U.S. ENVIRONMENTAL PROTECTION AGENCY

PROPOSED PLAN

Arkla Terra Property Superfund Site

Thonotosassa, Hillsborough County, Florida **June 2018**

A. Introduction

The U.S. Environmental Protection Agency (EPA) invites comments on the **Proposed Plan**[1] (Plan) for the Arkla Terra Property (ATP) **Superfund** Site, located in Thonotosassa, Hillsborough County, Florida (Figure 1 & 2). EPA, the lead agency for the Site in consultation with the Florida Department of Environmental Protection (FDEP), the supporting agency, developed this Plan. A glossary defining key terms is provided in Appendix A at the end of this document; the key terms appear in bold the first time they are presented.

***Purpose of the Proposed Plan*:** This Proposed Plan presents all options evaluated and the Preferred Alternative to address **Groundwater** and **Soil Gas** contamination at the Site and provides a rationale for the preference.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA)** and Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP).** NCP Section 300.430(f)(2) states that "*The purpose of the proposed plan is to supplement the RI/FS and provide the public with a reasonable opportunity to comment on the preferred alternative for remedial action, as well as alternative plans under consideration, and to participate in the selection of remedial action at a site.*"

A summary of findings from major Site activities, such as the **Performance Assessment of the Non-Time Critical Removal Action**, **Remedial Investigation** (RI), the Human Health and Ecological **Baseline Risk Assessment** (BRA), and the **Feasibility Study** (FS) is contained in the **Administrative Record** file for the Site. EPA and the FDEP encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund

PUBLIC COMMENT PERIOD

June 22 – July 23, 2018

Public Meeting

Seffner-Mango Branch Library
410 N Kingsway Road
Seffner, FL 33584
June 27, 2018
6:00 pm to 8:00 pm

As part of public involvement during the public comment period, the community is invited to a public meeting. EPA will present its understanding of the site, describe its reasoning for the Preferred Alternative presented in this Proposed Plan, and answer questions from the community. Oral and written comments also will be accepted at the public meeting.

For Additional Information:

Arkla Terra Site Information Repository

Thonotosassa Branch Library
Thonotosassa, FL
Phone: 813-273-3652
Hours: Mon - Sat 10am – 6pm;
Sunday Closed

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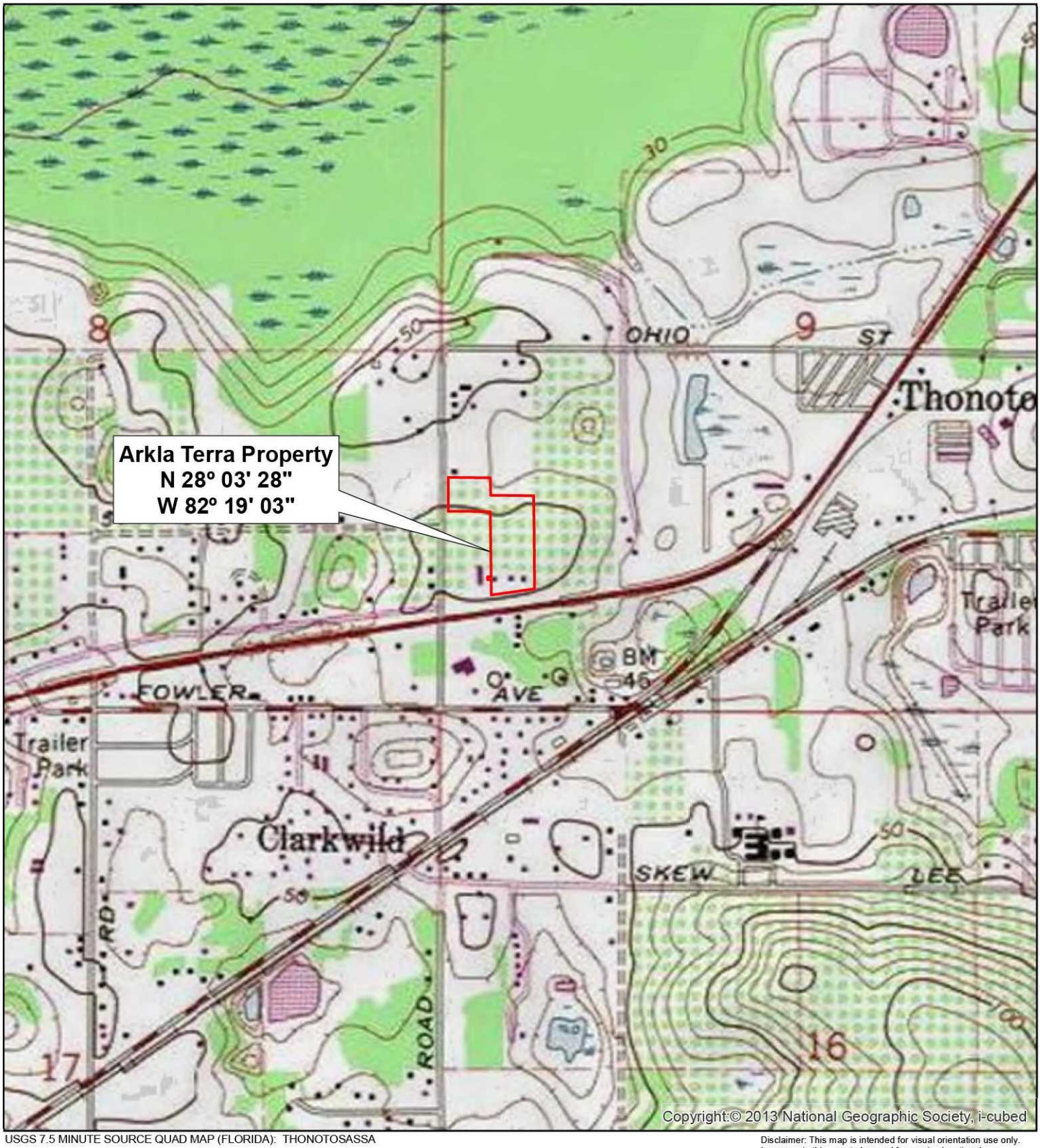
1 Terms first appearing in bold are defined in a glossary at the end of this document.



USGS 7.5 MINUTE SOURCE QUAD MAP (FLORIDA): THONOTOSASSA

Disclaimer: This map is intended for visual orientation use only. In no way is this map to be used for precise locational use.

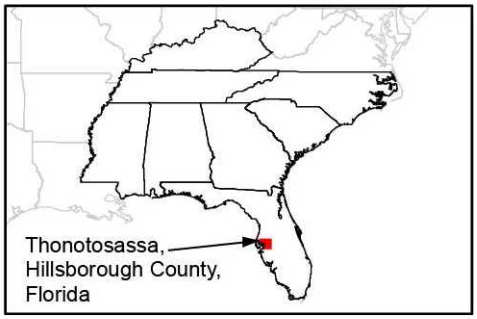
G:\GIS_Workspace\Arkla Terra\Data July 2017\RI-FS\Section 1\Figure 1-1 - Site Location Map.mxd

Legend

Arkla Terra Property

N

0 1,000 2,000 Feet



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PROPOSED PLAN
ARKLA TERRA SITE
THONOTOSASSA, FLORIDA

FIGURE 1
SITE LOCATION MAP

activities that have been conducted. The EPA, in consultation with FDEP, will select the final remedy for the Site after receiving and considering all information submitted during the **public comment period**. EPA, in consultation with FDEP, may modify the Preferred Alternative or select another alternative presented in this Proposed Plan, based on new information or public comments.

Therefore, the public is encouraged to review and comment on all alternatives presented in this Proposed Plan. A complete set of documents related to FDEP Site activities is available at the Arkla Terra Property Site **Information Repository** at the Thonotosassa Public Library in Thonotosassa, FL. Please refer to the text box entitled, "Public Comment Period" for additional details on community participation.

B. Site Background

Several businesses formerly conducted tank farming and refurbishing operations on the property. The Site property is located in a mixed residential/commercial area and covers an approximate area of 7.1 acres. Due to past operations and disposal practices conducted on the Site, there is volatile organic compound (VOC) contamination in onsite soil, soil gas, and groundwater, and in offsite groundwater extending up to approximately one mile. Trichloroethylene (TCE) and perchloroethylene (PCE), also known as tetrachloroethylene, are the primary contaminants in groundwater, soil gas, and soil.

