483,841	5,600	1,821	210	68
July 2021	63.0	292	9,252,145	4,500	1,179	170	44.5
August 2021	100.0	294	11,851,822	3,800	1,275	140	47.0
September 2021	86.9	293	9,294,278	3,200	932	110	32
October 2021	100.0	295	14,870,520	2,100	884	89	38
November 2021	100.0	292	11,790,270	2,900	968	110	37
December 2021	100.0	287	11,584,737	2,400	787	110	37
January 2022	11.4	285	1,639,042	2,400	111	110	5
February 2022	59.3	262	6,273,939	2,100	373	78	14
March 2022	89.9	257	9,317,868	2,500	660	100	26
April 2022	62.9	266	8,428,173	3,100	740	110	26
May 2022	--	--	--	--	--	--	--
Total	**79.8**	**285**	**330,446,413**	--	**79,480**	--	**2,802**

Deep SVE System contaminant concentrations and mass removal quantities for each reporting period are shown in the figure below.



SHALLOW SOIL VAPOR EXTRACTION AND TREATMENT SYSTEM

The Shallow SVE System continued normal operations during the current reporting period. The power supply and battery backup equipment for the control system failed and caused the system to be shut down from 12 May 2022 until 18 May 2022. EA collected performance samples on 1 June 2022.

Shallow SVE System Air Concentrations – 1 June 2022

Analyte	Before 1st GAC	After 1st GAC	After 2nd GAC
PCE (µg/m³)	48,000	18,000	BRL
TCE (µg/m³)	1,950	2,200	BRL
1,1-DCE (µg/m³)	13	15	13
cis-1,2-DCE (µg/m³)	4,100	4,000	4,700
trans-1,2-DCE (µg/m³)	26	28	29
VC (µg/m³)	275	280	270

Influent contaminant concentrations for all Shallow SVE System performance samples are as follows:

Shallow SVE System Influent Concentrations

Date	Influent Concentration (µg/m³)		Date	Influent Concentration (µg/m³)	
	PCE	TCE		PCE	TCE
30-Jul-2019	Cancelled	Cancelled	29-Oct-2020	265,000	8,250
28-Aug-2019	730,000	43,000	19-Nov-2020	120,000	3,500
18-Sep-2019	38,000	15,000	29-Dec-2020	12,000	470
10-Oct-2019	970,000	50,000	4-Feb-2021	22,000	730
24-Oct-2019	160,000	7,300	23-Apr-2021	98,000	3,800
4-Dec-2019	180,000	6,700	21-May-2021	12,500	1,750
16-Dec-2019	200,000	8,800	30-Jun-2021	3,300	120
30-Dec-2019	320,000	13,500	5-Aug-2021	51,500	1,050
14-Jan-2020	235,000	28,500	1-Sep-2021	17,000	400
12-Feb-2020	42,000	1,500	20-Sep-2021	9,100	240
19-Mar-2020	120,000	5,700	4-Nov-2021	13,000	330
30-Apr-2020	21,000	640	30-Nov-2021	76,000	4,650
20-May-2020	90,000	3,800	20-Dec-2021	44,000	2,600
24-June-2020	130,000	3,000	24-Feb-2022	10,500	310
22-Jul-2020	330,000	10,000	29-Mar-2022	8,150	440
19-Aug-2020	77,000	2,000	27-Apr-2022	20,000	815
30-Sep-2020	62,500	1,400	1-June-2022	48,000	1,950

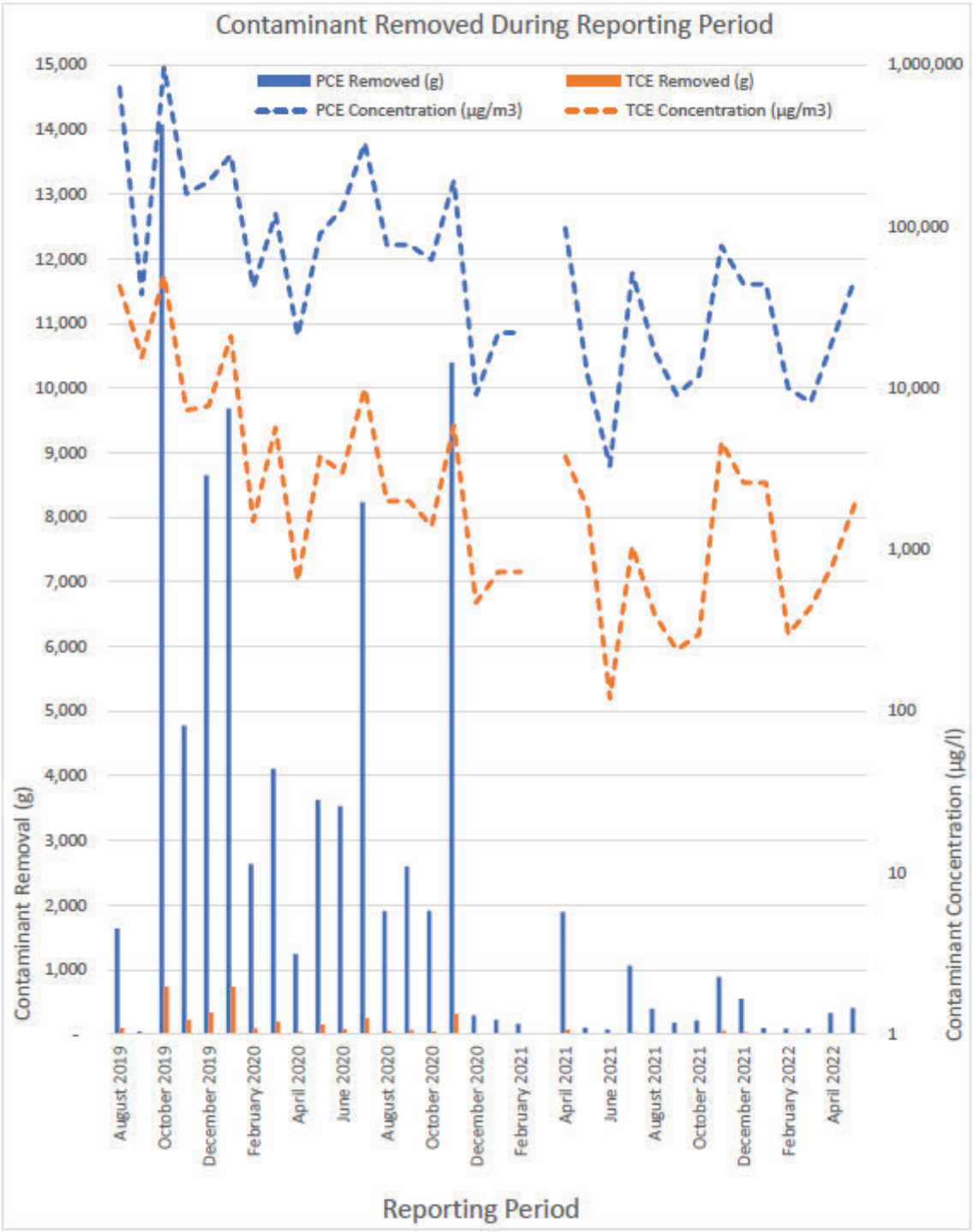
The Shallow SVE System performance by reporting period is summarized below.

