U.S. Environmental Protection Agency Region 6 Announces Superfund Proposed Plan for Interim Remedial Action

Delfasco Forge Superfund Site
Grand Prairie, Texas
June 2022

The Purpose of the Proposed Plan is to:

- Describe a plan designed to address hazardous chemicals in the subsurface at the Delfasco Forge Superfund Site source area (the most contaminated section at the site).
- Provide information and history on the how the former Delfasco manufacturing facility became a Superfund site.
- Describe the principal toxic contaminants at the site source area, their exposure and human health risks, as well as the preliminary remediation goals and proposed remediation systems.
- Solicit public review and comment on the Proposed Plan and review of site information contained in the Administrative Record File; and,
- Provide information on how community members can be involved in the Superfund process to jointly select the remedial alternatives and support implementation of the interim remedial action at the site source area.

The United States Environmental Protection Agency (EPA) has released the Proposed Plan for addressing hazardous substance contamination at the Delfasco Forge Superfund Site in Grand Prairie, TX. EPA, as the lead agency for site activity, is issuing the Proposed Plan with support from the Texas Commission on Environmental Quality (TCEQ). Following discussion and public review of this Proposed Plan, EPA, in consultation with the TCEQ, will make an interim remedial action selection of a cleanup alternative that will be documented in an interim Record of Decision.

The purpose of the Proposed Plan is to fulfill statutory requirements pursuant to Sections 113(k)(2)(B), 117(a), and 121(f)(1)(G) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), 42 U.S.C. §§ 9613(k)(2)(B), 9617(a), and 9621(f)(1)(G). It also describes the alternatives analyzed, identifies EPA's Preferred Alternative, and solicits public involvement in the selection of a remedy.

Highlight of EPA's Preferred Remedial Alternative:

- Soil vapor extraction (SVE) system to reduce subsurface contamination at the site source area.
- Granular activated charcoal technologies to effectively capture and safely manage the extracted hazardous chemicals.
- In-situ groundwater (GW) treatment barrier to reduce contaminant of concern (COC) concentrations at the site source area.
- Design and use of a source area monitoring program to assess and verify the performance and effectiveness of the remediation systems.

The EPA has developed this Proposed Plan for an interim remedial action. In developing this interim remedial action, the EPA consulted with the TCEQ, which participated in this environmental remediation project and is an integral stakeholder in implementing this Proposed Plan. EPA and TCEQ believe that the Preferred Alternative identified in the Proposed Plan is necessary to protect human health and welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Community Participation

The Proposed Plan highlights key information from the site investigations and focused feasibility study (FFS) reports for the site, but it is not a substitute for these detailed reports. The results of the sampling activities and an assessment of the potential exposure risks at the site source area are presented in the Administrative Record File. The development and evaluation of a remedial alternative to address site source area contamination is presented in the FFS report. For a complete source of information, please refer to these reports, which are in the Administrative Record File located at the repositories listed below. The EPA encourages the public to review these documents to gain a comprehensive understanding of (1) the site source area and sitewide Superfund activities that have been conducted there, and (2) the environmental remediation alternatives that have been developed and evaluated to address and reduce the hazardous vapor-forming chemicals at the site source area in the immediate future. The EPA also encourages the public to participate in the Superfund decision-making process for the site by reviewing the Administrative Record File, including important site documents such as the FFS report, and making comments on this Proposed Plan. The Administrative Record File is available at the following repositories:

Texas Commission on Environmental Quality
TCEQ Central File Room
12100 Park 35 Circle Building E
First Floor Room 103
Austin, TX 78753

Tony Shotwell Life Center
2750 Graham Street
Grand Prairie, Texas 75050
972-237-5730

EPA, in cooperation with the TCEQ, announces a Public Comment Period and public meeting regarding the proposed interim remedial action at the site source area. The meeting will be held at the

Tony Shotwell Life Center
2750 Graham Street
Grand Prairie, Texas 75050

on **Thursday, June 30th at 6:00 PM**. The public is invited to comment on this Proposed Plan. Final decisions regarding the remediation of the site source area will only be made after public comments are considered**.** The official public comment period begins on **June 20th and will go through July 20th.** During the public comment period, written comments may be submitted to:

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Community Participation thus far has been conducted through community meetings, site updates to the Grand Prairie City Council, and outreach coordinated with the City of Grand Prairie. Flyers have also been sent to residents with information about the site, upcoming meetings, and contacts. EPA project managers have also responded individually to community requests for information about the site.

INTRODUCTION

The Delfasco Forge Superfund Site (site) is in the city of Grand Prairie, west of Dallas, Texas (Figure 1). The former Delfasco Forge facility operated as a munitions manufacturing and forge plant since the 1950s. Chlorinated solvents were spilled or released onto the soil and groundwater at the site. The facility ceased operations in 1998. The EPA Resource Conservation and Recovery Act (RCRA) program conducted a vapor intrusion investigation of the neighborhood in 2008, sampling sub-slabs, crawl spaces, and indoor air in 16 homes and two commercial structures. Ten of the 18 structures had measurable levels of trichloroethylene (TCE) in indoor air. In July 2008, owners of Delfasco Forge filed for bankruptcy. In November 2008, vapor control fans (aka vapor intrusion mitigation systems or VIMS) were installed at the four homes with the highest TCE vapor concentrations, under the Superfund Removal program. The EPA received money under the bankruptcy settlement to conduct vapor intrusion mitigation work. EPA's RCRA program used the bankruptcy funds to offer presumptive vapor control fans to residents in approximately 80 homes situated above the TCE-contaminated groundwater plume. Thirty-one of those residents accepted vapor control fans which were installed in 2014.

The site was proposed for addition to the National Priorities List (NPL) in May 2018 and was added to the NPL on September 13, 2018.

This Proposed Plan is based on a series of field-scale studies and remedial investigation sampling conducted to determine the best plan of action to quickly reduce the concentrations of volatile organic

chemicals in the subsurface at the site source area. The information in the FFS report will be used to support an Interim Record of Decision.