Operational History: The Southeast Oil and Development Corporation (SODC) conducted its business on the Site prior to Arkla Terra Property business operations. SODC purchased the Site property in 1980 and operated a tank farm for storage and distribution of petroleum hydrocarbon products and for refurbishing underground storage tanks (USTs). Entrepreneur Property, owned by SODC, was conducting UST refurbishing operations at a location near the Site. In mid-1980, Entrepreneur Property moved its operations to the SODC property. Arkla Terra, Inc. purchased the business from SODC in 1993 and continued the tank farm and refurbishing operations until 2006.

Regulatory History: The Hillsborough County Health Department (HCHD) and FDEP conducted multiple soil and groundwater investigations beginning in 1989, based on local resident complaints of gasoline odor in their drinking water. Their investigations have identified the Site property as the source for PCE and TCE contamination in soil and groundwater.

EPA initiated a Site Investigation (SI), Expanded SI, and an Integrated Site Investigation (ISI) in 2005, which included hazard ranking system (HRS) scoring. Based on Site history and operations, FDEP's investigations, and HRS score, the Site was listed on the **National Priorities List (NPL)** on May 11, 2009 as an EPA fund-lead Site.

C. Site Characteristics

Topography: The Site is relatively flat and situated about 50 feet (ft.) above mean sea level (amsl). Several commercial buildings and industrial facilities are located on the southwest, northwest, and eastern portions of the Site. A paved parking lot occupies much of the northern half of the Site. At least one sinkhole is located on the Site and five sinkholes exist in close proximity to the Site.

Geology/Hydrogeology: Onsite soils consist of unconsolidated interbedded layers of silt, clay, and silty to clayey sands. This layer of soil extends from the surface to approximately 50-55 feet below ground surface (bgs). Following the soils is the Arcadia Formation limestone, located 50-55 feet bgs and extending down to 135 feet bgs. The limestone is interbedded with calcareous sands and clay and is fractured and weathered near the top of the limestone (50-55 feet bgs). At some locations, a clay layer sits on the top of the limestone. Offsite soils are similar to onsite soils and generally extend from the ground surface to 45 feet bgs and up to 75 feet bgs at some locations. Limestone offsite is similar to the onsite limestone with interbedded sandy calcareous clay and extends to approximately 200 feet bgs.

The onsite groundwater-producing zone (**aquifer**) is located approximately 20-35 ft bgs, and is referred to as the "Surficial Aquifer." Beneath the Surficial Aquifer within the limestone formation is the "Floridan Aquifer." The Site sources have also contaminated the Floridan Aquifer at the Site. The Floridan Aquifer was divided into three depths for delineating onsite contamination: Intermediate zone

(I): 56-100 ft bgs; Deeper zone (D): 100-130 ft bgs; and, Floridan zone (F): 140-200 ft bgs. The groundwater flow direction within the Floridan Aquifer at the Site moves in the south/southwest direction. Residents near the Site use well water drawn from the Surficial Aquifer and Floridan Aquifer.

Nature and Extent of Contamination: RI/FS investigations were conducted in the onsite Area and offsite area. These investigations included the installation, sampling, and analysis of soil boring samples; soil gas samples; Membrane Interface Probe (MIP) samples; installation and sampling of groundwater from permanent and temporary monitoring wells; and, sampling of groundwater from multiple residential wells. Soil borings were installed as deep as 56 feet bgs and soil samples from various depth intervals were collected and analyzed. Analytical results of soil and groundwater samples identified PCE and TCE contamination.

Onsite Area: The onsite area represents the primary PCE source area (sinkhole), PCE-contaminated groundwater, soil, and soil gas (Figure 2). RI/FS investigations have determined that the Site sources have contaminated both the Surficial and Floridan Aquifers with PCE and TCE in the 50 to 100 feet depth zone and that the contamination was migrating offsite. Prior to treatment, the PCE plume extended downgradient (southwest) beyond the Site property. The onsite area also includes low level PCE soil contamination at depths below 32 feet. The high PCE and TCE concentrations in groundwater at the source area has contributed to soil gas PCE and TCE contamination Onsite.

Offsite Area: The offsite area is the contaminated plume that has since migrated from the onsite area. Prior to treatment, the offsite PCE plume included lower concentrations of PCE and TCE that extended to approximately 5,000 feet downgradient of the Site with an average width of 1,700 feet. Offsite groundwater contamination extends downgradient of the Site in the southwesterly direction.

EPA mailed out fact sheets and access agreement letters to the community in late 2010 explaining Site conditions and seeking permission to sample their residential wells. Following receipt of signed access agreements, EPA sampled residential wells and advised residents who were above the Federal PCE and TCE Safe Drinking Water Act Maximum Contaminant Levels (MCLs), not to drink their well water. EPA continues to collect groundwater samples quarterly from monitoring wells and select residential wells and evaluate PCE and TCE contamination, its daughter products, and natural attenuation parameters.

Hillsborough County, under a grant from FDEP, has been hooking up willing residents to a municipal water line and supplying clean potable water.

EPA initiated an **Engineering Evaluation/Cost Analysis (EE/CA)** in support of a **Non-Time Critical Removal Action (NTCRA)** while continuing with the RI/FS activities. The EE/CA investigations included sampling of onsite monitoring wells and residential wells within a 1¼-mile radius of the Site. Site investigations included installation of soil borings to various depths and collecting multiple interval samples. Karst features, and at least one sinkhole, was identified on the Site through geological investigations. Sub-slab and indoor air samples were collected from onsite businesses. PCE was detected in sub-slab samples but not in indoor air samples.

The EE/CA identified various alternatives and evaluated their effectiveness, implementability, and cost in satisfying removal action objectives. The objective of the removal action was to minimize or reduce the contaminant source contributing to offsite migration of contaminated groundwater. The EE/CA treatment Removal Action Goal for PCE was 30 - 100 micrograms per kilogram (µg/kg) in soil, based on leaching to groundwater.

EPA issued an Action Memorandum in March 2011 and implemented the NTCRA between August 2012 and January 2013, to treat onsite soil contamination. The selected **response action** was a multi-phase extraction (MPE) system working in conjunction with the Electro-Thermal Dynamic Stripping (ET-DSP™) electrical resistivity heating (ERH) technology. The ERH treatment targeted a source area measuring approximately 2,025 square feet and resulted in a contaminant mass removal of approximately 1,500 pounds of VOCs from both the vapor-phase and groundwater recovery systems.

AERIAL: BING MAPS

Disclaimer: This map is intended for visual orientation use only. In no way is this map to be used for precise locational use.

G:\GIS_Workspace\Arkla Terra\Data July 2017\RI-FS\Section 1\Figure 1-2 - Site Boundary Map with Source Area.mxd

Legend

- Arkla Terra Property Parcel
- Source Area

N

0 150 300 Feet

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ARKLA TERRA SITE
THONOTOSASSA, FLORIDA

FIGURE 2
SITE BOUNDARY WITH SOURCE AREA

Soil samples collected from various depths after the ERH treatment had indicated a removal of 94% to 99% of PCE mass in the treated source area, resulting in an average of 13 µg/kg. One boring location below 38 ft had PCE concentrations between 710 µg/kg and 1,400 µg/kg. The soil objective was met in all but two soil-boring locations at depths between 32 and 52 feet bgs. Treatment also showed a decline in PCE concentrations in all wells in the Floridan Aquifer, except for EPA-5I and MW-1, with maximum concentration of 2,100 µg/L observed in monitoring well MW-1. These results and groundwater results indicated some remaining residual contamination in Site soils and groundwater.

After treatment, the groundwater plume (Figure 3) extent decreased to approximately 4,700 feet hydraulically down gradient of the Site boundary, with an average width of 1,700 feet. PCE contamination resided primarily in the intermediate depths (56-100 feet bgs) of the aquifer. The highest remaining PCE concentration in the onsite portion of the plume extends from the former source area to approximately 320 feet hydraulically down-gradient (southwest) to the Site boundary. The width of this plume segment is approximately 350 feet. The plume extends down gradient of the Site with elevated PCE concentrations occurring primarily near monitoring well EPA-7.