Shallow SVE System Performance by Reporting Period

Month	Uptime (%)	Avg. Flow (SCFM)	Volume of Air (cu ft.)	PCE Concentration ($\mu g/m^3$)	PCE Removed (g)	TCE Concentration ($\mu g/m^3$)	TCE Removed (g)
August 2019	17.9	11.0	79,000	730,000	1,637	43,000	96
September 2019	7.1	14.0	40,000	38,000	44	15,500	18
October 2019	51.4	20.0	518,000	970,000	14,076	50,000	741
November 2019	82.1	20.0	1,027,000	160,000	4,779	7,300	221
December 2019	88.7	35.0	1,565,000	190,000	8,650	7,750	337
January 2020	78.6	38.0	1,204,000	277,500	9,690	21,000	731
February 2020	100.0	55.0	2,218,000	42,000	2,637	1,500	94
March 2020	100.0	30.0	1,210,000	120,000	4,110	5,700	195
April 2020	100.0	50.0	2,088,000	21,000	1,242	640	38
May 2020	92.9	38.0	1,423,000	90,000	3,626	3,800	153
June 2020	66.1	36.0	959,000	130,000	3,530	3,000	81
July 2020	53.7	32.6	881,000	330,000	8,234	10,000	250
August 2020	72.4	30.0	876,000	77,000	1,909	2,000	50
September 2020	69.6	42.5	1,192,000	77,000	2,599	2,000	68
October 2020	60.0	35.8	1,083,000	62,500	1,916	1,400	43
November 2020	98.2	48.2	1,908,000	192,500	10,398	5,875	317
December 2020	78.6	28.9	1,142,000	12,000	388	470	15
January 2021	62.7	11.3	357,000	22,000	222	730	7
February 2021	32.5	19.6	257,000	22,000	160	730	5
March 2021	0.0	-	-	0	0	0	0
April 2021	82.3	16.5	683,000	98,000	1,896	3,800	74
May 2021	71.4	10.2	297,000	12,000	101	1,800	15
June 2021	98.5	20.4	810,000	3,300	76	120	3
July 2021	62.5	23.2	731,000	51,500	1,065	1,050	22
August 2021	100	20.5	826,000	17,00	398	400	9
September 2021	86.9	19.8	695,000	9,100	179	240	5
October 20201	61.7	20.8	647,000	12,000	220	300	5
November 2021	98.8	10.4	413,000	76,000	890	4,650	54
December 2021	100	11.4	443,000	44,000	552	2,600	33
January 2022	11.4	13.7	79,000	44,000	99	2,600	6
February 2022	55.8	14.6	330,000	10,000	93	300	3
March 2022	89.4	10.9	394,000	8,150	91	440	5
April 2022	95.0	12.2	583,000	20,000	330	815	13
May 2022	69.9	10.6	298,000	48,000	406	1,950	16
Total	**70.1**	**26.5**	**27,256,000**	--	**86,150**	--	**3,723**

*NOTE: *PCE and TCE mass removal for the current period are based on the SVE system influent concentration from analytical sampling on 1 June 2022.*

Shallow SVE System contaminant concentrations and mass removal for each reporting period are shown in the figure below.



WATER TREATMENT SYSTEM

The amount of water generated by the Shallow SVE System during this reporting period is approximately 4,360 gallons. The amount of water generated by the Shallow SVE System since startup is approximately 165,290 gallons.

The amount of treated water discharged to the injection wells during this reporting period is approximately 3,510 gallons.

Water samples were not collected from the SVE treatment system during the current reporting period.

Abbreviations:

% = Percent.
$\mu g/m^3$ = Microgram(s) per cubic meter.
BRL = Below reporting limit.
cu. ft. = cubic feet.
DCE = Dichloroethene.
g = Gram(s).
GAC = Granular activated carbon.
HMI = Human machine interface
NS = Not Sampled
PCE = Perchloroethene.
SCFM = Standard cubic feet per minute.
TCE = Trichloroethene.
VC = Vinyl chloride

APPENDIX H – DETAILED DATA ANALYSIS

Table H-1: Summary of Groundwater Analytical Sample Results, Post-SVE

Summary of Groundwater Analytical Sampling

Well	Zone	PCE Concentration					TCE Concentration			
		Jun-20	Jan-21	*Decrease Jun. '20 - Jan. '21*	Jul-21	*Decrease Jun. '20 - Jul. '21*	Jun-20	Jan-21	*Decrease Jun. '20 - Jan. '21*	Jul-21
SVE-1	Deep	68.0	71.0	*-4%*	42.0	*38%*	3.1	2.10	*32%*	1.7
SVE-2	Deep	33.0	20.0	*39%*	9.5	*71%*	3	2.00	*33%*	1.3
SVE-3	Deep	74.0	48.0	*35%*	37.0	*50%*	2.8	1.50	*46%*	1.4
SVE-4	Deep	81.0	43.0	*47%*	48.0	*41%*	6.4	3.60	*44%*	4.1
SVE-5	Deep	120.0	81.0	*33%*	60.0	*50%*	8.7	6.80	*22%*	5.3
SVE-6	Deep	20.0	16.0	*20%*	21.0	*-5%*	1.7	1.10	*35%*	1.6
SVE-7	Deep	36.0	43.0	*-19%*	36.0	*0%*	2.7	3.30	*-22%*	3.3
SVE-8	Deep	95.0	90.0	*5%*	62.0	*35%*	5.5	3.90	*29%*	3.8
SVE-9	Deep	100.0	73.0	*27%*	81.0	*19%*	7.4	6.50	*12%*	5.7
SVE-10	Deep	48.0	11.0	*77%*	79.0	*-65%*	5.7	1.10	*81%*	6.2
SVE-11	Deep	22.0	88.0	--	BRL	--	1.9	7.10	*-274%*	BRL
Average		63.4	53.1	*20%*	47.6	*25%*	4.4	3.5	*26%*	3.4
MW-01	Shallow	1.1	BRL	--	20.0	--	2.1	BRL	---	21
MW-02	Shallow	30.0	120.0	--	130.0	--	16	38.0	*-138%*	53
MW-03	Shallow	2.5	4.3	*-72%*	0.3	*88%*	BRL	6.1	---	1.3
MW-04	Shallow	N/S	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-05	Shallow	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-06	Shallow	0.6	BRL	---	BRL	--	1.9	1.0	*48%*	23
MW-07	Shallow	BRL	BRL	---	0.5	--	BRL	BRL	---	BRL
MW-08	Shallow	N/S	BRL	---	N/S	--		BRL	---	---
MW-09	Shallow	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-10	Deep	BRL	0.1	---	BRL	--	BRL	BRL	---	BRL
MW-11R	Deep	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-12	Deep	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-13	Deep	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL

Well	Zone	PCE Concentration					TCE Concentration			
		Jun-20	Jan-21	*Decrease Jun. '20 - Jan. '21*	Jul-21	*Decrease Jun. '20 - Jul. '21*	Jun-20	Jan-21	*Decrease Jun. '20 - Jan. '21*	Jul-21
MW-14	Deep	BRL	0.1	---	BRL	--	BRL	BRL	---	BRL
MW-15	Deep	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-16	Deep	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-17	Deep	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-18	Deep	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
MW-19	Deep	0.13	0.2	-31%	0.2	*-15%*	BRL	BRL	---	BRL
MW-20	Shallow	8,900.0	680.0	92%	160	*98%*	3200	780.0	*76%*	270
MW-21	Shallow	N/S	BRL	---	0.38	--	BRL	BRL	---	BRL
MW-22	Shallow	0.25	1.7	-580%	BRL	--	0.47	BRL	---	BRL
MW-23	Shallow	1.5	0.07	95%	BRL	--	0.12	BRL	---	BRL
MW-24	Shallow	BRL	BRL	---	BRL	--	BRL	BRL	---	BRL
Average		1,276.6	100.8	*-99%*	44.5	*57%*	536.8	206.3	*-5%*	73.7
CMT-01-01	Deep	0.41	1.0	-134%	BRL	---	BRL	BRL	---	N/S
CMT-01-02	Deep	0.97	1.8	-86%	BRL	---	BRL	0.11	---	N/S
CMT-01-06	Deep	0.79	3.3	-318%	BRL	---	BRL	0.3	---	N/S
CMT-02-02	Deep	0.1	0.1	0%	BRL	---	BRL	BRL	---	BRL
CMT-02-03	Deep	BRL	0.07	---	BRL	---	BRL	BRL	---	BRL
CMT-02-04	Deep	BRL	BRL	---	BRL	---	BRL	BRL	---	BRL
CMT-02-05	Deep	BRL	BRL	---	BRL	---	BRL	BRL	---	BRL
CMT-03-02	Deep	BRL	---	---	---	---	BRL	N/S	---	N/S
CMT-03-03	Deep	BRL	0.13	---	BRL	---	BRL	BRL	---	BRL
CMT-03-04	Deep	BRL	0.11	---	BRL	---	BRL	BRL	---	BRL
CMT-03-05	Deep	BRL	0.1	---	BRL	---	BRL	BRL	---	BRL
CMT-04-02	Deep	0.1	0.2	-58%	BRL	---	BRL	BRL	---	BRL
CMT-04-03	Deep	BRL	0.2	---	BRL	---	BRL	0.1	---	BRL

