SECOND FIVE-YEAR REVIEW REPORT FOR GRIGGS AND WALNUT GROUND WATER PLUME SUPERFUND SITE LAS CRUCES, DOÑA ANA COUNTY, NEW MEXICO

August 2021

Prepared by

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

This page is intentially left blank

SECOND FIVE-YEAR REVIEW REPORT
GRIGGS AND WALNUT GROUND WATER PLUME SUPERFUND SITE
EPA ID#: NMD0002271286
DOÑA ANA COUNTY, NEW MEXICO

This memorandum documents the U.S. Environmental Protection Agency's (EPA's) performance, determinations, and approval of the Griggs and Walnut Ground Water Plume Superfund Site (Site) second five-year review (FYR) under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S. Code § 9621(c), as provided in the attached Second Five-Year Review Report (FYR Report).

Summary of the Second Five-Year Review Report

The Site consists of a ground water plume contaminated with dissolved perchloroethylene (PCE). The dissolved PCE plume was measured at an estimated 1.8 miles long by 0.5 miles wide and located within the City of Las Cruces (CLC), New Mexico. Perchloroethylene contamination has been detected in ground water at depths ranging from more than 100 ft. to 650 ft. below ground surface (bgs). The PCE contamination impacted several CLC municipal water supply wells.

The Site was proposed to the National Priorities List (NPL) of Superfund sites on January 11, 2001, to address contaminated ground water. Final listing was on June 14, 2001. EPA issued the Record of Decision (ROD) for the remedy on June 19, 2007, selecting enhanced ground water extraction (pumping) with treatment of extracted ground water to remove PCE. The ROD estimated a period of 14 years to clean up the Site ground water. The City of Las Cruces and Doña Ana County are implementing the remedy as a Joint Superfund Project (JSP) and hereinafter are jointly referred to as the JSP.

The remedy utilizes the water production capacity of two rehabilitated and modified municipal water supply wells and existing infrastructure to deliver treated ground water into the public water supply. The water treatment plant consists of two parallel stacked-tray air strippers. The remedy is supported by institutional controls for the temporary moratorium on new well permits within the area of ground water contamination and a long-term monitoring program. Construction of the remedy began in September 2011 and was completed in April 2012. The ground water extraction and treatment system has been operating since April 2012, with no major down-times.

The most recent Site visit was conducted on September 26, 2019 by EPA and New Mexico Environment Department (NMED) representatives. In review of the most recent annual report (dated April 2020), the remedial system was found to be operating efficiently. During the second FYR period, the JSP adjusted the extraction wells pumping rates in accordance with optimization recommendations made by EPA, in order to achieve higher PCE mass removal. The JSP also ceased pumping of other municipal water supply wells within the plume that are not part of the Site ground water extraction system.

In review of annual reports and the preparation of time-series plots of PCE concentrations versus time for the pumping wells, it was determined that the remedy is effective at extracting and treating contaminated ground water. Since 2012, over 875 million gallons of ground water have been extracted for treatment, and over 86 pounds of PCE mass have been removed from the extracted water.

In 2019, the JSP notified EPA and the NMED that the integrity of the casing liners of the seven deep, multi-port ground water monitoring wells had failed and needed to be replaced. The multi-port monitoring wells were constructed during the remedial investigation phase of the project in the early 2000s, using the Flexible Liner Underground Technology (FLUTe) liner system. The JSP also indicated that the timing of the failure was not known and that the last several years of ground water monitoring data collected from the FLUTe wells were likely unreliable. The EPA subsequently approved the replacement of the multi-port monitoring wells in 2020. The JSP completed the construction of the new wells in April 2021. The JSP is currently collecting new ground water samples from the entire monitoring well network, included the newly constructed monitoring wells.

In light of the compromised FLUTe well liners, the ground water data collected from the seven multi-port monitoring wells over a period from 2016 to 2019 were rejected, and the FLUTe wells were not sampled during the January 2020 monitoring event. Since the FLUTe wells represent a significant component of the ground water monitoring well network for the Site, there is insufficient data for a complete review and assessment of the current state of hydraulic containment and remediation of the PCE plume during this second FYR period.

In the first FYR report, dated 2016, a protectiveness determination could not be made until additional sampling was conducted to assess potential indoor air vapor intrusion. In addition, EPA recommended a supplemental remedial investigation (RI), focused on reassessing the potential for PCE vapors to intrude into residences at concentrations that may pose a health risk. During this second FYR period, the EPA completed the focused RI, including a focused human health risk assessment, for the indoor air vapor intrusion (VI) exposure pathway and documented the results in a Focused RI Report, dated September 2020. The VI investigation consisted of an initial phase (Phase 1) of investigation for sampling exterior soil vapors, followed by a second phase (Phase 2) of investigation for sampling indoor air/sub-slab air at residences. The Phase 1 results showed the presence of PCE in exterior soil vapors at concentrations above EPA's soil vapor intrusion screening level for PCE. The exceedance of the soil vapor intrusion screening level triggered indoor air/sub-slab soil vapor sampling at the residences. Ten residences were targeted for indoor air sampling. These residential locations were targeted for indoor air sampling based on exceedance of the soil vapor intrusion results. However, only five were sampled due to an inability to obtain access agreements from the home owners. The PCE concentrations measured in the sub-slab soil vapor samples at the residences exceeded the screening level. However, the PCE concentrations detected in the indoor air samples were below EPA's health-based screening levels for indoor air. The EPA human health risk assessment showed that the PCE concentrations in exterior soil vapor, and indoor air/sub-slab air presented no risk above EPA's acceptable cancer risk range or NMED's threshold cancer risk level. The non-cancer risk levels were also below EPA's threshold value of 1. Based on these findings, EPA determined that no mitigation efforts were warranted for indoor air vapors.

EPA evaluated data, including the Focused RI Report (2020) and determined the remedy at the Griggs and Walnut Ground Water Plume Superfund site currently protects human health and the environment in the short term. There is no known exposure to contaminated ground water, and an institutional control is in place that restricts permitting of new ground water wells over the area of the contaminant plume while remediation is ongoing. The institutional control limits exposure to contaminated ground water. Additionally, there are no known contaminant vapors present in indoor air at concentrations above EPA's health-based screening levels that would pose an unacceptable human health risk. EPA has determined the remedy to be protective in the short-term because there is no known adverse human health exposures, while the report further specifies additional actions that must be taken for the site to be protective in the long term.

As part of this FYR, Government Performance and Results Act Measures have also been reviewed. The measures and their status are as follows:

Environmental Indicators

Human Exposure Status: Under Control.

Contaminanted Ground Water Migration Status: Under Control.

Site-Wide Ready for Anticipated Reuse: Yes.

Actions Needed

The following actions must be taken for the remedy to be protective in the long term:

- Perform a site-wide ground water sampling event inclusive of the newly converted and co-located conventional monitoring wells, to determine the current state of hydraulic containment and remediation of the PCE plume.
- Assess and, if needed, adjust the pumping rate of the extraction wells for optimized remedy performance.
- Perform additional indoor air/sub-slab soil vapor sampling at the ten previous residences targeted for sampling, and other nearby residences, if exterior soil gas samples continue to exceed the Vapor Intrusion Screening Level for soil gas concentrations, to verify that future intrusion of contaminant vapors at unsafe concentrations does not arise due to changing conditions of building foundations or potential temporal or spatial variability of indoor air quality or soil vapor concentrations. The indoor air/sub-slab sampling is contingent upon EPA obtaining access agreements from property owners.

Determination

I have determined that the remedy at the Griggs and Walnut Ground Water Plume Superfund site is protective in the short term. The remedy currently protects human health and the environment because there is no known exposure to contaminated ground water, and an institutional control is in place that restricts permitting of new ground water wells over the area of the contaminant plume while remediation is ongoing. The institutional control limits exposure to contaminated ground water. Additionally, there are no known contaminant vapors present in indoor air at concentrations above EPA's health-based screening levels that would pose an unacceptable human health risk. For the remedy to be protective in the long-term, this five-year review report specifies the actions that need to be taken.

WREN STENGER

Digitally signed by WREN STENGER
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=WREN STENGER, 0.9.2342.19200300.100.1.1=68001003651787
Date: 2021.08.11 15:00:36 -05'00'

Wren Stenger
Director, Superfund and Emergency Management Division
U.S. Environmental Protection Agency Region 6

CONCURRENCES

SECOND FIVE-YEAR REVIEW REPORT
GRIGGS AND WALNUT GROUND WATER PLUME SUPERFUND SITE
EPA ID#: NMD0002271286
DOÑA ANA COUNTY, NEW MEXICO

NANCY NGOC HANNA

Digitally signed by NANCY NGOC HANNA
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=NANCY NGOC HANNA, 0.9.2342.19200300.100.1.1=68001003655648
Date: 2021.07.26 17:32:57 -05'00'

Nancy Hanna
Remedial Project Manager

BLAKE ATKINS

Digitally signed by BLAKE ATKINS
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=BLAKE ATKINS, 0.9.2342.19200300.100.1.1=68001003652741
Date: 2021.07.28 10:10:56 -05'00'

Blake Atkins
Chief, Louisiana, New Mexico and Oklahoma Section

JOHN MEYER

Digitally signed by JOHN MEYER
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=JOHN MEYER, 0.9.2342.19200300.100.1.1=68001003655626
Date: 2021.07.28 17:00:24 -05'00'

John C. Meyer
Chief, Superfund Remedial Branch

AMY SALINAS

Digitally signed by AMY SALINAS
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=AMY SALINAS, 0.9.2342.19200300.100.1.1=68001003655531
Date: 2021.08.05 08:59:16 -05'00'

Amy Salinas
Attorney, Office of Regional Counsel

I-JUNG CHIANG

Digitally signed by I-JUNG CHIANG
DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=I-JUNG CHIANG, 0.9.2342.19200300.100.1.1=68001003655489
Date: 2021.08.10 20:50:54 -05'00'

I-Jung Chiang
Chief, Superfund Branch, Office of Regional Counsel

ISSUES/RECOMMENDATIONS

SECOND FIVE-YEAR REVIEW REPORT
GRIGGS AND WALNUT GROUND WATER PLUME SUPERFUND SITE
EPA ID#: NMD0002271286
DOÑA ANA COUNTY, NEW MEXICO

Issues/Recommendations				
Issues/Recommendations Identified in the Five-Year Review:				
OU(s):	**Issue Category: Monitoring**			
	Issue: The liner integrity of all seven FLUTe multi-port monitoring wells at the Site has been compromised. As a result, the ground water monitoring data collected in 2018 from the multi-port wells were rejected and the wells were not sampled in 2019. The only other ground water sampling event during this FYR period was in 2016, and the reliability of these data are in question due to the uncertain timing of liner failure in the multi-port wells.			
	Recommendation: Conduct a site-wide ground water sampling event inclusive of the newly converted and co-located conventional monitoring wells to determine the current state of hydraulic containment and remediation of the PCE ground water plume.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	5/31/2024

Issues/Recommendations				
Issues/Recommendations Identified in the Five-Year Review:				
OU(s):	**Issue Category: Remedy Performance**			
	Issue: Because of the lack of reliable ground water monitoring data from the FLUTe multi-port monitoring wells for the last few years, the current PCE plume extent and mass are not defined, and it is uncertain whether both extraction wells' pumping rates are operating efficiently for plume containment, capture, and clean-up.			
	Recommendation: Assess and, if needed, adjust the pumping rates of the extraction wells, or install additional extraction wells for optimized remedy performance.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	5/31/2023

Issues/Recommendations				
Issues/Recommendations Identified in the Five-Year Review:				
OU(s):	**Issue Category: Other**			
	Issue: The indoor air vapor intrusion Focused RI and Focused BHHRA conducted by EPA from 2017 through 2019 at residential structures determined that exposure to PCE and daughter products via the indoor air vapor intrusion exposure pathway posed no unacceptable health risk. However, only four of the ten residences targeted for indoor air/sub-slab sampling were sampled, because access agreements could not be obtained from the other homeowners who refused to allow the sampling. One additional residence located outside of the targeted zone was sampled at the request of the home owner. Based on the sampling results, EPA concluded that there was a fairly high level of confidence that PCE levels in the untested homes, if present, would similarly not exceed the health-based indoor air VISLs for a residence, assuming relatively unattenuated or enhanced transport of vapors into a residence was not occurring. Prudently, indoor air sampling will be repeated at the targeted residential locations until the sub-slab soil gas concentrations drop below the VISLs for soil gas. Additional residential indoor air/sub-slab soil vapor sampling should be conducted in the future to verify that potential future intrusion of contaminant vapors at unsafe concentrations does not arise due to the following factors: 1) changing conditions of building foundations, 2) the potential temporal and spatial variability of indoor air quality or soil vapor concentrations, and 3) the presence of Site COCs in sub slab soil vapors above the target sub-slab vapor screening levels.			
	Recommendation: Perform additional indoor air/sub-slab soil vapor sampling at the ten previous residences targeted for sampling, and other nearby residences, if exterior soil gas samples continue to exceed the Vapor Intrusion Screening Level for soil gas concentrations. Potential sampling initiated due to VISL exceedances will be conducted in order to verify that future intrusion of contaminant vapors at unsafe concentrations does not arise due to changing conditions of building foundations or potential temporal or spatial variability of indoor air quality or soil vapor concentrations. The indoor air/sub-slab sampling is contingent upon EPA obtaining access agreements from property owners, and the indoor air/sub-slab sampling will be performed if exterior soil gas samples continue to exceed the Vapor Intrusion Screening Level for soil gas concentrations.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	5/31/2025

OTHER FINDINGS

In addition, the following recommendation is made that does not affect current or future protectiveness:

- NMED and EPA were unable to perform a Site inspection for the second FYR due to travel restrictions associated with the COVID-19 pandemic. A Site inspection should be performed once conditions associated with the COVID-19 pandemic allow for safe travel to and from the Site. Results of the Site inspection should be detailed in the next FYR report (the Third FYR report) along with a completed Site inspection checklist.

Table of Contents

LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
BHHRA	Baseline Human Health Risk Assessment
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLC	City of Las Cruces
DACTD	Doña Ana County Transportation Department
DBS&A	JSP's (see below) consultant, Daniel B. Stephens and Associates
DWB	New Mexico Environment Department Drinking Water Bureau
EPA	United States Environmental Protection Agency
FLUTe	Flexible Liner Underground Technology
FYR	Five-Year Review
gpm	Gallons per minute
HRS	Hazard Ranking System
ICs	Institutional Controls
ICIAP	Institutional Control Implementation and Assurance Plan
JEM	Johnson and Ettinger Model
JSAI	John Shoemaker & Associates, Inc., environmental contractor for the JSP
JSP	Joint Superfund Project whereby Doña Ana County and City of Las Cruces have combined efforts to address ground water contamination at the Griggs and Walnut Ground Water Plume Superfund Site
LHZ	Lower Hydrogeologic Zone
MCLs	Maximum Contaminant Levels
NMED	New Mexico Environment Department
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300
NPL	National Priorities List
O&M	Operation and Maintenance
OSE	New Mexico Office of the State Engineer
OSWER	Office of Solid Waste and Emergency Response
ppbv	parts per billion by volume
PRP	Potentially Responsible Party
RA SAP	Remedial Action Sampling and Analysis Plan
RAO	Remedial Action Objectives
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
SDWIS	NMED (see above) Drinking Water Bureau Safe Drinking Water Information System
SOS	NMED Superfund Oversight Section
SOW	Statement of Work
TBC	To be considered
UAO	Unilateral Administrative Order
UHZ	Upper Hydrogeologic Zone
UU/UE	Unlimited Use/Unrestricted Exposure
µg/L	Micrograms per liter
$\mu g/m^3$	Micrograms per cubic meter
VISL	Vapor Intrusion Screening Level

I. INTRODUCTION

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

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

This is the second FYR for the Griggs and Walnut Ground Water Plume Superfund Site (hereinafter the "Site"). The triggering action for this statutory review is the completion date of the previous FYR. The second FYR has been performed due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of a single operable unit to address a ground water plume contaminated with dissolved tetrachloroethene (also known as perchloroethylene or "PCE"), a volatile organic compound (VOC). The objective of the remedy is to reduce the concentrations of PCE in ground water to the Federal Safe Drinking Water Act (SDWA) maximum contaminant level (MCL) for PCE, which is 5 micrograms per liter (µg/L).

The Site FYR was led by Ms. Nancy Hanna, EPA Region 6, Remedial Project Manager (RPM) and Mr. Anthony McGlown, New Mexico Environment Department (NMED) Superfund Oversight Section (SOS). Participants included the City of Las Cruces (CLC or City) Utilities Water Resources Administrator and Operations Manager and the CLC Utilities Remedial Design/Remedial Action (RD/RA) consultant. The CLC Utilities Water Resources Administrator was notified of the initiation of the FYR. The review began on August 31, 2020.

Appendix A is a reference list of the documents that were reviewed for the compilation of this report. Site maps and figures are provided in Appendix B. A Site chronology table is provided in Appendix C. The table highlights the significant events and dates that occurred at the Site regarding the CERCLA process from initial discovery to the present.

Site Background

The Site is located in the City of Las Cruces, Doña Ana County, New Mexico (Appendix B, Figure 1). The Site is located within the Mesilla Basin (also known as Mesilla Bolson, a closed intermontane basin). The Rio Grande flood plain alluvium (Quaternary) and the Santa Fe Group alluvial fan deposits (Miocene to Middle Pleistocene age) comprise the two major aquifers in the Mesilla Basin, with the two aquifers forming a complex aquifer system. Ground water occurs under

unconfined conditions within the flood plain alluvium and under unconfined to semi-confined conditions within the Santa Fe Group. Ground water flow within the basin is generally to the southeast. The Site-related PCE contamination is present in the ground water at depths generally ranging from more than 100 ft. bgs to 650 ft. bgs. The ground surface elevation across the Site ranges from 3,980 feet to 4,090 feet above mean sea level (amsl).

At the time of the Remedial Investigation (RI), which was completed in 2005, the geographical extent of dissolved PCE contamination in the ground water was estimated to be approximately 1.8 miles long by 0.5 miles wide, located generally between East Griggs Avenue and East Hadley Avenue, extending east to beyond Interstate 25 (I-25) and west to beyond North Solano Avenue. Land use at and near the Site is characterized by a broad mix of commercial, public recreational, light industrial, and residential.

As early as 1993, PCE was detected in ground water at a depth of approximately 190 feet below ground surface (bgs), affecting the local municipal water supply to a depth of approximately 650 feet bgs. Five municipal water supply wells (CLC Wells 18, 19, 21, 24 and 27) have been affected by PCE contamination associated with the Site (Appendix B, Figure 1). Based on review of the New Mexico Office of the State Engineer (OSE) Water Rights Reporting System database (i.e., well permit records) and the NMED Drinking Water Bureau (DWB) Safe Drinking Water Information System (SDWIS) database, a broad estimate of 102,000 people may be served by public water supply and private/domestic wells within a 4-mile radius of the Site.

Based on soil vapor survey data collected during the RI, three sources of PCE contamination were identified at the Site. Elevated concentrations of PCE in soil vapor were found at the former location of the Crawford Municipal Airport, at the present location of the Doña Ana County Transportation Department (DACTD) maintenance facility, and near the former location of a National Guard Armory (Appendix B, Figure 2).