PCE and TCE concentrations above the Federal Vapor Intrusion Screening Levels (VISL) criteria was identified in onsite soil gas samples collected in 2017. VOC samples from sub-slab and indoor air were collected from onsite businesses. PCE was detected in sub-slab samples and in one indoor air sample but were below the VISL criteria for sub slab and indoor air. Analytical results indicated incomplete pathways for vapor intrusion for the onsite buildings.

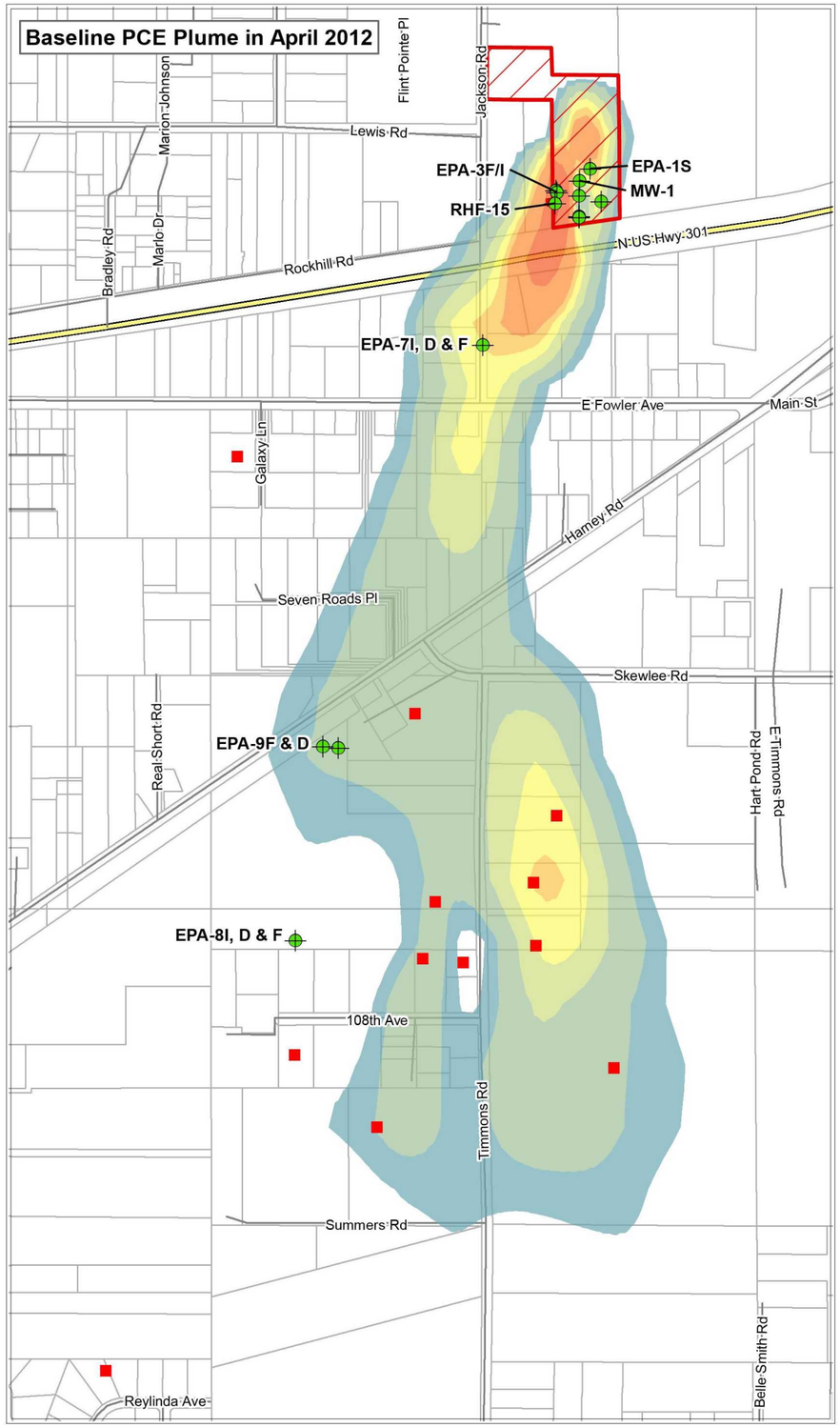
Monitored Natural Attenuation

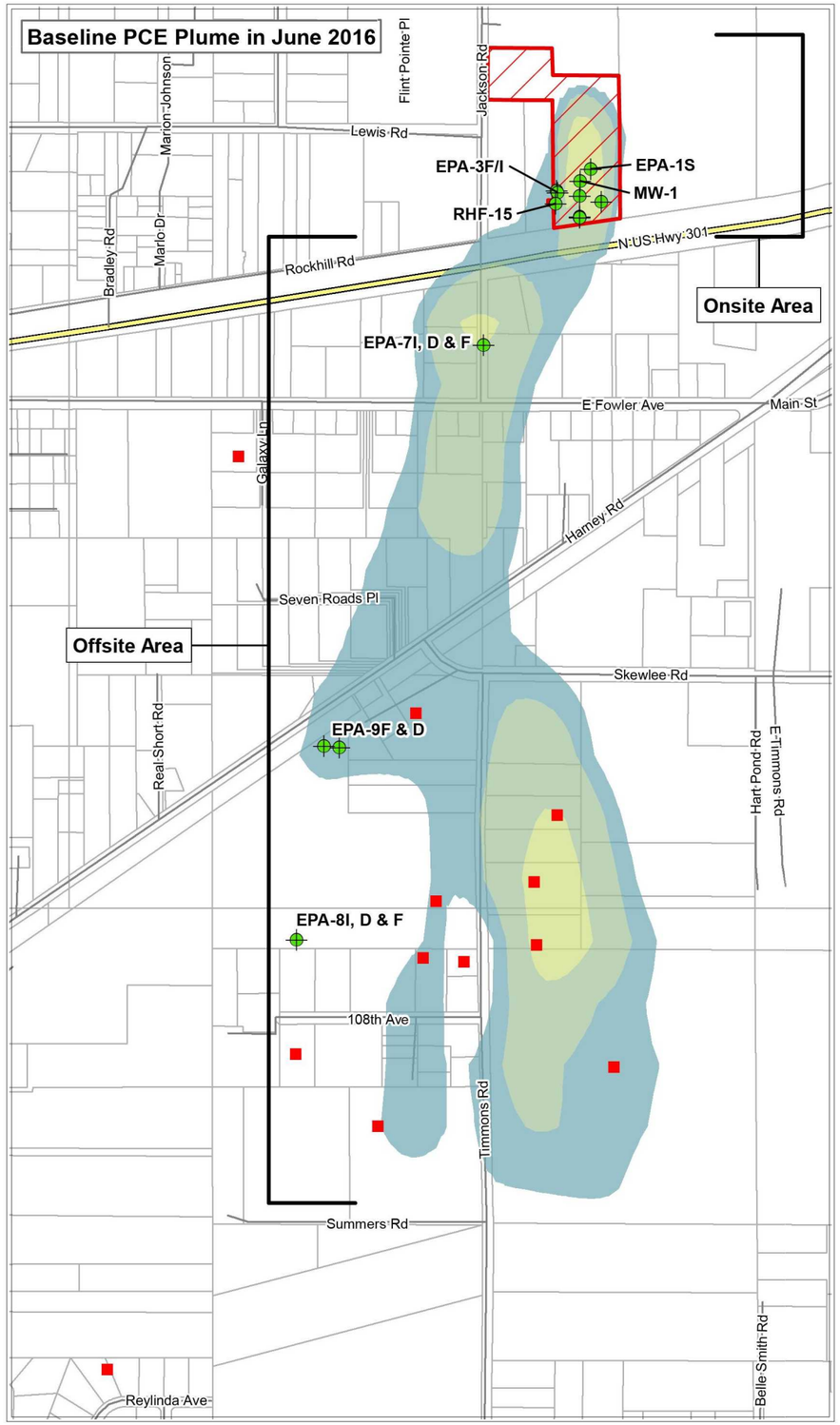
Natural attenuation is a natural process that decrease or attenuate soil and groundwater contaminant concentrations. Samples collected from monitoring and residential wells were analyzed and monitored for natural attenuation parameters. The Monitored Natural Attenuation (MNA) parameters included degradation products of PCE, namely, TCE, cis-1,2-dichloroethlyene (cis-1,2-DCE), ethane, and vinyl chloride (VC), as well as natural attenuation parameters (e.g., pH, temperature, oxygen reduction potential, dissolved oxygen, specific conductance, sulfide, sulfate as SO_4, chloride, un-ionized hydrogen, alkalinity, etc). TCE was detected at higher concentrations in offsite groundwater relative to concentrations detected in onsite groundwater. This is indicative of possible biodegradation of PCE to TCE in offsite areas of the plume. Biodegradation occurs when very small organisms, known as microbes, naturally occurring in soils and groundwater, eat contaminants and change them in to breakdown products. The EPA devised a screening method based on MNA parameters to assess a site for the likelihood that bioattenuation is a viable remedial alternative. This screening method involves evaluating several lines of evidence and assigning a score based on a 30-point scoring system. These lines of evidence of MNA for the Site include the occurrence of PCE breakdown products, namely, TCE, 1,2-DCE; occurrence of chloride ion at twice the background concentrations; occurrence of nitrate and sulfate ions and dissolved oxygen. The Site MNA has a rank of 16 and indicates that there is adequate evidence of anaerobic biodegradation of VOCs at the Site.

