



GRIGGS AND WALNUT GROUND WATER PLUME SUPERFUND SITE STATUS UPDATE

Community Meeting
Branigan Library, 200 East Picacho
September 25, 2019

ROLES AND RESPONSIBILITIES



EPA – REGULATES CLEANUPS UNDER 1980 SUPERFUND LAW

- Selects Site-Specific Remedies based on Evaluation of Contamination, Risk, and Cleanup Options

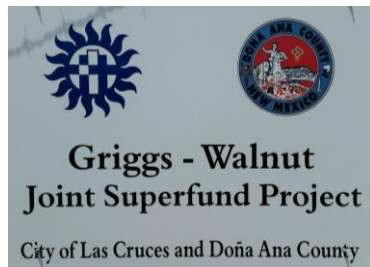


NEW MEXICO ENVIRONMENT DEPARTMENT (NMED)

- Regulates Protection of Ground Water under NM Water Quality Act

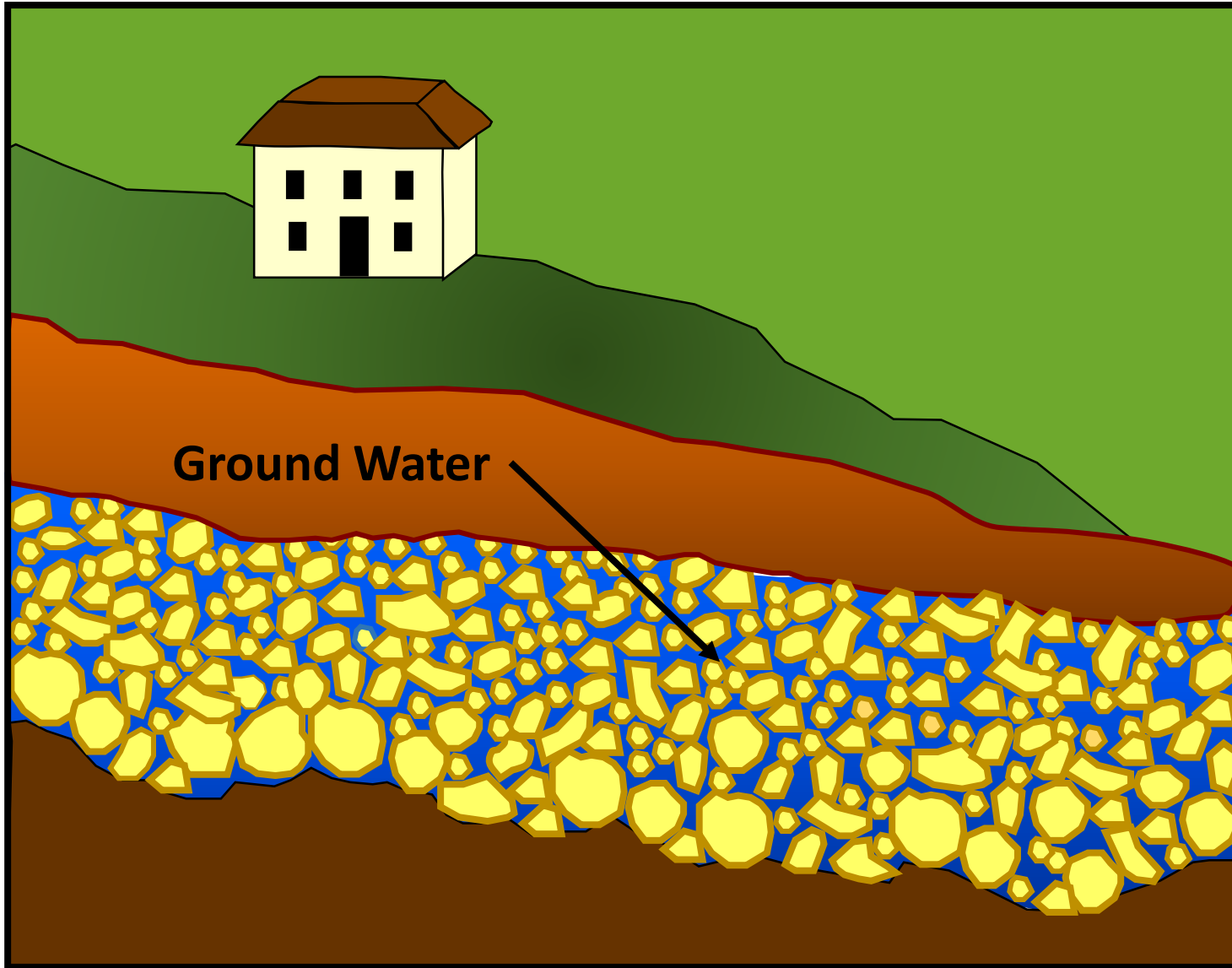
CITY OF LAS CRUCES AND DOÑA ANA COUNTY

- Identified as “Potentially Responsible Parties”
- Formed the “Joint Superfund Project” (JSP) to Implement Remedy Selected by EPA
- Currently Performing Work under EPA Administrative Order



SITE BACKGROUND CHRONOLOGY

- GROUND WATER CONTAMINATION DISCOVERED – 1993
 - Tetrachloroethylene (PCE)
- PLACED ON EPA NATIONAL PRIORITIES LIST (NPL) – 2001
- EPA COMPLETES INVESTIGATION OF PCE PLUME - 2005
- EPA SELECTS REMEDY – 2007
- REMEDY DESIGN AND CONSTRUCTION COMPLETED BY JSP – 2012
- OPERATIONAL STARTUP – 2012
- FIRST FIVE-YEAR REVIEW ON REMEDY PROTECTIVENESS – 2016