Summary of Groundwater Analytical Sampling

Well	Zone	PCE Concentration					TCE Concentration			
		Jun-20	Jan-21	*Decrease Jun. '20 - Jan. '21*	Jul-21	*Decrease Jun. '20 - Jul. '21*	Jun-20	Jan-21	*Decrease Jun. '20 - Jan. '21*	Jul-21
CMT-04-04	Deep	BRL	BRL	---	N/S	---	BRL	BRL	---	N/S
CMT-04-05	Deep	BRL	BRL	---	0.18	---	BRL	BRL	---	BRL
CMT-05-02	Deep	BRL	BRL	---	N/S	---	BRL	BRL	---	N/S
CMT-05-03	Deep	BRL	0.24	---	BRL	---	BRL	0.2	---	BRL
CMT-05-04	Deep	BRL	1.6	---	BRL	---	BRL	0.3	---	BRL
CMT-05-05	Deep	BRL	0.42	---	BRL	---	BRL	BRL	---	BRL
CMT-05-06	Deep	BRL	0.38	---	BRL	---	BRL	0.1	---	BRL
Average		0.1	0.4	*-58%*	0.2	---	---	0.2	---	---
(b) (6)										
	Deep	N/S	N/S	---	0.1	---	N/S	N/S	---	BRL
	Deep	7.4	6.8	8%	7.7	*-4%*	0.84	0.97	*-15%*	0.92
	Deep	13	11	15%	36.0	*-177%*	1	1.1	*-10%*	BRL
	Deep	7.1	9.1	-28%	13.0	*-83%*	0.69	0.93	*-35%*	BRL
	Deep	26	26	0%	29	*-12%*	2.3	2.4	*-4%*	2.5
	Deep	BRL	N/S	---	0.5	---	BRL	N/S	---	BRL
Average		0.1	7.0	*-16%*	14.4	*-69%*	1.2	0.9	*-16%*	1.7

NOTES:
Concentrations are reported in micrograms per liter (µg/L).
BRL = Below Reporting Limit
N/S = Not Sampled.
PCE = Tetrachloroethene.

Source: Table 10, Annual Technical Memorandum on the SVE System Operation and Maintenance, August 2020 to July 2021

Table H-2: Sampling Results – Before and After Vapor Mitigation System Installation, Before and During SVE System Operations

Jones Road Groundwater Plume Superfund Site
Sampling Results – Before and After VMS Installation, Before and During SVE System Operations

Location			TCE (µg/m³) (also known as Trichloroethylene or Trichloroethene)											PCE (µg/m³) (also known as Tetrachloroethylene or Tetrachloroethene or Perchloroethylene)										
8-hr Industrial Noncancer Indoor Air Screening Level			8.8 µg/m³											180 µg/m³										
Sampling Dates			9-Dec-15	12-Oct-16	31-May-17	5-Jun-18**	6-Nov-18**	5-Jun-19**	29-Jan-20**	17-Jun-20**	27-Jan-21**	28-Jul-21**	16-Feb-22**	9-Dec-15	12-Oct-16	31-May-17	5-Jun-18**	6-Nov-18**	5-Jun-19**	29-Jan-20**	17-Jun-20**	27-Jan-21**	28-Jul-21**	16-Feb-22**
Background	In Parking Lot	ASBKG-1	0.564 U	0.051 J	0.81 B	0.81 U	0.54U	0.54U	0.28	ND	ND	ND	0.12J	0.346 U	0.23	4.21 B	1.02 U	1.2	2.65	0.27	0.29	0.045J	0.11J	7.2
	In Parking Lot	ASBKG-2	0.564 U	0.15 J	0.54 U	1.15 U	0.54U	0.54U	ND	ND	0.034J	0.11J	0.12J	0.441 J	0.48	1.02 B	1.45 U	0.8	1.9	0.079J	0.16J	0.058J	0.25J	0.62
Indoor Air	Grocery Store/Realtor	ASI-101-DUP	3.14	9.2	25.4	6.89	4	1.62	0.067J	0.12J	0.034J	0.098J	0.075J	110	59	262	108	53	19.4	1.3	1.8	0.45	1.9	0.68
	Grocery Store/Realtor	ASI-101	2.83	9.1	26.4	7.04	4.2	1.29	0.066J	0.13J	0.034J	0.094J	0.084J	110	59	269	110	51	17.1	1.3	1.9	0.45	2.2	1
	Grocery Store/Realtor	ASI-102	1.62 J	6.6	15.5	6.14	4.6	1.56	0.086J	0.12J	0.041J	0.15J	0.26	76.7	38	144	90.3	57	19.0	1.4	1.7	0.6	1.9	0.8
	Grill	ASI-103	0.564 U	8.7	19.2	6.61	0.5	0.54U	0.031J	0.074J	ND	0.054J	0.077J	8.31	45	208	109	5.1	2.72	2.5	1.2	0.15J	0.73	0.67
	Grill	ASI-104	0.564 U	8.9	17	5.77	0.54U	0.54U	0.034J	ND	ND	0.037J	0.12J	7.83	46	161	93.7	4.7	2.38	4.6	1.1	0.15J	0.68	0.58
	Sandwich Shop	ASI-105	0.564 U	0.38	2.1	0.74 U	0.54U	0.54U	0.03J	ND	ND	0.031J	0.22	5.82	4.4	31.3	8.14	3.3	2.11	3.6	0.74	0.14J	0.56	50
	Sandwich Shop	ASI-106	0.564 U	0.37	3.12	1.5	0.54U	0.54U	0.022J	ND	ND	0.076J	0.18	5.89	4.2	49.1	18.9	3.4	1.84	3	0.73	0.12J	0.69	73
Sub-Slab	Grocery Store/Realtor	ASS-101-DUP	68,800 J	73,000	325,000	NS	NS	4,180	61	260	110	130	37	593,000 J	1,000,000	4,310,000	NS	NS	85,400	1,400	3,800	1,200	2,600	970
	Grocery Store/Realtor	ASS-101	31,900 J	78,000	315,000	NS	NS	4,180	70	300	110	130	37	264,000 J	1,100,000	4,250,000	NS	NS	85,700	1,600	4,300	1,200	2,700	970
	Grocery Store/Realtor	ASS-102	7,170	150,000	641,000	NS	NS	224,000	120	120	26	47	22	53,300	460,000	4,020,000	NS	NS	2,090,000	3,100	3,800	1,300	4,100	2,700
	Grill	ASS-103	5,560	26,000	NS	NS	NS	233	8.6	43	12	11	3.6	36,200	130,000	NS	NS	NS	1,620	44	290	69	81	31
	Grill	ASS-104	110 J	7,400	NS	NS	NS	259	8.6	7.6	2.9	1.4	6.9	24,100	140,000	NS	NS	NS	5,950	220	100	31	15	9.1
	Sandwich Shop	ASS-105	329 J	5,500	33,800	NS	NS	49.9	78	23	9	5.9	2.1	25,000	130,000	338,000	NS	NS	665	62	300	92	50	18
	Sandwich Shop	ASS-106	46 J	440	4,050	NS	NS	233	2.2	2	0.47	0.92	0.42	9,900	30,000	166,000	NS	NS	588	88	78	16	53	19

Notes:
All units are in µg/m³

ASBKG = Air sample - background
ASI - Air sample - indoor
ASS = Air sample - sub-slab
B = Blank was contaminated
J = Result is less than the RL, but greater than or equal the MDL, and the MDL = Method Detection Limit
µg/m³ = Micrograms per cubic meter
NS = Not Sampled
ND = Not Detected
PCE = Tetrachloroethene / Tetrachloroethylene
RL = Reporting Limit
TCE = Trichloroethene/ Trichloroethylene
U = Indicates the analyte was analyzed for but not detected
** Sampling after Vapor Mitigation System installation on May 26, 2018
**Sampling after SVE System was opertational in July, 2019

Before Vapor Mitigation System Installation
Before SVE System Operation
Current Sampling Results

Source: Cumulative Results received from EPA Region 6 RPM in July 2022.