A site-wide groundwater analyses was performed, which included discussion on plume attenuation and concentration versus time plots. Based on these plots, the approximate number of years required for the groundwater PCE concentration to reach the State MCL of 3 µg/L by natural attenuation in the offsite area is approximately 13 years. The approximate number of years required for the groundwater PCE concentration to reach the State MCL of 3 µg/L by natural attenuation on the Arkla Terra property will take slightly longer and is estimated to be 17 years.

D. Scope and Role of Response Action

This Proposed Plan presents a final site-wide remedy and offsite remedy to address risks due to





Legend

- Monitor Well Location
- Residential Well Location
- Schematic Profile
- Arkla Terra Property
- Parcel Boundary

PCE Plume (µg/L)

<3 | 3-5 | 5-10 | 10-15 | 15-20 | 20-25 | 25-50 | 50-100 | >100

Note:
This figure was produced by SERAS and originally presented in the report, "Performance Assessment of the Non-Time Critical Removal Action at the Arkla Terra Site, Thonotosassa, Florida."

N

0 750 1,500

Scale in Feet

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FIGURE 3
ONSITE AND OFFSITE AREA WITH PCE PLUME IN APRIL 2012 (BEFORE TREATMENT) AND JUNE 2016 (AFTER TREATMENT)

G:\GIS_Workspace\Arkla Terra\May 2018\Figure 3.mxd

contaminated groundwater. The PCE and TCE contaminated media includes onsite and offsite groundwater and onsite soil gas. Onsite contaminated soil and potential source areas were addressed during the 2012-2013 NTCRA performed by EPA. This removal action removed VOC contamination in general up to 52 feet bgs, except at two soil-boring locations varying in depths between 32 and 52 feet bgs.

The focus of the remedial alternatives presented in this Proposed Plan is to address contaminated groundwater and soil gas. The Preferred Alternative in this plan address these risks to human health and the environment.

E. Summary of Site Risks

The baseline risk assessment estimates what risks the site poses if no **remedial actions** were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that must be addressed during development of remedial alternatives. EPA conducted a **Human Health Risk Assessment (HHRA)** and an **Ecological Risk Assessment (ERA)** as part of the RI. Details of the risk assessment are presented in Appendix B of the RI/FS Report. The findings of the risk assessment are summarized below.

Human Health Risk Assessment

The HHRA evaluated the potential health risks associated with exposure to **contaminant of concern (COC)** identified in groundwater and soil gas. Site contamination was compared to the applicable risk-based screening levels and **Applicable or Relevant and Appropriate Requirements (ARARs)**. The benchmark risk levels used for comparison were EPA's target cancer risk of $1x10^{-4}$ (one in 10,000) and a non-cancer hazard index (HI) of 1.0. A cumulative incremental cancer risk [ICR] greater than $1x10^{-4}$ generally indicates that some degree of remediation is required, and a cancer risk below $1x10^{-6}$ (one in 1,000,000) normally will not result in remedial efforts. EPA considers a non-cancer HI of 1.0 as health protective for a lifetime exposure and therefore not an exposure of concern.

The HHRA evaluated the current and potential future exposure of receptors to onsite soil and groundwater and offsite groundwater. In accordance with the EPA Groundwater Exposure Point Concentration (EPC) Guidance, residential well data are not included with monitoring well data for evaluating a reasonable maximum exposure condition. Therefore, the use of monitoring well data in developing the offsite groundwater EPC is highly conservative, as it represents a hypothetical offsite current receptor in a worst-case exposure scenario.

Exposure routes evaluated in the HHRA consisted of ingestion, dermal contact, and inhalation. The calculated reasonable maximum exposure (RME) non-cancer HI estimated for the future hypothetical onsite child and adult resident exceeded the target value of one. The non-cancer HI estimated for the hypothetical future industrial worker was two, which also exceeded the target value of one. Cancer risks estimated for the onsite receptors were within the EPA target risk range of 1E-06 to 1E- 04. PCE in groundwater and soil gas was identified as the primary risk driver for hypothetical onsite receptors. Screening of the indoor air and sub slab gas data against concentrations protective of the vapor intrusion pathway identified no potential threats to current receptors residing or working in the two buildings sampled onsite. By using the EPA VISL calculator, PCE and TCE in soil gas were identified as a potential threat to future hypothetical receptors that may reside in buildings that may be newly constructed onsite. This potential threat may arise because of soil disturbances that occur due to building construction.

Non-cancer risks for the hypothetical offsite child and adult resident exposed to groundwater exceeded the target value of one. TCE was identified as the primary risk driver in offsite groundwater, with exposure occurring from drinking, dermal contact, and vapors. Cancer risks estimated for the hypothetical offsite receptors were within the EPA target risk range of 1E-06 to 1E- 04.

Table 1 and Table 2 provide a summary of cancer risks and non-cancer hazards that warrant a response under CERCLA. These are based on current (Table 1) and future (Table 2) land use scenarios. Bolded text indicates a cancer risk > 10^{-4} and/or a total HI >1.0. The COCs identified in soil gas and groundwater are also listed in the Tables.

The contaminated soil gas is present on the ATP property itself while groundwater contamination is present on the property as well as in the residential area to the south, southwest.

Ecological Risk Assessment

The objective of the ERA is to determine the potential effects to the environment from the Site contamination. A Screening Level Ecological Risk Assessment (SLERA) evaluated potential risks to terrestrial receptors from exposure to Site soil. EPA also evaluated both direct exposure and indirect exposure via the food web. The SLERA indicated that the chemicals detected in Site soil do not pose a threat to ecological receptors. The information presented in the SLERA was sufficient to determine that no further data was required to assess ecological risks.

It is EPA's current judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures presented in this Proposed Plan, is necessary to protect public health, or welfare, or the environment, from actual or threatened releases of hazardous substances.

Table 1: Summary of Reasonable Maximum Exposure Risks and Hazards – Current Land Use

Location	Receptor	Cancer Risk	Non-Cancer Hazard Index	Contaminant of Concern	
				Soil Gas	Groundwater
Onsite	Industrial Worker	5E-06	0.02	--	--
	Trespasser/Visitor	2E-06	0.01	--	--
Offsite	Child Resident	NA	**5**	--	TCE
	Adult Resident	NA	**3**	--	TCE
	Age-Adjusted Resident	3E-05	NA	--	--

Table 2: Summary of Reasonable Maximum Exposure Risks and Hazards – Hypothetical Future Land Use

Location	Receptor	Cancer Risk	Non-Cancer Hazard Index	Contaminant of Concern	
				Soil Gas	Groundwater
Onsite	Industrial Worker	2E-05	**2**	PCE	PCE
	Trespasser/Visitor	2E-06	0.01	--	--
	Construction Worker	6E-07	0.1	--	--
	Child Resident	NA	**17**	PCE and TCE	PCE
	Adult Resident	NA	**10**	PCE and TCE	PCE
	Age-Adjusted Resident	1E-04	NA	--	--
Offsite	Child Resident	NA	**5**	--	TCE
	Adult Resident	NA	**3**	--	TCE
	Age-Adjusted Resident	3E-05	NA	--	--

Note:

Cancer risk for the resident was calculated for the age-adjusted resident. Non-cancer risk was calculated for the child resident and adult resident.