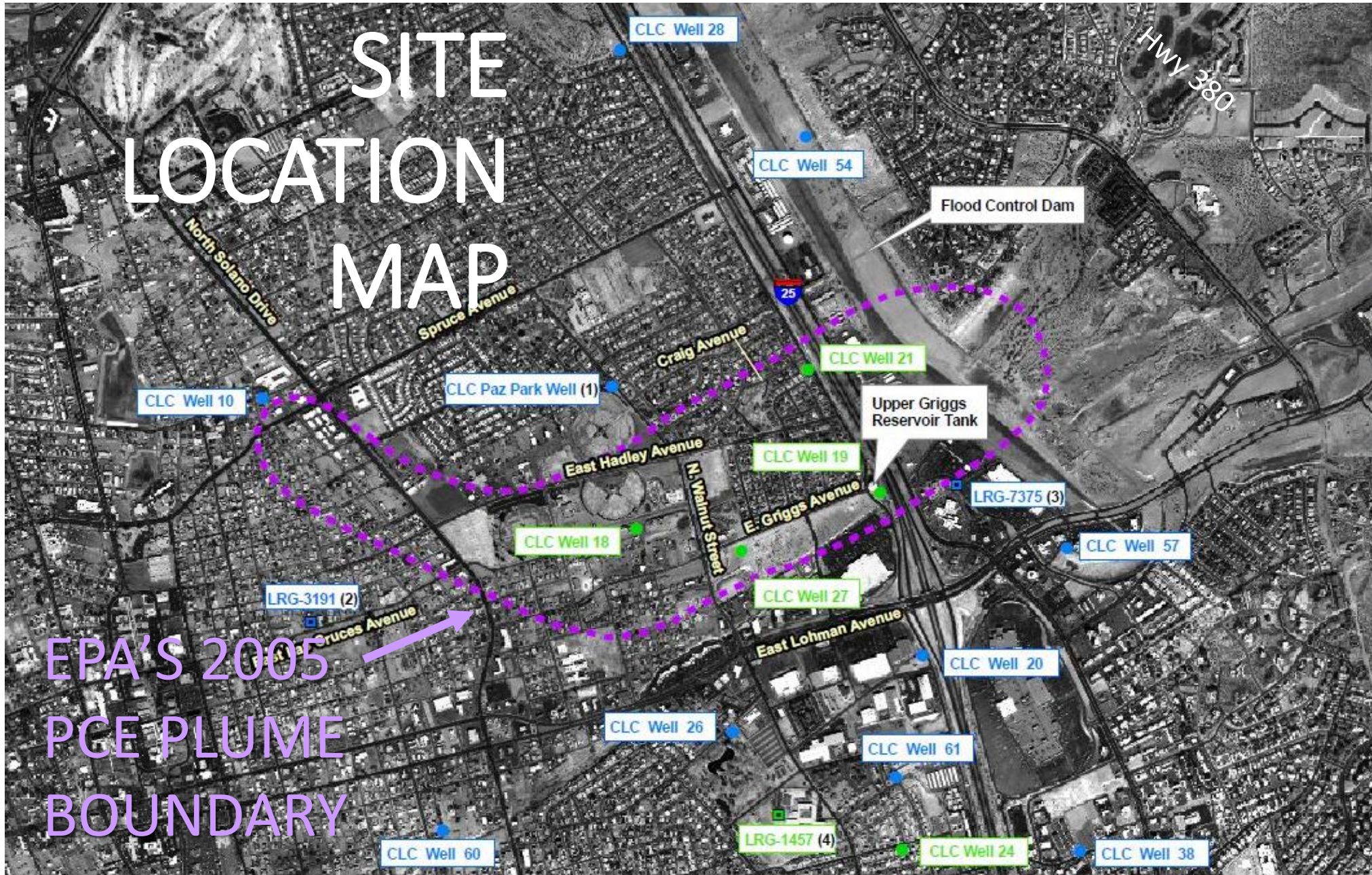
Ground Water

GROUND WATER

ILLUSTRATION

Modified from City of Las Cruces
Poster Display

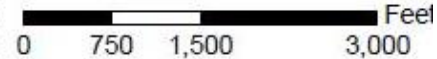
SITE LOCATION MAP



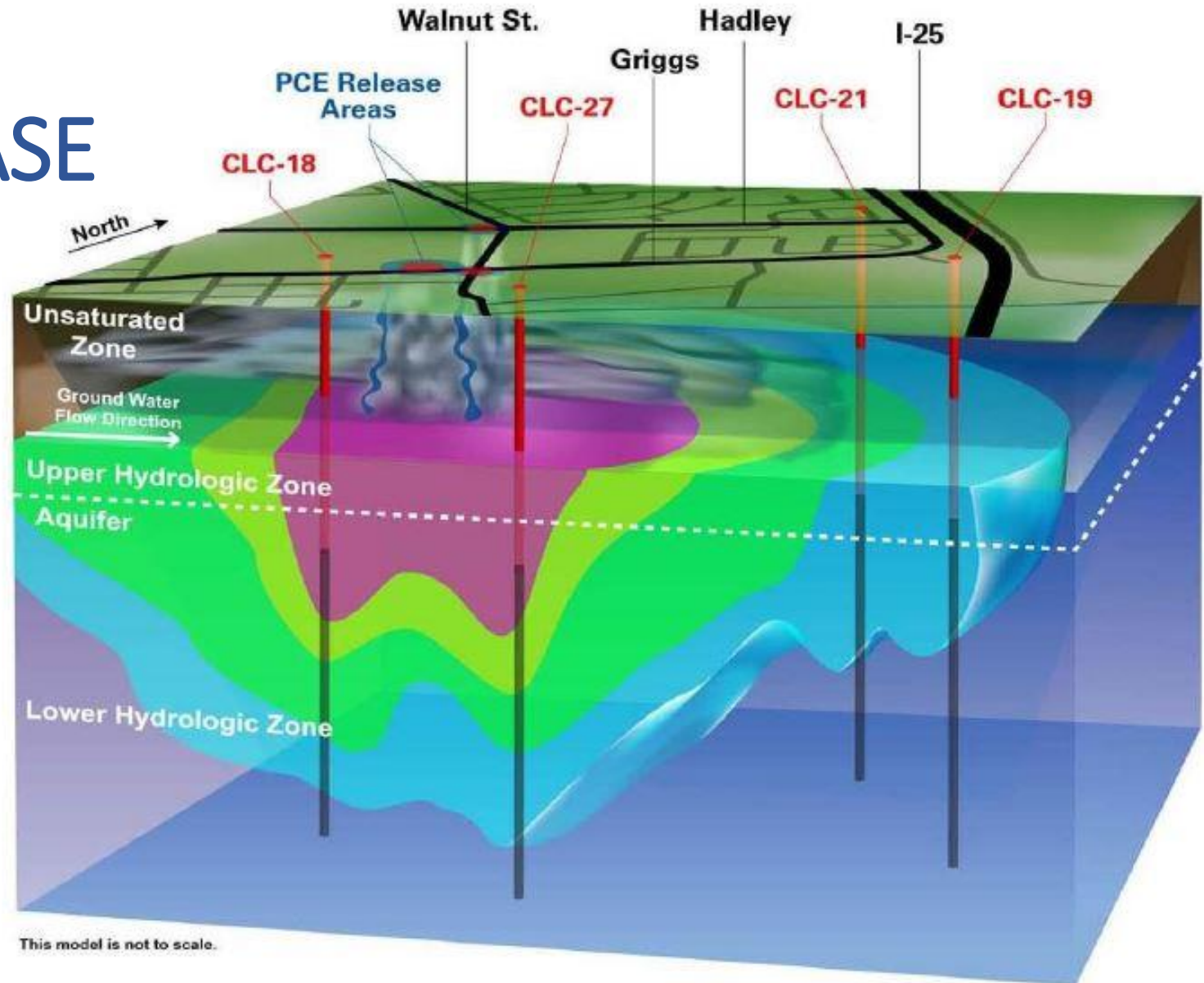
EPA'S 2005
PCE PLUME
BOUNDARY



Las Cruces



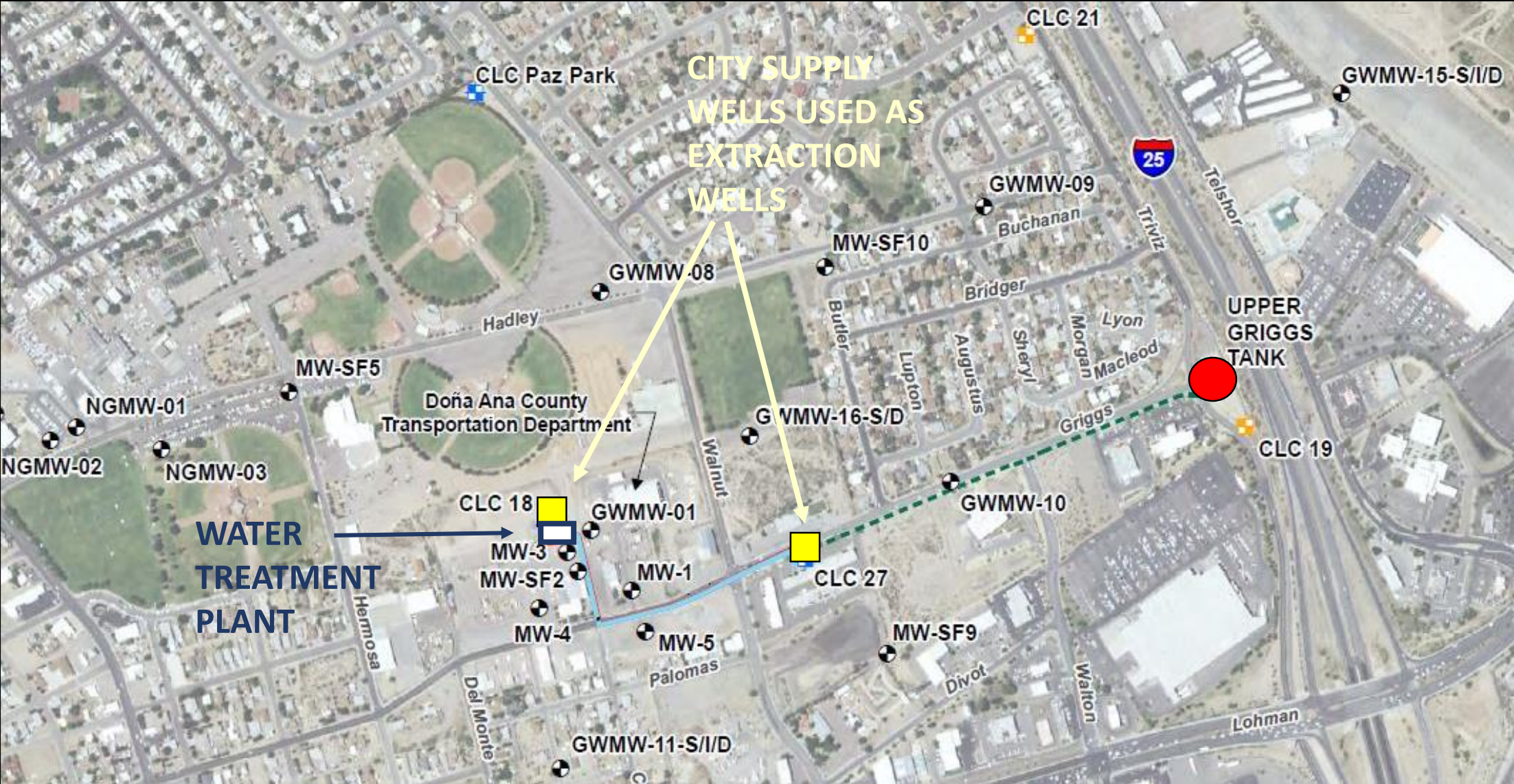
EPA 2005 CONCEPTUAL MODEL OF PCE RELEASE TO GROUND WATER



EPA SELECTED GROUND WATER REMEDY

- HYDRAULIC CONTROL OF PCE PLUME
 - Operate Existing Municipal Wells as Extraction Wells
- RESTORE GROUND WATER TO BENEFICIAL USE AS A DRINKING WATER SUPPLY SOURCE