Figure H-1: Private Wells Sampled in February 2020

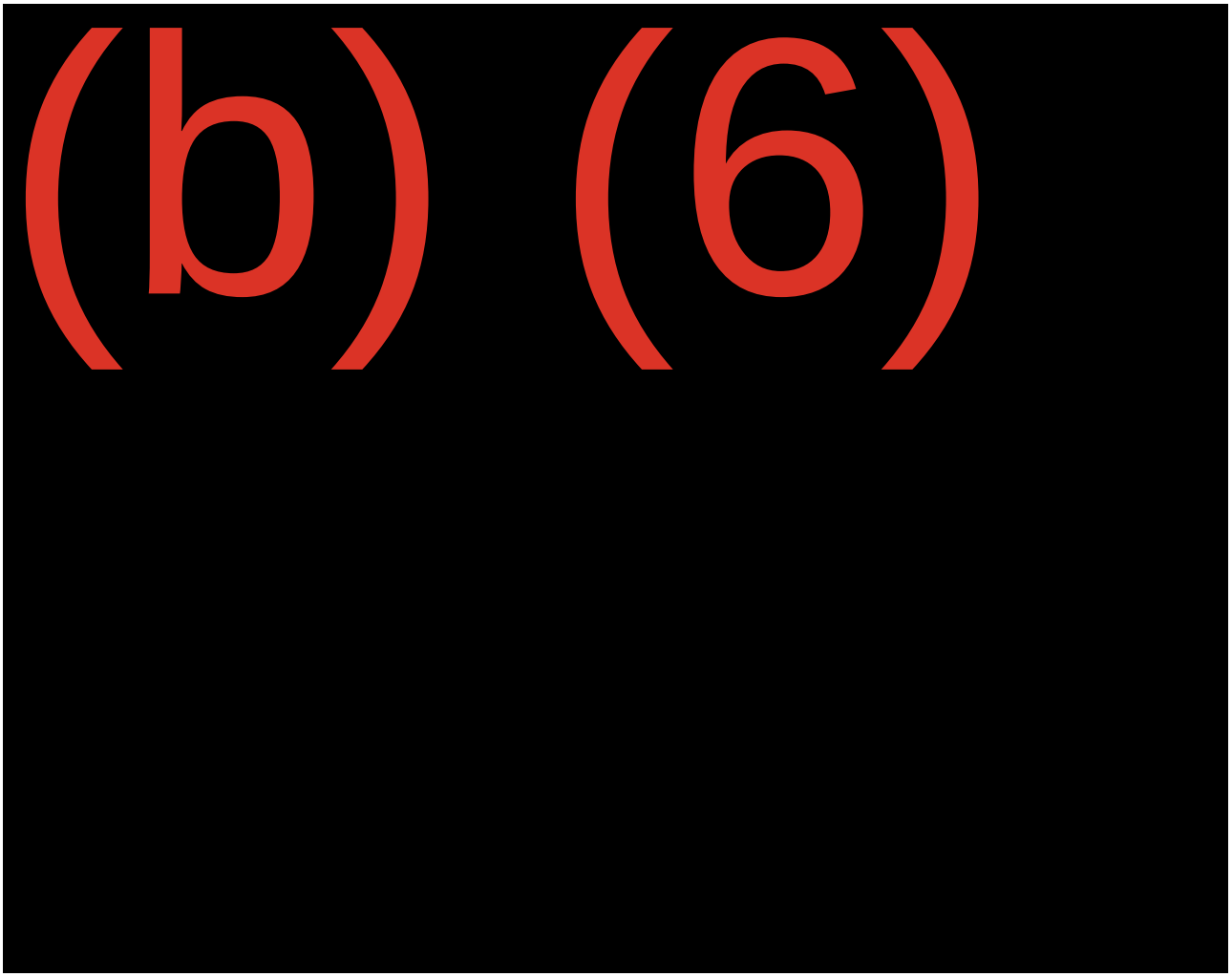


Figure H-2: Private Wells Sampled in June 2020

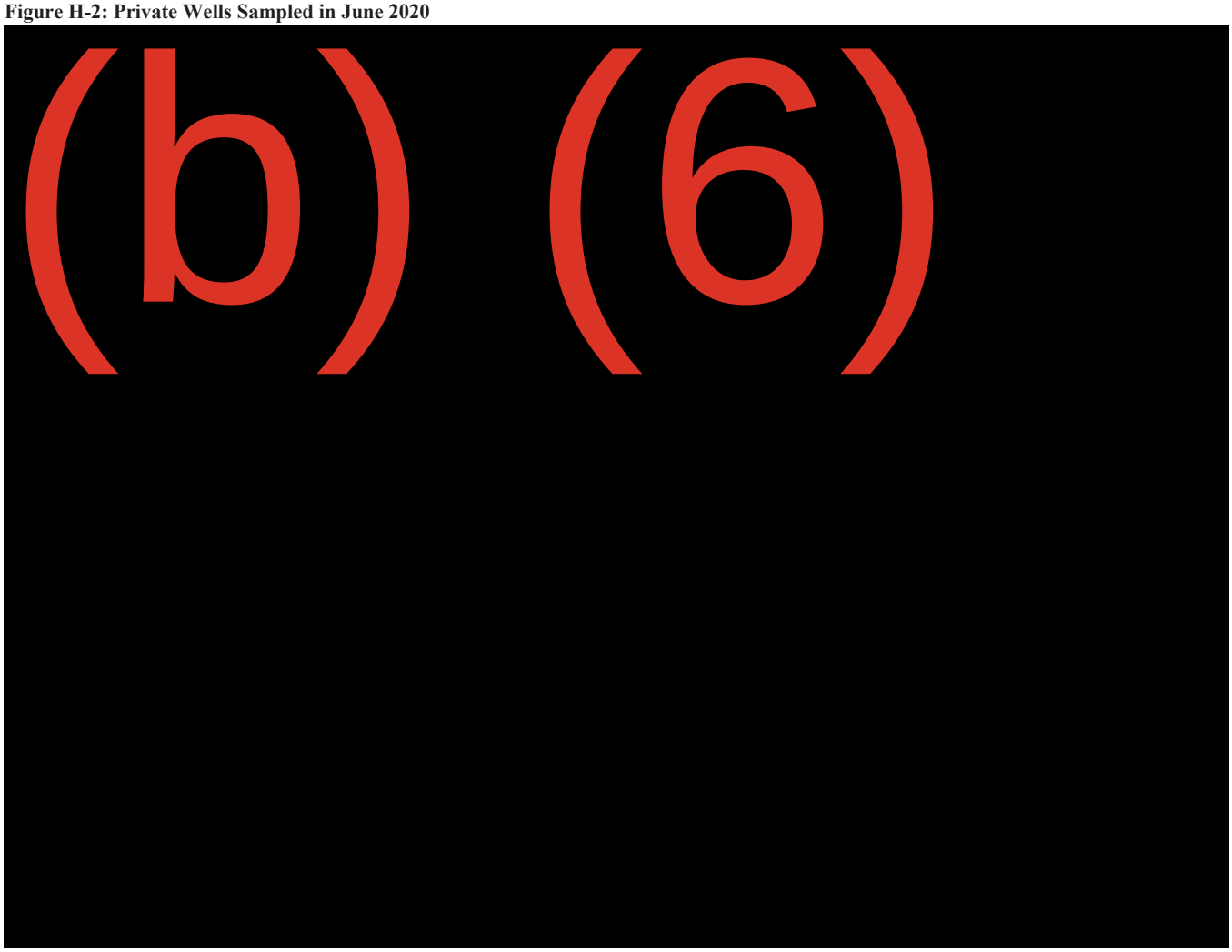
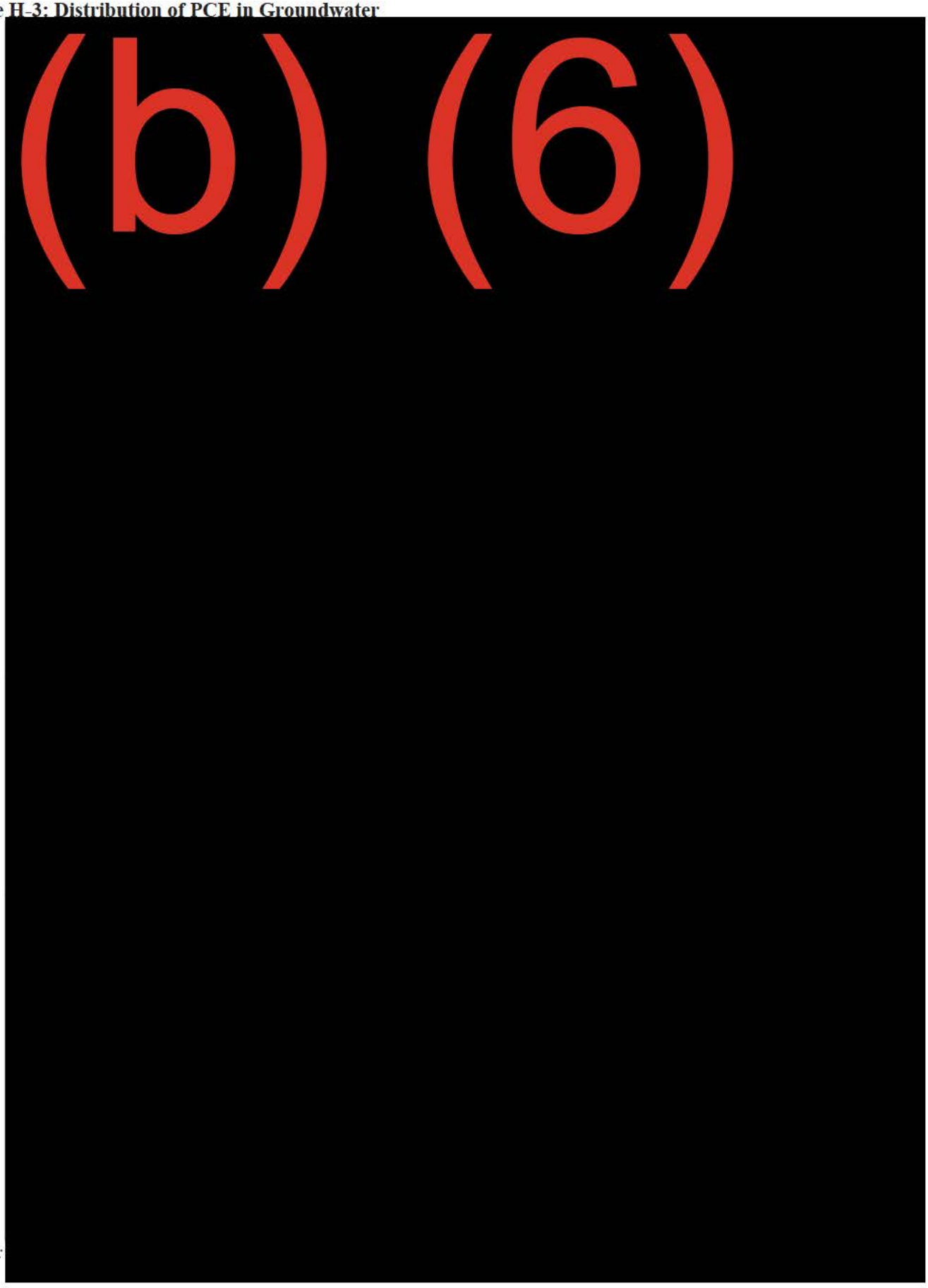
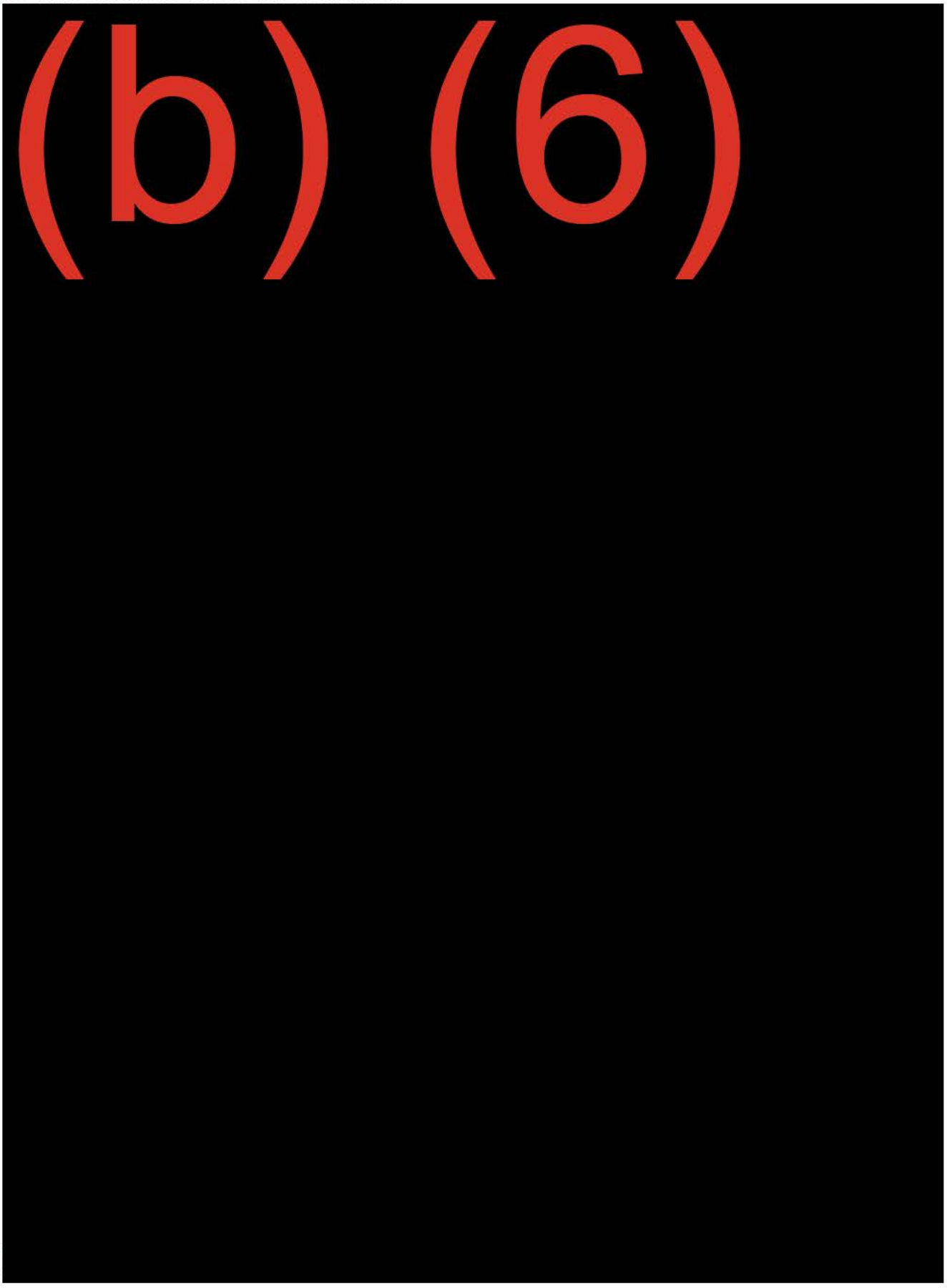