PCE – perchloroethylene or tetrachloroethene

TCE – trichloroethylene

-- – No contaminant of concern identified

NA – Not applicable

F. Remedial Action Objectives

Remedial Action Objectives (RAOs) describe what a proposed Site **cleanup** is expected to accomplish. The Site has the following RAOs:

1. Prevent human (workers, adult / child resident) exposure to Site-related contaminated groundwater at concentrations above levels that are protective.
2. Prevent human (worker, adult / child resident) exposure to soil gas vapors associated with groundwater contamination at concentrations above levels that are protective.
3. Restoration of the aquifer to its beneficial use as a source of drinking water

Preliminary Remediation Goals (PRGs) are concentrations set for individual COCs in distinct media that must be met in order for the remedy to achieve RAOs. The PRGs for the Site were based on specific chemical-based ARARs and risk based levels, if standards did not exist. As presented in Table 3, the PRGs chosen for onsite and offsite groundwater were based on the Florida MCLs, as they are more stringent than the site-specific risk assessment PRGs and Federal MCLs. The chosen PRGs for soil gas were based on an HQ of 1 calculated from the exposure assumptions used in the site risk assessment. Accordingly, the chosen PRGs for TCE and PCE in soil gas were 70 µg/m^3 and 1,410 µg/m^3, respectively. The **Record of Decision (ROD)** will provide the final cleanup levels selected for the Site.

G. Summary of Remedial Alternatives

Based on results from the RI and BRA, the EPA determined that remedial actions would be required for the groundwater on the Site and in the residential areas offsite. An onsite area and an offsite (Residential) area was delineated in the FS to develop and focus the remedial alternative evaluation process. COCs, depth of occurrence, former source for contamination, and/or presence of VOCs define the onsite area. The groundwater contamination plume beyond the onsite area is referred to as the offsite plume. Figure 3 illustrates the two areas.

Table 3: Preliminary Remediation Goals for COCs

Onsite/ Offsite	COC	Units	Medium	Risk Driver?	Florida Criteria	MCL	Site-Specific Remedial Goal Options					
							Cancer Risk			Non-Cancer Risk		
							1.E-06	1.E-05	1.E-04	HQ = 0.1	HQ =1	HQ = 3
Child Resident Receptor												
Offsite	TCE	µg/L	Groundwater	Yes	**3**	5	See footnote 1			0.687	6.87	20.61
Onsite	PCE	µg/L	Groundwater	Yes	**3**	5	See footnote 1			7.3	73	219
Adult Resident Receptor												
Offsite	TCE	µg/L	Groundwater	Yes	**3**	5	See footnote 1			1.11	11.1	33.3
Onsite	PCE	µg/L	Groundwater	Yes	**3**	5	See footnote 1			11.9	119	357
Age-Adjusted Resident Receptor												
Offsite	TCE	µg/L	Groundwater	Yes	**3**	5	0.98	9.8	98	See footnote 1		
Onsite	PCE	µg/L	Groundwater	Yes	**3**	5	22.78	227.8	2,278	See footnote 1		
Vapor Intrusion Resident Assessment												
Onsite	PCE	µg/m^3	Soil Gas	Yes	NA	NA	361	3,610	36,100	141	**1,410**	4,230
Onsite	TCE	µg/m^3	Soil Gas	Yes	NA	NA	16	160	1,600	7	**70**	210

Notes:
NA = Not Available
Site-Specific Remedial Goal Options were based on the Site exposure assumptions used for a child resident, adult resident, and age-adjusted resident.
1 - Cancer risk for the resident was calculated for the age-adjusted resident. Non-cancer risk was calculated for the child resident and adult resident.

Remedial alternatives were developed using various combinations of general response actions and evaluated with respect to their effectiveness in protecting human health and the environment, compliance with ARARs, implementability, cost, and the time required to achieve the RAOs and PRGs[1]. For additional details regarding the remedial alternatives, refer to the final FS report.

One or more remedial alternatives are coupled with land use controls (LUCs) called Institutional Controls (ICs) and Engineering Controls (ECs).

ICs are administrative and legal controls, like deed restrictions specifically set for the Site and that help minimize contamination exposure and protect the integrity of the remedy. ECs are physical controls such as fences, gates, etc., that restrict or prevent exposure to Site contamination.

Because of some remaining onsite soil and groundwater contamination, contaminated vapors could pose threats to onsite future hypothetical occupants. Even though there are no residents currently residing on the Site, and future use of the property is expected to remain non-residential, vapor intrusion mitigation engineering controls addresses mitigation actions for any future occupants based on residential criteria.

ICs - ICs for the Site are land use and zone restrictions to prevent groundwater use and interrupt exposure pathways. Specific ICs and ECs applicable to all onsite remedial alternatives include:

1. Zoning restrictions include Restrictive Covenant to restrict the Site use for non-residential purposes only
2. Restrictive Covenants prohibiting any construction/intrusion activities in the former ERH treatment foot print
3. Restrictive Covenant prohibiting the installation of any new residential or industrial wells on Arkla Terra property. Hillsborough County already has a zone restriction that prohibits the installation of new residential wells in the plume area.
4. Legal Controls – For all future construction on the Arkla Terra property, the EPA will have to be notified to determine the need for vapor intrusion assessment and possible engineering controls. The EPA will re-access site conditions again and evaluate consistency with applicable regulations in making this determination
5. Legal Controls - Require all new intrusive construction activities to follow Occupational Health and Safety Administration (OSHA) requirements for hazardous facilities (proper personal protection equipment, personal monitoring, appropriate management of site soils and groundwater, etc.)
6. Deed Restrictions - Require new buildings/structures on the Arkla Terra property be constructed with engineering controls should they be needed to abate actual or potential vapor exposure to the occupants.
7. Deed Restrictions - Annual indoor air and sub-slab gas assessments of onsite commercial/industrial buildings will be required for evaluating site COCs. If a vapor intrusion threat is found based on PRGs, these buildings will also have to construct appropriate Vapor Abatement Systems.

ECs - ECs include demarcation of the former ERH foot print area, fence installation and maintenance to control Site access, posting hazardous site signs, and posting of trespassing and warning signage to limit use to those compatible with Site conditions.

8. Passive Vapor Abatement System on future construction (buildings) will be required to remove any potential vapor exposure threats to the building occupants. **EC-1 Passive Vapor Intrusion Mitigation by Vapor Barrier System-** A plastic or similar geomembrane sheeting is installed beneath a house or building. The sheeting is usually installed during building construction. In addition to the geomembrane, a venting layer beneath the house is constructed in such a way that the vapors move naturally through the venting layer towards the sides of the building and escape outdoors. The barrier

[1] Final cleanup levels will be selected in the ROD.

systems would prevent VOCs from entering a house or building structures.

This vapor intrusion mitigation EC will require indoor air sampling for COCs based on an annual basis and 5-year reviews would be required until monitoring results indicate no unacceptable VI risk. This EC is anticipated to remain in place until the source(s) are controlled at the Site and any required long-term groundwater alternative has been implemented and achieved its objectives.

9. Active Vapor Abatement System (sub-slab Depressurization System) on all existing buildings will be required if future sampling indicates indoor air contamination above PRGs. **EC 2: Active Vapor Intrusion Mitigation by Sub Slab Depressurization System-** This involves active vapor intrusion mitigation methods through venting of vapors from beneath the house to the outside with a blower or similar air pumps. This engineering control is applicable only to existing commercial and industrial buildings in the event that future indoor air monitoring or sampling indicate a potential vapor exposure risk. For the existing buildings, vapor mitigation can be achieved through building sub slab depressurization system (SSD). The SSD systems would prevent VOCs from entering structures by creating lower pressure beneath the slabs and venting vapors to the atmosphere.

   This vapor intrusion mitigation EC will be coupled with ICs requiring each SSD system to be operated and maintained by building occupants. Ongoing soil vapor and sub-slab vapor monitoring, maintenance of the systems, and 5-year reviews would be required until monitoring results indicate mitigation of unacceptable VI risks. This EC is anticipated to remain in place until the source(s) are controlled at the Site and the selected alternative achieved its objectives.