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Griggs and Walnut Ground Water Plume		
EPA ID: NMD0002271286		
Region: 6	**State:** NM	**City/County:** Las Cruces/ Doña Ana County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	

REVIEW STATUS
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**
Author name (Federal or State Project Manager): Nancy Hanna (EPA-RPM)
Author affiliation: U.S. Environmental Protection Agency, Region 6
Review period: 9/28/2016 – 9/28/2021
Date of site inspection: N/A
Type of review: Statutory
Review number: 2
Triggering action date: 9/28/2016
Due date *(five years after triggering action date)*: 9/28/2021

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The Site affects the sole source drinking water aquifer and the public water supply for the CLC, which must be protected and kept from further contamination.

In conjunction with the Remedial Investigation (RI), a Baseline Human Health Risk Assessment (BHHRA) was completed in 2006. The BHHRA estimated what human health risks the Site contamination would have posed if no action were taken. It provides the basis for taking a remedial action at this Site and identifies the contaminants and exposure pathways that need to be addressed by the action. The BHHRA identified the contaminant of concern (COC) as PCE, assessed exposure and toxicity related to this COC, and characterized the human-health risk at the Site.

Two complete exposure pathways exist for the contaminant of concern: 1) ingestion by way of consuming PCE-affected ground water, and 2) inhalation exposure pathway from soil vapor (by way of indoor vapor intrusion).

Ground Water Contamination

Based on the findings of the RI and BHHRA, the primary contaminant identified in ground water at the Site is PCE. PCE was detected in ground water at depths ranging from approximately 190 to 650 feet bgs and impacts were identified to the local municipal water supply wells (Appendix B, Figure 3). PCE degradation products (trichloroethene (TCE), cis-1,2 dichloroethene (DCE), and trans-1,2, DCE) have been detected within the PCE plume boundary, but no remediation goal was established, because their concentrations remain below their respective MCLs and because the aquifer conditions were evaluated and determined not to be conducive to natural attenuation of PCE.

Vapor Intrusion

While a complete PCE inhalaton exposure pathway from soil vapor exists, the 2006 BHHRA concluded that Site-specific risk values related to the vapor intrusion pathway ranging from 1×10^{-5} to 4×10^{-5} were within the 1×10^{-4} (one per ten thousand) to 1×10^{-6} (one per million) excess lifetime cancer risk range, established by EPA as protective of human health for the VI exposure pathway, and no further action to address VI was required in the ROD.[1]

Response Actions

EPA proposed the Site for placement on the NPL on January 11, 2001, and the Site was finalized on the NPL on June 14, 2001. EPA initiated the RI/FS, which was completed in November 2006.

The EPA signed a Settlement Agreement with the City and Doña Ana County (DAC or County) on April 20, 2005, while the RI/FS was being conducted. This agreement addressed the completion of the RI/FS at the Site. The City and County formed the Joint Superfund Project (JSP) to facilitate their participation in the remedial process.

The EPA formed a Technical Work Group with NMED and the JSP to provide a forum for stakeholders to participate in the completion of the RI/FS and to provide input related to stakeholder needs. In addition to supporting and assisting field data collection efforts, the JSP modeled flow and transport of PCE in the ground water to refine the conceptual site model (Appendix B, Figure 4) and to support the evaluation of remedial alternatives in the FS.

The ROD for the Site was signed by EPA on June 19, 2007. The ROD documented the selected remedy for the Site as enhanced ground water extraction (pumping) with treatment of extracted ground water to remove PCE. The remediation goal for PCE selected in the ROD for ground water is presented in Table 1, below.

Table 1: Remediation Goal Selected in Record of Decision

Site Ground Water COC	National Primary Drinking Water Standards (Non-Zero MCLGs and MCLs) µg/L
PCE	5

The Remedial Action Objectives (RAOs) for ground water at the Site were established in accordance with the EPA guidance document entitled "*Presumptive Response Strategy and Ex Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, Final Guidance*" (EPA 1996).

[1] *See* Section V (Technical Assessment) Question B, below, for a more complete explanation of cancer risk, and the uncertainty inherent in the Johnson-Ettinger screening-level model.

The RAOs are provided as follows:

- Prevent human exposure to contaminated ground water above the MCL (5 μg/L) for PCE;
- Maintain capture of the PCE-contaminated ground water plume above the MCL for PCE; and
- Restore ground water to its beneficial use as a drinking water supply with PCE concentrations no greater than the MCL.

The major components of the selected remedy in the ROD are:

- Water will be pumped from municipal supply wells (CLC Wells 18 and 27, or other wells, if it is determined during RD and implementation that the use of other wells is appropriate) and treated. The preferred water treatment technology is air stripping.
- Based on ground water modeling results, it is expected that within approximately five years, one new extraction well will be necessary to continue treating and reducing the PCE concentrations to below the MCL of 5 μg/L. The new extraction well would likely replace CLC Well 18 after the first five years of operation because the fate and transport model predicts that over time, CLC Well 18 will draw more clean water than PCE affected water and consequently, it will remove contamination less efficiently. [2]
- PCE plume containment will rely on hydraulic control, and on discontinuing pumping operations at CLC wells 19, 20, 21, 24, 26, and 38, during remediation. Hydraulic control, treatment of contaminated ground water, and plume reduction will be further evaluated and refined during RD to determine the appropriate measures for implementation.
- The remedy will be supported by institutional controls (ICs), a long-term monitoring program, and annual reviews and reporting. The RAO for restoring ground water to its beneficial use as a drinking water supply is expected to be reached in approximately 14 years.

Status of Implementation

On October 15, 2009, EPA issued a unilateral administrative order (UAO) to the City and County. The UAO required the City and County to perform a RD for the Site remedy selected in the ROD.

On February 14, 2011, EPA issued another UAO to the City and County, requiring the City and County to undertake the construction of the selected remedy as designed under the first UAO. On February 14, 2011, the UAO was rescinded before its effective date, and a new UAO calling for the construction of the selected remedy was issued on May 11, 2011. Construction of the ground water extraction and treatment system began in September 2011. The City and County completed construction of the ground water extraction and treatment system described in the ROD, under the UAO, in July 2012. The EPA certified the construction to be complete and the remedy to be operational and functional in July 2012.

[2] *See* "Data Review" section, below, for a more complete discussion of Site hydrogeology and capture of the ground water contaminant plume by CLC Wells 18 and 27.

The remedy utilizes the water production capacity of two rehabilitated / modified municipal supply wells (CLC Wells 18 and 27) and existing infrastructure to deliver treated ground water into the public water supply.

The City and County have been operating the extraction and treatment system to remove PCE contamination from the ground water since August 2012. The EPA issued a third UAO, effective November 6, 2017, to address deficiencies in the JSP's evaluation of the ground water extraction and treatment system in protecting the affected aquifer. The UAO was modified after EPA met with the City and County on November 11, 2017, and EPA received written comments from legal counsel representing the City and County, dated December 11, 2017. The modified UAO became effective on December 19, 2017, and the 2017 UAO was rescinded. The modified UAO contains a Statement of Work (SOW) that specifies Pre-Achievement O&M activities (including all operation and maintenance required for the Remedial Action to achieve performance standards) and at minimum, annual reporting requirements to ensure that the operation of the extraction and treatment system is making adequate progress toward achieving the Site RAOs and RGs.

On July 16, 2020, the U.S. Department of Justice lodged a Consent Decree (CD), negotiated between the City and County (Settling Local Government Entities), EPA, and the U.S. Department of Defense and National Guard Bureau (Settling Federal Defendants), with the U.S. District Court, District of New Mexico. The CD requires the City and County to continue to perform the work set forth in the UAO SOW, as modified by the CD. The modified UAO SOW is incorporated into the CD. The State of New Mexico elected not to participate in the negotiations. On July 30, 2020, the CD was entered by the U.S. District Court as a final judgement between the EPA, the Settling Local Government Entities and the Settling Federal Defendants (Civil No. 2:17-cv-00809 JCH-GBW).

Institutional Controls

An Institutional Control Implementation and Assurance Plan (ICIAP) was prepared by the JSP in November 2011, to describe the ICs that were implemented at the Site. The ICs implemented at the Site are administrative controls that minimize the potential for human exposure to contamination by limiting water resource use (Table 2). The JSP worked with the NMED in requesting that the Office of the State Engineer (OSE) institute a temporary moratorium on the permitting of new wells within an area defined by the PCE plume, with an additional 500-foot buffer (Appendix B, Figure 5).

The OSE issued the well drilling moratorium on October 12, 2011, stating that no new wells or the transfer of water to existing wells (water injection) could occur within the designated boundaries of the PCE plume and 500-foot buffer. The moratorium specifically excludes wells installed for the purpose of remediation at the Site, and it remains in place to minimize the potential for human consumption of contaminated ground water until the RAOs are achieved.

Based on a review of the New Mexico Water Rights Reporting System (NMWRRS), no well permit applications have been filed with the OSE since the well drilling moratorium was issued on October 12, 2011.

The JSP also has agreed that it will communicate with other local departments, state agencies, and authorities, requesting that these departments, agencies, and authorities notify the JSP whenever a release occurs that may affect the Site ground water or the remediation efforts under the ROD. The JSP has agreed that it will notify these departments, agencies, and authorities when they become aware of such a release that could result in comingling of contaminants at the Site.

Table 2: Summary of Planned and/or Implemented Institutional Controls

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Ground water, engineered control, discontinued operation of CLC Wells 19, 20, 21, 24, 26, 38, and 61	Yes	Yes	PCE plume area and 500-foot buffer (Appendix B, Figure 6)	Supports hydraulic control and prevention of ground water plume expansion	Discontinued use: Well 19: July 2005 Well 20: July 2005 Well 21: April 2007 Well 24: Nov 2007 Well 26: Feb 2014 Well 38: Nov 2007 Well 61: March 2019
Ground water, IC	Yes	Yes	PCE plume area and 500-foot buffer (Appendix B, Figure 6	Well drilling moratorium to minimize the potential for human exposure to contamination by limiting water resource use	State Engineer Order, October 12, 2011
Ground water conditions or the remediation efforts may be affected if a contaminant release occurs at the Site	Yes	Yes	PCE plume area	Prevent the comingling of contaminants onsite	The Unilateral Administrative Order issued May 17, 2011, required the JSP to request that other CLC departments, state agencies, and authorities provide notification should a contaminant release occur.

Systems Operations/Operation & Maintenance

An updated "*Pre-Achievement Operation and Maintenance Plan"* was prepared in accordance with the December 2017 UAO and was approved by EPA in November 2018. The July 2020 CD requires the JSP to implement the November 2018 updated *"Pre-Achievement Operation and Maintenance Plan."*

The ground water extraction and treatment system has been operating since April 2012, with no major down-times. The ground water treatment system is fed by CLC Wells 18 and 27. CLC Well 18 is

located within a fenced treatment compound, and CLC Well 27 is located approximately 1,500 feet southeast of the treatment facility compound. A pre-fabricated steel building was constructed to house the ground water treatment system next to CLC Well 18. Two pipelines approximately 1,500-feet long and two 28,000-gallon holding/equalization tanks (extracted/raw water and treated/finished water) were installed as part of the treatment system. Backflow prevention between the holding tanks and extraction wells is achieved using check valves and air breaks.

The ground water treatment system consists of two parallel stacked-tray air strippers and transfer pumps that convey untreated/raw ground water to the two air strippers, to remove VOCs to concentrations below the MCL. Chemical pretreatment is needed to address potential scaling and is achieved by injecting a polyphosphate anti-scalant compound in-line between the raw/untreated water equalization tank and the air strippers.

The treated water from the air strippers is pumped to a second 28,000-gallon equalization tank, and is disinfected and pumped through an 8-inch PVC discharge pipeline that ties into an existing 10-inch conveyance pipeline near CLC Well 27, for delivery to the 3 million-gallon capacity, Upper Griggs Reservoir (Appendix B, Figure 1).

Operation and maintenance (O&M) activities have been conducted in accordance with the pre-achievement O&M plan and include the following tasks:

- Routine O&M of the extraction, conveyance, and treatment system equipment;
- Monthly sampling of CLC Well 18 and Well 27 for PCE concentrations;
- Monthly sampling of untreated (raw) and treated (finished) water for PCE concentrations; and
- Quarterly air stripper emissions sampling.

Routine O&M of the treatment system equipment is conducted by CLC-Utilities staff per the manufacturers' instructions for various system components, and includes the following:

- Routine maintenance of mechanical equipment, including pumps, compressors, blowers, and valves;
- Removal of residual buildup in wells, pumps, piping, and treatment equipment due to chemical scaling and biofouling; and
- Replacement of chemicals per manufacturers' specifications and system usage rates.

Routine O&M of the treatment system includes monthly monitoring of the extracted (raw) and treated (finished) water for VOCs and annual monitoring of both filtered and unfiltered samples for trace metals and radionuclides (i.e., uranium and arsenic). These data are used to calculate contaminant removal rates and efficiencies and to ensure that the treated water meets the MCLs prior to mixing into the City's drinking water system. In order to ensure that air quality standards are not exceeded in the removal of VOCs during air stripping, air quality samples are also collected quarterly from the treatment system.

Optimization of System Operations/O&M

As part of the JSP's optimization efforts, the submersible pumps in CLC Well 18 and CLC Well 27 were replaced, and pumping rates were adjusted in March 2018. Pumping of CLC Well 18 was changed from 170 gpm for 4 hours per day to 90 gpm for 8 hours per day, maintaining an average pumping rate of 28 gpm. The pumping rate of CLC Well 27 was increased from 153 gpm to 200 gpm in March 2018 and was incrementally increased during this second FYR period to 240 gpm by October 2019.

The EPA approved the JSP's May 5, 2020 "*Flute Well Replacement Work Plan*" on May 22, 2020. Four FLUTe wells with compromised liners, GWMW-01, GWMW-08, GWMW-09 and GWMW-10, have been converted to single-depth "deep" conventional monitoring wells. Co-located conventional monitoring wells have been installed adjacent to each of these four converted FLUTe wells at depths corresponding to selected "shallow" and "intermediate" sample port elevations of the former FLUTe wells. FLUTe well GWMW-06 has been converted to a single-depth "shallow" conventional monitoring well with no new adjacent wells installed. FLUTe well conversion and co-located monitoring well installation were completed in the Spring 2021.

Ground Water Extraction System

Based on ground water monitoring and updated ground water modeling results (after the first year of operation), the JSP concluded that pumping CLC Well 18 at a rate of 170 gallons per minute (gpm) for 4 to 5 hours daily and allowing the well to recover would optimize PCE extraction rates. CLC Well 18 operated by pumping at a rate of 170 gpm between 2013 and 2018. In March 2018, the submersible pump was replaced and the pumping rate was reduced to 90 gpm while the pumping cycle was increased to 8 hours per day (maintaining an average pumping rate of approximately 28 gpm since 2014).

The JSP also proposed increasing the pumping rate of CLC Well 27, to see if doing so would optimize the PCE removal rate from that well. From 2013 to 2017, the CLC Well 27 pumping rate averaged 153 gpm. Replacement with a new submersible pump in March 2018 allowed the pumping rate to be increased to 200 gpm, then to 220 gpm by September 2018. In October 2019, the pumping rate was increased to 240 gpm.

The combined volume of extracted and treated PCE ground water from CLC Well 18 and 27 increased during the FYR period to approximately 135 million gallons in 2019.

Ground Water Monitoring Program

The JSP has been implementing the Ground Water Monitoring Program. Select monitoring wells and inactive CLC water supply wells have been sampled periodically since 2012, to evaluate the performance of the extraction system at achieving hydraulic capture of the PCE plume and reduction of PCE concentrations to below the MCL of 5 µg/L. The wells included in the monitoring program are identified in the Sampling and Analysis Plan (SAP) of the January 2018 updated Pre-Achievement

O&M Plan. The wells and number of samples included in the 2018 SAP for the Site are listed in Table 3 (shown on the next page), as well as the years in which each well was sampled and any change in the integrity of the well. During this FYR period, annual ground water sampling events were completed in January 2017, January 2019 and January 2020. An annual ground water monitoring event was not conducted between January 2017 and January 2019, while updates to the Pre-Achievement O&M Plan and SAP were being completed.

During the December 2018-January 2019 annual monitoring event and subsequent well testing, the JSP identified that the liner integrity of all Flexible Liner Underground Technology (FLUTe) multi-port[3] monitoring wells at the Site had been compromised. All data from the FLUTe wells from the December 2018-January 2019 event was rejected and the FLUTe wells were not sampled during the January 2020 event. The JSP submitted an evaluation report for FLUTe well replacement alternatives in November 2019. Following conference calls between the JSP, EPA, and NMED to discuss the alternatives, EPA issued a letter in February 2020, approving the replacement of the FLUTe wells with conventional monitoring wells. Sampling of the site-wide monitoring well network has not occurred since the January 2020 sampling event. The EPA approved postponement of the next sampling event to follow the replacement of the FLUTe wells with nested conventional monitoring wells in 2021.

[3] A multi-port monitoring well is constructed with multiple tubes and/or casings within a larger diameter casing for collecting ground water samples from multiple discrete depths or zones of an aquifer within a single wellbore.

Table 3: Ground Water Monitoring Program Monitoring Well Network

Well	No. of Samples[a]	Years Monitoring Performed since Remedy Start-up[b]	Notes
CLC 18	1	2012 – 2016, 2018 – 2019	
CLC 26	1	2012 – 2016, 2018 – 2019	
CLC 27	1	2012 – 2016, 2018 – 2019	
GWMW 01	7	2012 – 2016, 2018[c]	
GWMW 03	3	2012 – 2016, 2018[c]	
GWMW 06 Port 1	1	2018[c]	
GWMW 06 Port 2	2	2018[c]	
GWMW 08	5	2012 – 2016, 2018[c]	
GWMW 09	7	2012 – 2016, 2018[c]	
GWMW 10	7	2012 – 2016, 2018[c]	
GWMW 11-S	1	2012 – 2016, 2018 – 2019	
GWMW 11-I	1	2012 – 2016, 2018 – 2019	
GWMW 11-D	1	2012 – 2016, 2018 – 2019	
GWMD 15-S	1	2012 – 2016, 2018 – 2019	
GWMD 15-I	1	2012 – 2016, 2018 – 2019	
GWMW 15-D	1	2012 – 2016, 2018 – 2019	
GWMW 16-S	1	2015 – 2016, 2018 – 2019	Well installed in August 2015
GWMW 16-D	1	2015 – 2016, 2018 – 2019	Well installed in August 2015
MW-1	--	2012 – 2016	Water level monitoring only per SAP
MW-3	--	2012 – 2014	Water level monitoring only per SAP; dry during 2018 and 2019 monitoring events
MW-4	--	2012 – 2014	Water level monitoring only per SAP; dry during 2016, 2018 and 2019 monitoring events
MW-5	1	2012 – 2014	Dry during 2016, 2018 and 2019 monitoring events
MW-SF2	1	2012, 2013, 2019	Unable to locate in 2016; dry during 2018
MW-SF5	1	2012 – 2016, 2019	
MW-SF9	1	2012 – 2016, 2019	
MW-SF10	1	2012 – 2016, 2019	
NGMW-01	10[d]	2018	
NGMW-02	9[d]	2018	
NGMW-03	9	2018, 2019	8 baseline samples, 1 annual sample

[a] A well with more than one sample reflects multiple sampling ports at that well.
[b] The 2019 annual ground water monitoring event was completed in January 2020
[c] FLUTe well not sampled during the 2019 annual monitoring event due to loss of liner integrity
[d] Not included for annual sampling in the SAP; baseline samples were collected in 2018

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last five-year review as well as the recommendations from the last five-year review and the current status of those recommendations. See Table 4 below and Table 5 on the next page.