 - By Extraction and Treatment of Ground Water
 - Treated Ground Water Available for Delivery into Public Water Supply
- INSTITUTIONAL CONTROL
 - Temporary Well Drilling Prohibition
 - Prevent Exposure

EPA SELECTED GROUND WATER REMEDY



WATER TREATMENT PLANT

TWO 28,000 GALLON HOLDING TANKS
EXTRACTED/RAW WATER AND
TREATED/FINISHED WATER

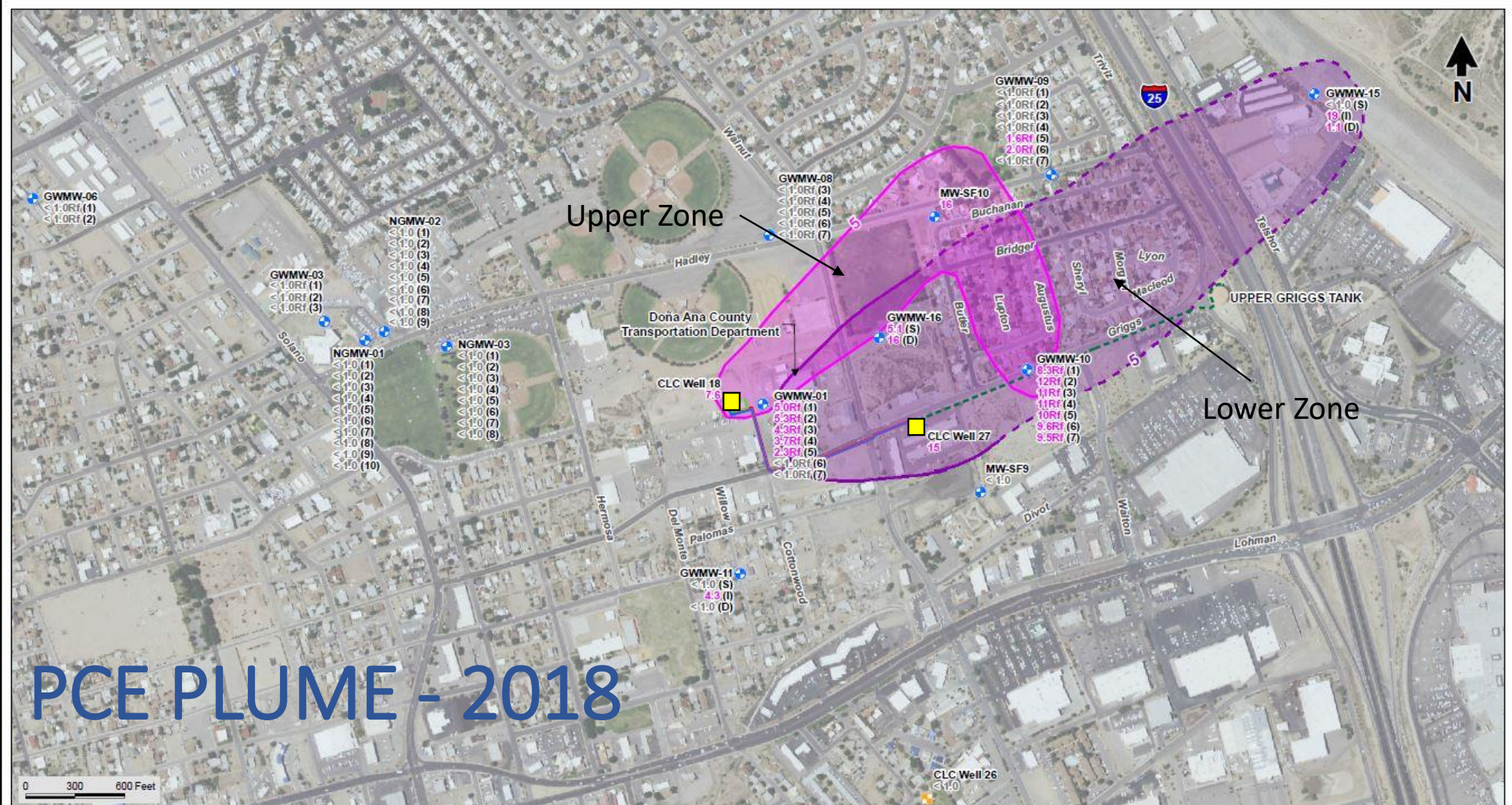


STACKED-TRAY AIR STRIPPER WATER TREATMENT SYSTEM



ENLARGED PHOTO OF STACKED TRAYS

S:\PROJECTS\ES13.0251 - OLD ENVIRONMENTAL SERVICES\GIS\MAPS\REPORTS\0018 ANNUAL\FIG 06 PCE GW 12 2018 UPPER AND LOWER LZ.MXD