All ICs and ECs will be included in an Environmental Covenant with user restrictions and will be implemented by Hillsborough County, Florida, in consultation with U.S. EPA Region 4.

Onsite Groundwater (OGW) Remedial Alternatives

OGW Alternative 1: No Action

Estimated Total Cost: $0
Estimated Present-Worth Value: $0
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs/Cleanup Levels: NA
This alternative does not involve any actions to prevent risk exposures posed by Site contaminants. Section 300.430(e)(6) of the NCP directs development of a "No Action Alternative" to establish a baseline scenario for comparing all other remedial alternatives. No funds are expended under the No Action Alternative to control or remediate the contaminated media. The No Action Alternative can typically include compliance **monitoring** only. Funds are required for the statutory Five-Year Reviews (FYRs) of the Site for Site visits, minimal compliance sampling and analyses of select contaminated media, review of regulatory changes, and report preparation. EPA will perform FYRs.

OGW Alternative 2: Monitored Natural Attenuation (MNA) with Institutional Controls (ICs)

Estimated Total Cost: $840,000
Estimated Present-Worth Value: $660,000
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs/Cleanup Levels: 15 years
OGW Alternative #2 involves natural attenuation processes to reduce Site contamination. Under optimal conditions, naturally occurring processes in soil and groundwater would reduce contamination. This naturally occurring process is termed as Natural Attenuation.

Under this alternative, PCE and TCE contaminants would undergo natural degradation to less harmful degradation products. The natural attenuation at the Site relies on dilution, volatilization, biodegradation, and adsorption mechanisms to reduce Site contamination below Site RAO levels in 15 years.

Performance **monitoring** will be required to determine the remedy's effectiveness in meeting pre-set remedial goals. This alternative requires ICs and ECs, as discussed above.

ICs and ECs for the Site are not anticipated to change or alter the fate and transport of COCs.

OGW Alternative 3: Emulsified Zero Valant Iron (EZVI) Remediation plus MNA with ICs

Estimated Total Cost: $1,250,000
Estimated Present-Worth Value: $1,090,000
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs/Cleanup Levels: 13 Years
OGW Alternative #3 consists of subsurface injection of micro- or nano-scale iron particles suspended in a water-in-oil emulsion (vegetable oil emulsion). In addition to iron particles, new microorganisms will be introduced in to the subsurface to assist with biodegradation. EZVI combines food-grade surfactant, biodegradable oil, water, and ZVI particles to form emulsion particles. EZVI is both a chemical treatment process and a biological treatment process. It promotes a chemical reaction between the VOCs and elemental iron and promotes hydrogen production from fermentation of the vegetable oil. The hydrogen is the food source for the microorganisms to biodegrade VOCs into less harmful chemicals. Because of underlying Karst geology and potentially unknown sinkholes, EZVI may require additional time than estimated for alternate completion and achievement of PRGs. This alternative will require periodic injections of EZVI and microorganisms and evaluation of its performance.

This alternative requires ICs and ECs, as discussed above.

OGW Alternative 4: Pump and Treat with *Ex situ* Air Stripping

Estimated Total Cost: $2,100,000
Estimated Present-Worth Value: $1,960,000
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs/Cleanup Levels: 10 years
OGW Alternative #4 consists of pumping groundwater from onsite wells to an aboveground air stripping treatment system that removes contaminants by volatilizing them.

Air stripping involves the mass transfer of volatile contaminants from water to air. This process typically occurs in a packed tower or an aeration tank. The generic packed tower air stripper includes a spray nozzle at the top of the tower to distribute contaminated water over the packing in the column, a fan to force air countercurrent to the water flow, and a sump at the bottom of the tower to collect decontaminated water. Auxiliary equipment may include air treatment systems such as activated carbon units, catalytic oxidizers, or thermal oxidizers to treat the released VOCs.

This alternative requires ICs and ECs, as discussed above.

Offsite Groundwater (DSW) Remedial Alternatives

Three remedial alternatives were developed for addressing offsite-contaminated groundwater. A common element to all these alternatives is the remediation of contaminated groundwater through natural attenuation process and monitoring of natural attenuation process through sampling until the groundwater contamination meets the cleanup levels.

DGW Alternative 1: No Action

Estimated Total Cost: $0
Estimated Present-Worth Value: $0
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs/Cleanup Levels: NA
This remedy is analogous to the No Action Alternative OGW #1.

DGW Alternative 2: Alternate Water Supply (Municipal Water) plus MNA with ICs

Estimated Total Cost: $730,000
Estimated Present-Worth Value: $580,000
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs/Cleanup Levels: 15 years
Alternative DGW #2 would provide new connections to current properties within the offsite contaminated groundwater plume area that are not already connected to municipal water supply system. PCE and TCE contamination will continue to undergo degradation to daughter products through natural attenuation processes already occurring in offsite groundwater.

This alternative requires the implementation of the existing IC, prohibiting the installation of new wells

and prohibiting potable use of groundwater. This alternative would remain in place until the groundwater cleanup levels have been achieved.

DGW Alternative 3: Point of Entry (POE) Treatment plus MNA with ICs

Estimated Total Cost: POE - $910,000
Estimated Present-Worth Value: POE - $695,000
Estimated Construction Timeframe: NA
Estimated Time to Achieve RAOs/Cleanup Levels: 15 years
Alternative DGW #3 would involve the installation of activated carbon in-line filters at properties located within the contaminated groundwater plume that are currently occupied and not connected to a municipal water supply system. The carbon filters would decrease risks from ingestion of contaminated groundwater and from contaminated water vapor inhalation. Filters would be added at the point-of-entry of the waterline in to the residence. Whole-house (point-of-entry) filters for residences help protect against multiple exposure pathways (ingestion and inhalation). Commercial and industrial facilities tend to see point-of-use filters as more appropriate. The point-of-entry alternative eliminates the site-specific ingestion and inhalation exposure pathway identified for the Site.

PCE and TCE contamination will continue to undergo degradation to daughter products through natural attenuation processes already occurring in offsite groundwater.

The IC prohibiting the installation of new residential wells and prohibiting potable use of groundwater has to be implemented under this alternative. This alternative would remain in place until groundwater cleanup levels have been achieved.

Evaluation of Alternatives

The NCP establishes a framework of nine criteria for evaluating remedial alternatives. These nine criteria shown in the text box on page 15, entitled, "Criteria for Evaluating Remedial Alternatives" were used to evaluate the remedial alternatives individually and against each other to identify preferred alternatives.

If an alternative did not meet the first two threshold criteria, namely the Overall Protection of Human Health and the Environment criteria and the Compliance with ARARs criteria, EPA did not consider that alternative for further evaluation. The EPA will recommend the cleanup alternative that provides the best balance of the first seven of the nine evaluation criteria. EPA, after considering FDEP acceptance and public comments received on this proposed plan, will select the final remedy in the ROD.

Comparison of the Alternatives to the Nine Criteria

A summary of the evaluation of the potential alternatives to address the Site contamination is presented below. Detailed evaluation of the alternatives is included in the Final FS Report, which can be found in the Information Repository. The objective of this section is to compare and contrast the remedial alternatives for onsite and offsite contamination, so that risk managers may select a preferred alternative.

Overall Protection of Human Health and the Environment

All Onsite and Offsite groundwater alternatives with the except the No Action alternatives, are protective of human health and the environment by eliminating, reducing, or controlling risks posed by Site COCs through treatment of the contaminants and/or institutional controls. Alternatives that include Monitored Natural Attenuation (OGW #2 and DGW #2) removes contamination through natural attenuation.

OGW #4 (Pump and Treat) alternative removes groundwater contamination through physical treatment but may not be efficient at the Site because of existing Site geological conditions. Offsite groundwater alternatives DGW #3 (Point of Entry Treatment) is user dependent for providing overall protection as the resident will be responsible for replacing filters and not reverting back to their use of groundwater.