Figure H-3: Distribution of PCE in Groundwater



Source:
2021

Figure H-4: Distribution of TCE in Groundwater



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APPENDIX I – ARARs REVIEW

CERCLA Section 121(d)(l) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater ARARs

According to the 2010 ROD and the 2017 Amendment, the groundwater ARARs are federal Safe Drinking Water Act MCLs. The 2017 Amendment did not change the groundwater ARARs identified in the 2010 ROD. EPA compared the ARARs identified in the decision documents to current federal MCLs (Table H-1). The comparison shows that the standards have not changed.

Table I-1: Previous and Current ARARs for Groundwater COCs

COC	2010 ROD Cleanup Goal[a] (µg/L)	Current MCLs (µg/L)[b]
Tetrachloroethylene (PCE)	5	5
Trichloroethylene (TCE)	5	5
cis-1,2-Dichloroethylene (DCE)	70	70
trans-1,2-DCE	100	100
Vinyl chloride	2	2

Notes:
a. Obtained from Section 19.4.1 of the 2010 ROD.
b. Federal MCLs obtained from https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (accessed 12/16/2021).

Soil ARARs

The 2010 ROD and 2017 ROD Amendment #1 did not establish soil ARARs.

APPENDIX J – TECHNICAL SUPPORT FOR QUESTION B

Changes in Standards and To-Be-Considered Criteria

According to the 2010 ROD, groundwater ARARs are federal Safe Drinking Water Act MCLs. EPA compared current federal MCLs and non-zero maximum contaminant level goals (MCLGs) to the 2010 ARARs for groundwater COCs (Appendix I, Table I-1). The ARARs associated with the Site's groundwater COCs have not changed since 2010 (Appendix I provides a detailed review of ARARs information) and the cleanup levels selected in the 2010 ROD remain valid.

The MCLs are based on potable use of the groundwater. Since the COCs are considered volatile, a screening-level vapor intrusion risk evaluation was conducted to determine if the cleanup goals are protective of the vapor intrusion exposure pathway. The MCLs for the COCs were entered into EPA's 2021 Vapor Intrusion Screening Level (VISL) calculator, which calculates vapor intrusion cancer risks and noncancer hazard indices (HIs) assuming conservative default residential exposure assumptions and current toxicity information. Table I-1 shows that the cumulative risk is within EPA's risk management range, while the cumulative noncancer HI exceeds the threshold of 1.0, due to TCE and trans-1,2-DCE. These results suggest that concentrations of these two COCs at the MCL could indicate the potential for a completed vapor intrusion exposure pathway when screening this potential exposure pathway as part of the potable well program. If the MCL is exceeded for TCE or 1,2-trans-DCE during the potable well sampling, the potential for vapor intrusion exposure should be considered using multiple lines of evidence since the VISL is conservative and does not take into account any site-specific conditions such as site soil strata, depth to water table and building properties that may reduce the transport of vapors from groundwater through the soil column.