Table 4: Protectiveness Determinations/Statements from the 2016 Five-Year Review

Sitewide Protectiveness Statement
Protectiveness Determination: Protectiveness Deferred
Protectiveness Statement: A site-wide protectiveness determination of the remedy at the Griggs and Walnut Ground Water Plume Superfund site cannot be made at this time until further information is obtained. Further information will be obtained by performing sampling to assess the potential indoor air vapor intrusion pathway for existing residential land use and other potential future land uses at a primary source area. It is expected that these actions will take approximately 12-15 months to complete, at which time a protectiveness statement will be made. For the ground water exposure pathway, there is currently no known human exposure. An institutional control is in place that restricts permitting of new ground water wells over the area of the contaminant plume while remediation is ongoing. The institutional control limits exposure to contaminated ground water. Follow-up actions are needed to achieve long-term protectiveness because the current long-term monitoring program and evaluation of remedial progress related to capture of the PCE plume and restoration of the ground water are inadequate. They are also needed to achieve long-term protectiveness because additional institutional controls may be necessary to address the indoor air vapor intrusion pathway under current or reasonably anticipated future land uses.

Table 5: Status of Recommendations from the 2016 FYR

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
PCE concentrations detected in 44 out of 45 exterior soil vapor samples collected at seven residential properties located near the intersection of North Walnut Street and East Hadley Avenue during the RI in 2005 exceeded EPA's excess lifetime cancer risk of 1 x 10^{-6} (i.e., EPA's point of departure). PCE concentrations detected in eight exterior soil vapor samples collected at the PCE release area across the street from this residential area in 2002 exceeded the 1 x 10^{-6} risk level by approximately an order of magnitude (i.e., ten times greater).	The vapor intrusion to indoor air pathway warrants further investigation for both the residential and PCE release areas of concern. The performance of sub-slab soil vapor and/or indoor air sampling to assess potential vapor intrusion at residential properties is recommended. The performance of exterior soil vapor sampling in the vicinity of the PCE release area is also recommended.	Completed	EPA conducted a multi-phased remedial investigation focused on potential indoor air vapor intrusion at the Site from 2017 through 2019. Phase I of the investigation consisted of an October 2017 exterior soil vapor survey at a vacant lot and parking area west of North Walnut Street and at East Hadley Avenue (former PCE release area) and at residential properties to the east of North Walnut Street and north of East Hadley Avenue. PCE was detected in exterior soil vapor samples in the residential area at concentrations that warranted indoor air sampling. PCE was also detected in exterior soil vapor samples in the vicinity of the PCE release area, but at concentrations that present a cumulative cancer risk within EPA's acceptable excess lifetime cancer risk range of 10^{-6} (one per million) to 10^{-4} (one per ten thousand) and below the New Mexico lifetime cancer risk threshold of 10^{-5} (one per one hundred thousand) for receptors of concern (future resident and construction worker). The non-cancer hazard was determined to be below the EPA's acceptable level of a Hazard Quotient (HQ) of 1. Therefore, no further response action to mitigate the soil vapors or	9/15/2020

			limit exposure to the soil vapors in the PCE release area (e.g., institutional control) was warranted. Indoor air and sub-slab air samples were collected from five residential properties during Phase 2 of the investigation in February 2019. PCE was detected above the Project Action Level in sub-slab soil vapor samples from four of the five residences sampled, indicating that unsafe indoor air concentrations may arise from vapor intrusion. However, PCE and TCE concentrations in indoor air samples collected from all five residences did not exceed EPA residential health-based Regional Screening Levels nor pose a health risk above EPA's excess lifetime cancer risk range or NMED's cancer threshold level, based on the Focused HHRA. The non-cancer hazard was also determined to be below the EPA's acceptable level of an HQ of 1. Therefore, no further response action was warranted to mitigate indoor air vapors. The results of both the Phase 1 and Phase 2 components of the indoor air vapor intrusion remedial investigation are presented in the EPA's Focused RI Report and Focused HHRA, dated September 2020.	
The Ground Water Monitoring Program has not been performed in accordance with the Remedial	Include additional monitoring wells and increase the frequency of sampling for the Ground Water	Completed	The JSP implemented changes to the Ground Water Monitoring Program as detailed in the 2018 updated Pre-Achievement O&M Plan and SAP. EPA	11/19/2018

Action Sampling and Analysis Plan and Pre-Achievement O&M Plan approved by EPA. An inadequate number of ground water samples were collected and water level measurements taken to adequately assess the progress of the remedy in achieving hydraulic capture of the PCE plume and reducing PCE concentrations to below the MCL of 5 µg/L over the entire Site. Additionally, seven wells that are part of the monitoring well network are inaccessible (could not be located) or have collapsed and can no longer be used as monitoring wells.	Monitoring Program as deemed necessary by EPA to adequately document the progress of the remedy in achieving the Remedial Action Objectives set forth in the Record of Decision.		approved the updated Pre-Achievement O&M plan on November 19, 2018.	
Variance in the sampling protocol used to collect samples from multi-port monitoring wells may have resulted in a bias toward lower PCE concentrations in samples collected from these wells.	Ensure that the sampling protocol implemented for the multi-port monitoring wells follows the manufacturer's "Sampling guidelines for Water FLUTe systems installed prior to May, 2009", Revised April, 2010.	Completed	The 2018 updated Pre-Achievement O&M plan includes a Standard Operating Procedure (SOP) for sampling of FLUTe wells at the Site. The SOP sampling protocol follows the manufacturer's "Sampling guidelines for Water FLUTe systems installed prior to May, 2009", Revised April, 2010.	11/19/2018

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was published in the Las Cruces Sun-News newspaper on 9/16/2020, stating that the second FYR was being conducted and inviting the public to submit any comments to EPA. The public notice was also posted to the Doña Ana County webpage at https://www.donaanacounty.org/superfund and is provided in Appendix E. The results of the review and the report will be made available at the Site information repository located at the Thomas Branigan Memorial Library, 200 E. Picacho Ave., in Las Cruces, New Mexico and on the EPA website at http://www.epa.gov/superfund/griggs-walnut.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date**.** The interview records are provided in Appendix D. All interviewees have granted their permission to use their names in the interview records. The results of these interviews are summarized below.

The O&M manager, O&M staff and the RD/RA consultant for the JSP generally praised the effectiveness of the extraction and remediation system, noting the effectiveness of PCE removal from the aquifer, pumping optimization efforts and daily O&M activities performed by JSP personnel. The interviewees acknowledged the failure of the FLUTe wells as a setback for monitoring the plume, but expressed confidence that the replacement wells would adequately address the issue.

Efforts to solicit interviews from community members for this FYR were unsuccessful. Restrictions related to the COVID-19 pandemic mandated by the New Mexico Governor's Office were in effect during the second FYR period and greatly limited community involvement for interviews. As noted above, the initial newspaper publication for the second FYR invited the public to contact the EPA for comments. However, EPA was not contacted. In addition, NMED attempted to directly contact members of the public interviewed during the first FYR, as well as from EPA's Site mailing list and sign-in sheets from community events provided by the JSP. NMED efforts to interview community members for the FYR were also unsuccessful.

Data Review

The second FYR included data review of the original Conceptual Site Model (CSM), groundwater flow data, status of contaminant plume remediation, and a focused vapor intrusion remedial investigation.

Conceptual Site Model

John Shoemaker & Associates, Inc. (JSAI) developed modifications to the Conceptual Site Model (CSM) in 2019 (Appendix B, Figure 4). The two distinct hydrogeologic zones beneath the Site, referred to as the Upper Hydrogeologic Zone (UHZ) and Lower Hydrogeologic Zone (LHZ), are primarily differentiated by a clay layer and ground water elevations measured in nested monitoring wells screened at different depths. The UHZ is composed of the lower portion of the Rio Grande alluvium and the

upper portion of the Santa Fe Group. The LHZ is within the Santa Fe Group. CSM updates are shown in clay layer elevation and thickness countours (Appendix B, Figure 6 and Figure 7) and hydrogeologic cross sections (Appendix B, Figure 8, Figure 9 and Figure 10). These figures, along with ground water elevation contour maps discussed below, are presented in Appendix A of the "*2019 System Operation and Remedial Action Progress"* report that was prepared by DBS&A for the JSP, dated August 12, 2020. The modified CSM was used by the JSP to propose new groundwater monitoring well sampling intervals to better define the horizontal and vertical extent of the contamination plume.

Ground Water Gradients and Flow

JSAI prepared ground water elevation contour maps (Appendix B, Figure 11, Figure 12 and Figure 13) for the UHZ and LHZ. These maps are based on water level data collected in December 2019 and primarily used water levels measured in nested and conventional monitoring wells. The 2019 annual report notes that several monitoring wells in the UHZ are starting to go dry (MW-2, MW-3, MW-4, MW-5, MW-SF2, MW-SF4 and MW-SF5) as the UHZ is dewatered due to pumping. Water-level elevation contours indicate an eastward ground water flow direction across the Site, with lower water-level elevations surrounding the active municipal supply wells (CLC Wells 32 and 35 and CLC Wells 58 and 65), and ground water extraction/capture wells (CLC Wells 18 and 27). The eastward ground water flow at the Site was influenced by municipal supply well pumping along the I-25 corridor that occurred between 1960 and 2000. In addition, a north to south oriented ground water trough that has varied in size with total pumping rate is present along the I-25 corridor.

The updated CSM interprets preferential flow pathways in the UHZ that are primarily influenced by the topography of the top of the clay layer; a topographic low in the top of the clay layer is consistent with the movement of the UHZ contaminant plume toward extraction well CLC Well 18 and then toward monitoring well MW-SF10. The UHZ and LHZ are not hydraulically connected, where the clay layer is present (e.g., at CLC Well 18), but are connected where the clay layer is absent. Vertical ground water flow from the UHZ to the LHZ is observed east of nested ground water monitoring wells GWMW-16(S,D), where the clay layer transitions to silt and sand. This downward vertical ground water flow is influenced by pumping CLC Well 27 and other regional municipal wells completed in the LHZ.

Ground Water Contaminant Plume

A limited review and interpretation of analytical results was performed for the Site-wide ground water monitoring program. Due to the liner integrity failure identified in all Site FLUTe wells in December 2018-January 2019, these FLUTe well results were rejected and the FLUTe wells were not sampled during the January 2020 monitoring event. The only other ground water monitoring event completed during this FYR period was the December 2016-January 2017 event and, due to uncertainty regarding the timing of liner integrity failure, the representativeness of ground water quality data from FLUTe well samples is questionable. The FLUTe wells represent a significant component of the ground water monitoring network at the Site; therefore, there is insufficient data for a complete review of ground water quality and contaminant concentration trends during this FYR period.

PCE was detected in nine of the conventional monitoring wells sampled during the FYR period, including MW-1, MW-SF2, MW-SF5, MW-SF10, GWMW-11(I), GWMW-15(I, D) and GWMW-16(S, D). All detected PCE concentrations in these wells were below the MCL, except for MW-SF10, GWMW-15(I) and GWMW-16(S, D). PCE concentrations in MW-SF10 decreased during the FYR period from 23 µg/L during the 2015 monitoring event to 11 µg/L during the January 2020 monitoring event. PCE concentrations in GWMW-15(I), GWMW-16(S) and GWMW-16(D) all increased during the FYR period. The PCE concentration in GWMW-15(I) increased from 6.1 µg/L during the 2015 monitoring event to a maximum of 19 µg/L during the December 2018-January 2019 monitoring event and remained consistent at 17 µg/L by January 2020. The PCE concentration in GWMW-16(S) increased from 1.6 µg/L during the 2015 monitoring event to 8.7 µg/L by January 2020. The PCE concentration in GWMW-16(D) increased from 3.1 µg/L during the 2015 monitoring event to a maximum of 16 µg/L during the December 2018-January 2019 monitoring event and remained consistent at 15 µg/L in January 2020.

TCE was the only PCE degradation product detected in ground water during this FYR period. TCE was detected in MW-SF10 at maximum concentration of 1.4 µg/L during the 2016-2017 event and in GWMW-16(D) at a maximum concentration of 1.3 µg/L in 2018-2019 event. These concentrations are below the respective MCL of 5 µg/L for TCE.

Due to FLUTe well data rejection during the FYR period, the horizontal and vertical extents of the PCE plume are currently not well defined. The most recent (January 2020) analytical data from monitoring wells MW-SF2, MW-SF10, GWMW-11(S) and GWMW-16(S) partially define the horizontal extent of the PCE plume above the clay layer in the UHZ, where PCE concentrations exceeding the MCL (5 µg/L) are present between CLC Well 18 and MW-SF10 (Appendix B, Figure 12). The horizontal extent of the LHZ PCE plume is currently estimated, based on analytical data from the January 2020 monitoring event for monitoring wells GWMW-11(I,D), GWMW-16(D), GWMW-15(I,D) and extraction well CLC Well 27 (Appendix B, Figure 13). In addition, PCE was not detected in samples collected from inactive municipal supply wells CLC Wells 20, 26 and 57, all located more than 1,000 feet south to southeast of the known LHZ plume.

The vertical extent of the PCE plume in the UHZ is limited by the presence of the clay layer between the UHZ and LHZ. Where the clay layer is absent, the UHZ PCE plume migrates vertically to the LHZ, due to pumping of CLC Well 27. This vertical migration is best observed in analytical results from GWMW-15(S) and GWMW-15(I), where a decrease in PCE concentrations in GWMW-15(S) from 18 µg/L in 2005 to below 5 µg/L by 2009 corresponds to an increase in GWMW-15(I) from below 5 µg/L in 2005 to 18 µg/L during the 2018-2019 monitoring event. The PCE concentration in GWMW-15(I) decreased slightly by January 2020 to 17 µg/L.

CLC Well 18 primarily captures the UHZ PCE plume through the well annulus, due to an inadequate well seal between the UHZ and LHZ. PCE concentrations in CLC Well 18 were initially as high as 70 µg/L (when system operations began in April 2012), and rapidly decreased (ranging from approximately 2 to 3 µg/L) in December 2012 through July 2013. Pumping optimization efforts employed since

February 2014 initially resulted in greater PCE concentrations (ranging from approximately 10 to 30 µg/L) and improved PCE extraction rates, as compared to the overall volume of water treated. As the UHZ plume has been remediated, PCE concentrations in CLC Well 18 have steadily decreased during the FYR period from an average of 15.8 µg/L in 2016 to less than 8 µg/L by 2019.

PCE concentrations in CLC Well 27 have been consistent (ranging from approximately 14 µg/L to 17 µg/L) since system operations began in 2012. PCE concentrations detected in CLC Well 27 have remained relatively stable, despite continued increases to the pumping rate (from a 2013-2017 average of 153 gpm to 240 gpm by October 2019), indicating that increasing the pumping rate increases the PCE mass removal, along with a greater volume of water requiring treatment. Performance monitoring indicates that CLC Well 27 is capable of sustaining pumping rates up to 400 gpm for the duration of the cleanup period, if needed.

A time-series plot of PCE concentrations versus time was prepared for CLC Wells 18 and 27 by DBS&A in the *"2019 System Operation and Remedial Action Progress"* report (Appendix B, Figure 14).

Indoor Air Vapor Intrusion Remedial Investigation

In the first FYR report, dated 2016, a protectiveness determination could not be made until additional sampling was conducted to assess potential indoor air vapor intrusion. In order to evaluate whether the remedy for the Site protects human health, the EPA conducted a multi-phased Focused Remedial Investigation (Focused RI) and Focused Human Health Risk Assessment (Focused HHRA) from 2017 through 2019. The purpose of the Focused RI was to assess the potential for intrusion of contaminant vapors from subsurface sources (e.g., ground water or soil vapor) into residences and other buildings (referred to as indoor air vapor intrusion or VI).[4] The first phase (Phase I) occurred in October 2017 and consisted of an exterior soil vapor survey during which samples were collected from twenty-three (23) locations at a vacant lot and parking area west of North Walnut Street and along East Hadley Avenue (identified as a former PCE release area) (Appendix B-Figure 2) and at residential properties to the east of North Walnut Street and north of East Hadley Avenue. The vacant lot and parking area are located on a commercially-zoned property currently used for recreational purposes. Soil vapor samples were collected from boreholes drilled to a depth of no less than five feet bgs and analyzed for detection of VOCs. The analytical results were compared to vapor intrusion screening levels (VISLs) calculated for

[4] Volatile organic compounds, such as PCE, that are released into the subsurface and contaminate soil or ground water may evaporate and move upward through the unsaturated soils as vapors and eventually enter buildings by seeping through cracks in basements or slab-on-grade foundations, crawlspaces, sewer lines or other openings. Concentrations of indoor vapors may accumulate to levels that pose a health concern for residents and workers.

shallow soil vapor, following EPA guidance (2015).[5] The soil vapor VISLs were designated as Project Action Limits (PALs) for triggering a second phase (Phase 2) of the Focused RI, to sample indoor air and sub-slab air at residential and other structures located in the area where the VISLs for soil vapor were exceeded.

Phase I exterior soil vapor PCE concentrations exceeded the PAL in four samples collected from the vacant lot and parking area west of North Walnut Street and at all sample locations at the residential properties to the east of North Walnut Street. Based on the exceedance of the exterior soil vapor PAL for PCE, indoor air and sub-slab air samples were collected from five residential properties during Phase 2 of the Focused RI in February 2019. PCE was detected above the PAL in the sub-slab soil vapor samples from four of the five residences sampled. The maximum COC concentrations detected in indoor air samples were 0.96 µg/m3 (PCE), 0.22 µg/m3 (TCE) and 0.068 µg/m3 (cis-1,2-DCE; estimated concentration below laboratory reporting limit). The detected PCE and TCE concentrations did not exceed EPA residential indoor air health-based VISLs. There is no applicable screening level for cis-1,2-DCE. Trans-1,2-DCE and VC concentrations were below laboratory detection limits. Based on evaluation of the Focused RI results for exterior soil vapor, sub-slab air and indoor air samples, the Focused HHRA concluded that exposure to PCE and daughter products poses no unacceptable risk to receptors at the Site. The receptors of concern evaluated in the Focused HHRA were for current and potential future residents and a construction worker.

A comparision of the Phase I exterior soil vapor PCE data collected at the residential area east of North Walnut Street in 2017 (Figure 2, Focused RI Report) to the soil vapor PCE data collected from the same residential area during the RI in 2005 (Figure 3, EPA 2016 FYR Report) show that PCE concentrations have decreased significantly at all but one of the sampled residential properties over the last 12 years (see Table 6). For those residential properties showing decreases, the 2017 PCE concentrations are approximately 1.5 to 6 times less than the 2005 PCE concentrations at the five-foot depth of sampling. This decreasing trend in PCE vapor concentrations is expected to continue over time.

[5] The soil vapor VISLs for COCs were calculated by dividing the EPA health-based Regional Screening Levels for indoor air for a resident, based on a target cancer risk level of 1×10^{-6}, by a vapor attenuation factor of 0.03. This calculation was performed in accordance with the methodology specified in Appendix A of EPA's *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (EPA 2015). Vapor attenuation refers to the reduction in concentrations of VOCs that occur during vapor movement in the subsurface soil (as a result of physical processes in soil) coupled with the dilution that can occur when the vapors enter a building and mix with indoor air.

Table 6 – Residential Exterior Soil Vapor PCE Data for 2017 Focused RI and 2006 RI

2005 Exterior Soil Vapor PCE Data			2017 Phase I Exterior Soil Vapor PCE Data	
Sample ID No.*	PCE Vapor Concentration Ppbv	PCE Vapor Concentration µg/m^3	Sample ID No.*	PCE Vapor Concentration µg/m^3
RIA 0023	34	238	ASG-14	580
RIA 0107	296	2,076	ASG-15	360
RIA 0108	165	1,157	ASG-16	700
RIA 0110	237	1,662	ASG-17	550
RIA 0117	278	1,949	ASG-18	650
No sample			ASG-19	440
No sample			ASG-20	430
No sample			ASG-22	640
RIA 0124	126	884	ASG-23	540

* While the exterior soil vapor sample locations between 2005 and 2017 are not identical, samples were taken within the same residential areas.