Compliance with ARARs

All Onsite and Offsite groundwater alternatives, except the No Action alternatives, are compliant with action-specific ARARs. All alternatives have the potential to reduce concentrations of COCs to meet cleanup levels

Long-Term Effectiveness and Permanence

Each alternative, except the No Action alternatives, provide some degree of long-term protection. Alternative OGW #2 (Monitored Natural Attenuation) and DGW #2 (Municipal Water and MNA) are most effective because they degrade site contaminants to less harmful byproducts and provide a permanent alternate water supply. Alternative OGW #4 (Pump and Treat) is less effective because over long-term, its efficiency of removing contamination from groundwater decreases and is limited by the availability of dissolved phase contaminants. Because Site contaminants typically adsorb to solid aquifer materials, the effectiveness of this technology in remediating Site COCs in the estimated timeframe and meeting the proposed cleanup levels is not certain.

Implementability

All treatment alternatives could easily be implemented. All materials and services needed for implementation are readily and commercially available. The most uncertainty lies with Alternative OGW #4 (Pump and Treat) because Site contaminants typically adsorb to solid aquifer materials resulting in less dissolved phase contaminants for treatment.

Onsite ICs are easily implementable through deed restrictions and ordinances prohibiting residential use, potable groundwater use, as well as requiring vapor mitigation assessment and possible system installations. Offsite institutional controls are hard to manage, especially for those alternatives that require residents to change chemical filters (point-of-enter filters).

Long-term maintenance would be applicable for OGW #4 (Pump and Treat) Alternative, which requires making repairs to all components of the treatment system, periodic sampling to evaluate its efficiency, and monitoring effluents in order to meet permit requirements. All alternatives require periodic groundwater sampling for verifying contaminant concentrations, natural attenuation parameters, degradation/daughter products, and their levels with respect to cleanup levels.

Short-Term Effectiveness

All alternatives would pose potential risks to construction workers and the community during implementation, except the No Action alternatives and the preferred alternatives. The potential risks

CRITERIA FOR EVALUATING REMEDIAL ALTERNATIVES

In selecting a preferred cleanup alternative, EPA uses the following criteria to evaluate those screened in the **Feasibility Study (FS)**. The first two criteria are threshold criteria and must be met for an option to be considered further. The next five are balancing criteria for weighing the merits of those that meet the threshold criteria. The final two criteria are used to modify EPA's proposed plan based on state and community input. All nine criteria are explained in more detail here.

1. **Overall Protection of Human Health and the Environment** – Eliminates, reduces, or controls health and environmental threats through institutional or engineering controls or treatment.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** – Compliance with Federal/State standards and requirements that pertain to the site or whether a waiver is justified.
3. **Long-Term Effectiveness and Permanence** – Protection of people and environment after cleanup is complete.
4. **Implementability** – Technical feasibility and administrative ease of conducting a remedy, including factors such as availability of services.
5. **Reduce Toxicity, Mobility, or Volume by Treatment** – Evaluates the alternative's use of treatment to reduce the harmful effects of principal contaminants and their ability to move in the environment.
6. **Short-Term Effectiveness** – Length of time to achieve protection and potential impact of implementation.
7. **Cost** – Benefits weighed against cost.
8. **State Acceptance** – Consideration of state's opinion of the preferred alternative(s).
9. **Community Acceptance** – Consideration of public comments on the Proposed Plan.

would be primarily associated with equipment movement and exposure to contaminated dust. However, air monitoring on facility and at the Site boundary, engineering controls and construction best management practices would control or reduce the potential for exposure.

Reduce Toxicity, Mobility or Volume through Treatment

All groundwater Alternatives OGW #2, OGW #3, OGW#4, DGW #2, and DGW #3 include treatment as a component of remedy and thus have the potential to reduce toxicity, mobility, or volume through treatment.

Alternatives with monitored natural attenuation as a component of the remedy provide the greatest reduction in toxicity, by degrading harmful contaminants to less harmful contaminants.

Cost

Cost estimates for all remedial alternatives were developed during the FS and are summarized below (Table 4). The present worth is based on an effective discount rate of 7 percent.

Cost estimates, including capital costs and long-term operating costs, were prepared for each alternative.

Cost Definitions

- Capital Cost is the cost to construct a remedial action.
- Present Worth Cost is the total cost across the lifespan of the remedial action including the initial capital cost plus any continuing operation and maintenance costs estimated over 30 years.

Table 4: Cost Estimates for Remedial Alternatives

Location	Medium	Alternative Name	Costs
Onsite	Groundwater	Alternate OGW 1 – No Action	$0
		Alternate OGW 2- Monitored Natural Attenuation with ICs	$840,000
		Alternate OGW 3 – Emulsified Zero-valent Iron with ICs	$1,250,000
		Alternate OGW 4 – Pump and Treat and Ex-situ Air Stripping with ICs	$2,100,000
Offsite	Groundwater	DGW 1 – No Action	$0
		DGW 2 – Municipal Water Supply and Monitored Natural Attenuation with ICs	$730,000
		DGW 3 – Point of Entry Treatment and Monitored Natural Attenuation with ICs	$910,000

There are no capital costs with No Action Alternative. Five-year reviews are necessary and estimated at $72,000 per each five-year review ($216,000 for three Five Year Reviews). The No Action Alternative would not be protective of human health and the environment.

The Onsite Groundwater Alternatives range from $0.84M to $2.2M, with OGW #4; Pump and Treat as the most expensive alternative. The Offsite Groundwater Alternatives range from $0.73M to $1.1M.

State Acceptance

The State of Florida has been involved actively in the process of determining and evaluating the Site cleanup alternatives presented in this Proposed Plan. The ROD and the **Responsiveness Summary** will describe the State acceptance of the remedy.

Community Acceptance

This Proposed Plan provides the opportunity for the public to comment on the Preferred Alternative as well as the other alternatives presented and evaluated in this Plan for the Site. After the public comment period, community acceptance of the Preferred Alternative will be evaluated. ROD and the Responsiveness Summary will describe the Community Acceptance of the remedy.

H. EPA's Preferred Alternative

The Preferred Alternative for addressing Onsite-contaminated groundwater and vapor is OGW #2 - MNA and Land Use Controls. Natural attenuation at the Site relies on dilution, volatilization, biodegradation, and adsorption mechanisms to reduce groundwater COCs below State MCLs. Performance monitoring will be conducted to determine if RAOs are being achieved. ICs will prohibit groundwater use onsite. Additionally, ECs will protect potential future exposure to future building occupants from possible onsite vapors.

The Preferred Alternative for addressing offsite-contaminated groundwater is DGW #2 – Alternate (Municipal) Water Supply with MNA. ICs prohibiting installation of potable wells and use of existing wells will be part of this Preferred Alternative.

Figure 4 illustrates the Preferred Alternative for OGW #2 and DGW #2. Figure 5 illustrates the IC and EC locations for the preferred alternative onsite. Based on the information available at this time, EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance among the other alternatives with respect to the balancing and modifying criteria.

Alternative OGW #2; MNA with ICs consists of sampling monitoring wells per Site's groundwater sampling plan and evaluating the progress of natural attenuation of contaminants. This sampling program will end when four consecutive sampling events indicate that COC concentrations are below the State MCLs.

EPA's Preferred Groundwater Remedial Alternatives

- Alternative OGW #2; Monitored Natural Attenuation with Land Use Controls (onsite)
- Alternative DGW #2; Alternate (Municipal) Water Supply with Monitored Natural Attenuation and Institutional Controls (Offsite)

Alternative DGW #2; Alternate (Municipal) Water Supply with MNA and ICs, consists of hooking up residents to municipal water supply and performing MNA sampling and evaluation as described in Alternative OGW #2. This sampling program will end when four consecutive sampling events indicate that COC concentrations are below the State MCLs cleanup levels.

Compliance with ARARs is achieved through natural attenuation of groundwater contamination and through alternate permanent water supply to the residents. Long-term effectiveness and permanence of the remedy will be attained by natural attenuation.

This alternative is easily implementable. Municipal water line connections are easily implementable as there are new water mains installed in the area by the Water Department.