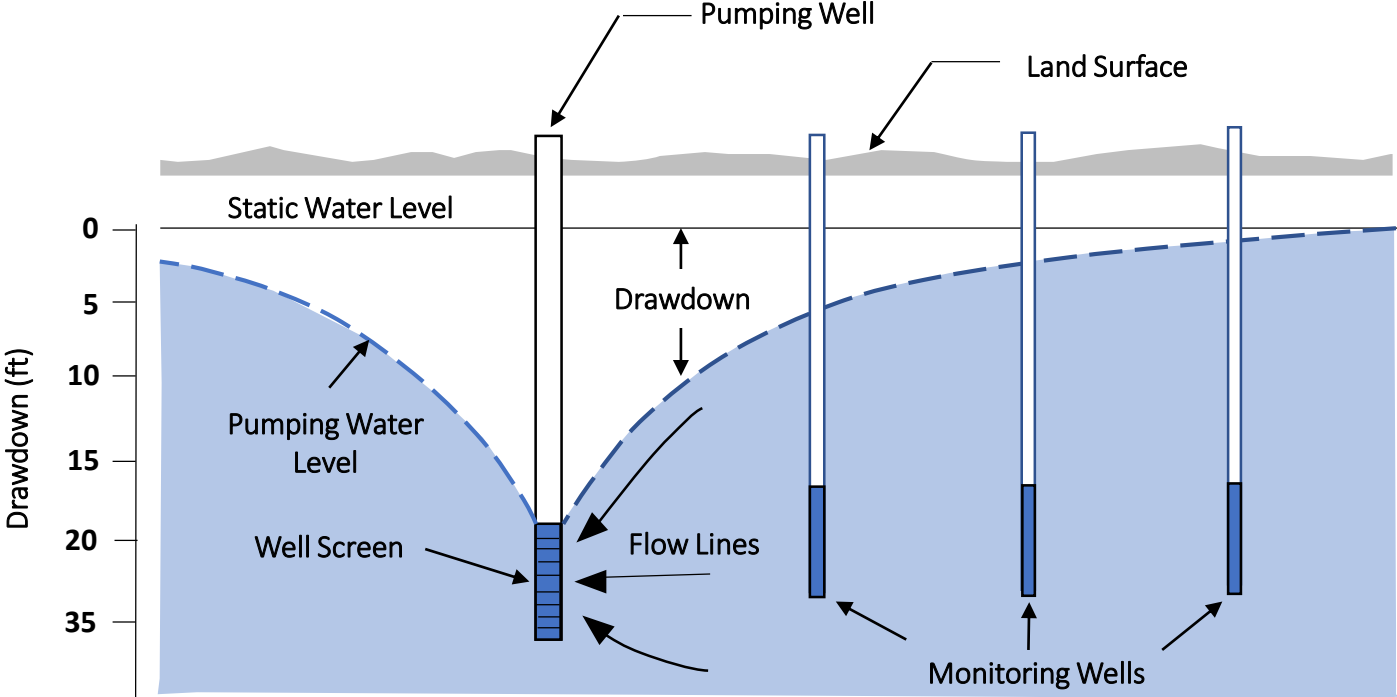
PCE PLUME - 2018

Explanation

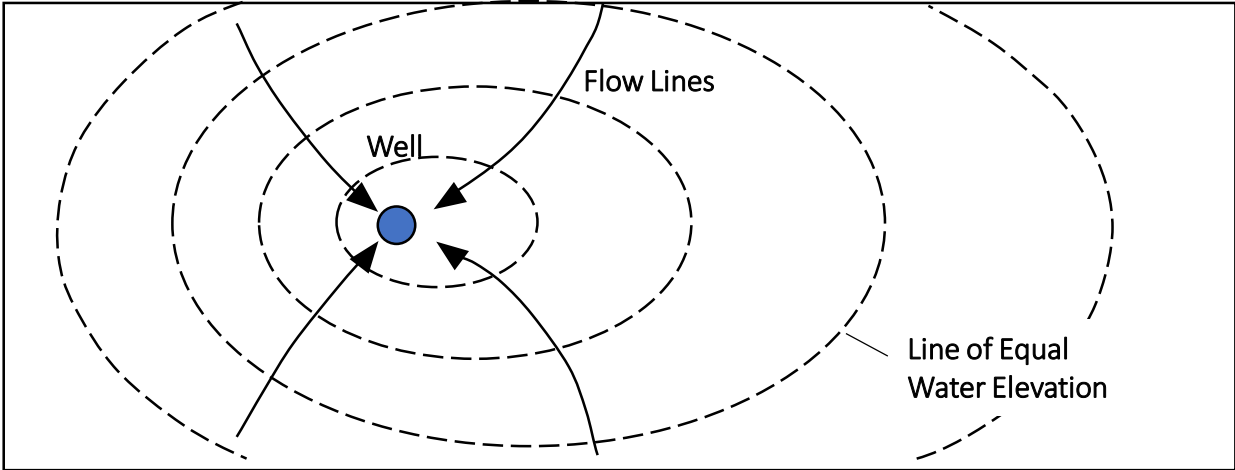
- Monitor well
- Public supply well
- Inactive public supply well
- 6" raw water line
- 8" finished water line
- Treatment compound
- Existing 10" water line to reservoir
- PCE concentration contour (µg/L), upper
- PCE concentration contour (µg/L), lower (dashed where inferred)
- CLC Pumping Well
- MW-SF10** Well designation
- 16** Concentration (µg/L)
- < 1.0** Not detected above reporting limit
- Rf** Rejected, the data are unusable. FLUTE well liner lacks integrity.

Source: 1. National Agricultural Imagery Program May 2016.
2. PCE plume provided by Shoemaker and Associates.