[The EPA residential indoor air health-based RSL for PCE is 11 µg/m^3. No COCs exceeded the EPA residential indoor screening values in any of the sample locations.]

ppvb parts per billion by volume
µg/m^3 micrograms per cubic meter

Site Inspection

Due to travel restrictions associated with the COVID-19 pandemic, EPA and NMED most recently visited the Site during the JSP's annual open house at the Site treatment facility on 9/26/2019. In attendance were Mark Purcell and Nelly Smith of the EPA, Anthony McGlown, Angelo Ortelli and Mark Garman of the NMED, and representatives from the City of Las Cruces, Doña Ana County and JSP contractors.

During the visit in September 2019, EPA and NMED representatives toured the treatment facility and were briefed on O&M activities. As far as the implementation of the ground water extraction and treatment system is concerned, no specific O&M issues were identified. The remedy is effective at extracting and treating contaminated ground water and functioning as designed. Routine O&M of mechanical equipment (including pumps, compressors, blowers, and valves) is conducted at a 6-month frequency, and demonstrates that the remediation system is properly maintained and is adequate for current protectiveness of the remedy.

JSP representatives were regularly onsite to provide operations oversight of the groundwater extraction and treatment system. In addition, operational personnel were on site daily. The onsite remediation manager reports the remediation continues to be monitored twenty-four hours a day. Appendix D includes interview records with personnel, including the O&M manager, O&M staff and the RD/RA

consultant for the JSP, who have provided EPA and NMED with current site photos, video, and reports regarding the Site status.

It is anticipated that EPA and/or NMED will conduct a formal Site inspection once conditions associated with the COVID-19 pandemic allow for safe travel to and from the Site. It is also anticipated that this future Site inspection will occur following FLUTe well replacement activities, which will allow for inspection of the modified ground water monitoring network.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

Remedial Action Performance for Extraction and Treatment of Contaminated Ground Water

The remedy is operating and functioning as designed for extraction and treatment. PCE removal rates were evaluated in the 2016, 2018 and 2019 "*System Operation and Remedial Action Progress"* reports that were prepared for the CLC-Utilities office during the FYR period.

According to the annual reports for the FYR period, the average PCE concentration entering CLC Well 18 has decreased from 15.8 µg/L in 2016 to 7.2 µg/L in 2019. The average PCE concentration entering CLC Well 27 was relatively stable during the FYR period at approximately 14 µg/L to 15 µg/L.

During the FYR period, the total annual PCE mass extracted by the treatment system increased from approximately 5 kilograms (kg) in 2016 to approximately 7.3 kg in 2019. The annual PCE mass extracted from CLC Well 18 has remained relatively stable during the FYR period at approximately 0.5 kg, while the annual PCE mass removed from CLC Well 27 has increased to from approximately 4.4 kg in 2017 at a pumping rate of 153 gpm to 6.9 kg in 2019 at a pumping rate of 240 gpm.

Remedial Action Performance for Capture of PCE Plume and Restoration of Ground Water

The remedy is at least partially effective at capturing the PCE-contaminated ground water plume above the MCL of 5 µg/L based on mapping performed by the JSP's consultant JSAI. Ground water elevation contour maps (Appendix B, Figure 11 through Figure 13) depict circular depressions of the water levels (*i.e.*, cones of depression) in the vicinity of the pumping wells CLC wells 18 and 27 for both the UHZ and LHZ. Appendix B, Figure 12 and Figure 13 show the PCE plume in relationship to the water level contours for the UHZ and LHZ. Hydraulic containment of the PCE plume is created within or near those cones of depression, with ground water flows toward the pumping wells (as depicted by the ground water flow direction arrows on the maps).

For the UHZ, the extent of the PCE plume to the north and east of the cone of depression centered over CLC Well 18 and captured by the pumping well is uncertain. No analytical results are available for this

FYR period for the multiport FLUTe wells located to the north (GWMW-08) and east (GWMW-10) of the cone of depression centered over CLC Well 18. Prior to FLUTe well liner failure, GWMW-08 delineated the northern extent of the UHZ PCE plume and had no historical PCE detections. To the east of the CLC Well 18 cone of depression, the eastern portion of the UHZ PCE plume is being at least partially captured by pumping of CLC Well 27 as the UHZ and LHZ are hydraulically connected in this area of the Site (*see* section on Ground Water Gradients and Flow, above). GWMW-10 is located to the east and approximately halfway between CLC Well 18 and GWMW-15-S, which is the easternmost monitoring well in the UHZ at the Site. Based on historical PCE detections in GWMW-15-S (up to 18 µg/L in 2005), the UHZ PCE plume historically extended east of GWMW-15-S; however, this portion of the UHZ plume appears to have migrated west toward extraction well CLC Well 27 based on regional ground water flow (Appendix B, Figure 11) and/or vertically to the LHZ. The area between GWMW-10 and GWMW-15-S represents an apparent data gap extending across the north to south oriented ground water trough along the I-25 corridor. Based on historical UHZ PCE detections in GWMW-10 and GWMW-15-S, the replacement of GWMW-10 with nested conventional monitoring wells may not be sufficient to determine whether the UHZ PCE plume has migrated south along the I-25 corridor.

For the LHZ, JSAI has interpreted a much larger cone of depression centered on CLC Well 27, which is pumped continuously (Appendix B, Figure 13). The entire PCE plume in the LHZ is located within or near this cone of depression and appears to be hydraulically captured by pumping. The extent of the LHZ PCE plume at GWMW-15(I) is not well defined but, as noted above, ground water flow at this location is toward extraction well CLC Well 27 (Appendix B, Figure 11). The FLUTe well liner integrity failure identified during this FYR period represents a major data gap for vertical delineation of the PCE plume in the LHZ. PCE was detected below the MCL of 5.0 µg/L in the deepest monitoring port of FLUTe well GWMW-01 as recently as 2014 and more recent non-detect results are questionable due to liner integrity failure. PCE was reported above the MCL in the deepest ports of FLUTe wells GWMW-09 (5.1 µg/L in 2016) and GWMW-10 (7.5 µg/L in 2016 and 9.5 µg/L in 2018), but these results are either questionable or were rejected due to liner integrity failure.

Overall, the efforts made by the JSP and its consultants to implement the Ground Water Monitoring Program have been consistent with the updated Pre-Achievement O&M Plan and SAP approved by EPA. However, due to the liner integrity failure identified in all Site FLUTe wells during the FYR period, there is insufficient data to to support the interpretation of hydraulic capture for the PCE plume in both the UHZ and the LHZ. Additional water level data and water quality data from FLUTe replacement wells are necessary to assess the degree of plume capture and reduction in PCE concentrations at the Site.

Expected Progress Towards Meeting Remedial Action Objectives

By removing the PCE mass from the ground water aquifers through the extraction and treatment of contaminated ground water, it can be assumed that some progress has been made in achieving the RAO for restoring the aquifers to its beneficial use as a drinking water supply with PCE concentrations no greater than the MCL. However, it cannot be determined whether the remedy is achieving such restoration over the entire Site as concentrations of PCE have increased in some wells and no reliable

PCE concentration data were available for the FLUTe wells during this second FYR period. It also cannot be determined whether the remedy is achieving another of the RAOs for hydraulic capture of the PCE plume. Due to the compromised liners in the FLUTe wells, an insufficient number of monitoring wells were avaiable during the second FYR period to measure ground water levels and collect ground water samples to allow adequate documentation of hydraulic capture of the plume and reduction of PCE levels to below the MCL throughout the entire Site.

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

Question B Summary:

The cleanup levels and RAOs used at the time of the remedy selection for ground water continue to remain valid. There have been no significant changes in physical conditions at the Site that would affect the short-term protectiveness of the remedy with respect to the ground water pathway. However, the exposure assumptions and toxicity data have changed for inhalation parameters and assessment of the indoor air vapor intrusion pathway. The RAOs set forth in the ROD do not address potential risk from indoor air vapor intrusion for residential land use and reasonably anticipated future residential land use. Therefore, the EPA conducted a multi-phased Focused RI and Focused HHRA from 2017 through 2019 for indoor air vapor intrusion.

Changes in Standards and To-Be-Considered Criteria

Remedial action (RA) at the Site is directed solely at cleaning up contaminated ground water. PCE is the COC that is the object of the Site cleanup. Federal and State of New Mexico (State) cleanup standards identified for PCE in ground water (e.g., MCLs, New Mexico Water Quality Control Commission ground water standards) have not changed since the time of remedy selection. Federal or State standards identified for COCs in ground water (i.e., PCE) in the ROD have not changed during this second FYR period. There have not been any new ground water standards promulgated for PCE that impact the protectiveness of the remedy selected in the ROD. Conditions at the Site have not changed in a manner that would question the protectiveness of the ground water remedy.

There are currently no promulgated (i.e., fixed numerical) nationwide or State-wide cleanup standards for soil vapor or indoor air. The EPA, under the NCP, selects cleanup levels for soil vapor and indoor air based on risk to human health and the circumstances at the Superfund site at issue. The EPA developed VISLs to help determine which sites warranted further assessment and possible cleanup. Generally, at properties where subsurface concentrations of vapor-forming chemicals, such as those in ground water or “near source” soil vapor concentrations, are below VISLs, no further action or study is warranted, so long as the exposure assumptions match those taken into account by the VISL calculations and the site fulfills the conditions and assumptions of the generic conceptual model underlying the screening levels (EPA 2015). Exceeding a subsurface VISL may indicate that further evaluation of the vapor intrusion pathway, typically consisting of indoor air and sub-slab and/or crawl space air sampling, is appropriate. Exceeding an indoor air VISL may indicate that additional evaluation or mitigation is

appropriate. Generally, when indoor air VISLs representing the upper end of the EPA's acceptable lifetime cancer risk range, EPA's non-cancer health effects level, or NMED's lifetime cancer risk threshold level are exceeded, response actions for mitigating indoor air contaminant vapors would be warranted to protect human health.

The EPA included generic VISLs calculated for ground water, soil vapor, and indoor air in the EPA 2002 draft subsurface vapor intrusion guidance (EPA 2002, Table 2a). However, the VISLs for PCE and TCE have changed since the 2002 guidance was released. The VISLs for PCE and TCE in indoor air were updated by EPA in May 2014. The previous VISLs were based on older (1980s) chemical toxicity data. They have been updated with new toxicological studies and better modeling predictions of chemical exposure. Based on a comparison of the 2002 VISLs to the current VISLs for indoor air, the VISLs for PCE and TCE have increased. For a target cancer risk of 1 x 10-6, which represents one chance in a million that an individual will get cancer from exposure to a chemical over a lifetime, the indoor VISL for PCE increased from 0.81 µg/m3 to 11 µg/m3 and the indoor air VISL for TCE increased from 0.022 µg/m3 to 0.48 µg/m3. The EPA VISLs for indoor air are part of a database of Regional Screening Levels (RSLs) that can be found at www.epa.gov/risk/regional-screening-levels-rsls-generic-tables.

The State abatement requirements for indoor air are described under New Mexico Administrative Code (NMAC) 20.6.2.4103(A)(2), which states that "any constituent listed in 20.6.2.3103 NMAC or any toxic pollutant in the vadose zone shall be abated so that it is not capable of endangering human health due to inhalation of vapors that may accumulate in structures, utility infrastructure, or construction excavations." The NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2019) includes residential and industrial VISLs for soil vapor, indoor air, and ground water that were revised in March 2017.

During the first FYR for the Site, the indoor air VI pathway was reassessed using EPA's 2015 VI guidance, the EPA Office of Solid Waste and Emergency Response (OSWER) Vapor Intrusion Screening Level (VISL) calculator, and the updated VISL for PCE in indoor air. Based on this reassessment, it was determined that PCE concentrations in 44 of 45 exterior soil vapor samples collected in 2005 at seven residential properties presented an excess lifetime carcinogenic risk of greater than 1×10^{-6}. PCE concentrations detected in eight exterior soil vapor samples collected at the PCE release area across the street from this residential area in 2002 also exceeded the 1×10^{-6} risk level by approximately an order of magnitude. These findings were documented in the 2016 first FYR Report, along with a recommendation to further investigate the indoor air VI pathway for both the residential and PCE release areas of concern, as well as exterior soil vapor sampling in the vicinity of the PCE release area.

Changes in Toxicity and Other Contaminant Characteristics

Toxicological information for PCE in ground water on which the MCL was established has not changed since the original baseline risk assessment was performed. The toxicological information for PCE in air has changed. Since the ROD was issued, the EPA's Office of Research and Development has published

a new toxicological assessment for PCE in EPA's Integrated Risk Information System (IRIS), which has resulted in a lower inhalation unit risk for PCE and TCE (indicating less toxicity).

Changes in Risk Assessment Methods

As part of the RI, EPA undertook the BHHRA for the Site. The methodologies used to develop the BHHRA have not changed. The indoor air VISLs for PCE and TCE have changed since the BHHRA was performed. These changes are discussed under "*Changes in Standards and To-Be-Considered Criteria"* above.

Changes in Exposure Assumptions

The remedies selected in the ROD for the Site do not address potential vapor intrusion to residential indoor spaces on the Site because the PCE detected in soil vapor samples collected at seven residential properties during the RI[6] were in such low concentrations, it was determined not to pose a significant health risk[7] based on the findings of EPA's BHHRA. Indoor air samples were not collected at these residences during the RI even though PCE levels in soil vapor exterior to the buildings had exceeded EPA's VISLs for soil vapor. At the time of the RI, the science and technology associated with evaluating and addressing risk from vapor intrusion was evolving, especially for vapor intrusion sourcing from subsurface soil or contaminated ground water. Moreover, EPA's 2002 guidance for evaluating the indoor air vapor intrusion pathway was only draft (EPA 2002).

---

[6] The Remedial Investigation (RI) is a process undertaken by EPA to determine the nature and extent of the problem presented by the release of hazardous substances at a Superfund site listed on the NPL, such as this Site. The RI emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with the Feasibility Study (FS). The RI includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial alternatives. The FS is undertaken by EPA to develop and evaluate options for remedial action. The FS emphasizes data analysis and is generally performed concurrently and in an interactive fashion with the RI, using data gathered during the RI. The RI data are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives. *See* 40 CFR § 300.5.

[7] To protect human health, EPA has set the acceptable risk range for carcinogens at Superfund sites from 1 in 10,000 to 1 in 1,000,000 (expressed as 1×10^{-4} to 1×10^{-6}). A risk of 1 in 1,000,000 (1×10^{-6}) means that one person out of one million people could be expected to develop cancer as a result of a lifetime exposure to the site contaminants. Where the aggregate risk from COCs based on existing applicable or relevant and appropriate requirements (ARARs) (*see* 40 CFR § 300.5) exceeds 1×10^{-4}, or where remediation goals are not determined by ARARs, EPA uses the 1×10^{-6} as a point of departure for establishing preliminary remediation goals. This means that an accumulative risk level of 1×10^{-6} is used as the starting point (or initial "protectiveness" goal) for determining the most appropriate risk level that alternatives should be designed to attain. Factors related to exposure, uncertainty and technical limitations may justify modification of initial cleanup levels that are based on the 1×10^{-6} risk level. Under the NCP, site cleanup should generally achieve a level of risk within the 10^{-4} to 10^{-6} carcinogenic risk range based on the reasonable maximum exposure for an individual. The cleanup levels to be specified include exposures from all potential pathways, and through all media (*e.g.*, soil, ground water, surface water, sediment, air, structures and biota). The upper boundary of the risk range for carcinogens in the NCP is not a discrete line at 1×10^{-4}, although EPA generally uses 1×10^{-4} in making risk management decisions. A specific risk estimate around 10^{-4} may be considered acceptable if justified based on site-specific conditions.

The exposure assumptions for modeling indoor air vapor intrusion have changed somewhat since the performance of the BHHRA and issuance of the ROD. The BHHRA relied upon the use of a one-dimensional, steady-state analytical model, which was published by Johnson and Ettinger in 1991 (JEM). Today, however, EPA has a greater recognition about the complexity of vapor intrusion processes and the limitations of mathematical models of vapor intrusion, which is reflected in the updated vapor intrusion guidance (EPA 2015). Very few buildings have been studied in detail to provide information for validation of any vapor intrusion model, including the JEM. The ROD suggested that because the JEM is "based on a number of simplifying assumptions" (*e.g.*, steady-state conditions, no biodegradation), the JEM tends "to overestimate the risk by an order of magnitude or more." Although the JEM is a steady-state model and does not account for biodegradation, it does not follow that the modeling predictions of indoor air concentrations will necessarily and always be conservative on these bases alone.

Changes in Exposure Pathways

The BHHRA estimated what human health risks the Site would have posed if no action was taken. It provided the basis for taking action at this Site and identified the COCs and exposure pathways that needed to be addressed by the remedial action. Since exposure pathways are dependent on current or future land uses at a site, a BHRRA assesses current and potential future land uses at NPL sites. There have been no changes in land uses at the Site, which are expected to remain zoned as commercial, public recreational, light industrial, and residential land uses. Further, no additional drinking water supply wells have been installed at the Site. Exposure pathways have not changed since the ROD was signed by EPA on June 19, 2007.

The BHHRA considered the indoor air vapor intrusion exposure pathway but did not identify it as a pathway that needed to be addressed by remedial action because it was shown not to present a health threat based on the JEM. Based on the results of the vapor intrusion Focused RI and Focused HHRA conducted by EPA from 2017 through 2019, exposure to PCE and daughter products via the indoor air vapor intrusion exposure pathway poses no unacceptable risk to human health receptors at the Site at this time (EPA 2020).

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

No other information that could call into question the protectiveness of the remedy has been obtained during this second FYR period.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations				
Issues/Recommendations Identified in the Five-Year Review:				
OU(s):	**Issue Category: Monitoring**			
	Issue: The liner integrity of all seven FLUTe multi-port monitoring wells at the Site has been compromised. As a result, the ground water monitoring data collected in 2018 from the multi-port wells were rejected and the wells were not sampled in 2019. The only other ground water sampling event during this FYR period was in 2016, and the reliability of these data are in question due to the uncertain timing of liner failure in the multi-port wells.			
	Recommendation: Conduct a site-wide ground water sampling event inclusive of the newly converted and co-located conventional monitoring wells to determine the current state of hydraulic containment and remediation of the PCE ground water plume.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	5/31/2024

Issues/Recommendations				
Issues/Recommendations Identified in the Five-Year Review:				
OU(s):	**Issue Category: Remedy Performance**			
	Issue: Because of the lack of reliable ground water monitoring data from the FLUTe multi-port monitoring wells for the last few years, the current PCE plume extent and mass are not defined and it is uncertain whether both extraction wells' pumping rates are operating efficiently for hydraulic containment and remediation of the PCE plume.			
	Recommendation: Assess and, if needed, adjust the pumping rates of the extraction wells, or install additional extraction wells for optimized remedy performance.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	5/31/2023

Issues/Recommendations				
Issues/Recommendations Identified in the Five-Year Review:				
OU(s):	**Issue Category: Other**			
	Issue: The indoor air vapor intrusion Focused RI and Focused BHHRA conducted by EPA from 2017 through 2019 at residential structures determined that exposure to PCE and daughter products via the indoor air vapor intrusion exposure pathway posed no unacceptable health risk. However, only four of the ten residences targeted for indoor air/sub-slab sampling were sampled because access agreements could not be obtained from the other homeowners who refused to allow the sampling. One additional residence located outside of the targeted zone was sampled at the request of the home owner. Based on the sampling results, EPA concluded that there was a fairly high level of confidence that PCE levels in the untested homes, if present, would similarly not exceed the health-based indoor air VISLs for a residence, assuming relatively unattenuated or enhanced transport of vapors into a residence was not occurring. Prudently, indoor air sampling will be repeated at the targeted residential locations until the sub-slab soil gas concentrations drop below the VISLs for soil gas. Additional residential indoor air/sub-slab soil vapor sampling should be conducted in the future to verify that potential future intrusion of contaminant vapors at unsafe concentrations does not arise due to the following factors: 1) changing conditions of building foundations, 2) the potential temporal and spatial variability of indoor air quality or soil vapor concentrations, and 3) the presence of Site COCs in sub slab soil vapors above the target sub-slab vapor screening levels.			
	Recommendation: Perform additional indoor air/sub-slab soil vapor sampling at the ten previous residences targeted for sampling, and other nearby residences, if exterior soil gas samples continue to exceed the Vapor Intrusion Screening Level for soil gas concentrations. Potential sampling initiated due to VISL exceedances will be conducted in order to verify that future intrusion of contaminant vapors at unsafe concentrations does not arise due to changing conditions of building foundations or potential temporal or spatial variability of indoor air quality or soil vapor concentrations. The indoor air/sub-slab sampling is contingent upon EPA obtaining access agreements from property owners, and the indoor air/sub-slab sampling will be performed if exterior soil gas samples continue to exceed the Vapor Intrusion Screening Level for soil gas concentrations.			