Table J-1: Screening-level Vapor Intrusion Evaluation of the Groundwater Cleanup Goals

COC	ROD Cleanup Goal (µg/L)	2021 VISL Calculator[a] (average groundwater temperature 25° Celsius)	
		Cancer Risk	Noncancer HQ
PCE	5	3.4×10^{-7}	0.09
TCE	5	4.2×10^{-6}	1
Cis-1,2-DCE	70	-	-
Trans-1,2-DCE	100	-	0.9
Vinyl chloride	2	1.3×10^{-5}	0.03
Cumulative Totals		1.8×10^{-5}	2

Notes:

a. EPA's November 2021 Vapor Intrusion Screening-Level Calculator obtained from: https://epa-visl.ornl.gov/cgi-bin/visl_search (accessed 12/20/2021).

Changes in Exposure Pathways

The potential exists for a complete exposure pathway through the ingestion of, and possibly dermal contact with, contaminated groundwater at the Site. Several private well users are aware of impacts on their wells but have not yet agreed to be connected to the public water supply. EPA continues to sample the remaining private wells that are not connected to the public water supply that are in the area affected by the groundwater contaminant plume. EPA also conducts routine community outreach to communicate the need for residents who still use private wells to have their wells sampled and, if impacted, requesting they get connected to the public water supply.

Expected Progress Toward Meeting RAOs

The 2017 FYR Report and FYR Addendum identified the need to protect human health from potable use of private wells. EPA has been able to gain access to slightly over half of the water well users and have connected many users to the public water supply. After the completion of a water well survey in 2018, EPA identified all well users within the groundwater plume. EPA continues to conduct routine community outreach to residents through mailings, public meetings and door-to-door visits to people who chose not to be connected to the public water supply and offering to connect them. Additional connections occur as residents provide EPA access to sample their wells and EPA offers the residents to opportunity to connect to the waterline if their wells are found

to be contaminated above drinking water standards. In 2020, EPA followed up with people who had initially expressed interest in November 2019 in connecting to the waterline and nine of them expressed interest in being connected to the waterline. EPA is working with the WOB MUD to provide more waterline connections to the area. The RAO of preventing exposure to groundwater through private well use will not be achieved until remaining affected private well users agree to be connected to the public water supply.

Implementation of the ISB injections for the shallow WBZ finished in 2018 and the SVE system started operating in 2019 to optimize groundwater remediation by addressing the shallow and deep soil vapors sourcing the groundwater. The remedial action is performing as expected for source control of contaminants at the point of the release and is expected to eventually meet the aquifer restoration RAOs.

APPENDIX K - INTERVIEW FORMS

JONES ROAD GROUNDWATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Jones Road Groundwater Plume	
EPA ID: TXN000605460	
Interviewer name:	**Interviewer affiliation:**
Subject name: Nicholas Dobberpuhl, PE	**Subject affiliation:** EA Engineering, Science, and Technology, Inc., PBC
Subject contact information: ndobberpuhl@eaest.com; 972-459-5046	
Interview date: 2/25/2022	**Interview time:**
Interview location: n/a, email	
Interview format (circle one): In Person Phone Mail [Email] Other:	
Interview category: O&M Contractor (Project Engineer)	

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Answer: The project seems to be effective in targeting cleanup at the source area and capturing contamination before it can reach deeper underlying aquifers. Maintenance to keep the Shallow SVE System operational is one of the biggest challenges. The Site is already developed and in use as a commercial establishment. The SVE remedy needs to be evaluated in terms of the overall Site cleanup strategy.

2. What is your assessment of the current performance of the remedy in place at the Site?

   Answer: Performance of the SVE remedy seems to have waned over time and may be reaching a point where it will not provide significant benefit without additional measures.

3. What are the findings from the monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?

   Answer: Groundwater sampling results from 2021 show modest improvements in contaminant concentrations in the shallow aquifers. Most monitoring well concentrations have trended down slightly, but some have had small increases. The contaminant plume does not appear to be migrating significantly. Contaminant removal from the Deep SVE System is significantly lower now than earlier in the project. Contaminant removal from the Shallow SVE System has decreased modestly over time. Results from the SVE system performance are published in a monthly SVE system performance report and results from the semiannual groundwater sampling events are published annually in an O&M report.

4. Is there a continuous on-site O&M presence? If so, please describe staff responsibilities and activities. Alternatively, please describe staff responsibilities and the frequency of site inspections and activities if there is not a continuous on-site O&M presence.

Answer: No. Regular on-site O&M occurs one day each week for several hours. There is continuous monitoring (telemetry) of the SVE system monitoring and control system, which is useful for remotely restarting the system after certain alarms, which do not require a Site visit to address. Non-routine visits may be performed to address more significant alarm conditions, breakdowns, or troubleshooting.

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.

   Answer: Yes. On-site O&M visits have been longer and more frequent than expected in response to severe weather conditions (such as tropical storms, flooding, or hard freeze events), water generation, and equipment troubleshooting. Sampling routines have not significantly changed; however, periodic SVE system performance sampling (typically monthly) have been adjusted for periods of system downtime. A vapor mitigation system (not maintained by EA) provides continuous protection for the commercial spaces nearest to the contaminant source area.

6. Have there been unexpected O&M difficulties or costs at the Site since start-up or in the last five years? If so, please provide details.

   Answer: Yes. O&M difficulties and costs have been experienced due to certain site-specific conditions. The water treatment piping is outdoors and non-insulated, so unprecedented freeze conditions (not typical of the Harris County area) have necessitated repairs and specific preparations to protect the system. The Shallow SVE System wells generate significant amounts of water and entrained fine sediment, especially during periods of high precipitation. Sediment coming through the Shallow SVE System conveyance lines has plugged lines and impacted flow rates and vacuum at the wellheads, and special measures have been implemented to deal with these conditions. In the early phase of operations after startup, the water generated by the Shallow SVE System had high concentrations of contaminants, which were not being effectively removed by the water treatment system. The sediment has plugged the Shallow SVE System lines, instrumentation and fittings at the SVE manifold, water system piping, water treatment vessels (GAC), and caused the water system transfer pump to seize up.

7. Have there been opportunities to optimize O&M activities or sampling efforts? Please describe changes and any resulting or desired cost savings or improved efficiencies.

   Answer: Yes, the O&M procedures have been continuously refined through consultation with support engineers, O&M personnel, and the O&M project manager. Effectively utilizing the telemetry system saves cost by eliminating certain unplanned site visits. Larger O&M items and repairs have been addressed during semiannual sampling events, when more personnel are already on-site, and our capabilities are temporarily increased. In addition, more cost-effective passive diffusion bags have replaced low-flow sampling for those wells that are only monitored for volatile organic compounds during semiannual sampling events.

8. Do you have any comments, suggestions or recommendations regarding O&M activities and schedules at the Site?

   Answer: Not at this time.

9. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which become a public document (please initial)
   a. Your name? Yes _____ No _____
   b. Your affiliation? Yes _____ No _____
   c. Your responses? Yes _____ No _____

JONES ROAD GROUNDWATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Jones Road Groundwater Plume	
EPA ID: TXN000605460	
Interviewer name:	**Interviewer affiliation:**
Subject name: Dr. Latrice Babin	**Subject affiliation: Harris County Pollution Control Services Executive Director**
Subject contact information: 713-920-2831	
Interview date: March 4, 2022	**Interview time: Noon**
Interview location: Pasadena, Texas	
Interview format (circle one): In Person Phone Mail (Email) Other:	
Interview category: Local Government	

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Harris County Pollution Control Services (PCS) is aware of environmental issues and cleanup activities through publicly available documents.

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

   PCS requests to be copied and included on all correspondence and communication, including those conducted by government agencies, contractors, landowners on the Site, and any other entity affiliated with the Site.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   PCS is not aware of any problems at the Site.

4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?

   PCS is not aware of any changes to state laws or local regulations.

5. Are you aware of any changes in projected land use(s) at the Site?

   PCS is not aware of any changes in the projected land use at the Site.

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   During the 2017 Five-Year Review (FYR), an interview with a shop owner was provided and the person did not understand the reasoning for the remedial actions.

   PCS recommends the EPA expand the geographical location of community outreach to include all groundwater contamination areas and to provide the outreach to the community in a manner the everyday person and people of other languages and cultures can understand. Additionally, PCS recommends the community outreach efforts to be expanded to not just property owners

but to tenants and employees in the affected area and include periodic reminders of the Site's existence, its contaminants, and the potential to adversely affect health.

7. Do you have any comments, suggestions or recommendations regarding the project?

During winter storm Uri remedial equipment was damaged and was not functional for several months.

PCS recommends the EPA require the weatherizing of exposed equipment of the Soil Vapor Extraction (SVE) system to withstand extreme weather conditions.