SITE HISTORY

Delfasco Forge, Inc. (Delfasco) was a metal forging, fabrication, and machining company that operated at 114 NE 28th Street in Grand Prairie from 1981 to 1998. Delfasco used TCE and other volatile organic chemicals to clean metals as part of its manufacturing processes. TCE was spilled onto the ground by Delfasco's manufacturing practices and seeped down through the ground and entered the groundwater beneath the facility. The groundwater carried the TCE to the northeast from the facility to the area beneath the residential neighborhood. Contaminated soil was detected on-site during a Phase II Environmental Site Assessment in 2002. Investigations conducted by the EPA and the Texas Department of State Health Services (DSHS) confirmed the potential that TCE vapors could enter homes overlying the contaminated groundwater through a process called "vapor intrusion." Vapor intrusion occurs when chemicals in soil or groundwater seep into a building from underneath and contaminate the air inside the building. As a result of these investigations, the EPA installed vapor control fans at 31 homes in the area overlying the groundwater contamination. The EPA and the state of Texas continue to monitor the TCE-contaminated groundwater and soil vapor in the area. In August 2008, the EPA installed passive soil gas samplers along the residential streets, and additional sampling continued in 2009. In 2017, EPA collected additional passive soil gas samples along the residential streets further out from the original sampling events. In October 2017, the EPA collected soil gas samples from 81 homes overlying the approximate location of the contaminated groundwater plume. The area sampled included the range previously sampled in 2008 and extended further to the northeast in the direction of movement within the contaminated groundwater plume. Analytical results of the soil gas samples showed the highest concentrations at locations next to the former Delfasco facility, consistent with the previous soil gas sampling. TCE contamination was detected in several soil gas samples located farther away from the former facility (See Figure 5).

SITE CHARACTERISTICS

The Delfasco Forge site source area is considered the most contaminated section at the site; it is located next to a residential community within a mixed residential/commercial environmental setting. This site source area has one exposure pathway: vapor intrusion from TCE, the principal chemical of concern. The shallow alluvial aquifer is not being used for drinking water and the deeper aquifers are protected by the Eagle Ford Formation shale. There are no identified private drinking water wells developed near the site source area, and the surrounding residential community is connected to the Grand Prairie public water system. The regional geology is characterized as Texas Blackland Prairie and the major soil groups are Houston Black-Urban and Lewisville-Urban complexes. The soils are characterized by moderately low permeability, maintain high water capacity, and are very susceptible to erosion.

SCOPE AND ROLE OF ACTION

The scope and role of the interim remedial action is implementation of a plan to address hazardous chemicals in the subsurface at the site source area (the most contaminated portion of the site). The interim remedial action includes installation of a soil vapor extraction system (SVE) as an effective way to remove the vapor forming chemicals at the site. SVE is a presumptive remedy that can be deployed and become fully functional very quickly.

Vapor-forming hazardous chemicals are present in the soil and groundwater at concentrations exceeding their screening levels. TCE, the principal contaminant of concern at the site, can cause unacceptable human health risks to workers in an onsite building and residents of homes within the proximity of the site source area (Figure 4). Environmental studies and investigations conducted by former site owners, the TCEQ, and EPA reveal that TCE is also present in the groundwater at concentrations above its federal/state screening levels. Cleanup of the subsurface environment is a lengthy process (e.g., several years) to attain the long-term cleanup goals and objectives.

The EPA proposes to install and operate two remedial systems to clean up COCs in the subsurface at the site source area. In addition to operation of an SVE system, an "*in-situ* groundwater (GW) treatment barrier" is proposed to address toxic chemicals in the groundwater. An *in-situ* GW treatment barrier is a group of about 30 to 50 borings placed below the ground surface between the layers of the aquifer underlying the site source area. The boreholes will be used to inject amendments that attach to the aquifer where contaminants in the GW react with the amendments to reduce TCE concentrations and limit the mobility of COCs. Construction of a robust GW treatment barrier, coupled with sampling and testing to evaluate optimal times to inject additional amendments to the most contaminated portions of the aquifer, is a practical and cost-effective way to begin stopping GW plume migration and expansion. Selection and implementation of the proposed SVE system and *in-situ* GW treatment barrier work well in tandem to attain the short-term preliminary remediation goals in this Proposed Plan.

Issuance of an Interim Record of Decision (Interim ROD) will document current site conditions and selection of the preferred remediation alternatives to address the hazardous contaminants in the subsurface, as well as address the contaminated GW plume at the site source area. The Interim ROD will be issued following EPA's evaluation of comments received on this Proposed Plan. The Interim ROD will be followed by issuance of a final ROD, which ultimately may: (1) provide long-term sitewide protection, (2) fully address any principal threats posed by other potential contaminants of concern, and (3) address the statutory preference for treatment that would reduce/eliminate sitewide toxicity, mobility, or volume of the full range of COCs in the soil and groundwater at the Delfasco Forge Superfund Site.

CONTAMINANTS OF CONCERN (COCs)

EPA defines COCs as those chemicals that pose a carcinogenic risk to human health greater than 1 in 1,000,000, have a non-carcinogenic hazard index greater than 1, or are found in site groundwater at concentrations that exceed Maximum Contaminant Levels (MCLs). MCLs are standards that are set by the EPA for drinking water quality. An MCL is the legal threshold limit on the amount of a hazardous substance that is allowed in public water systems under the federal Safe Drinking Water Act.

The selection of preliminary COCs for the proposed interim remedy is grounded on information regarding the historical source release(s) from cleaning operations and machining works at the former Delfasco facility and their frequency of detection in soil, soil vapor, groundwater, and indoor air sampling events. EPA has identified two principal chlorinated volatile organic contaminants that might pose risks and potential public health threats: *trichloroethylene* and *tetrachloroethylene*.

Trichloroethylene (TCE): TCE is the primary COC at the site. It has historically been associated with former facility operations and detected in subsurface soil and groundwater samples collected at the site. In previous studies and remedial investigations conducted by former operators, as well as by the TCEQ and EPA, trichloroethylene has been frequently detected in site groundwater samples at concentrations that exceed the 5-ppb federal cleanup level for drinking water. TCE has also been detected at elevated

concentrations in soil vapor samples collected near commercial and residential buildings in the vicinity of the site source area. TCE contamination at and near the site poses a public health endangerment to occupants in buildings within the proximity of the site source area contamination from potential vapor intrusion to indoor air. In addition, TCE decomposition byproducts: *cis*-dichloroethylene (*cis*-DCE), *trans*-dichloroethylene (*trans*-DCE), 1,1-dichloroethylene (1,1-DCE), 1,1,2-trichloroethane (1,1,2-TCA), 1,2-dichloroethane (1,2-DCA), chloroform, and vinyl chloride (VC) were also identified during previous environmental studies, but not at significant concentrations nor as frequently as TCE or PCE. Usually, when these other chlorinated organic chemicals appear in remedial investigations, they are not the result of any former industrial activity involving those chemicals at the site as they are daughter products. Exposure to TCE has been associated with harmful health effects to the liver and kidney and is known to cause cancer in laboratory animals. TCE is a probable human carcinogen.

Tetrachloroethylene (PCE): PCE, likely also released from historical industrial operations at the site, has also been detected in groundwater at concentrations that exceed the 5-ppb federal cleanup level for drinking water and in soil gas samples at elevated concentrations near commercial and residential buildings in the vicinity of the site source area. Exposure to PCE has been associated with adverse health effects in humans, including skin rashes and liver and kidney disorders. PCE is considered to be a carcinogen in laboratory animals and is suspected of being carcinogenic in humans.