CONCEPTUALIZATION – HYDRAULIC CONTROL OF A PLUME



CONE OF DEPRESSION
CROSS SECTIONAL VIEW



CONE OF DEPRESSION
MAP VIEW

Modified from Fletcher G. Driscoll, 1987, 2nd Printing

MONITORING WELL NETWORK



WELL CLC-18

PCE LEVELS AND PUMPING VS TIME

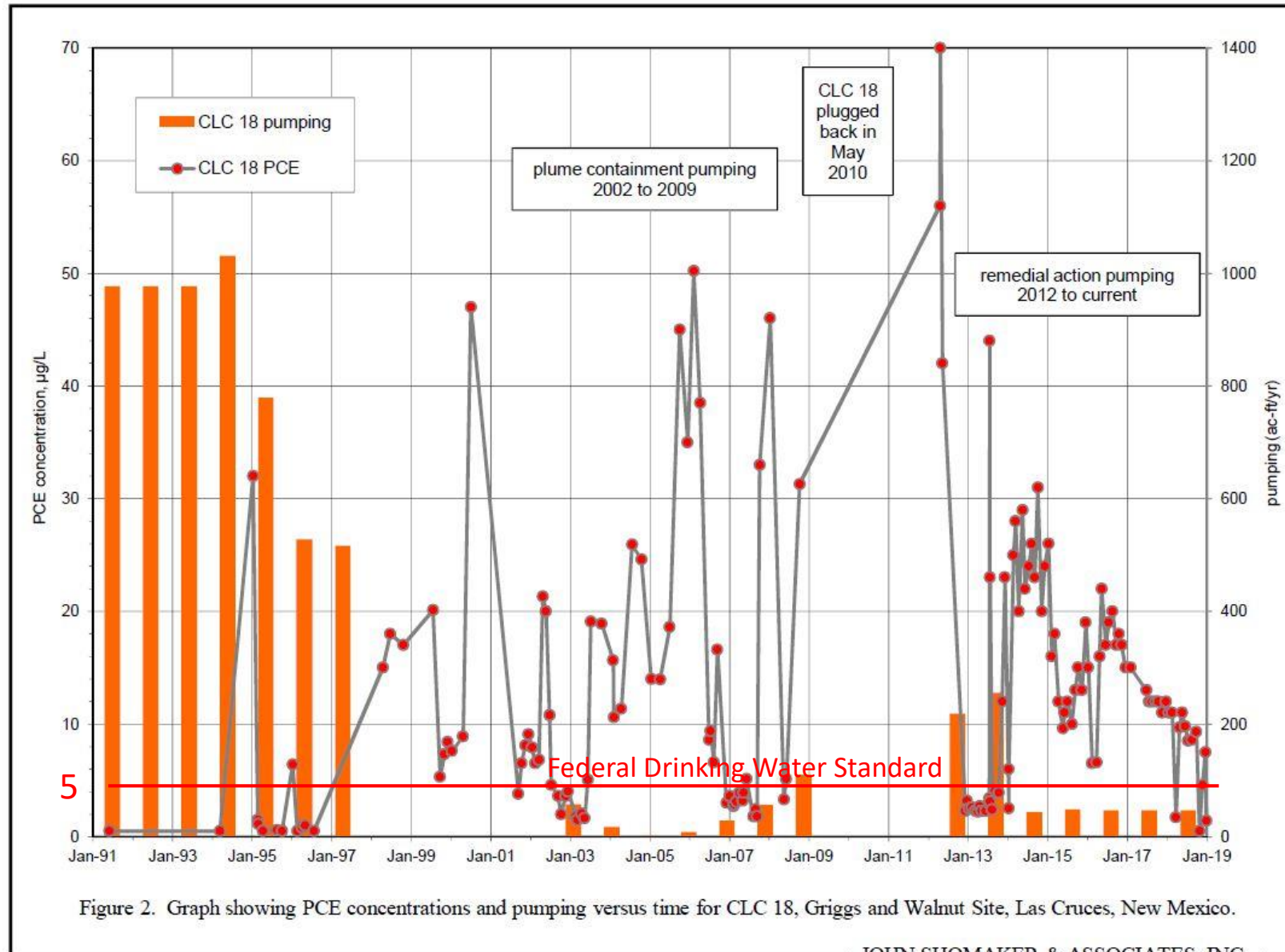
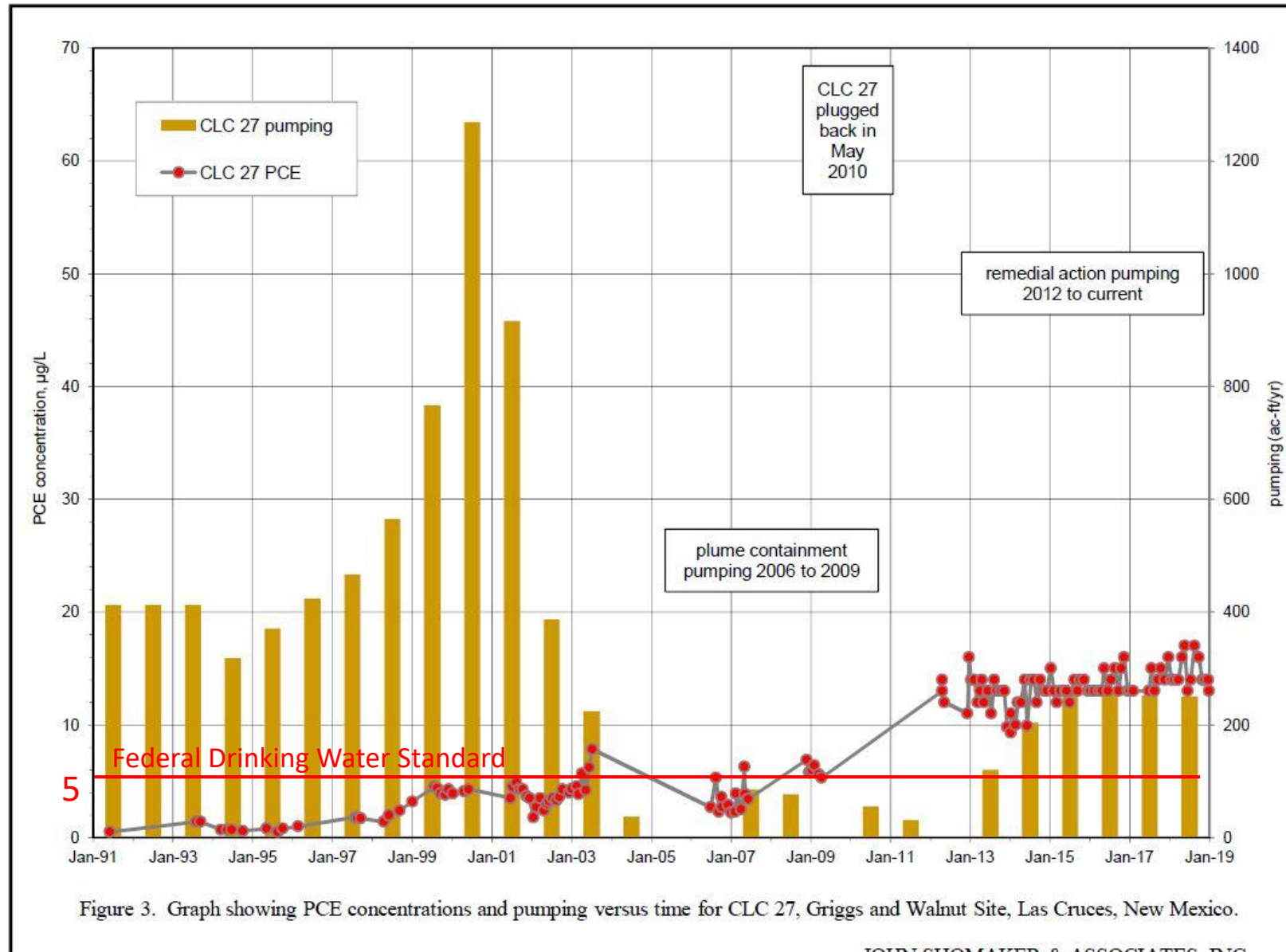


Figure 2. Graph showing PCE concentrations and pumping versus time for CLC 18, Griggs and Walnut Site, Las Cruces, New Mexico.