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA	5/31/2025

OTHER FINDINGS

In addition, the following recommendation is made that does not affect current or future protectiveness:

- NMED and EPA were unable to perform a Site inspection for the second FYR due to travel restrictions associated with the COVID-19 pandemic. A Site inspection should be performed once conditions associated with the COVID-19 pandemic allow for safe travel to and from the Site. Results of the Site inspection should be detailed in the next FYR report (the Third FYR report) along with a completed Site inspection checklist.

VII. PROTECTIVNESS STATEMENT

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Planned Addendum Completion Date:* Not Applicable
Protectiveness Statement: The remedy at the Griggs and Walnut Ground Water Plume Superfund site currently protects human health and the environment in the short term because there is no known exposure to contaminated ground water, and an institutional control is in place that restricts permitting of new ground water wells over the area of the contaminant plume while remediation is ongoing. The institutional control limits exposure to contaminated ground water. Additionally, there are no known contaminant vapors present in indoor air at concentrations above EPA's health-based screening levels that would pose an unacceptable human health risk. However, for the remedy to be protective in the long-term, the following actions need to be taken: 1) perform a site-wide ground water sampling event inclusive of the newly converted and co-located conventional monitoring wells to determine the current state of hydraulic containment and remediation of the PCE ground water plume, 2) assess and, if needed, adjust the pumping rates of the extraction wells, or install additional extraction wells for optimized remedy performance, and 3) perform additional indoor air/sub-slab soil vapor sampling at the ten previous residences targeted for sampling, and other nearby residences, if exterior soil gas samples continue to exceed the Vapor Intrusion Screening Level for soil gas concentrations, to verify that future intrusion of contaminant vapors at unsafe concentrations does not arise due to changing conditions of building foundations or potential temporal or spatial variability of indoor air quality or soil vapor concentrations. The indoor air/sub-slab sampling is contingent upon EPA obtaining access agreements from property owners, and the indoor air/sub-slab sampling will be performed if exterior soil gas samples continue to exceed the Vapor Intrusion Screening Level for soil gas concentrations.	

VIII. NEXT REVIEW

The next five-year review report for the Griggs and Walnut Ground Water Plume Superfund Site is required in August 2026, five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Griggs and Walnut Ground Water Plume Superfund Site
Documents & Information Reviewed

Agency for Toxic Substances & Disease Registry (ATSDR), 2005. *"Public Health Assessment for Griggs & Walnut Ground Water Plume (a/k/a Griggs & Walnut Groundwater Site)"*, Las Cruces, Doña Ana County, New Mexico. EPA Facility ID: NM0002271286. Prepared by the U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Division of Health Assessment and Consultation, Superfund and Program Assessment Branch, Atlanta, Georgia. February 25, 2005.

Daniel B. Stephens & Associates, Inc. (DBS&A), 2010a. *"Remedial Design Work Plan, Remediation of PCE Contamination"*, Griggs and Walnut Ground Water Plume Superfund Site. Prepared for the U.S. Environmental Protection Agency, on behalf of the City of Las Cruces and Doña Ana County. March 10, 2010.

DBS&A, 2010b. *"Preliminary Engineering Report, Remediation of PCE Contamination"*, Griggs and Walnut Ground Water Plume Superfund Site. Prepared for the NMED Construction Bureau, on behalf of the Joint Superfund Project, City of Las Cruces and Doña Ana County. July 7, 2010.

DBS&A, 2010c. *"Strategy for the Remediation of PCE Contamination"*, Griggs and Walnut Ground Water Plume Superfund Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. October 5, 2010.

DBS&A, 2011a. *"Final Remedial Design Report, Griggs-Walnut Ground Water Plume Site"*, Las Cruces, Doña Ana County, New Mexico. Volume 1: Report and Appendices A through F. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. May 24, 2011.

DBS&A, 2011b. *"Remedial Action Work Plan"*, Griggs-Walnut Ground Water Plume Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. August 25, 2011.

DBS&A, 2011c. *"Institutional Control Implementation and Assurance Plan"* and associated *"Appendix A: NMOSE Well Permitting Moratorium"*, Griggs-Walnut Ground Water Plume Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. November 28, 2011.

DBS&A, 2012a. *"Interim Remedial Action Report"*, Griggs-Walnut Ground Water Plume Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. August 12, 2012.

DBS&A, 2012b. *"Pre-Achievement Operations and Maintenance Plan"*, Griggs-Walnut Ground Water Plume Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. August 12, 2012.

DBS&A, 2012c. *"Post-Achievement Operations and Maintenance Plan"*, Griggs-Walnut Ground Water Plume Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. August 12, 2012.

DBS&A, 2013. *"2012-2013 System Operation and Remedial Action Progress"* Report, Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Las Cruces-Utilities, Las Cruces, New Mexico. October 15, 2013.

Griggs and Walnut Ground Water Plume Superfund Site
Documents & Information Reviewed (continued)

DBS&A, 2014. *"2013-2014 System Operation and Remedial Action Progress"* Report, Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Las Cruces-Utilities, Las Cruces, New Mexico. December 1, 2014.

DBS&A, 2016. *"2014-2015 System Operation and Remedial Action Progress"* Report, Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Las Cruces-Utilities, Las Cruces, New Mexico. April 8, 2016.

DBS&A, 2017. *"2016 System Operation and Remedial Action Progress"* Report, Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Las Cruces-Utilities, Las Cruces, New Mexico. September 11, 2017

DBS&A, 2018. *"Pre-Achievement Operation and Maintenance Plan",* Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. October 10, 2018.

DBS&A, 2019. *"2018 System Operation and Remedial Action Progress"* Report, Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Las Cruces-Utilities, Las Cruces, New Mexico. June 3, 2019.

DBS&A, 2019. *"FLUTe Well Replacement or Repair Assessment",* Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. November 14, 2019

DBS&A, 2020. *"2019 System Operation and Remedial Action Progress"* Report, Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Las Cruces-Utilities, Las Cruces, New Mexico. August 12, 2020

DBS&A, 2020. *"FLUTe Well Replacement Work Plan",* Griggs-Walnut Ground Water Plume Superfund Site. Prepared for the Joint Superfund Project, Las Cruces, New Mexico. May 5, 2020.

EA Engineering, 2020. *"Focused Remedial Investigation Report",* Griggs and Walnut Ground Water Plume Superfund Site Vapor Intrusion Remedial Investigation, Las Cruces, New Mexico. Prepared for U. S. EPA Region 6. September 2020.

John Shoemaker & Associates, Inc. (JSAI), 2009a. *"Analysis of water-level data from the Griggs and Walnut PCE plume monitoring network, Las Cruces, New Mexico"*. Technical Memorandum to Dan Santantonio, Project Manager, Griggs and Walnut Joint Superfund Project, Las Cruces, New Mexico. March 3, 2009.

JSAI, 2009b. *"Updates to the Groundwater Model and Recommendations for using City of Las Cruces Wells 18 and 27 to capture and contain the Griggs and Walnut Plume"*. Technical Memorandum to Dan Santantonio, Project Manager, Griggs and Walnut Joint Superfund Project, Las Cruces, New Mexico. November 5, 2009.

NMED, 2019. *"NMED Risk Assessment Guidance for Site Investigations and Remediation Updates to the 2018 Risk Assessment Guidance"*. February 2019.

U. S. District Court, District of New Mexico, 2020. *"Consent Decree, Civil No. 2:17-cv-00809"*, July 30, 2020.

U. S. Environmental Protection Agency (U.S. EPA), 2002. *"OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)"*. November 2002.

U. S. EPA Region 6, 2003. *"Identification of PCE Release Areas in the Vicinity of the Griggs and Walnut Ground Water Plume"*, Las Cruces, New Mexico. November 2003.

U. S. EPA Region 6, 2005. *"Settlement Agreement for Funding of EPA's Remedial Investigation/ Feasibility Study"*, and Letter from EPA to the City of Las Cruces and Doña Ana County regarding the *"Involvement of the City of Las Cruces and Doña Ana County in the RI/FS Process"*. April 20, 2005.

U. S. EPA Region 6, 2006a. *"Remedial Investigation Report"*, Griggs and Walnut Ground Water Superfund Site, Las Cruces, New Mexico. November 2006.

U. S. EPA Region 6, 2006b. *"Feasibility Study Report"*, Griggs and Walnut Ground Water Superfund Site, Las Cruces, New Mexico. November 2006.

U. S. EPA Region 6, Superfund Division, 2007. *"Record of Decision"*, Griggs and Walnut Ground Water Superfund Site, Las Cruces, New Mexico. June 2007.

U. S. EPA Region 6, 2012. *"Preliminary Close-Out Report"*, Griggs and Walnut Ground Water Superfund Site, Las Cruces, New Mexico. May 21, 2012.

U. S. EPA Region 6, 2015. *"OSWER Technical Guide For Assessing And Mitigating The Vapor Intrusion Pathway From Subsurface Vapor Sources To Indoor Air"*, U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response (OSWER) Publication 9200.2-154. June 2015.

U. S. EPA Region 6, 2016. *"First Five-Year Review Report"*, Griggs and Walnut Ground Water Plume Superfund Site, Las Cruces, New Mexico. September 2016.

U. S. EPA Region 6, 2017. *"Unilateral Administrative Order for Operation and Maintenance, U.S. EPA Region 6 CERCLA Docket No. 06-07-17"*, Griggs and Walnut Ground Water Plume Superfund Site, Las Cruces, New Mexico. December 19, 2017.

U. S. Geological Survey (USGS), 1997. Water-Quality Assessment of the Rio Grande Valley, Colorado, New Mexico, and Texas – Ground-Water Quality in the Rio Grande Flood Plain, Cochiti Lake, New Mexico, to El Paso, Texas, 1995. Water-Resources Investigations Report 96-4249.

APPENDIX B – SITE FIGURES

Figure 1 – Site Location Map

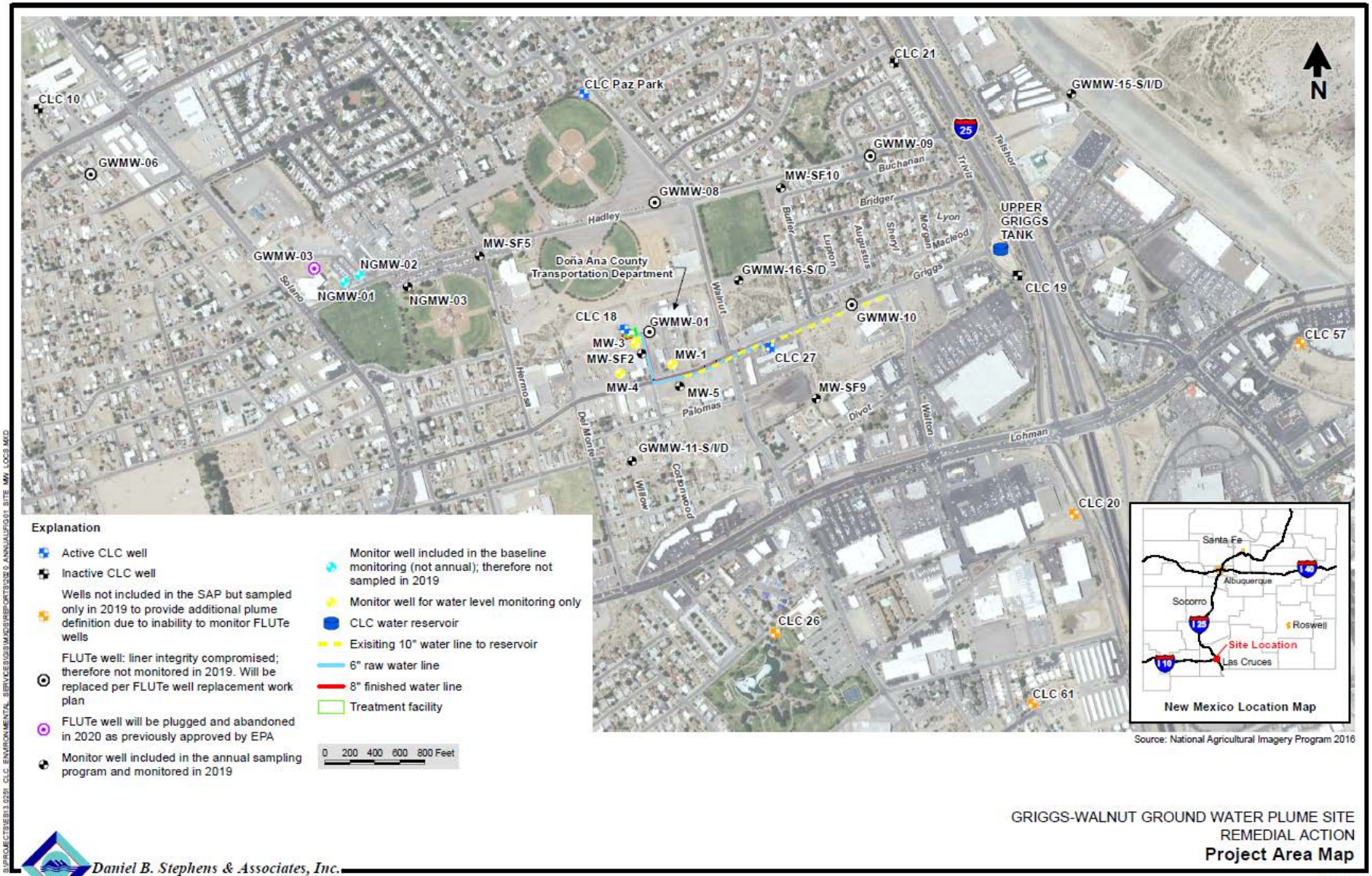


Figure 2 – PCE Release Areas

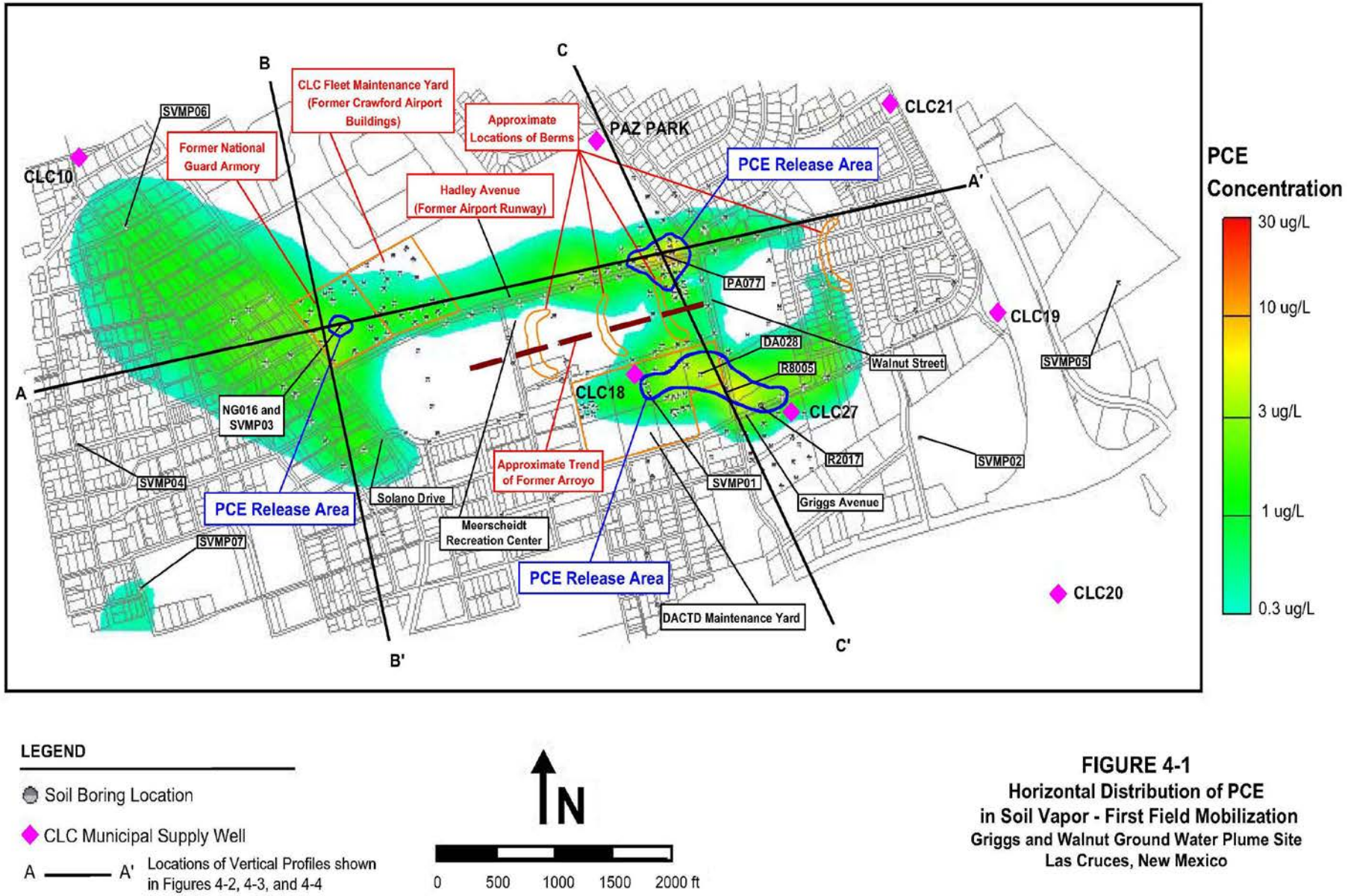


FIGURE 4-1
Horizontal Distribution of PCE in Soil Vapor - First Field Mobilization
Griggs and Walnut Ground Water Plume Site
Las Cruces, New Mexico

Figure 3 – PCE Ground Water Plume Area (December 2005)