Another group of volatile non-chlorinated organic compounds, collectively known as BTEX compounds, comprised of benzene, toluene, ethylbenzene and xylene (often expressed as total xylenes), as well other petroleum-related hydrocarbons, were also identified in previous groundwater samples collected at the site. BTEX and other chlorinated VOCs are attributed to former machining/cleaning releases/spills and were detected in historical site studies conducted by the former owner. BTEX compounds, while historically detected at the site, do not pose the same immediate health concerns as TCE and PCE, and therefore are not the basis for the Interim ROD. BTEX compounds will be further evaluated during the Remedial Investigation. The final ROD will identify all site related COCs.

PRINCIPAL AND LOW-LEVEL THREAT WASTES

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to public health or the environment should exposure occur. Low level threat waste is source material that generally can be reliably contained and would present only a low risk in the event of a release. The decision to treat low level threat wastes is made on a site-specific basis through a detailed analysis of remedial alternatives using the nine remedy selection criteria specified in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and summarized in Table 2. This analysis provides the basis for making a statutory finding that the selected remedy uses a proven treatment technology as a principal element.

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable and use engineering controls such as containment for wastes that pose a relatively low, long-term threat or where treatment is impracticable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. Source material is any material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, air, or act as a source for direct exposure. Based on high levels and frequency of detection of TCE and PCE found in soil, soil vapor, groundwater, and indoor air within the site source area, these contaminated environmental media may

represent primary source material at the site. In general, wastes may be considered a principal threat where toxicity and mobility combine to pose a potential human health risk of 1 in 10,000 (10^{-4}) or greater for carcinogens (EPA 1991d). For these areas, EPA will evaluate an alternative that includes treatment. The practicability of treatment will be evaluated against the NCP's nine remedy selection criteria. Based on available technology, treatment may be considered practical at this site. *In-situ* containment can also be effective for principal threat wastes, where that approach represents the best balance of the NCP nine remedy selection criteria.

Although the contaminated soils present in the site source area represent a source material, they are not characterized as a "principal threat waste." However, because current and future public exposure to TCE and PCE present in soil, soil vapor, and groundwater exceeds EPA Region 6 risk management criteria, and because TCE and PCE concentrations in groundwater could potentially impact current and future groundwater uses, treatment alternatives will be evaluated.

SUMMARY OF SITE RISKS

- Risk to residents in homes next to the site source area where indoor air TCE concentrations exceed EPA's Regional screening levels,
- Risk to commercial workers occupying an on-site building,
- Risk from vapor intrusion to occupants at homes in the path of migrating TCE-contaminated groundwater plume deriving from the site source area, and
- Risk of onsite groundwater plume expansion into off-site areas and further aquifer degradation.

The EPA will complete a baseline human health risk assessment during the final remedial investigation/feasibility study phase of the Superfund process to confirm the current and potential future public health and environmental exposure risk conditions at the site. The need for sitewide remedial action will be evaluated and established in part based on the results of the completed baseline human health and ecological risk assessments and documented in the final ROD.

Human Health Risks

There is evidence of vapor intrusion to indoor air from TCE-contaminated soil and groundwater at homes next to the Delfasco facility and at a commercial building overlying the site source area. Remedial investigation studies found that concentrations of TCE in indoor air in the on-site commercial building corresponded to an excess lifetime cancer risk (ELCR) greater than 1 in 10,000 (10^{-4}). At a home next to the site source area, concentrations of TCE in indoor air correspond to ELCR values between 10^{-4} and 1 in 100,000 (10^{-5}). Concentrations of TCE in indoor air environments at and near the site source area are above EPA Region 6 protective benchmarks and could have a Hazard Index greater than 1. These risk metrics reveal that consideration of the vapor intrusion pathway is warranted because vapor-forming chemicals at the site source area could continue to negatively impact the public health at adjacent homes.

The proposed interim remedial actions are designed (1) for SVE to mitigate the migration of TCE vapors at the site source area from groundwater into indoor air until such time as EPA selects a final remedy for the entire site and (2) for the in-situ groundwater barrier to treat impacted groundwater at the site source area to reduce mobility and concentration of the COC's.

Investigations conducted by former site owners, the TCEQ, and EPA have found concentrations of TCE and PCE in the site source area groundwater are in excess of their respective *Safe Drinking Water Act* established Maximum Concentration Levels (MCLs). In the final baseline human health risk assessment (BHHRA), EPA will consider that residential use of groundwater around the site source area might become a future drinking water source. The comprehensive BHHRA will be completed and used to substantiate the sitewide remedy and described in the final ROD.

Standard Basis for Action

Based on current data, it is the EPA's determination that the proposed remedy identified and considered in this Proposed Plan, is necessary to protect public health and the environment from actual or threatened releases of pollutants or contaminants from this site, which may present an imminent and substantial endangerment to public health or welfare.

REMEDIAL ACTION OBJECTIVES

Under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 300.430(e)(2)(i), EPA plans to establish remedial action objectives (RAOs) specifying contaminants and media of concern, potential exposure pathways, and remediation goals. Remediation goals shall establish acceptable exposure levels (i.e., contaminant concentration levels) that are protective of human health and the environment, and shall be developed considering certain factors, including Applicable or Relevant and Appropriate Requirements (ARARs, which represent the cleanup standards a remedy must attain), as specified in the NCP.

RAOs provide a general description of what a Superfund cleanup is designed to accomplish. Because there are no federal or state cleanup levels for TCE-contaminated soil or groundwater that is a source of contaminants to indoor air, EPA establishes short-term Preliminary Remediation Goals (PRGs) for the site source area predicated on information evaluated by EPA Regional risk assessors. EPA will establish long-term, sitewide PRGs for groundwater contamination in the final baseline human health risk assessment. PRGs will be developed for TCE and PCE in site source area soil and groundwater, using a residential land use scenario and an ELCR for a receptor of $1x10^{-6}$ (where remediation goals are not determined by ARARs, EPA may use an ELCR of $1x10^{-6}$ as a point of departure for establishing PRGs for carcinogens) or a hazard index of 1. Following are the interim remedial action PRGs established to address and control unacceptable human health risks from vapor intrusion and begin reducing subsurface vapor sources at the site source area.

Remedial Action Objectives and Goals

The Remedial Action Objectives (RAO) for this interim remedial action are to:

- Prevent or minimize further migration of COCs in the vadose zone at the site source area that could result in further groundwater contamination that could continue to source contaminants to indoor air.

- Reduce the concentrations of COCs in the site source area groundwater that could continue to source contaminants to indoor air.

- Minimize migration and expansion of COCs in groundwater at concentrations exceeding federal/state protective levels at the site source area.