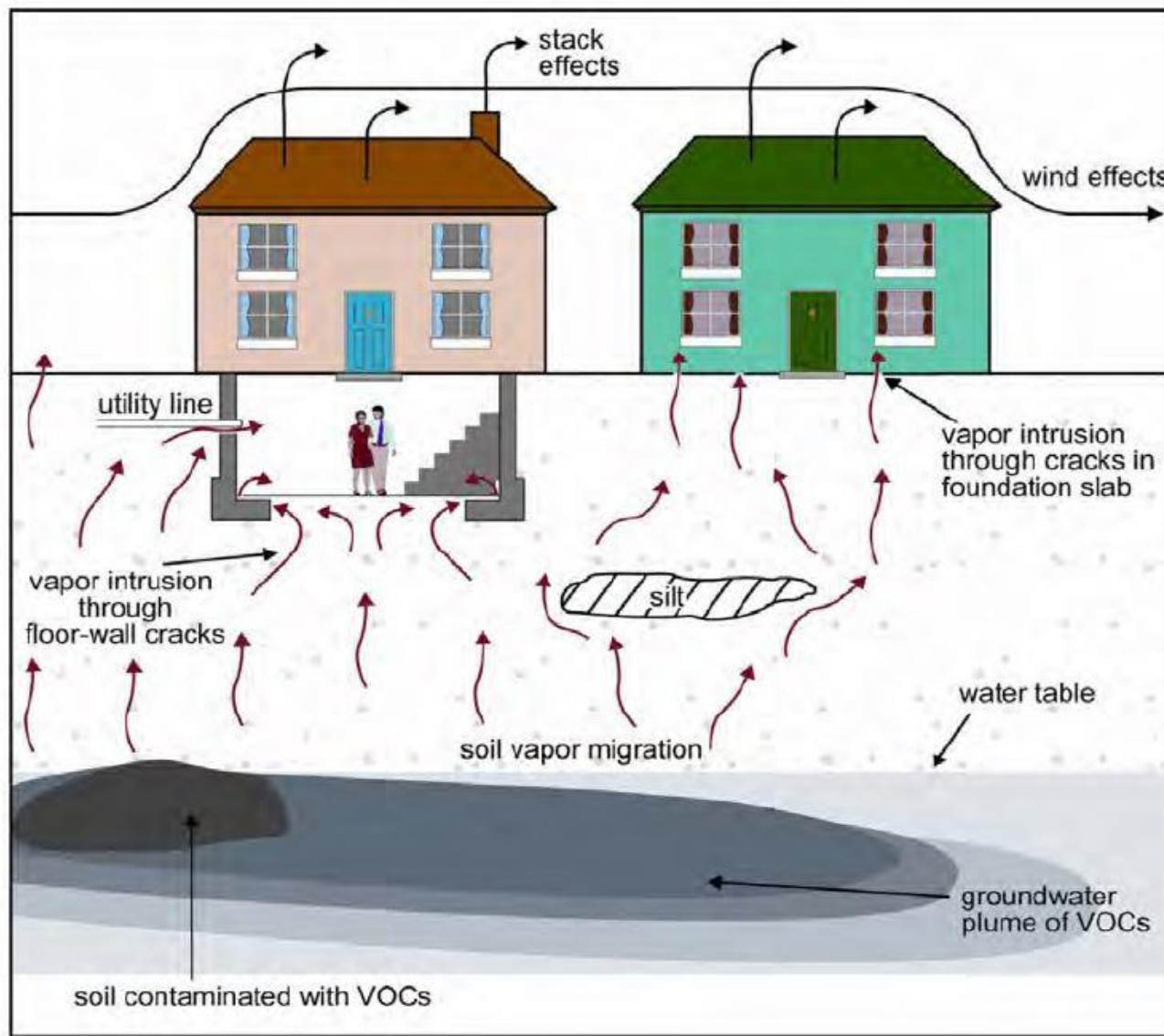
WELL CLC-27

PCE LEVELS AND PUMPING VS TIME



2016 FIVE-YEAR REVIEW FINDINGS

- **PROTECTIVENESS DETERMINATION DEFERRED**
 - Indoor Air Vapor Intrusion Pathway – Warranted Investigation
 - Ground Water Pathway – No Known Human Exposure
- **KEY RECOMMENDATION:**
 - Assess Indoor Air Vapor Intrusion Pathway - Completed