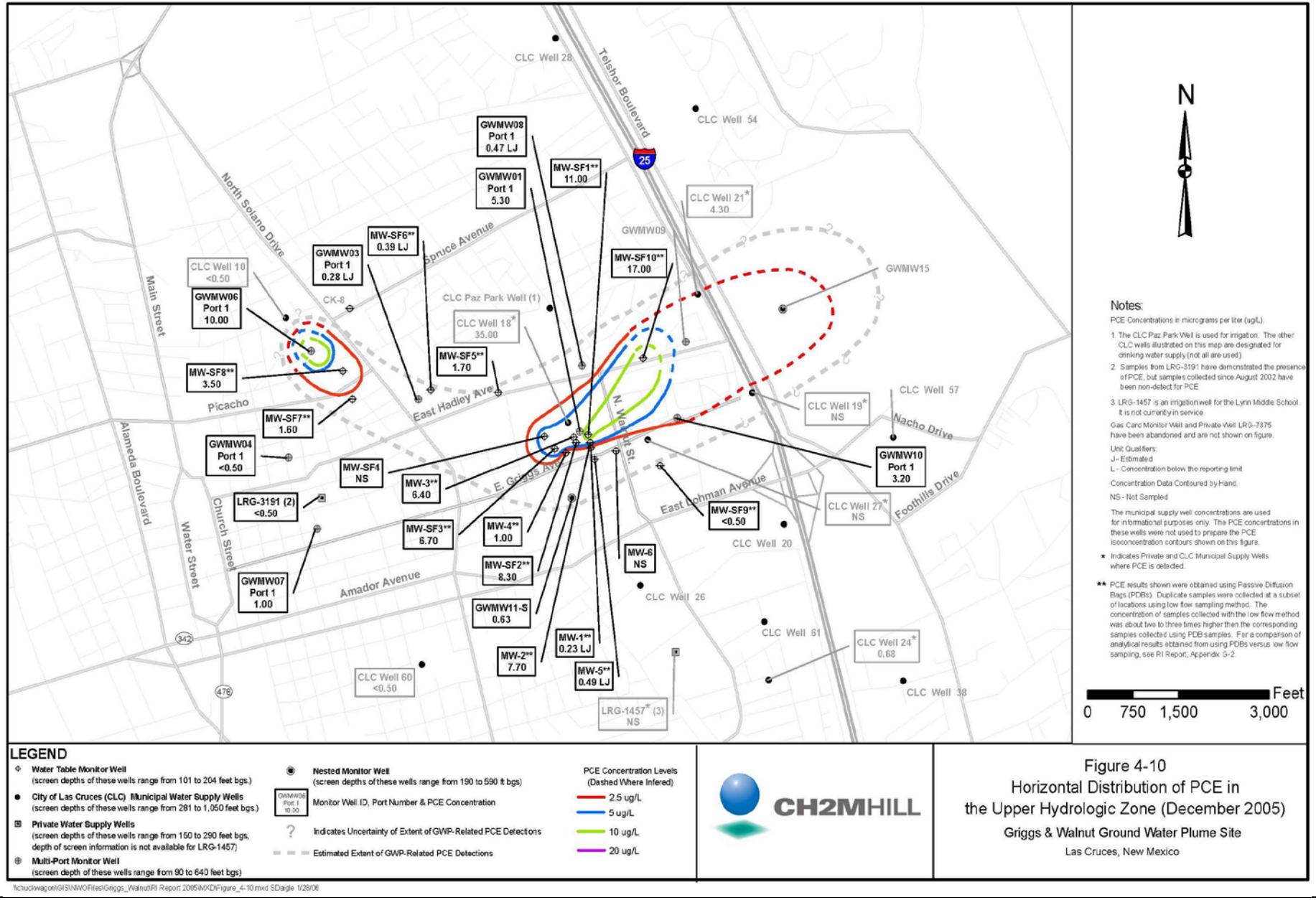


Figure 4 – Conceptual Site Model

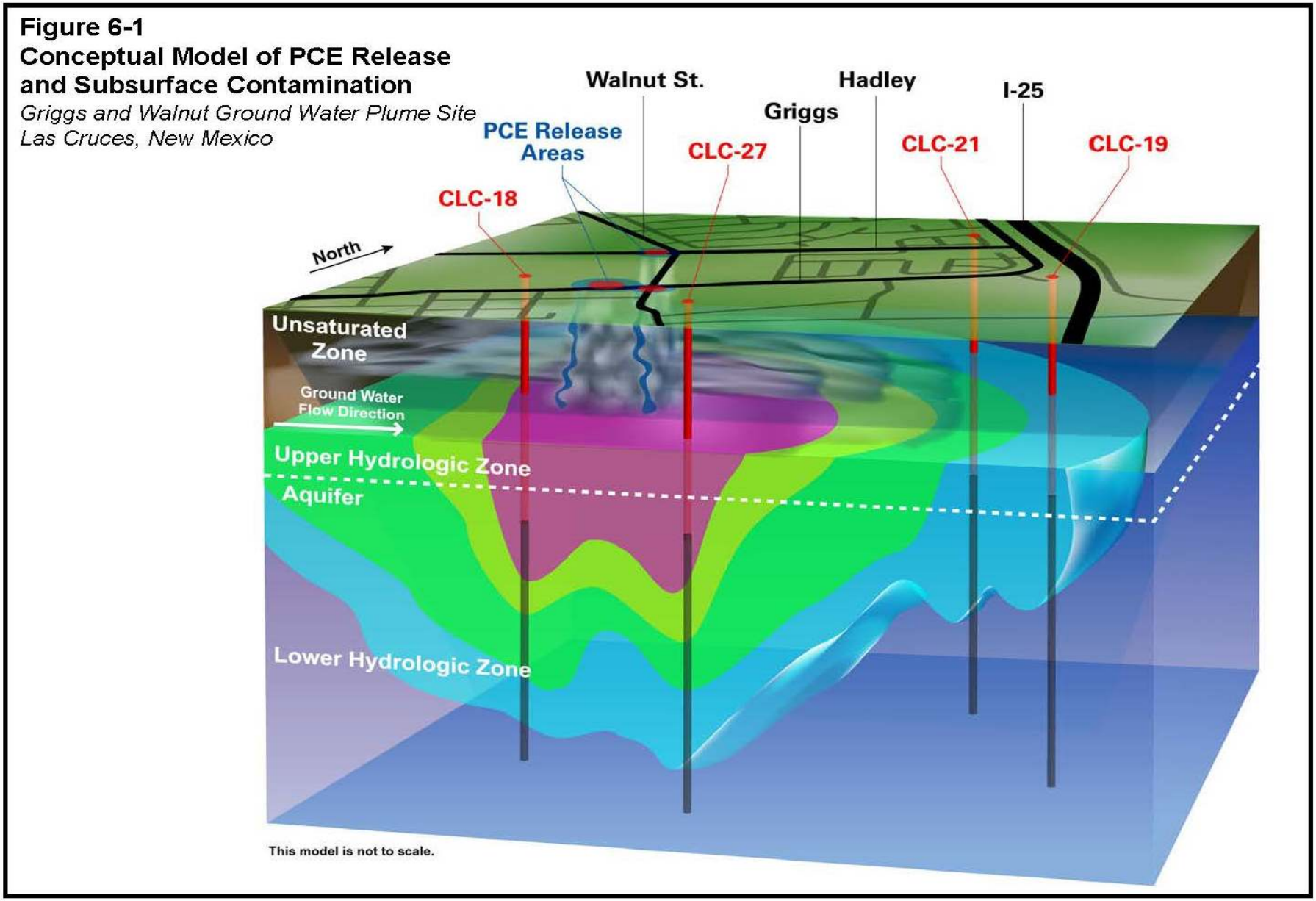
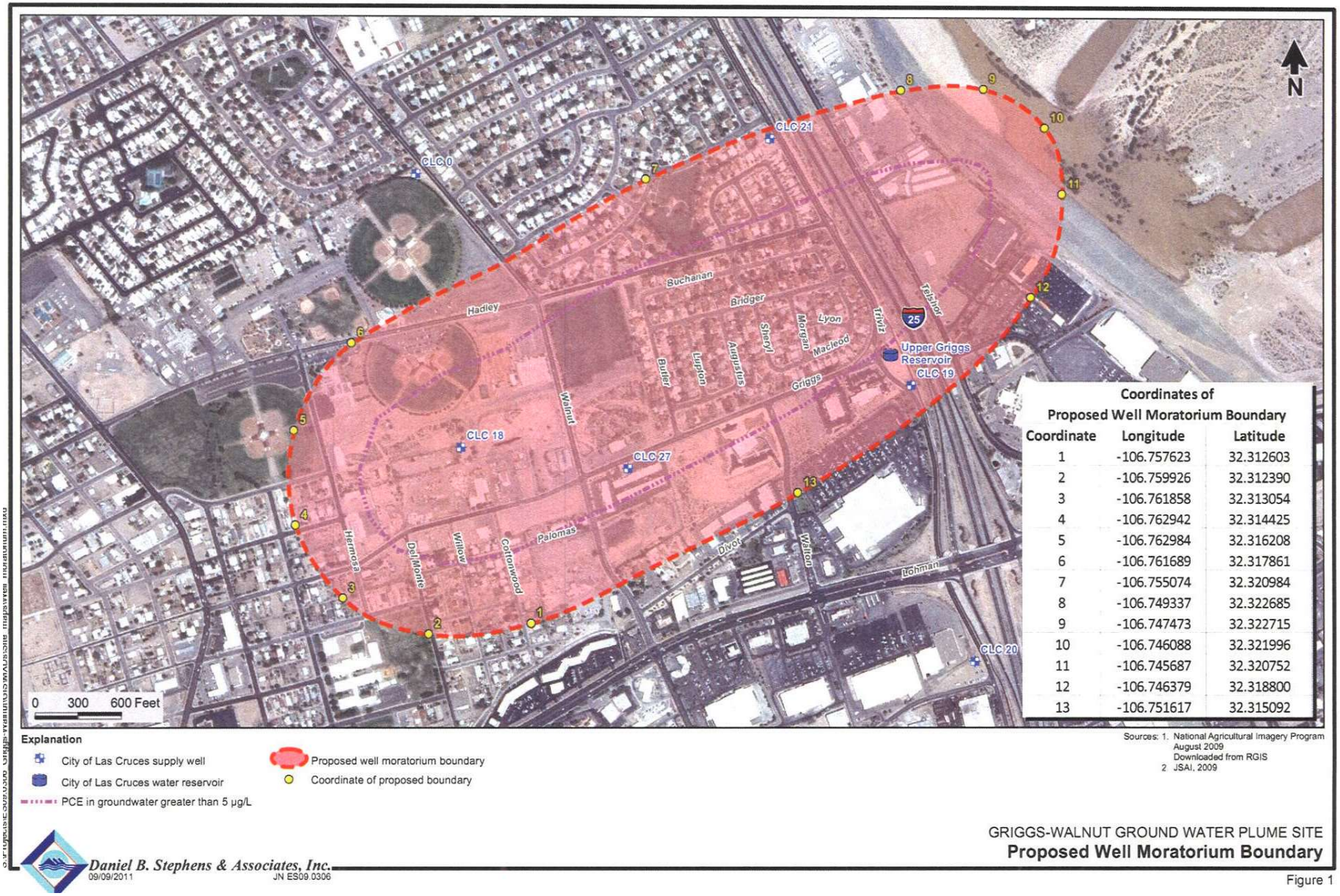


Figure 5 – Institutional Controls



Coordinates of Proposed Well Moratorium Boundary

Coordinate	Longitude	Latitude
1	-106.757623	32.312603
2	-106.759926	32.312390
3	-106.761858	32.313054
4	-106.762942	32.314425
5	-106.762984	32.316208
6	-106.761689	32.317861
7	-106.755074	32.320984
8	-106.749337	32.322685
9	-106.747473	32.322715
10	-106.746088	32.321996
11	-106.745687	32.320752
12	-106.746379	32.318800
13	-106.751617	32.315092

Figure 6 – Top of Clay Layer Elevation Countours (JSAI, 2020)

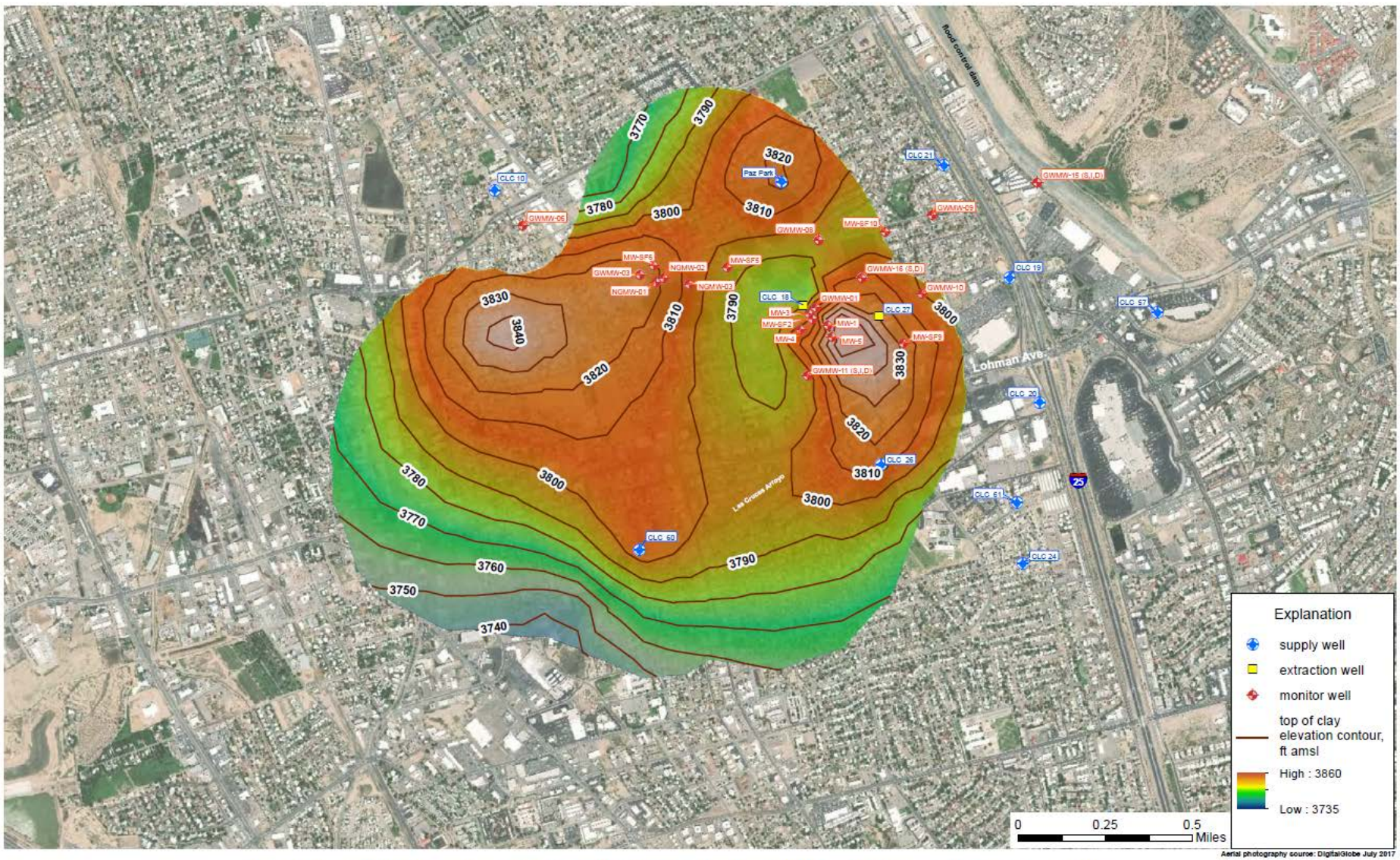


Figure 2. Aerial photograph of the Griggs and Walnut Site showing top of clay layer elevation contours and clay layer extent, Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

Figure 7 – Clay Layer Thickness Countours (JSAI, 2020)

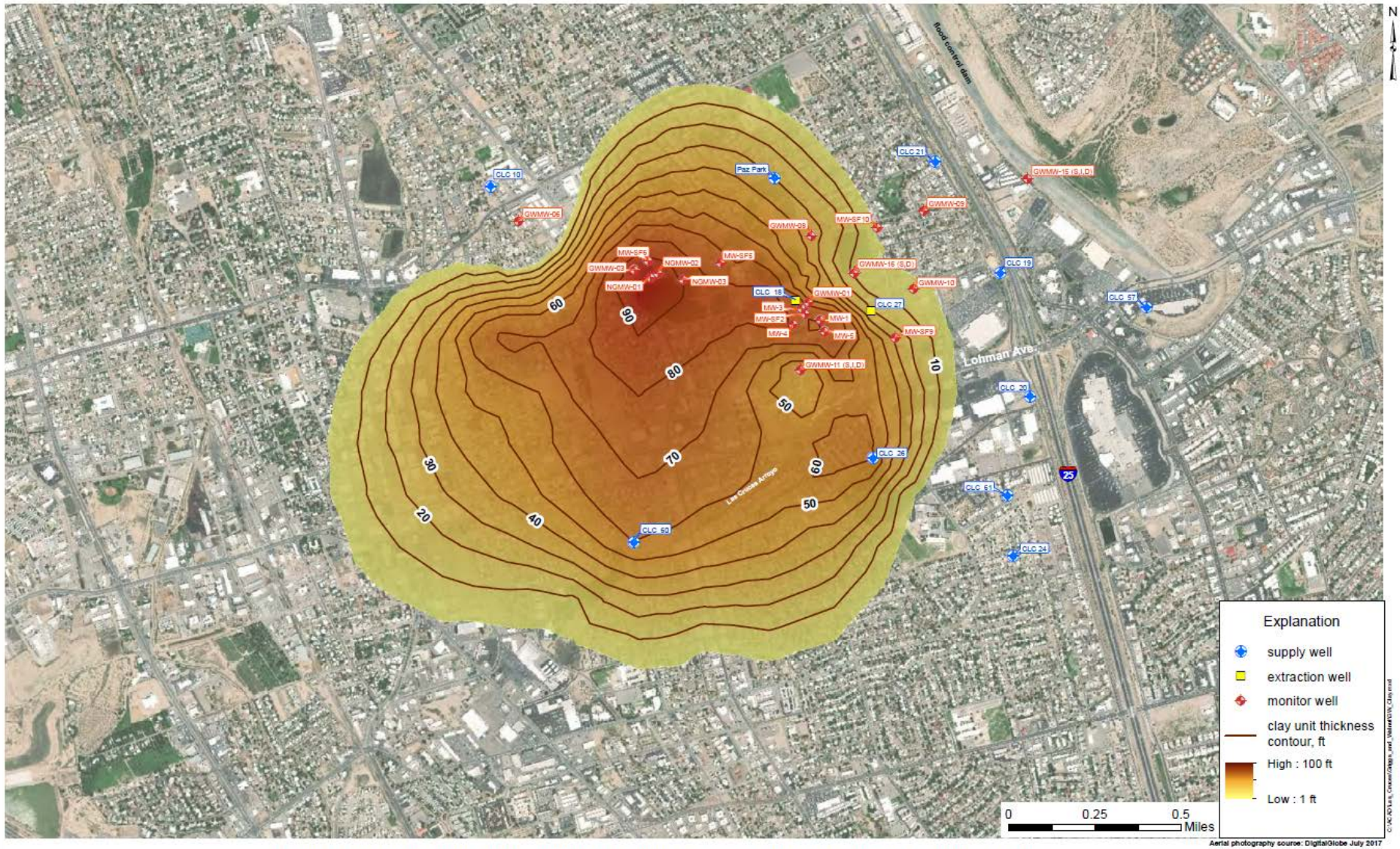


Figure 3. Aerial photograph of the Griggs and Walnut Site showing clay layer extent and thickness contours, Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