The EPA guidance states that "an interim action is limited in scope and only addresses areas/media that also will be addressed by a final site/operable unit ROD." These RAOs are designed to support a final remedial action which will comply with CERCLA requirements to cleanup contaminants in groundwater and restore the groundwater to beneficial use. Therefore, the RAOs in this Proposed Plan reflect the limited scope of an interim remedial action. By preventing or minimizing the continued migration of COCs from the vadose zone to the underlying groundwater and reducing COC concentrations in the site source area groundwater, the interim remedial action prioritizes site source area reduction and treatment so that aquifer restoration can begin during subsequent response actions.

This proposed remedy is an interim remedial action under CERCLA as EPA continues to investigate the nature and extent of contamination at the Site. The proposed remedy is intended to serve as a source control action and specific numeric cleanup standards or goals will not be established at this time. The general strategy for assessment of performance and closure of the SVE system will be based on four components considered integral to the successful operations: (1) site characterization, (2) system design, (3) performance monitoring, and (4) mass flux to and from the groundwater. These four components form converging lines of evidence regarding performance of the interim action. Each component is interrelated and requires continuous evaluation during the system operation. The use of converging lines of evidence for evaluating continued operation of the SVE system is outlined in EPA's "Development of Recommendations and Methods to Support Assessment of Soil Venting Performance and Closure" (EPA/600R-01/070, September 2001).

SUMMARY OF REMEDIAL ALTERNATIVES

Remediation alternatives for site source area soil and soil vapor and groundwater are summarized in Table 1 and discussed further in the following sections. The interim remedial action alternatives are numbered to correspond with those prescribed in the focused feasibility study (FSS) report.

TABLE 1: SUMMARY OF REMEDIAL ALTERNATIVES

Area and Media	FFS Designation	Description
SOURCE AREA SOIL & SOIL VAPOR	SA-S1	No Action
	SA-S2	**Soil Vapor Extraction**
SOURCE AREA GROUNDWATER	SA-GW1	No Action
	SA-GW2	***In-Situ* Groundwater Treatment Barrier**

SOURCE AREA SOIL AND SOIL VAPOR ALTERNATIVES

This section of the Proposed Plan describes the remedial alternatives that were developed in the FFS report to address COC-contamination in the site source area vadose zone.

ALTERNATIVE SA-S1: NO ACTION

Estimated Capital Cost: $0
Estimated Average Annual O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Timeframe: None

Regulations governing the Superfund Program generally require that a "no-action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action at the site to reduce COC concentrations in vadose zone.

ALTERNATIVE SA-S2: SOIL VAPOR EXTRACTION

(This is EPA's preferred alternative to reduce COCs in the vadose zone.)

Estimated Capital Cost: $3,750,000
Estimated Average Annual O&M Cost: $150,000
Estimated Periodic Costs: $100,000
Estimated Present Worth Cost: $3,750,000
Estimated Construction Timeframe: 12 to 18 months

Soil Vapor Extraction (SVE) – Since TCE and PCE are the primary contaminants identified at the site source area, SVE was the preferred presumptive remedy selected for application of a field-scale study to study and evaluate its implementability as an effective technology to use at the site. The FFS report supports its use as a tried and proven method to reduce COCs in the vadose zone. SVE works by applying a vacuum to the contaminated soil. SVE wells are drilled and screened in the most contaminated zones in the soil and connected to a vacuum pump through conveyance pipes. The vacuum pump draws vapor-forming chemicals from the soil surrounding individual wells and passes them through an off-gas treatment system before discharge. The extraction of COCs from the soil also induces further vaporization of other vapor-forming chemicals in the groundwater. Over a period of sustained SVE (ranging from months to about 3 years), a substantial amount of contaminant mass can be removed at the site source area.

SOURCE AREA GROUNDWATER ALTERNATIVES

Regulations governing the Superfund Program generally require that the "no-action" alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action at the site to prevent exposure or to reduce COC concentrations in site source area groundwater.

ALTERNATIVE SA-GW1: NO ACTION

Estimated Capital Cost: $0
Estimated Average Annual O&M Cost: $0
Estimated Periodic Costs: $0

Estimated Present Worth Cost: $0
Estimated Construction Timeframe: None

ALTERNATIVE SA-GW2: *IN-SITU* GROUNDWATER TREATMENT BARRIER

(This is EPA's preferred interim measure for reducing COC-contaminated groundwater migration and expansion.)

Estimated Capital Cost: $2,250,000
Estimated Average Annual O&M Cost: $62,000
Estimated Periodic Costs: $356,546
Estimated Present Worth Cost: $2,996,546 ($3M)
Estimated Construction Timeframe: 8 to 12 months

Since there are no identified private drinking water wells developed in the site source area vicinity, no immediate current risk is posed by exposure to groundwater. However, groundwater containing COCs at concentrations exceeding protective levels in the shallow alluvial aquifer underlying the site source area might pose potential future risk if the local aquifer is ever developed as a future drinking water supply for the community. Following is a brief description of the interim remedial action alternative proposed to reduce COC-contaminated groundwater migration and plume expansion from the site source area.

Construction of Additional *In-Situ* GW Treatment Barrier Infrastructure and a Groundwater Monitoring Program

Selection of the SA-GW2 interim RA component would allow implementation of a groundwater monitoring program to assess and verify the performance and effectiveness of the recommended technologies proposed under this interim remedial action. Samples for testing and monitoring would be obtained from boreholes drilled to define the site source area groundwater treatment area. New monitoring wells would be installed to document TCE and PCE concentration reductions.

Alternative SA-GW2 includes the design and construction of a reactive barrier infrastructure as the preferred presumptive remedial technology to reduce TCE and PCE concentrations in the groundwater at the site source area. The FFS report concluded that a wider-ranging reactive barrier would be best to prevent progressive COC-contaminated groundwater migration and plume expansion derived from the site source area. Selection of this proposed groundwater alternative would include drilling 30 to 50 additional borings below the ground surface between the lower clay and upper sand layers and downgradient of pilot-study boreholes. The alternative also includes the use of two supplementary activated carbon/zero-valent iron infusions (in year 3 and year 5), focused around the northeastern sector of the site where added reactive barrier boreholes would be constructed to treat and halt plume migration/expansion).

EVALUATION OF ALTERNATIVES

The National Contingency Plan requires the use of nine criteria to evaluate and compare the remedial alternatives. These criteria include *threshold criteria*, which each alternative must meet in order to be eligible for selection. *Primary balancing criteria* are used to weigh major trade-offs among alternatives, and *modifying criteria* involve state and community acceptance.

The two threshold criteria are:

(1) overall protection of human health and the environment, and

(2) compliance with applicable or relevant and appropriate requirements.