The impacted zones and treatments at the Site include:

Zone 1 - Shallow soil, with ongoing SVE treatment
Zone 2 - Shallow water-bearing zone, with treatment completed
Zone 3 - Deep unsaturated zone, with ongoing SVE treatment
Zone 4 - Deep water-bearing zone, with future groundwater remedy yet to be determined

According to the Addendum to the First Five Year Review 2021 (Addendum), February 2020 sampling of water wells in Zone 4, outside of the water service line area, showed concentrations of Contaminants of Concern (COCs) greater than the Maximum Contaminant Level (MCL). Sampling also confirmed COCs at concentrations above the MCL in Zone 2, southwest and west of the original dry-cleaning facility.

PCS recommends treatment in Zone 2 continue due to the 2020 sampling results confirming some of the COC concentrations are greater than the MCLs.

According to the 2017 FYR, data gaps indicate the Record of Decision (ROD) may not address the contamination. Sampling is performed once or twice a year and doesn't accurately reflect the concentration of COCs. As an example, a private well sampled for Perchloroethylene (PCE) in June 2019 resulted in a concentration of 5.4 µg/l however in February 2020, the result was 7.1 µg/l which is an increase, and both results were above the drinking water limit of 5.0 µg/l.

PCS recommends sampling be performed more often and at regularly scheduled intervals.

PCS recommends groundwater contamination maps be updated to reflect the plumes current boundary. PCS also recommends maps to be updated regularly upon completion of sampling events and to make the maps available on the website.

The 2017 FYR included a map noting the properties with private water wells and properties connected to the public water supply (PWS). Within the map, approximately 40% of properties in the defined area were listed as unknown as to whether they were connected to a PWS or to a private well.

PCS is concerned private water well users may not fully understand the potential threat to human health and the environment from the groundwater contamination.

Per the 2017 FYR, a survey should be performed to identify all properties utilizing water wells, sample the wells, and based on the results, take appropriate measures to prevent human exposure to COC. Per the Addendum, a survey was conducted in 2018 to verify private wells, determine their use, and request access to the wells for sampling.

PCS recommends that surveys be conducted regularly and updates be provided on the EPA's website.

Based on the 2017 FYR, Institutional Controls (IC) are in place with the Harris County Subsidence District and Texas Department of Licensing and Regulations (TDLR) to restrict wells drilled in the area and for no new wells to be drilled however deed restriction covenants are not in place. According to the Addendum, the TCEQ has agreed to enforce the restrictive covenants and deed restrictions.

PCS recommends effective ICs be implemented to restrict the installation of water wells in the area and to make landowners aware and reminded of the Site and its contaminants at regularly scheduled intervals.

Property owners were informed of COC concentrations greater than the MCLs and were instructed not to use the well water for drinking purposes. The community was also provided an opportunity to connect to a PWS.

PCS recommends the PWS connection option be revisited and made available to those interested in connecting to the PWS.

An inspection conducted for the 2017 FYR noted several issues around the commercial shopping area, such as:

- **Concrete around wells being broken**
- **Standing water accumulating around wellheads**
- **Damage to some monitoring wells (MWs)**
- **MWs not being secure with caps, and**
- **No signage indicating a Superfund site.**

PCS recommends an increase in inspection frequency to ensure the above-mentioned issues, plus any others are addressed in a timely manner.

A vapor mitigation system (VMS) was installed at 3 locations at a shopping center overlying the Site.

PCS recommends the EPA require sampling for vapor phase contaminants in all remaining units in the shopping area and require the installation of VMS if concentrations are unsafe and include the VMS as part of the above-mentioned inspections.

PCS requests to be notified if any changes are made to the projected land uses at and around the Site.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which become a public document (please initial)
    a. Your name? Yes __X___ No _____
    b. Your affiliation? Yes __X__ No_____
    c. Your responses? Yes _X____ No _____

JONES ROAD GROUNDWATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM					
Site Name: Jones Road Groundwater Plume					
EPA ID: TXN000605460					
Interviewer name:		**Interviewer affiliation:**			
Subject name: Diane Britt		**Subject affiliation:** TCEQ			
Subject contact information: diane.britt@tceq.texas.gov					
Interview date: 5/12/2022		**Interview time:** N/A			
Interview location: received form in e-mail					
Interview format (circle one): In Person	Phone	Mail	X Email	Other:	
Interview category: State Agency					

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? *Remedial activities are being conducted per EPA's Optimization Report Recommendations and in accordance with the 2017 Record of Decision (ROD) Amendment #1 (2017 ROD Amendment). The remedial action is targeting the source area contamination, while monitoring the groundwater plume. More work needs to be done to fully delineate the groundwater contamination plume and ensure the remedy's protectiveness.*

2. What is your assessment of the current performance of the remedy in place at the Site? *Remedial Action (RA) activities are in-progress and include recovering volatile organic vapors (VOCs) from two subsurface zones (shallow zone and deep zone) using a Soil Vapor Extraction (SVE) system. Overall, the system is working with routine and non-routine maintenance. The shallow SVE system requires non-routine maintenance to clean-out sediment build-up in the tubing. SVE wells with impacted tubing are temporarily taken off-line until the lines are cleared and therefore the system is not operating at 100 percent capacity. From the perspective of needing to conduct non-routine maintenance due to system clogging and partial system shutdown; the system does not appear to be working at optimal capacity and a cost benefit analysis may be needed to determine if contaminant mass reduction can be achieved by supplementing the system with other methods. Additionally, to more effectively prevent human exposure to contaminated groundwater, additional institutional controls that are enforceable by the TCEQ need to be filed with the County.*

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years? *Refer to question 4 below.*

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities. *The TCEQ receives occasional telephone inquiries regarding site status, real estate/property ownership, or the water supplier (i.e., White Oak Bend Municipal Utility District [MUD]) and has received at*

least two Public Information Requests (PIRs) over the past several years. Based on the scope of the inquiry, the call may be referred to the EPA and/or the EPA website.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy? *No.*

   Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues? *No, additional work is needed to ensure that proper institutional controls that are enforceable by the TCEQ are in place because the ordinances and drilling restrictions may not be effective. The ordinances that are currently in place regarding the installation and use of water wells in the site area are not obvious to property owners. Also, water well drillers may be unaware of the drilling restrictions. Considering this, the TCEQ suggests that copies of the Harris County ordinance be mailed to all persons and entities within the impacted area. It should also be requested that the TDLR re-submit the drilling restriction notice to all their licensed water well drillers.*

   Lastly, in the absence of zoning, an institutional control that is enforceable under TRRP is needed for the source property at 11600 Jones Road. The institutional control should prohibit any use of groundwater, any activities that create an exposure pathway to the contaminated soil, and land use on the property should be restricted to commercial use only (no residential land use).

6. Are you aware of any changes in projected land use(s) at the Site? *I am not aware of any changes in projected land use; however, Harris County has no zoning, and the area is mixed commercial, residential, and light industrial. The concern is there may be additional potential source areas within the impacted groundwater plume that could have potentially contributed to the contamination or have the potential to contribute based on the well status at their property. TCEQ suggests this be re-evaluated to determine all land use within the area and the well status.*

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? *The TCEQ agrees with the EPA that there are remaining private wells potentially with access to groundwater with site-related contaminants at concentrations exceeding the Remedial Goals for drinking water and as such, a protectiveness determination cannot be made at this time. Until the groundwater exposure pathway is eliminated, the TCEQ recommends that a more aggressive approach to informing the public of the risks and the ICs that are currently in-place, be undertaken.*

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which become a public document (please initial)
   a. Your name? Yes *DB* No_____
   b. Your affiliation? Yes *DB* No_____
   c. Your responses? Yes *DB* No _____

JONES ROAD GROUNDWATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Jones Road Groundwater Plume	
EPA ID: TXN000605460	
Interviewer name:	**Interviewer affiliation:**
Subject name: John Armon as person interviewed	**Subject affiliation: resident**
Subject contact information:	
Interview date: 5/27/2022	**Interview time: 3 pm**
Interview location: home/residence	
Interview format (circle one): In Person Phone Mail Email Other:	
Interview category: Resident	

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? Yes

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)? Good, but that last chemical's increase again is perplexing.