Figure 8 – Site Monitoring Network and Cross-Section Lines (JSAI, 2020)

Figure 1. Aerial photograph of the Griggs and Walnut Site showing monitoring network, Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

Figure 9 – Hydrogeologic Cross-Section A-A' (JSAI, 2020)

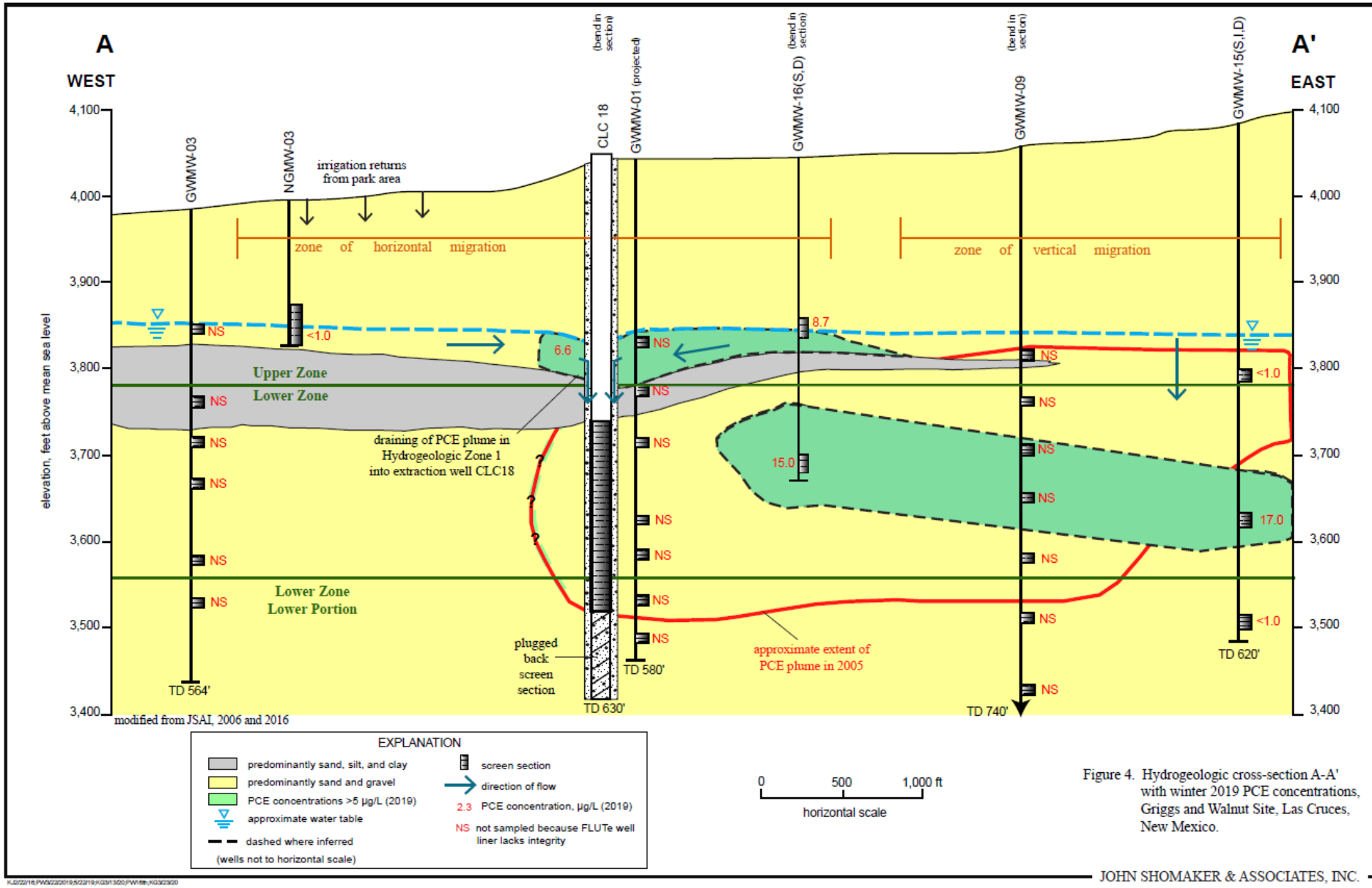


Figure 4. Hydrogeologic cross-section A-A' with winter 2019 PCE concentrations, Griggs and Walnut Site, Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

Figure 10 – Hydrogeologic Cross-Section B-B' (JSAI, 2020)

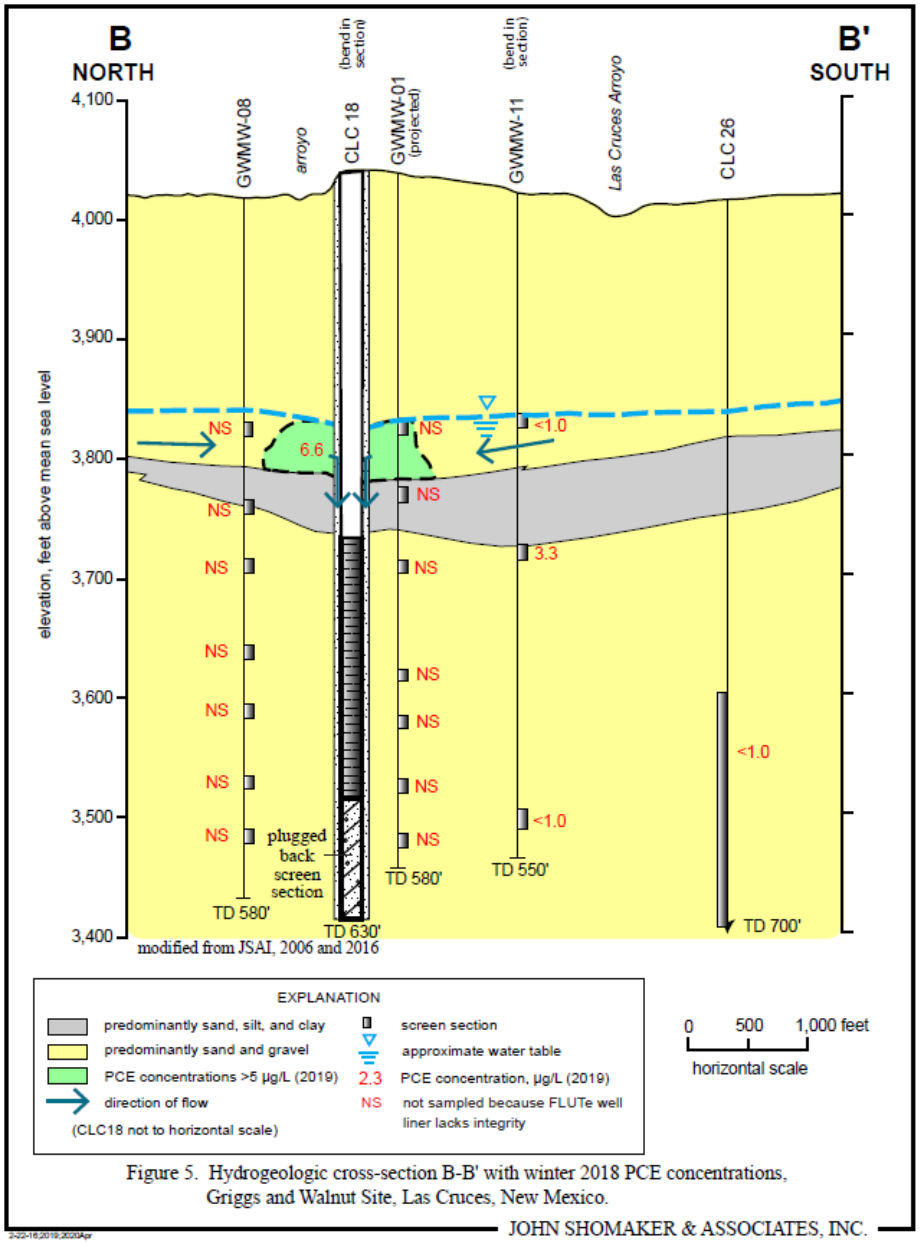


Figure 5. Hydrogeologic cross-section B-B' with winter 2018 PCE concentrations, Griggs and Walnut Site, Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

Figure 11 – Ground Water Elevation Contours for City of Las Cruces Area, December 2019 (JSAI, 2020)

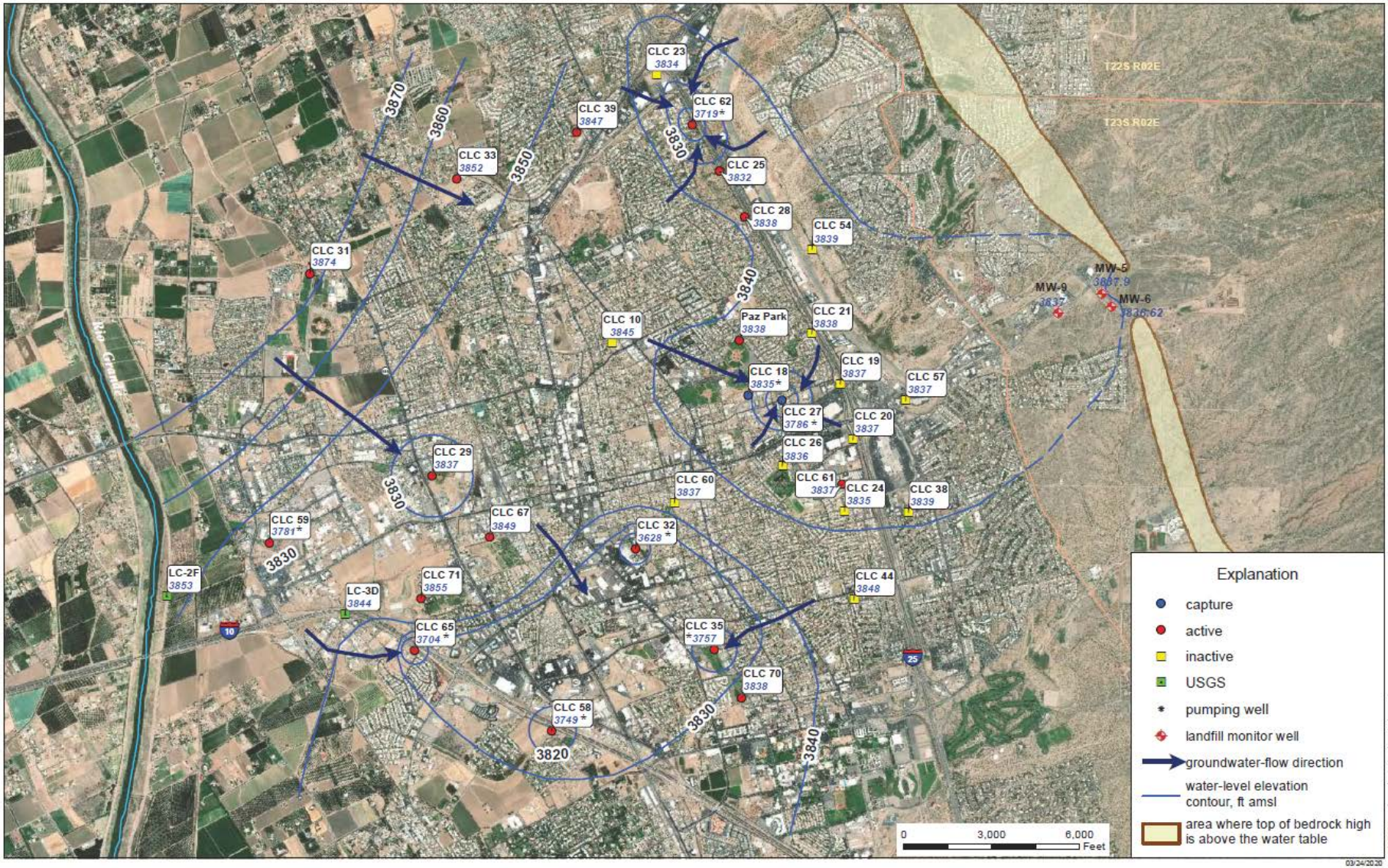


Figure 7. Aerial photograph showing December 2019 water-level elevation contours, City of Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

Figure 12 – Upper Hydrogeologic Zone Ground Water Elevation Contours and PCE Concentrations, December 2019 (JSAI, 2020)

Figure 8. Aerial photograph showing December 2019 water-level elevation contours and PCE concentrations for the Upper Hydrogeologic Zone, Griggs and Walnut Site, Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

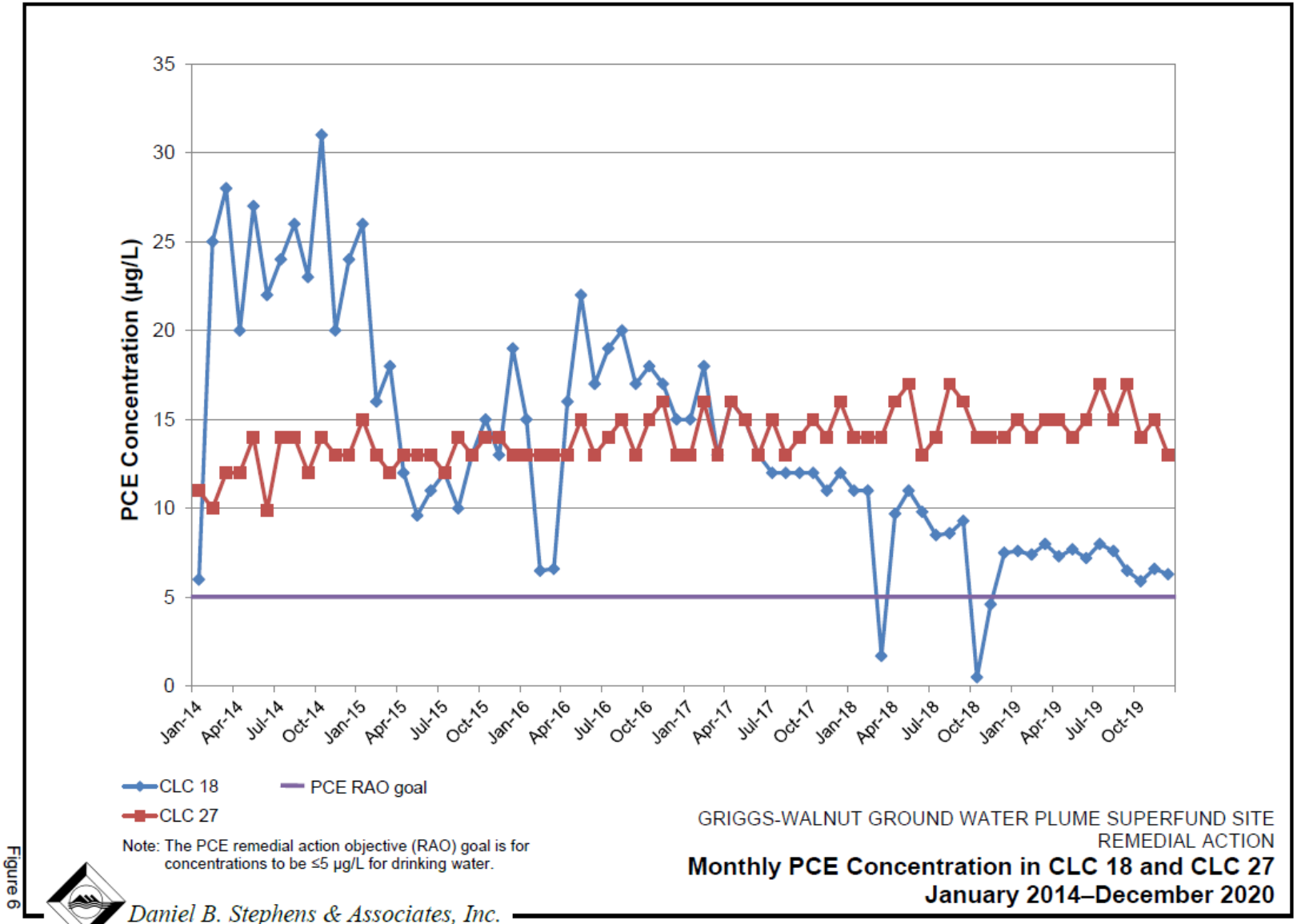
Figure 13 – Lower Hydrogeologic Zone Ground Water Elevation Contours and PCE Concentrations, December 2019 (JSAI, 2020)

Figure 9. Aerial photograph showing Winter 2019-2020 water-level elevation contours and PCE concentrations for the Lower Hydrogeologic Zone, Griggs and Walnut Site, Las Cruces, New Mexico.

JOHN SHOMAKER & ASSOCIATES, INC.

Figure 14 – Monthly PCE Concentration in CLC Wells 18 and 27, January 2014 – December 2020 (DBS&A, 2020)

P:_DB19-1466\2019 Annl Rpt.8-20\Figures\Word\Fig06_WellsPCE.docx



APPENDIX C – SITE CHRONOLOGY

Site Chronology

Date	Event
August 8, 1993	PCE was detected in CLC Well 21 and CLC Well 27 in samples collected by the NMED Drinking Water Bureau (DWB), the first sampling event performed under the Safe Drinking Water Act (SDWA) requirements which added PCE to the list of drinking water contaminants.
January 10, 1995	PCE was detected in CLC Well 18 in a sample collected by the NMED-DWB. This was the first detection of PCE in this well. The concentration of PCE was 32.0 µg/L.
September 26, 1996	CLC Well 18 was removed by the CLC from the municipal drinking water distribution system (mechanical difficulties were reported).
May – October 1997	The NMED Superfund Oversight Section (SOS) performed a Preliminary Assessment for the GWP site, and completed a PA Report in October 30, 1997. The PA report stated that PCE detected in groundwater at CLC Well 18 represented a risk to human health and the environment.
February 6, 1998	NMED-SOS performed a Focused Site Inspection (SI) for the Site, and prepared an SI work plan, dated February 6, 1998.
July 1999	NMED-SOS conducted a soil vapor survey at the DACTD maintenance facility as part of the Focused SI for the Site.
June 2000	NMED-SOS installed 10 monitoring wells in the vicinity of the GWP to determine the extent of contamination and to identify potential sources of contamination associated with the Site.
November 2000	EPA prepared the Hazard Ranking System (HRS) Scoring documentation for the Site under CERCLA.
January 11, 2001	The Site was proposed for inclusion on the Superfund National Priorities List (NPL).
June 14, 2001	The Site listing on the NPL was finalized.
September 2001	CLC Well 27 was removed from the drinking water supply distribution system due to increases in the PCE concentration (4.9 µg/L at that time).
April 29, 2002	EPA initiated the first mobilization to conduct field work for the GWP Remedial Investigation (RI) under CERCLA.