The five primary balancing criteria are:

(3) long-term effectiveness and permanence;

(4) reduction of toxicity, mobility, or volume through treatment;

(5) short-term effectiveness;

(6) implementability; and

(7) costs.

The two modifying criteria are:

(8) state acceptance, and

(9) community acceptance.

The nine criteria are defined in Table 2 below. This section of the Proposed Plan summarizes the comparative analysis performed in the focused feasibility study report against the nine criteria. The analysis of each alternative with respect to the nine criteria is presented in the FFS report.

TABLE 2 - EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
1. *Overall Protectiveness of Human Health and the Environment* - determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
2. *Compliance with ARARs* - evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
3. *Long-term Effectiveness and Permanence* - considers the ability of an alternative to maintain protection of human health and the environment over time.
4. *Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment* - evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
5. *Short-term Effectiveness* - considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. *Implementability* - considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
7. *Cost* - includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. *State/Support Agency Acceptance* - considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.
9. *Community Acceptance* – considers whether the local community agrees with EPA's analyses and the preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Threshold Criteria

The proposed remedy is anticipated to be climate resilient and is not expected to be impacted by any future change in climate.

1. Overall Protection of Human Health and the Environment.

The "no action" alternative SA-S1 does not protect human health and the environment. For the site source area vadose zone alternatives, only SA-S2 would provide adequate protection of human health and the environment by reducing COC concentrations through SVE and treatment. SA-S2 would achieve RAOs by using a presumptive remedy and technologies that reduce COC concentrations in the site source area vadose zone. For the site source area groundwater alternatives, only SA-GW2 would provide varying degrees of protection over time for the environment and future public health protection, so the local groundwater aquifer could be used as a potential future drinking water supply.

2. Compliance with ARARs

The "no action" alternatives SA-S1 and SA-GW1 do not comply with ARARs. Alternative SA-S1 relies on natural environmental degradation processes to reduce COC concentrations in site source area soil and soil vapor. Because sufficient destructive natural attenuation processes have not been observed at the site, there is no evidence that these alternatives could achieve ARARs. For site source area soil, alternative SA-S2 SVE complies with ARARs through removal of COCs from the vadose zone and utilization of granular activated carbon as an emission control prior to atmospheric discharge. The disposal or regeneration of the spent carbon media at an off-site facility effectively removes the COCs from the community and avoids transfer of COCs to another medium. For site source area groundwater alternative (SA-GW2), an *in-situ* groundwater treatment barrier at the hot-spot would be implemented to meet the identified ARARs.

Since Alternative SA-S1 and SA-GW1 do not meet the threshold criteria, these alternatives are not carried forward for comparison with the remaining seven criteria.

In accordance with the NCP (40 CFR 300.430(f)(l)(ii)(C)(l), interim actions such as this are not required to comply with ARARs as long as the final remedial action at the Site will attain them. However, EPA expects that SVE and in-situ bio treatment barrier will comply with those federal and state requirements that are applicable or relevant and appropriate to the limited scope of this interim action.

Primary Balancing Criteria

3. Long-term Effectiveness and Permanence

Site source area soil alternative SA-S2 (soil vapor extraction) is a presumptive remedy and is proven technology for removal of TCE and other COCs from the vadose zone.

Site source area groundwater alternative SA-GW2 (*in-situ* groundwater treatment barrier) is expected to achieve long term protectiveness and permanence by reducing COC concentrations in the groundwater. There is potential for residual contamination to remain. Alternative SA-GW2 would target specific areas of the groundwater plume core.

4. Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment.

Alternative SA-S2 would reduce the mobility and volume of the contaminants at the site source area through the extraction of VOCs from the unsaturated zone between the water table and the ground surface. The extracted vapors would be captured and removed from the site using granular activated carbon units that are transported to permitted off-site disposal facilities.

Site source area groundwater alternative SA-GW2 would reduce the concentrations of COCs in the site source area groundwater through treatment.

5. Short-term Effectiveness.

Alternatives SA-S2 and SA-GW2 will subject the local community and site workers to short-term risks during the construction phase. Construction traffic may increase the risk of vehicular accidents. However, adequate planning and compliance with safe work practices will mitigate these risks. Workers will face potential exposure to contaminated media during construction, operation, and maintenance. Compliance with a site-specific health and safety plan will mitigate these risks. Wastes produced during installation of the SVE and the in-situ groundwater treatment barrier systems include drill cuttings from the well and boring installation and water used to decontaminate the equipment. Wastes generated by the SVE system operation include the spent GAC media and water collected in the knockout drum that are transported for off-site disposal. Mobilization, installation, and start-up of alternative SA-S2 should be accomplished within 12 to 18 months and within 8 to 12 months for alternative SA-GW2.

6. Implementability.

Alternative SA-S2 can be implemented with existing technology and services that are commercially available and have been used at numerous contaminated sites with the same chlorinated VOCs. An SVE treatability field-scale study was conducted to test and evaluate use of SVE as a viable remediation technology that could rapidly reduce soil contamination at the site source area. The results of the treatability pilot-study indicated that SVE is a practicable technology that would reduce vapor-forming contaminants from the soil at the site source area. Alternative SA-S2 would require temporary facilities (sewer and power supply) accommodations and selection of a location to set up and secure the SVE unit operations.

Site source area groundwater alternative SA-GW2 is also readily implementable. Alternative SA-GW2, requires drilling of soil boreholes, emplacement of activated carbon and zero-valent iron slurry; these construction activities pose the greatest technical challenge. There are very few vendors who have the necessary expert bioremediation experience, and this could increase costs and overall implementation schedule.

7. Cost.

Alternative SA-S2 (SVE) has an estimated present worth cost of $3.75 million. Alternative SA-GW2 has an estimated present worth cost estimated at $3.0 million.

Modifying Criteria

8. State/Support Agency Acceptance

The State of Texas, through the Texas Commission on Environmental Quality, as the support agency, has been an active participant in the review and approval of important site documents, including the FFS reports, and in the development and evaluation of remedial alternatives. The State of Texas has provided its support of the Proposed Plan pending public comments in the selection of the Preferred Alternative.

9. Community Acceptance.

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the Interim Record of Decision for the site source area.

Summary of the Preferred Alternative

Alternative SA-S2 (Soil Vapor Extraction) and SA-GW2 (In-Situ Groundwater Treatment Barrier) are the preferred alternatives to address TCE and other VOC contaminants in the vadose zone soil and groundwater in the site source area. The use of SVE is a presumptive remedy for VOCs in soils for the effective reduction in the mobility and volume of contaminants. The in-situ groundwater treatment barrier will reduce VOC contaminants in the site source area groundwater. These preferred alternatives are consistent with a site-wide cleanup strategy that targets the site source area reduction and treatment because long-term aquifer restoration cannot begin until the source is removed or controlled. The preferred alternatives satisfy the statutory mandate for permanence and treatment to the maximum extent practicable. The preferred alternatives can change in response to comments received during the public meeting or written comments received during the public comment period.