ONSITE PREFERRED REMEDY:
MNA WITH ICs

OFFSITE PREFERRED REMEDY:
MUNICIPAL WATER CONNECTION
MNA WITH ICs

1/4 MILE

1/2 MILE

LEWIS RD
TOM FOLSOM RD
BRADLEY RD
MARLO DR
ROCK HILL RD
US HIGHWAY 301
JACKSON RD
ELYSSA RD
MAIN ST
E FOWLER AVE
HIGDON DR
JAMES ST
MARK ST
GALAXY LN
SEVEN ROADS PL
HARNEY RD
SKEW LEE RD
REAL SHORT RD
HART POND RD
108TH AVE
TOMMY TYNES RD

Legend

- Monitoring Well
- Hydrant
- Potable Control Valve
- Potable System Valve
- Fitting
- Potable Meter
- Potable Pressurized Main
- Potable Lateral Line
- Road
- Radius Ring
- PCE Plume June 2016
- Arkla Terra Property
- Properties not connected to municipal water
- Properties without private potable wells and not connected to municipal water
- Properties proposed to be connected to municipal water supply
- Properties not connected to municipal water but on a filter
- Potable Customers Connected
- MNA — Monitored Natural Attenuation
- ICs — Institutional Controls

N

0 500 1,000

Feet

Basemap Source: Hillsborough County Property Appraiser's Office

United States Environmental Protection Agency

REMEDIAL INVESTIGATION
ARKLA TERRA SITE
THONOTOSASSA, FLORIDA

FIGURE 4
PREFERRED ALTERNATIVES FOR ONSITE AND OFFSITE UNITS AT THE ARKLA TERRA SITE

G:\GIS_Workspace\Arkla Terra\May 2018\Figure 4.mxd

Aerial Source: Bing Maps Property Parcels Source: Hillsborough County Property Appraiser's Office

Legend

- Outer Vapor Cap
- Inner Vapor Cap
- Former Treatment Area
- Arkla Terra Property
- Existing Buildings - Engineering Control - EC2

Note:

All Institutional Controls, Engineering Controls, and Deed Restrictions are applicable to the entire property.

N

0 80 160

Scale in Feet

United States Environmental Protection Agency

PROPOSED PLAN
ARKLA TERRA SITE
THONOTOSASSA, FLORIDA

FIGURE 5
INSTITUTIONAL CONTROL, DEED RESTRICTION, AND ENGINEERING CONTROLS

G:\GIS_Workspace\Arkla Terra\May 2018\Figure 5.mxd

Reduction in toxicity and volume (T/V) is achievable with natural attenuation but the reduction of mobility of contaminants is not achievable with these alternatives. ICs reduce or eliminate the risk exposure pathway.

The cost of EPA's Preferred Alternative for onsite is $0.84 million and for offsite is $0.73 million.

Land Use Controls (ICs and ECs) as discussed above, will be required as part of the selected remedies. ICs usually include legal controls to affect human activities in such a way to prevent or reduce exposure to contamination. The purpose of the ICs is to impose on the subject property "use" restrictions for the purpose of implementing, facilitating and monitoring a remedial action to reduce exposure, thereby protecting human health and the environment. Restrictive covenants would be placed on the Site to prohibit intrusive activities and incompatible uses on the ATP property. Restrictive covenants would be required of the residences in the plume area, prohibiting use of groundwater for potable purposes and prohibiting the installation of new potable wells.

Community Participation

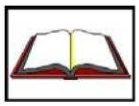
The EPA relies on public input to ensure the concerns of the community are considered in selecting an effective remedy for each Superfund Site. The Administrative Record and Information Repositories for the Site are located at:

Thonotosassa Branch Library 10715 Main Street Thonotosassa FL 33592-2831 Phone: 813-273-3652 Hours: Mon - Sat 10am – 6pm; Sunday - Closed	USEPA Region 4 Records Center 61 Forsyth Street Atlanta, Georgia 30303 404-562-8561 Hours: Mon-Fri 8:00am-4:30pm

The dates for the public comment period are June 22, 2018 through July 23, 2018.

If you prefer to submit written comments, please mail them postmarked no later than midnight July 14, 2018 to Angela Miller at USEPA, 61 Forsyth Street, Atlanta, GA 30303.

After EPA has received comments and questions during the public comment period, EPA will summarize the comments and provide responses in the **Responsiveness Summary**, which is part of the ROD. The ROD will select the final remedial action and will provide the rationale for EPA's selection.



GLOSSARY

Administrative Record: Materials, information and documents that provide the basis and support EPA's selection of a remedial action at Superfund sites usually placed in the **information repository** near the Site.

Applicable or Relevant and Appropriate Requirements (ARARs): Refers to Federal and State promulgated standards that a selected remedy must attain

Aquifer: An underground geologic formation, or group of formations, containing water.

Baseline Risk Assessment (BRA): A qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and the environment by the presence or potential presence and use of specific pollutants.

Contaminant of Concern (COCs): Chemical constituents associated with a Superfund Site that have been released into the environment and pose an unacceptable risk to human health.

Cleanup: Actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and/or the environment. The term "cleanup" is sometimes used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendment and Reauthorization Act (SARA). The act created a trust fund, to investigate and cleanup abandoned or uncontrolled hazardous waste sites.

Engineering Evaluation/Cost Analysis (EE/CA): An EE/CA establishes the removal action objectives and provides the documentation for identified ARARs, analyzes cost-effective removal alternatives, and recommends a preferred removal alternative that best meets the removal objectives.

Ecological Risk Assessment (ERA): A qualitative and quantitative evaluation performed in an effort to define the risk posed to ecological receptors by the presence or potential presence of specific contaminants.

Feasibility Study (FS): The FS is conducted after the RI to develop and evaluate remedial alternatives to address the risks posed by the contamination at a site.

Groundwater: Water located beneath the ground surface in soil pore spaces and in the fractures of lithologic formations.

Human Health Risk Assessment (HHRA): A qualitative and quantitative evaluation performed in an effort to define the risk posed to human health by the presence or potential presence of specific contaminants.

Information Repository: A library or other location where documents and data related to a Superfund project is placed to allow public access to the material.

Monitoring: The periodic or continuous surveillance or testing to determine the level of pollutants in various media.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The federal regulation that guides the Superfund program.

National Priorities List (NPL): EPA's list of the most serious uncontrolled hazardous waste sites identified for possible long-term remedial response. This list is based primarily on the score a site received on the Hazard Ranking System.

Non-Time Critical Removal Action (NTCRA): Non-time-critical removal actions are conducted at Superfund sites when the lead Agency determines, based on the site evaluation, that a removal action is appropriate, and a planning period of at least six months is available before on-site activities must begin.

Proposed Plan: Document that summarizes the RI/FS, the alternatives developed and the proposed preferred alternative and the rationale for its proposal.

Public Comment Period: The time allowed for the public to express its views and concerns on the information provided in the Proposed Plan and EPA's proposed preferred alternative.

Record of Decision (ROD): A decision document that selects and describes the remedy that will be implemented at a Site. The ROD is based on information and technical analysis generated during the remedial investigation/feasibility study and consideration of public comments.

Remedial Action Objectives (RAOs): Provide a general description of what the cleanup will accomplish (e.g., restoration of ground water to drinking water levels). These goals typically serve as the as the basis for developing remedial alternatives.

Remedial Investigation (RI): An investigation conducted to fully characterize the nature and extent of contamination of a release, or threat of release, of hazardous substances, pollutants, or contaminants. In addition, the RI also evaluate risks posed to human health and the environment. The RI gathers the necessary data to support the corresponding FS.

Response Action: A CERCLA-authorized action involving either a short-term removal action or a long-term removal response. This may include but is not limited to: removing hazardous materials from a site to an EPA-approved hazardous waste facility for treatment, containment or treating the waste onsite, identifying and removing the sources of ground-water contamination and halting further migration of contaminants.

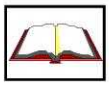
Responsiveness Summary: A summary of oral and written comments received by EPA during the public comment period on EPA's Proposed Plan , and EPA's responses to those comments. The responsiveness summary is a key part of the ROD, highlighting community concerns for EPA decision-makers.

Soil Gas: Vapors that travel through the pore space between soil particles below the ground surface.

Superfund: The common name used for the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended in 1986.

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Arkla Terra Property Superfund Site is important in helping EPA select a remedy for the site. You may use the space below to write your comments, then fold and mail. A response to your comment will be included in the Responsiveness Summary.

 *Arkla Terra Property Superfund Site*

PUBLIC COMMENT SHEET

Place Stamp Here

Name_____
Address_____
City_____State_____Zip_____

Beth Walden, Remedial Project Manager
U. S. Environmental Protection Agency, Region 4
Superfund Division
61 Forsyth St., SW
Atlanta, GA 30303