Date	Event
June 2002	CLC began pumping CLC Wells 18 and 27 to provide some measure of plume control with the goal of preventing further migration of PCE toward CLC Wells 19 and 21.
July 2002 – September 24, 2002	CLC submitted a blending plan to the NMED DWB for CLC Well 21 in July 2002. The blending plan was designed to maintain PCE concentrations in drinking water from the Upper Griggs Reservoir below drinking water standards. The NMED-DWB approved the final blending plan on September 24, 2002.
February 2003	Field work for the first mobilization of the RI was completed. Field activities included the collection of over 600 soil vapor samples, installation of 7 deep SVMPs, installation of 8 multi-port ground water monitoring wells, and collection of over 200 groundwater samples from new and existing monitoring wells.
October 2003	The NMED-DWB begins quarterly sampling of PCE-affected CLC drinking water supply wells.
November 2003	EPA issued the report entitled "*Identification of PCE Release Areas in the Vicinity of the Griggs and Walnut Ground Water Plume"* documenting the results of the first field mobilization.
April 2005	A settlement agreement between the EPA, CLC, and Doña Ana County (DAC) was signed. A Technical Activities Work Group was formed between the EPA, CLC, DAC, and NMED to provide a forum for stakeholder input into the RI/FS process for the Site.
July 21, 2005	The Technical Activities Work Group finalized the scope for the RI/FS at the Site.
October 17, 2005 – December 27, 2005	Field activities were conducted for the second mobilization of the RI. Field activities included the installation of two additional monitoring wells, installation of one additional deep SVMP, additional shallow subsurface soil vapor sampling to support the BHHRA, and groundwater sampling of new and existing monitoring wells.
August 2006	The "*Ground Water Flow and Transport Model*" for the GWP was completed and integrated into the Feasibility Study (FS) for the Site.
November 21, 2006	The "*Remedial Investigation Report*" and "*Feasibility Study Report*" were completed and released.
December 7, 2006	Public Meeting on the Proposed Plan for the Site. Public comment period on the Proposed Plan extended from December 4, 2006 through January 5, 2007.

Date	Event
June 18, 2007	The Record of Decision (ROD) was authorized on June 18, 2007, and outlined EPA's selected remediation strategy to address groundwater contamination at the Site.
October 14, 2009	EPA issued a Unilateral Administrative Order (UAO) for the Remedial Design (RD) to the Joint Superfund Project (JSP).
March 10, 2010	The "*Remedial Design Work Plan for Remediation of PCE Contamination*" was prepared by the JSP for submittal to the EPA.
July 7, 2010	The "*Preliminary Engineering Report for Remediation of PCE Contamination*" was prepared by the JSP for submittal to the NMED Construction Programs Bureau.
July 12, 2010	The *"Geotechnical Engineering Report"* was prepared for the JSP, and integrated into the RD for the Site.
October 5, 2010	The "*Strategy for Remediation of PCE Contamination*" report was prepared for the JSP, and integrated into the RD for the Site.
January 7, 2011	The *"Results of Back plugging and Testing Wells No. 18 and No. 27"* report was prepared for the JSP, and integrated into the RD for the Site.
March 3, 2011	The *"Sampling and Analysis Plan"* was prepared for the JSP, and integrated into the RD for the Site.
April 7, 2011	The *"Permitting Requirements and Compliance Plan"* was prepared for the JSP, and integrated into the RD for the Site.
May 17, 2011	EPA issued a Unilateral Administrative Order (UAO) and Statement of Work (SOW) for the Remedial Action (RA) to the JSP.
May 24, 2011	The *"Final Remedial Design Report"* was prepared for the JSP and released.
August 25, 2011	The "*Remedial Action Work Plan"* and associated documents required by the RA UAO-SOW were prepared by the JSP for submittal to the EPA.
September 2, 2011	Start of RA construction activities.
November 28, 2011	The "*Institutional Control Implementation and Assurance Plan"* and associated *"Appendix A: NMOSE Well Permitting Moratorium"* were prepared by the JSP for submittal to the EPA.
April 16, 2012	RA construction was completed, pre-final inspection was conducted, and shakedown operations began to evaluate the operational capacity of the remedial system.

Date	Event
April to May 2012	Baseline groundwater monitoring was conducted for pre-achievement operation & maintenance (O&M).
May 21, 2012	The *"Preliminary Close-out Report"* for the RA construction was signed by the EPA.
June 20, 2012	The EPA certified the remedy to be operational and functional.
August 14, 2012	The "*Interim Remedial Action Report", "Pre-Achievement Operations and Maintenance Plan"* and *"Post-Achievement Operations and Maintenance Plan"* as required by the RA UAO-SOW were prepared by the JSP for submittal to the EPA.
October 15, 2013	The "*2012-2013 System Operation and Remedial Action Progress"* report was prepared by the JSP and submitted to the EPA.
December 1, 2014	The "*2013-2014 System Operation and Remedial Action Progress"* report was prepared by the JSP and submitted to the EPA.
April 8, 2016	The "*2014-2015 System Operation and Remedial Action Progress"* report was prepared by the JSPr and submitted to the EPA.
September 2016	EPA completed the *"First Five-Year Review Report for the Griggs and Walnut Ground Water Plume Superfund Site"*.
September 11, 2017	The *"2016 System Operation and Remedial Action Progress"* report was prepared by the JSP for submittal to the EPA.
November 06, 2017	EPA issued a Unilateral Administrative Order (UAO) and Statement of Work (SOW) for the Operation and Maintenance (O&M) to the JSP.
December 19, 2017	EPA rescinded the November 6, 2017 UAO and issued a new modified Unilateral Administrative Order (UAO) and Statement of Work (SOW) for the Operation and Maintenance (O&M) to the JSP. This UAO includes revisions made based on the JSP's comments.
October 10, 2018	An updated *"Pre-Achievement Operation and Maintenance Plan"* was prepared by the JSP and submitted to the EPA.
June 3, 2019	The *"2018 System Operation and Remedial Action Progress"* report was prepared by the JSP and submitted to the EPA.

Date	Event
November 14, 2019	The *"FLUTe Well Replacement or Repair Assessment"* report was prepared by the JSP and submitted to the EPA.
May 5, 2020	The *"FLUTe Well Replacement Work Plan"* was prepared by the JSP and submitted to the EPA.
July 30, 2020	Consent Decree signed by the court. Under the settlement, the United States will pay $7,249,407 to resolve the United States' liability at the Site, and the JSP will pay $1,140,000 to the United States in reimbursement of past costs, will pay EPA's future costs at the Site and will perform the remedial action, including the operation and maintenance of a groundwater extraction and treatment system.
August 12, 2020	The updated*"2019 System Operation and Remedial Action Progress"* report was prepared by the JSP and submitted to the EPA.
September 2020	EPA issued the report entitled "*Focused Remedial Investigation Report – Griggs and Walnut Ground Water Plume Superfund Site Vapor Intrusion Remedial Investigation,*" which includes the Focused Human Health Risk Assessment documenting the results of the vapor intrusion indoor air sampling.
October 29, 2020	The JSP submitted to EPA the Notice to Successors-in-Title and Transfers of Real Property (Notice) per the requirements of the Consent Decree (signed by the court on July 30, 2020).

APPENDIX D – INTERVIEW RECORDS

GRIGGS & WALNUT GROUND WATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW SUMMARY	
Site Name: Griggs & Walnut Ground Water Plume Superfund Site	
EPA ID: NMD0002271286	
Contact Made By: **Name:** Ms. Nancy Ho **Title:** Remedial Project Manager **Organization:** EPA Region 6 **Name:** Mr. Anthony McGlown **Title:** Project Manager **Organization:** NMED	
Individual Contacted Name: Ms. Kelly Jayne **Individual Contacted Title**: Project Engineer	**Individual Contacted Affiliation:** Daniel B. Stephens & Assoc.
Individual Contact information: Telephone No: 505-353-9162 Email: kjane@geo-logic.com Street Address: 6020 Academy Rd NE, Suite 100; Albuquerque, NM 87109	
Interview date: 11/25/2020	**Interview subject:** Second Five-Year Review
Interview type: Email Correspondence	
Location of Visit: Not applicable	

1) What is your overall impression of the project? (general sentiment)

The extraction system and remediation system are operating as designed and providing treatment that exceeds standards.

2) Is the remedy functioning as expected? How well is the remedy performing?

The remedy is functioning as expected and is performing well. The City Utilities crews responsible for maintenance and monthly sampling do a fantastic job keeping things organized and maintained.

The failure of monitoring wells installed during the RI has been a setback in terms of monitoring the plume, but the extraction and treatment system itself is performing well.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

Although some monitoring wells installed during the RI failed in the last few years, the general trends from the data available indicate that contaminant concentrations are decreasing. The influent concentrations to the system are lower than during the first year of operation and the concentrations in many monitoring wells have decreased since the start of operation.

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

DBS&A is not involved in the daily O&M; the O&M staff five year review form provides a detailed description of O&M frequency.

DBS&A's knowledge of O&M activities is primarily derived from City Utilities staff site visits and maintenance reports reviewed as part of the annual reporting process. Based on this information, it appears that the O&M activities are highly organized, performed by experienced staff, proactive maintenance is performed routinely, system repairs are made quickly, and O&M activities are well documented.

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

Adjustments to pumping rates from each well have been made over the operating life to improve mass removal. The pumping rate from Well 18 has been increased and the pumping time per day has been decreased to maximize PCE extraction from groundwater and minimize the extraction of clean water. The pumping rate from Well 27 has been increased gradually to increase mass removal. No changes to O&M requirements or maintenance schedules have negatively affected the protectiveness or effectiveness of the remedy.

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

Typical equipment parts replacements have been required during the operation. The largest unexpected cost will be replacement of the failed FLUTe monitoring wells, scheduled for Winter 2020/2021.

7) Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

The treatment system and process is fairly straightforward, so O&M optimization has primarily focused on pumping strategies to optimize mass removal. Evaluation of mass removal in annual reports demonstrates that optimization efforts have been effective. Optimization has not resulted in cost savings but has increased mass removal.

8) Do you have any comments, suggestions, or recommendations regarding the project?

The O&M staff at the City should be commended for their superior efforts in operations and maintenance of the remedy. Replacement monitoring wells will provide better information regarding plume distribution in the aquifer, so we are looking forward to the monitoring results in 2021.

GRIGGS & WALNUT GROUND WATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW SUMMARY	
Site Name: Griggs & Walnut Ground Water Plume Superfund Site	
EPA ID: NMD0002271286	
Contact Made By: **Name:** Ms. Nancy Ho **Title:** Remedial Project Manager **Organization:** EPA Region 6 **Name:** Mr. Anthony McGlown **Title:** Project Manager **Organization:** NMED	
Individual Contacted Name: Mr. Pascual Rodriguez **Individual Contacted Title**: Facility Operator	**Individual Contacted Affiliation:** City of Las Cruces-Utilities
Individual Contact information: Telephone No: 575-528-3506 Email: prodriguez@las-cruces.org Street Address: 680 N. Motel Blvd., Las Cruces, NM 88007	
Interview Record Received: 12/02/2020	**Interview subject:** Second Five-Year Review
Interview type: Email Correspondence	
Location of Visit: Not applicable	

1) What is your overall impression of the project? (general sentiment)

My overall impression of the project is excellent. The process of the plant is effective, from pumping the water form the ground to running it through the treatment process and the final processed water that is put back into the system.

2) Is the remedy functioning as expected? How well is the remedy performing?

The remedy is functioning as expected and successful. The remedy is performing satisfactory. When the water is sampled and tested for PCE, the results are non-dectible.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

Monitoring the data from sampling raw water data shows levels of PCE that non-detectible. Contaminant trends and monitoring data is handled by the consultant.

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

There is continuous on-site O&M presence. The facility is visited and monitored on a daily basis. Every 6 months, staff shuts down the facility to perform the semi-annual

preventative maintenance. During the semi-annual preventative maintenace, staff checks the gallons per minute; inspects the raw water tank and pumps; inspect the blowers and strippers; calibrate the flow meter; inspect the finished product pumps; lube all pumps; inspect and calibrate the chlorine analyzer; replace air filters on the blowers; inspect inlet anti-scalant pumps; inspect sodium hypo-chlorine pumps; and inspect and calibrate the conductivity meter.

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

CLC Production Well NO. 18 has been modified to run 8 hours a day to maximize the capture of PCE as recommended by John Shomkaer and Associates, Inc.

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

Staff has had to replace the 2" check valves that are on top of the transfer pump every 6 months due to wear and tear. Staff has had to also replace a transfer pump and floats.

7) Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

Frequency of startup and shut down of CLC Production Wells 27 and 18 have been modified to increase PCE concentration for treatment as recommended by consultant.

8) Do you have any comments, suggestions, or recommendations regarding the project?

None.

GRIGGS & WALNUT GROUND WATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW SUMMARY	
Site Name: Griggs & Walnut Ground Water Plume Superfund Site	
EPA ID: NMD0002271286	
Contact Made By: **Name:** Ms. Nancy Ho **Title:** Remedial Project Manager **Organization:** EPA Region 6 **Name:** Mr. Anthony McGlown **Title:** Project Manager **Organization:** NMED	
Individual Contacted Name: Ms. Adrienne Widmer **Individual Contacted Title**: Administrator	**Individual Contacted Affiliation:** City of Las Cruces-Utilities
Individual Contact information: Telephone No: 575-528-3514 Email: Street Address:	
Interview Record Received: 12/02/2020	**Interview subject:** Second Five-Year Review
Interview type: Email Correspondence	
Location of Visit: Not applicable	

1) What is your overall impression of the project? (general sentiment)

The project continues to be successful in removing PCE from the aquifer. Participation in the yearly open houses continues to be successful with returning residents coming to learn about the progress or learn about project in general.

2) Is the remedy functioning as expected? How well is the remedy performing?

The remedy is functioning as expected where the removal rate continues to be 100%.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

Monitoring data shows that the operational modifications to Well 18 continue to be successful in removing PCE from the upper level of the plume. PCE treatment also continues to be consistent in pumping Well 27 nearly 24 hours per day from the lower level of the plume. Monitoring data from the 2019 annual report clearly indicated that the FLUTe well liners were failing and required rehabilitation. Rehabilitation is currently underway where sampling and analysis will occur for the whole project as soon and rehabilitation is complete.

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

Yes, operational personnel are on site daily and the remediation continues to be monitored 24 hours a day. Maintenance continues to be conducted as scheduled or as needed.

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

The only significant change for the project is rehabilitation of the FLUTe monitoring wells. The project continues to be effective and we are confident that the upcoming sampling and analysis of all monitoring wells will provide data to show an updated plume size and shape.

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

The replacement of a few valves and pumps, but operations stays on top of the project and it continues to function as designed and anticipated.

7) Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

Well 18 was optimized during the first five years. That optimization change is still current. With the upcoming FLUTe well replacement, sampling efforts will be optimized for the remainder of the project.

8) Do you have any comments, suggestions, or recommendations regarding the project?

None at this time.

GRIGGS & WALNUT GROUND WATER PLUME SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW SUMMARY	
Site Name: Griggs & Walnut Ground Water Plume Superfund Site	
EPA ID: NMD0002271286	
Contact Made By: **Name:** Ms. Nancy Ho **Title:** Remedial Project Manager **Organization:** EPA Region 6 **Name:** Mr. Anthony McGlown **Title:** Project Manager **Organization:** NMED	
Individual Contacted Name: Paul Gamboa **Individual Contacted Title**: Water Production Project Coordinator	**Individual Contacted Affiliation:** City of Las Cruces-Utilities
Individual Contact information: Telephone No: 575-528-3580 Email: Street Address: 680 N. Motel Blvd., Las Cruces, NM 88007	
Interview Record Received: 12/02/2020	**Interview subject:** Second Five-Year Review
Interview type: Email Correspondence	
Location of Visit: Not applicable	

1) What is your overall impression of the project? (general sentiment)

I think that that the overall process to remove the contaminants from the plume is going at a successful rate. I think that the process picked to remove the contaminate using air in the air strippers is a great method to use and is very efficient. The project at the Griggs Walnut Facility has been a learning process these first five years but seems to be working at its best to date.

2) Is the remedy functioning as expected? How well is the remedy performing?

The remedy of removing the contaminate from the ground water using blown air in the strippers is a very efficient process and works great. The air strippers are low maintenance and are a economical way to remove the contaminate from the ground water for many years to come.

3) What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?

Monitoring data that I have seen from CLC shows that the contaminate levels have been decreasing on a yearly basis and show that the contaminate in the plume has moved. The 3D renderings that have been produced also show the contaminate at each level of the aquifer and give a real visual of how the contaminate looks in the plume.

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

The CLC Water Production Operations staff go to the treatment plant every day 365 days a year and respond to all emergencies at the treatment plant. Operators from Water Production go daily to the plant to record data and check the operations and process of the plant to ensure it is operating precisely. Hours that are attended to treatment plant vary from 2 to 6 hours daily depending on process situations. The treatment process and site are monitored by SCADA and CLC dispatch 24 hours a day 365 days a year and notify Water Production Operators of any alarms or issues associated with the treatment plant.

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

There have been some adjustments to run hours and flow rates at the two wells 27 and 18 to maximize the removal of contaminates from the plumes. Sampling for the plant and wells occur regularly on start up and have not changed in the past five years only when the time changes twice a year does this vary. Very little has changed from the initial start up of the treatment plant five years ago minor tweaks have occurred in the process but only to enhance its effectiveness at contaminate removal.

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

No the operations and maintenance of the treatment plant is minor on a daily basis. The treatment plant does receive a thorough maintenance twice a year and that has kept it operating and looking immaculate.

7) Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency.

The cost to operate the Treatment plant remains consistent every month because nothing really changes in its operations and chemical dosages. So raw water treated, finished water produced, chemical costs, and operations costs are relatively the same every month except for February when there are less days in the month.

8) Do you have any comments, suggestions, or recommendations regarding the project?

No will continue to operate and maintain the treatment plant and continue to clean up the plume of contamination PCE.

APPENDIX E – PRESS NOTICE

Published in the Legal Notices Section of the Las Cruces Sun-News on September 16, 2020.

PUBLIC NOTICE
GRIGGS-WALNUT GROUND WATER PLUME SUPERFUND SITE
U.S. EPA Region 6 Initiates
Second Five-Year Review of Site Remedy
September 2020

The U.S. Environmental Protection Agency, Region 6 (EPA) and the New Mexico Environment Department (NMED) are conducting the second five-year review of the remedy for the Griggs-Walnut Ground Water Plume Superfund Site, located in Las Cruces, Doña Ana County, New Mexico.

The review is being conducted to assure that human health and the environment are being protected by the remedial actions taken at the Site. The review will summarize the past five years of the remedial activities and evaluate if the remedy continues to protect public health and the environment.

Due to the presence of tetrachloroethylene (a chemical commonly referred to as PCE) detected in municipal water supply wells, the EPA included the Site on the National Priorities List (NPL) in June 2001. A Record of Decision was signed by EPA on June 19, 2007, which documented the selected remedy for the Site as enhanced groundwater extraction (pumping) with treatment of the collected groundwater to remove the PCE.

The objective of the remedy is to reduce the concentrations of PCE in groundwater to the drinking water standard.

Construction of the treatment system was completed in 2012, and groundwater treatment has been ongoing since May 2012. The remedy utilizes the water production capacity of existing municipal supply wells and infrastructure to deliver treated groundwater into the public water supply. Cleanup activities, including operation and maintenance, and groundwater quality monitoring are ongoing.

The EPA seeks the public's input for this five-year review. Please contact EPA/NMED to schedule a teleconference interview which will be conducted in the Nov. / Dec. 2020 timeframe.

The Second Five-Year Review Report is scheduled for completion by September 2021 and will be available to the public at www.epa.gov and at the following information repositories:

Thomas Branigan Memorial Library
200 E. Picacho Ave.
Las Cruces, NM 88001

New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive
Santa Fe, NM 87502-6110

Information about the Site is available on the Internet at:
http://www.donaanacounty.org/superfund and
https://www.epa.gov/superfund/griggs-walnut

For more information about the Site, please contact:

Ms. Nancy Ho, RPM
Environmental Protection Agency, Region 6
214.665.3179 or 1.800.533.3508 (toll-free), or
e-mail at
ho.nancy@epa.gov

Mr. Anthony McGlown
New Mexico Environment Department
GWQB, Superfund Oversight Section
505.827.2908, or e-mail at
anthony.mcglown@state.nm.us

All media inquiries should be directed to the EPA Region 6 Press Office at 214.665.2200.