Based on information currently available, EPA believes the early interim remedial action meets the threshold criteria and provides the best balance of tradeoffs with respect to the balancing and modifying criteria. The EPA expects the preferred alternatives to satisfy the following statutory requirements of CERCLA Section § 121(b), 42 U.S.C. § 9621(b): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element.

COMMUNITY PARTICIPATION

EPA and TCEQ will provide information regarding the interim cleanup of the Delfasco Forge Superfund Site to the public through information sessions, bilingual handouts, public meetings, fact sheets posted on the EPA Region 6 website at http://www.epa.gov/region6/r6sf.htm, the Administrative Record File for the site, and through announcements published in the Grand Prairie Daily Herald-Tribune. The EPA and TCEQ encourage the public to gain a more comprehensive understanding of the site and the Superfund activities that have been completed at the site source area. The dates for the public comment period, the date,

location and time of the public meeting, and the locations of the Administrative Record files, are provided on the pages 2 and 3 of this Proposed Plan.

GLOSSARY OF ACRONYMS

Acronym	Definitions
ARARs	Applicable or Relevant and Appropriate Requirements
BTEX	Benzene, toluene, ethylbenzene, and xylenes
COCs	Contaminant of Concern
ELCR	Excess Lifetime Cancer Risk
EPA	The Environmental Protection Agency
FS	Feasibility Study
FFS	Focused Feasibility Study
GAC	Granular Activated Carbon
MCLs	Maximum Contaminant Levels
NPL	National Priorities List
O&M	Operation and Maintenance
PCE	Tetrachloroethylene (aka perchloroethylene or perc)
PRGs	Preliminary Remediation Goals
RAOs	Remedial Action Objectives
RI	Remedial Investigation
ROD	Record of Decision
SVE	Soil Vapor Extraction
TCE	Trichloroethylene
VOCs	Volatile Organic Compound

GLOSSARY OF TERMS

Administrative Record – All documents which the Environmental Protection Agency considered or relied upon in selecting the response action at a Superfund site, culminating in the Interim Record of Decision for a Remedial Action.

Aquifer - An underground geological formation, or group of formations, containing water that is a source of water for private and public water supply wells.

Applicable or Relevant and Appropriate Requirements (ARARs) – The federal and State environmental laws that a selected remedy will meet. These requirements may vary among sites and alternatives.

Baseline Human Health Risk Assessment – A formal risk assessment conducted as part of the Remedial Investigation according to EPA-prescribed procedures. The need for ultimate remedial action at a site is established in part on the results of the baseline risk assessment.

Carcinogen – Capable of causing the cells of an organism to react in a manner to produce cancer.

Chlorinated Solvents – An organic hydrocarbon in which chlorine atoms substitute for one or more hydrogen atoms in the compound's structure, for example, trichloroethene.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) – Also known as Superfund. The Comprehensive Environmental Response, Compensation, and Liability Act is a Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. Under the Comprehensive Environmental Response, Compensation, and Liability Act, the Environmental Protection Agency can either pay for the site cleanup or take legal action to force parties responsible for site contamination to clean up the Site or pay back the Federal government for the cost of the cleanup.

Contaminant Plume – A zone of contamination with measurable horizontal and vertical dimensions that is suspended in and moves with ground water.

Contaminants of Concern (COCs) – Those chemicals that are identified as a potential threat to human health or the environment and need to be addressed by the response action proposed in the Interim Record of Decision.

Daughter Products – Isotopes that are formed by the decay or degredation of some other isotope

Groundwater – Underground water that fills pores in soils or openings in rocks to the point of saturation. Ground water is often used as a source of drinking water via municipal or domestic wells.

Groundwater Monitoring – Ongoing collection of ground water information about the environment that helps gauge the effectiveness of a cleanup action.

GLOSSARY OF TERMS (Continued)

Human Health Risk Assessment – Estimates the current and possible future risk if no action were taken to clean up a site. The Environmental Protection Agency's Superfund risk assessors determine how threatening a hazardous waste site is to human health and the environment. They seek to determine a safe level for each potentially dangerous contaminant present (e.g., a level at which ill health effects are unlikely and the probability of cancer is very small). Living near a Superfund site doesn't automatically place a person at risk; that depends on the chemicals present and how a person is exposed to the chemical.

Interim Record of Decision (IROD) – A public document describing EPA's rationale for selection of a Superfund response action.

Maximum Contaminant Levels (MCLs) – Standards that are set by the EPA for drinking water quality under the Safe Drinking Water Act.

Microgram per Liter (µg/L) - A unit of measurement equivalent to one microgram of contaminant per liter of water or approximately one part per billion.

Milligrams per Liter (mg/L) – Is a measurement of concentration used to measure how many milligrams of a contaminant are present in one liter of water. One mg/L is equal to 1000 micrograms per liter (µg/L).

National Contingency Plan (NCP) – The National Oil and Hazardous Substances Pollution Contingency Plan is composed of the federal regulations that guide the Superfund program.

National Priorities List (NPL) – EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under Superfund. A site must be on the NPL to receive money from the Trust Fund for remedial action.

Natural Attenuation – The processes in soil and ground water environments that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentrations of contaminants in those media. These in-situ processes include biodegradation, dispersion, dilution, adsorption, volatilization, and chemical or biological stabilization or destruction of contaminants.

Preliminary Remediation Goals (PRGs) – Concentration levels set for individual chemicals that, for carcinogens, corresponds to a specific cancer risk level of 1 in 1 million and for non-carcinogens corresponds to a Hazardous Quotient of 1.

Present Worth Cost – A method of evaluation of expenditures that occur over different time periods. By discounting all costs to a common base year (using a 4% discount rate), the costs for different remedial action alternatives can be compared on the basis of a single figure for each alternative. When calculating present worth cost for Superfund sites, total operation & maintenance costs are to be included.

GLOSSARY OF TERMS (Continued)

Remedial Action Objectives (RAOs) – Objectives established for CERCLA remedial actions that define the extent to which sites require cleanup to meet the objective of protecting human health and the environment.

Remedial Investigation – The collection and assessment of data to determine the nature and extent of contamination at a site.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) – The NCP is the federal government's blueprint for responding to both oil spills and hazardous substances releases.

Principal threat wastes – Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

Record of Decision (ROD) – A formal document that is a consolidated source of information about a Superfund site, the remedy selection process, and the selected remedy.

Remedial Action – Action(s) taken to correct or remediate contamination.