3. What have been the effects of this Site on the surrounding community, if any? Cannot say.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing? Doubt it, don't know.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? News has come occasionally from the EPA, but I don't recall news of ongoing activity. That is probably due to my age and the mass of mail/info these days.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used? Garden watering only.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project? Perhaps considering a few of the most likely reasons (?) for the increase in the PCE, mapping it if its distribution is irregular …. and letting us know. *(You can tell I had Geography in my early years)*

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which become a public document (please initial)
    a. Your name? Yes_____ No_____
    b. Your affiliation? Yes ____ No elderly private owner_____
    c. Your responses? Yes _____ No _____

APPENDIX L – ENVIRONMENTAL JUSTICE SCREENING

United States Environmental Protection Agency

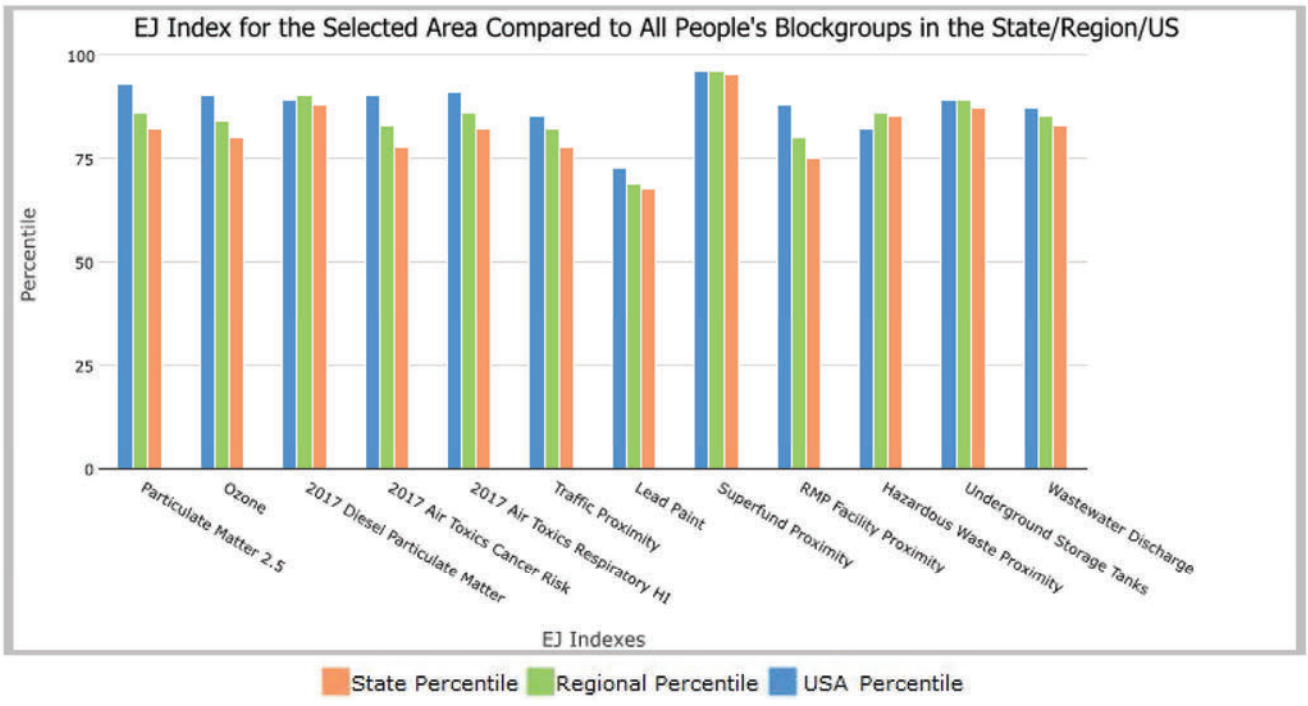
EJScreen Report (Version 2.0)

1 mile Ring Centered at 29.941857,-95.583962, TEXAS, EPA Region 6

Approximate Population: 11,848

Input Area (sq. miles): 3.14

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	82	86	93
EJ Index for Ozone	80	84	90
EJ Index for 2017 Diesel Particulate Matter*	88	90	89
EJ Index for 2017 Air Toxics Cancer Risk*	78	83	90
EJ Index for 2017 Air Toxics Respiratory HI*	82	86	91
EJ Index for Traffic Proximity	78	82	85
EJ Index for Lead Paint	68	69	73
EJ Index for Superfund Proximity	95	96	96
EJ Index for RMP Facility Proximity	75	80	88
EJ Index for Hazardous Waste Proximity	85	86	82
EJ Index for Underground Storage Tanks	87	89	89
EJ Index for Wastewater Discharge	83	85	87



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

May 10, 2022

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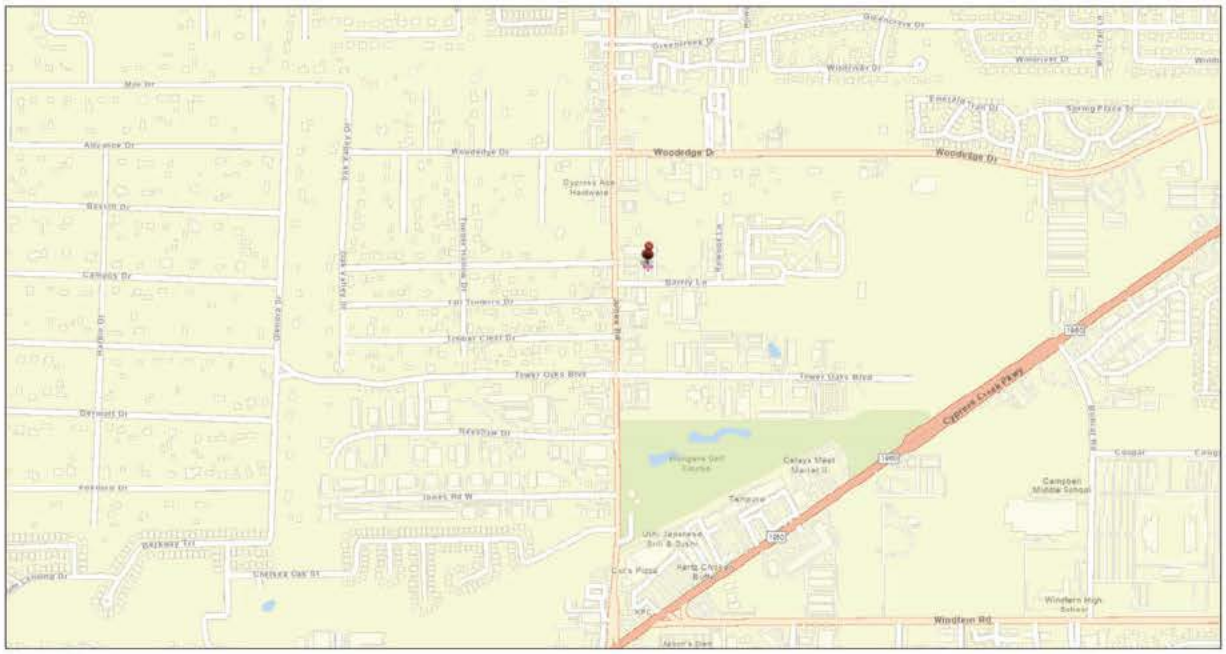
EJScreen Report (Version 2.0)

1 mile Ring Centered at 29.941857,-95.583962, TEXAS, EPA Region 6

Approximate Population: 11,848

Input Area (sq. miles): 3.14



Sites reporting to EPA	
Superfund NPL	1
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJScreen Report (Version 2.0)

1 mile Ring Centered at 29.941857,-95.583962, TEXAS, EPA Region 6

Approximate Population: 11,848

Input Area (sq. miles): 3.14

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	10.4	9.57	89	9.32	91	8.74	88
Ozone (ppb)	38.1	40	33	41.1	30	42.6	22
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.314	0.214	85	0.219	80-90th	0.295	60-70th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	83	32	70-80th	29	80-90th
2017 Air Toxics Respiratory HI*	0.4	0.36	95	0.37	80-90th	0.36	80-90th
Traffic Proximity (daily traffic count/distance to road)	280	510	57	470	61	710	55
Lead Paint (% Pre-1960 Housing)	0.033	0.15	46	0.16	39	0.28	23
Superfund Proximity (site count/km distance)	0.26	0.084	94	0.08	95	0.13	89
RMP Facility Proximity (facility count/km distance)	0.67	0.92	59	0.83	63	0.75	66
Hazardous Waste Proximity (facility count/km distance)	0.73	0.72	71	0.8	67	2.2	50
Underground Storage Tanks (count/km^2)	3.5	2.2	77	2	80	3.9	70
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0073	0.33	71	0.5	71	12	66
Socioeconomic Indicators							
Demographic Index	54%	46%	62	44%	66	36%	77
People of Color	69%	58%	59	52%	66	40%	77
Low Income	40%	34%	62	36%	59	31%	68
Unemployment Rate	8%	5%	80	5%	78	5%	77
Linguistically Isolated	11%	8%	75	6%	81	5%	85
Less Than High School Education	16%	16%	58	15%	60	12%	71
Under Age 5	5%	7%	34	7%	36	6%	45
Over Age 64	12%	12%	55	13%	47	16%	36

*Diesel particular matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

For additional information, see: www.epa.gov/environmentaljustice