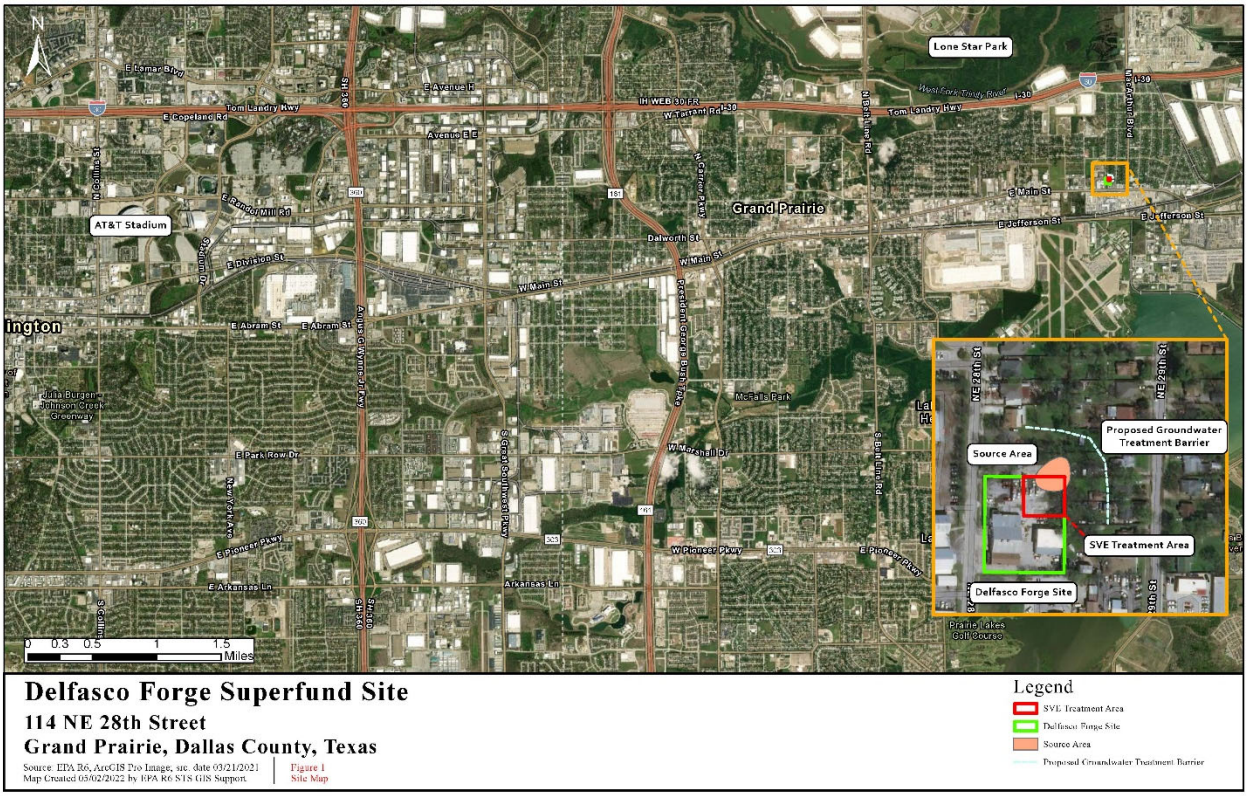
Remedial Action Objectives (RAOs) – Remediation objectives for protection of human health and the environment.

Resource Conservation and Recovery Act (RCRA) – The Federal act that established a regulatory system to track hazardous wastes from the time they are generated to their final disposal. RCRA also provides for safe hazardous waste management practices and imposes standards for transporting, treating, storing, and disposing of hazardous waste.

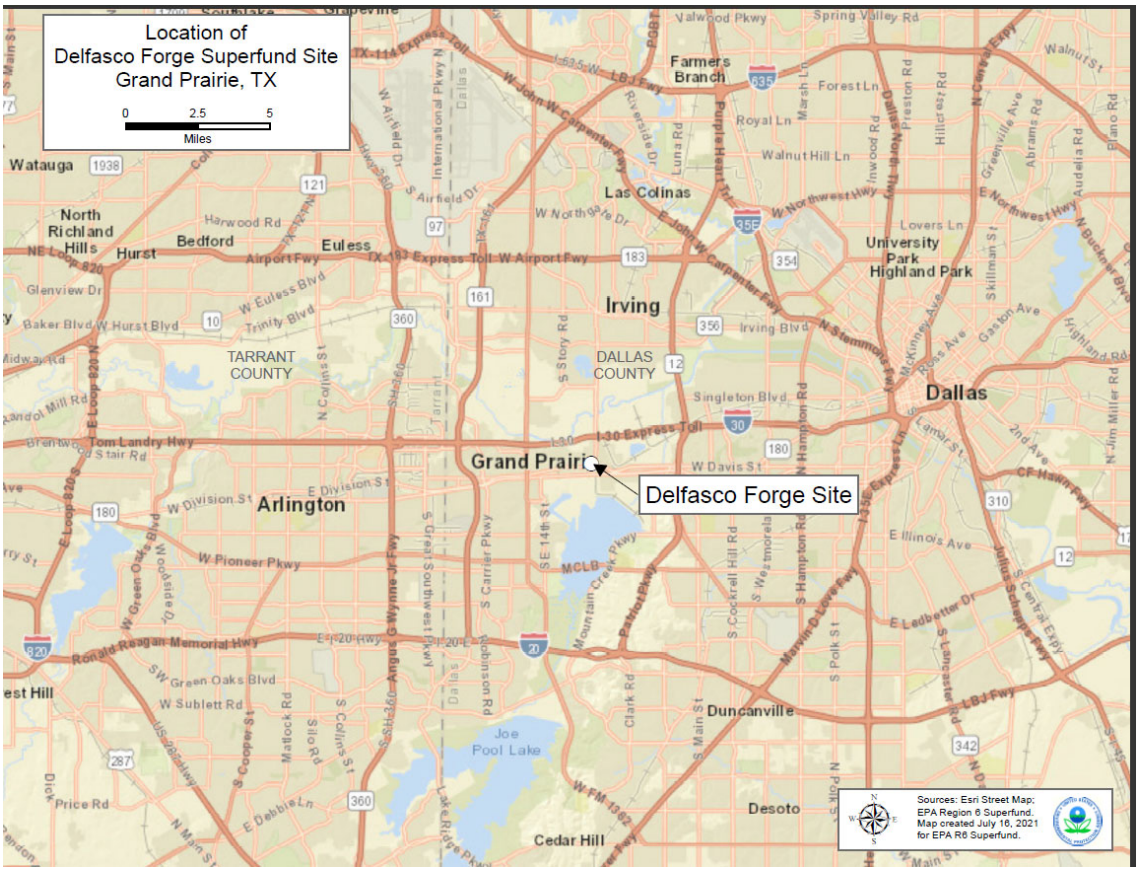
Soil Vapor Extraction (SVE) – A treatment process that applies a vacuum to wells screened in the vadose zone (unsaturated) soils for recovery of volatile organic contaminants (VOCs).

Superfund – The common name for the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), the federal law that mandates cleanup of hazardous waste sites.

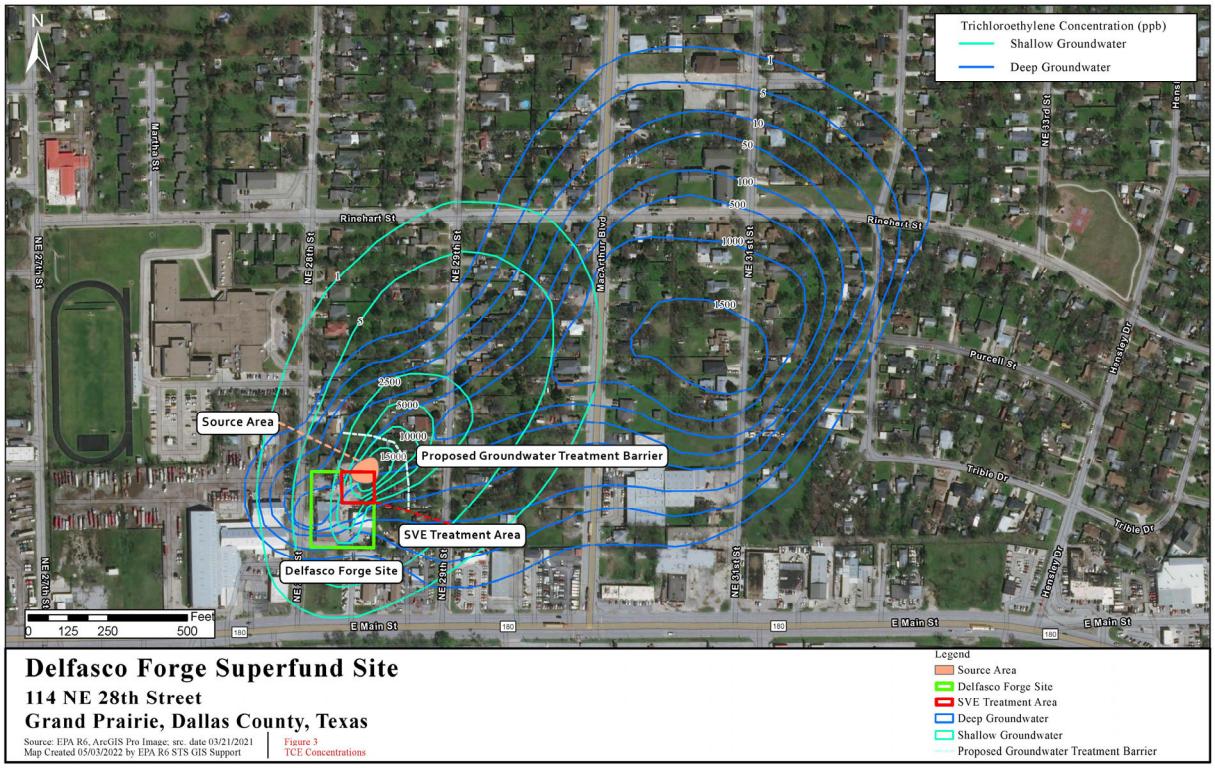
Delfasco Forge Proposed Plan Figures:



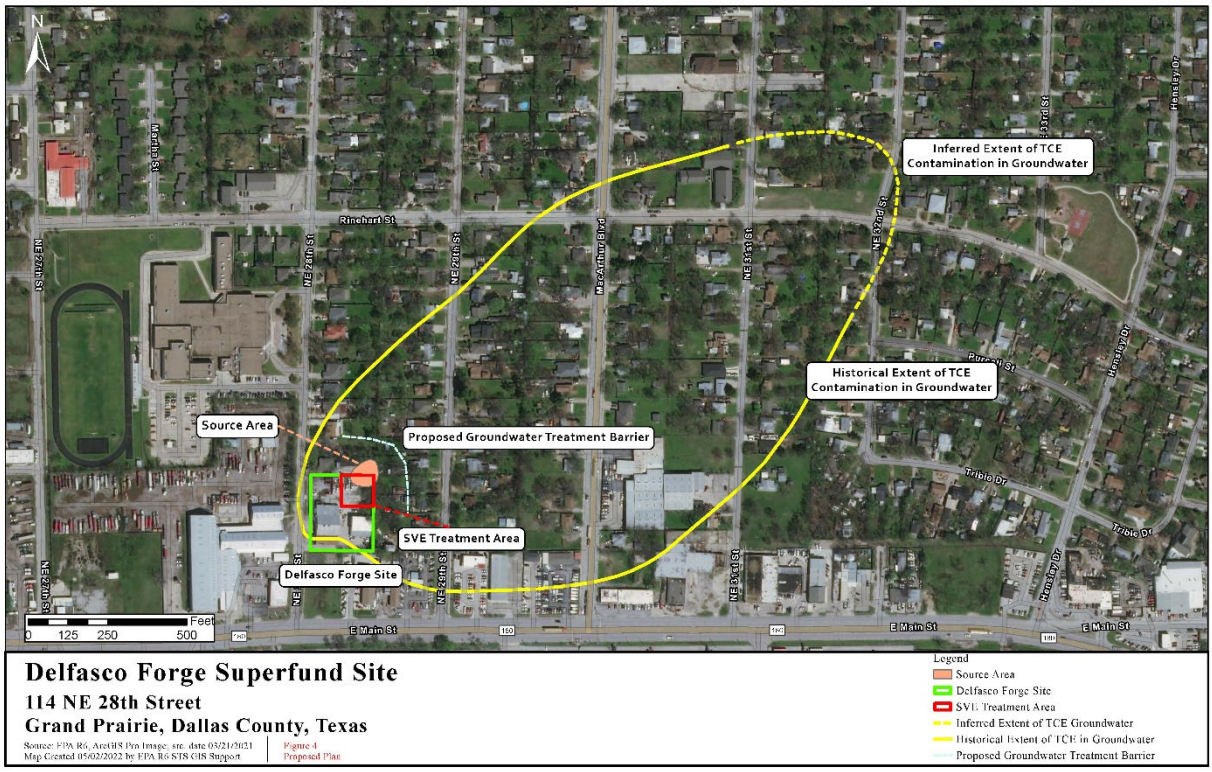
Delfasco Forge Proposed Plan Figure 1



Delfasco Forge Proposed Plan Figure 2



Delfasco Forge Proposed Plan Figure 3



Delfasco Forge Proposed Plan Figure 4

Delfasco Forge Proposed Plan Figure 5