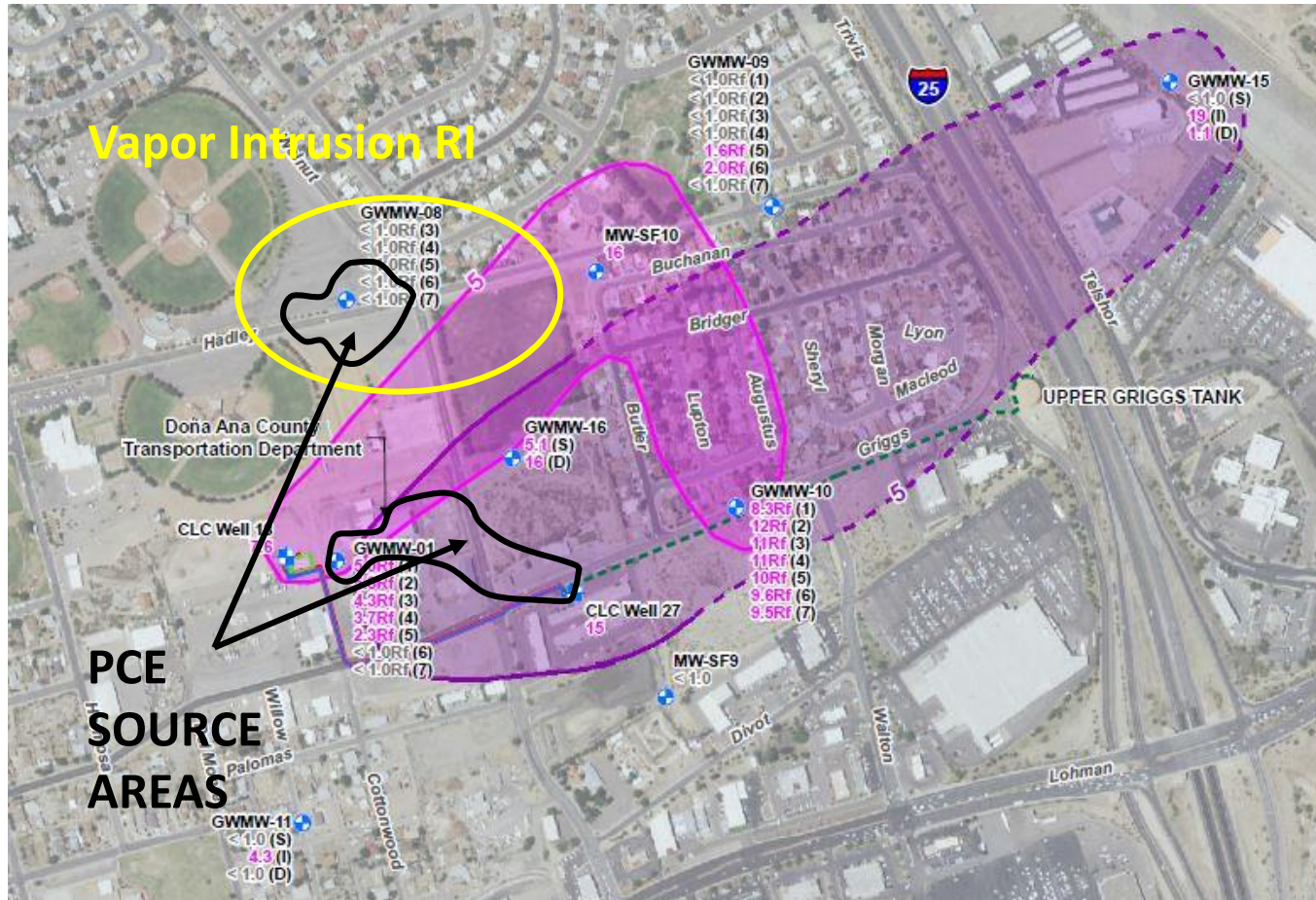


INDOOR AIR VAPOR INTRUSION

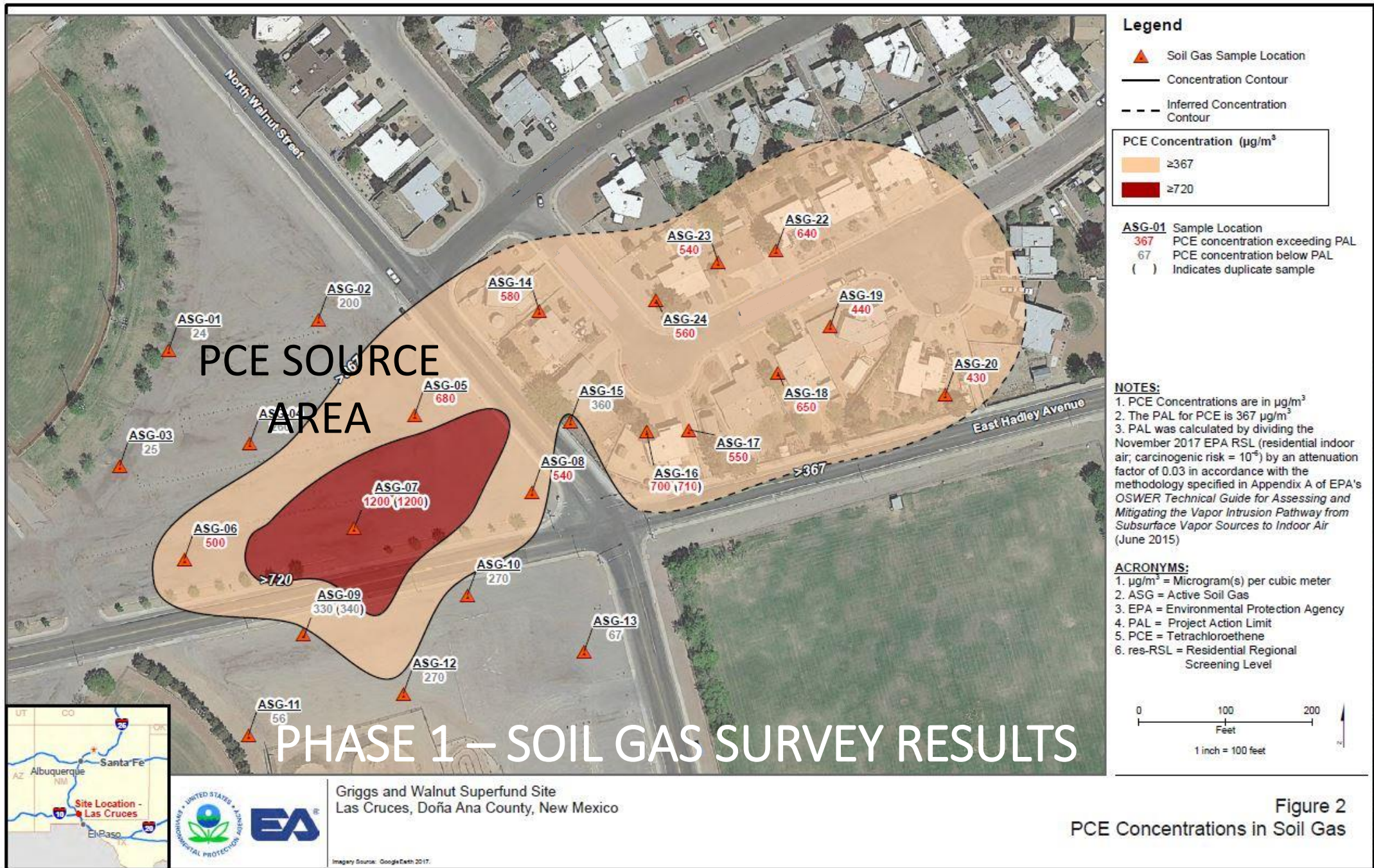
ILLUSTRATION

VOCs – Volatile Organic Compounds

EPA VAPOR INTRUSION REMEDIAL INVESTIGATION (RI)



- INITIATED IN 2017
- TARGETED PCE SOURCE AREA AND RESIDENTIAL COMMUNITY
- 2-PHASED APPROACH
 - Phase 1 – Exterior Soil Gas Survey
 - Phase 2 – Indoor Air/Sub-slab



Legend

- ▲ Soil Gas Sample Location
- Concentration Contour
- - - Inferred Concentration Contour

PCE Concentration ($\mu\text{g}/\text{m}^3$)	
	≥ 367
	≥ 720

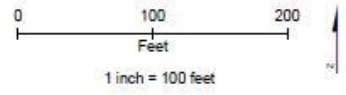
ASG-01	Sample Location
367	PCE concentration exceeding PAL
67	PCE concentration below PAL
()	Indicates duplicate sample

NOTES:

1. PCE Concentrations are in $\mu\text{g}/\text{m}^3$
2. The PAL for PCE is $367 \mu\text{g}/\text{m}^3$
3. PAL was calculated by dividing the November 2017 EPA RSL (residential indoor air; carcinogenic risk = 10^{-6}) by an attenuation factor of 0.03 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 (June 2015)

ACRONYMS:

1. $\mu\text{g}/\text{m}^3$ = Microgram(s) per cubic meter
2. ASG = Active Soil Gas
3. EPA = Environmental Protection Agency
4. PAL = Project Action Limit
5. PCE = Tetrachloroethene
6. res-RSL = Residential Regional Screening Level



PHASE 1 — SOIL GAS SURVEY RESULTS



Griggs and Walnut Superfund Site
Las Cruces, Doña Ana County, New Mexico

Imagery Source: Google Earth 2017.

Figure 2
PCE Concentrations in Soil Gas

2018-08-29 P:\g\Projects\Griggs and Walnut\GIS\Tech Memo 2017-08\Fig 2 - PCE Concentrations.mxd EA-Albuquerque Study

PHASE 2 - INDOOR AIR/SUB-SLAB AIR SAMPLE RESULTS

- FIVE HOMES SAMPLED IN 2019
- SUB-SLAB SAMPLE RESULTS
 - PCE Detected above Project Action Limit of 367 $\mu\text{g}/\text{L}$ beneath Foundation Slabs
- INDOOR AIR SAMPLE RESULTS
 - PCE and TCE Detected below Health-based Screening Levels of 11.0 and 0.48 $\mu\text{g}/\text{m}^3$

***NO
CONTAMINANTS
EXCEEDED
HEALTH-BASED
SCREENING
LEVELS IN
INDOOR AIR
SAMPLES!***

$\mu\text{g}/\text{L}$ = micrograms per liter

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

NEXT STEPS

- COMPLETE VAPOR INTRUSION REMEDIAL INVESTIGATION REPORT – FALL 2019
- PREPARE AMENDMENT TO 2016 FIVE-YEAR REVIEW REPORT - 2020
- CONTINUE TO OPERATE GROUND WATER REMEDY
- CONTINUE TO MONITOR GROUND WATER
- NEXT FIVE-YEAR REVIEW - 2021

SITE DOCUMENTS

AVAILABLE TO THE PUBLIC AT FOLLOWING REPOSITORIES:

BRANIGAN PUBLIC LIBRARY

200 EAST PICACHO, LAS CRUCES, NM 88001

NEW MEXICO ENVIRONMENT DEPARTMENT

GROUND WATER QUALITY BUREAU

HAROLD RUNNELS BUILDING

1190 ST. FRANCIS DRIVE

SANTA FE, NM 87502-6110

COMMUNITY OUTREACH

- WHAT ARE PREFERRED METHODS FOR COMMUNITY OUTREACH?
 - EPA WEBSITE
 - SOCIAL MEDIA
 - ELECTRONIC MAIL
 - NEWSPAPER NOTICES
 - COMMUNITY BULLETINS
 - COMMUNITY MEETINGS

EPA WEBSITE:

<http://www.epa.gov/superfund/griggs-walnut>

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ADRIENNE WIDMER

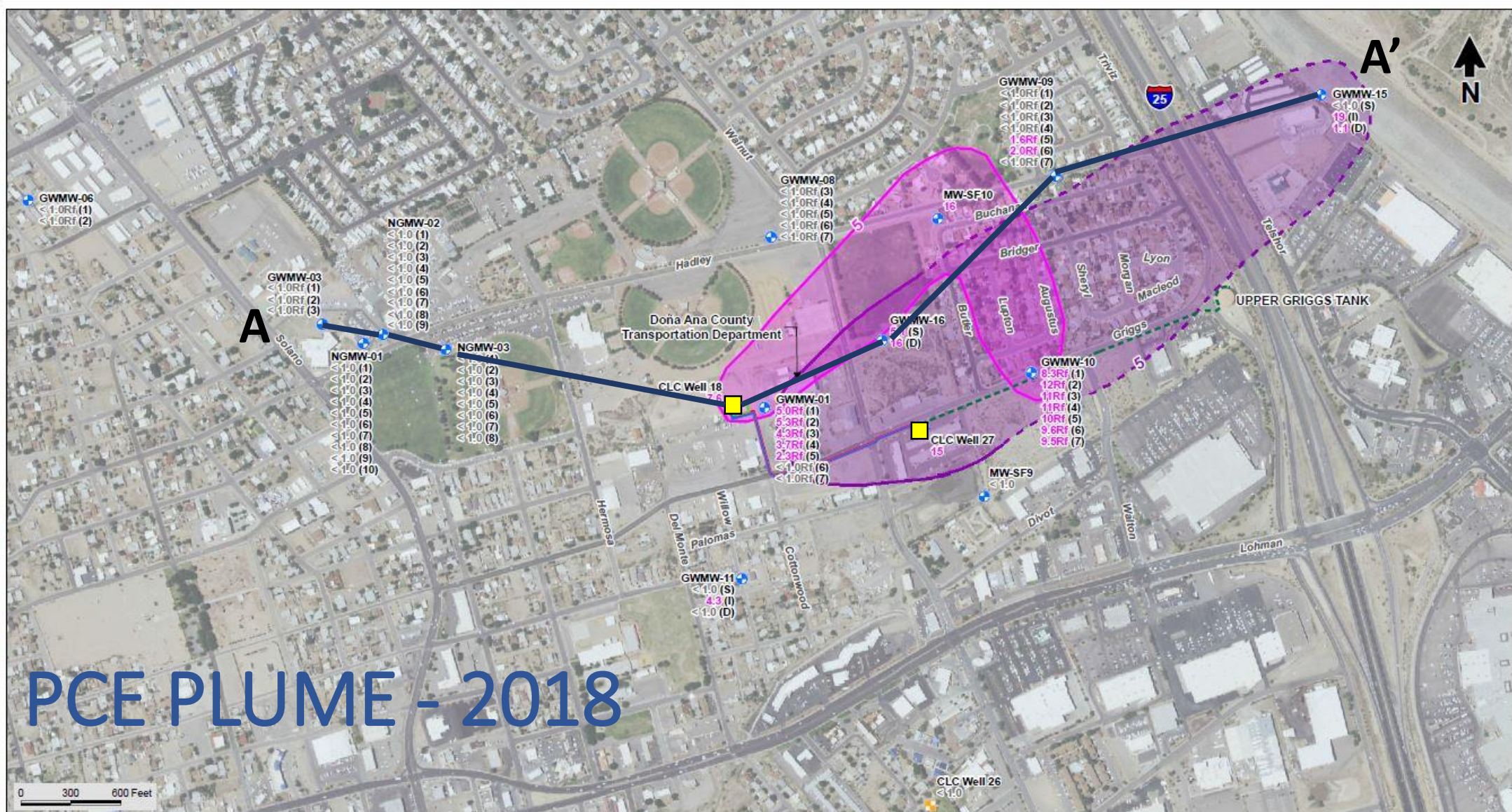
Las Cruces Utilities/Water

Tel: 575-528-3514

E-mail: awidmer@las-cruces.org

OTHER SLIDES

ES:PROJECTS/ES13.0251_OLD ENVIRONMENTAL SERVICES/ES/MS/DR/REPORTS/0018 ANNUAL/036_PCE_GW_12_2018_UPPER AND LOWER 1/2.MXD



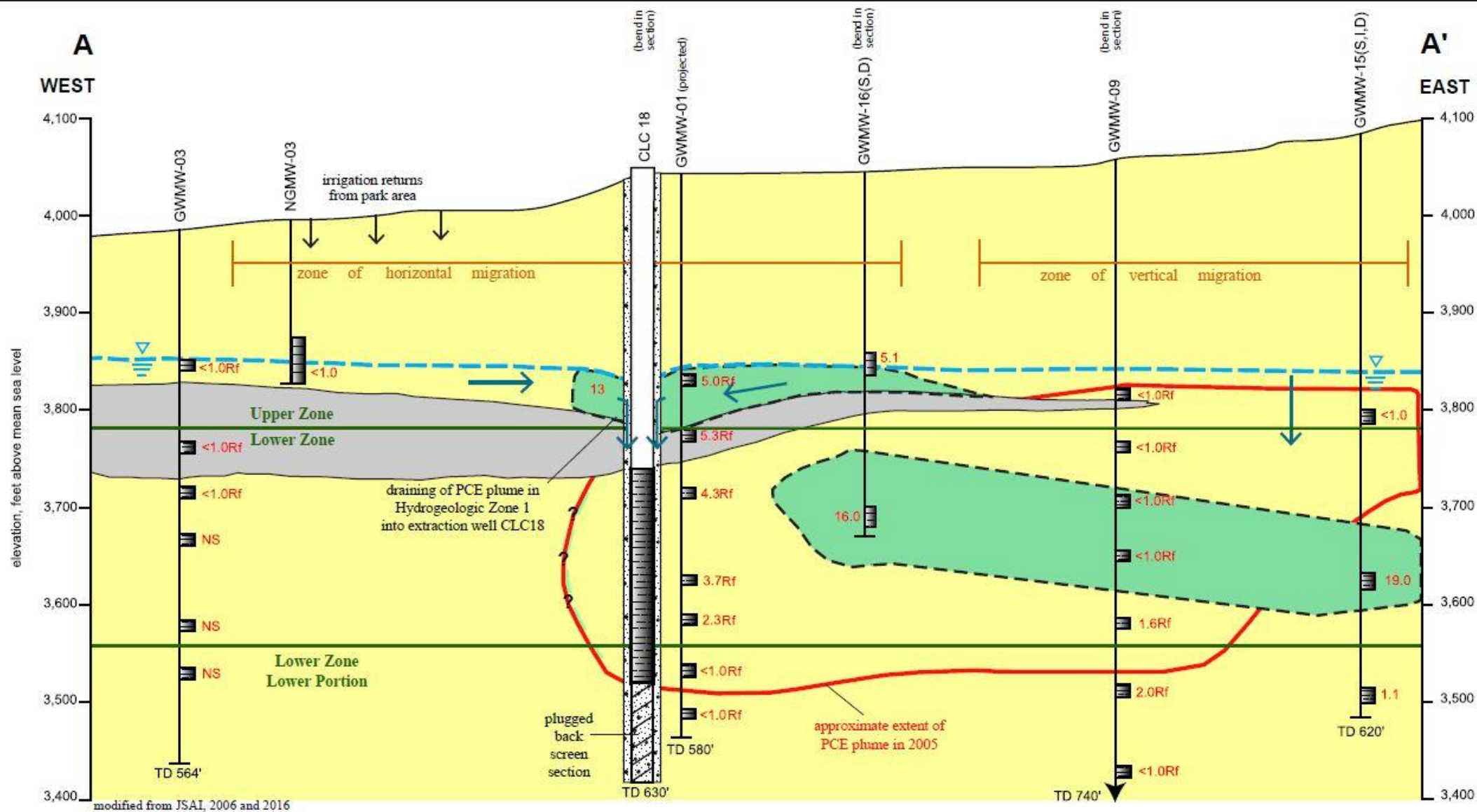
PCE PLUME - 2018

Explanation

- | | | | |
|--------------------------------------|------------------------|---|--|
| Monitor well | 6" raw water line | PCE concentration contour (µg/L), upper | MW-SF10 Well designation |
| Public supply well | 8" finished water line | PCE concentration contour (µg/L), lower (dashed where inferred) | 16 Concentration (µg/L) |
| Inactive public supply well | Treatment compound | CLC Pumping Well | < 1.0 Not detected above reporting limit |
| Existing 10" water line to reservoir | | | Rf Rejected, the data are unusable. FLUTE well liner lacks integrity. |

Source: 1. National Agricultural Imagery Program May 2016.
 2. PCE plume provided by Shoemaker and Associates.

GRIGGS-WALNUT GROUND WATER PLUME SITE
 REMEDIAL ACTION
 PCE in Groundwater, December 2018



modified from JSAI, 2006 and 2016

EXPLANATION	
predominantly sand, silt, and clay	screen section
predominantly sand and gravel	direction of flow
PCE concentrations >5 µg/L (2018)	2.3 PCE concentration, µg/L (2018)
approximate water table (wells not to horizontal scale)	Rf rejected, the data are unusable, FLUTE well liner lacks integrity
	- - - dashed where inferred

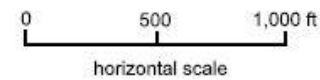


Figure 4. Hydrogeologic cross-section A-A' with winter 2018 PCE concentrations, Griggs and Walnut Site, Las Cruces, New Mexico.

WATER LEVEL ELEVATION MAP - 2018

Upper Hydrogeologic Zone



Figure 8. Aerial photograph showing December 2018 water-level elevation contours and PCE concentrations for the Upper Hydrogeologic Zone, Griggs and Walnut Site, Las Cruces, New Mexico.

WATER LEVEL ELEVATION MAP - 2018

Lower Hydrogeologic Zone

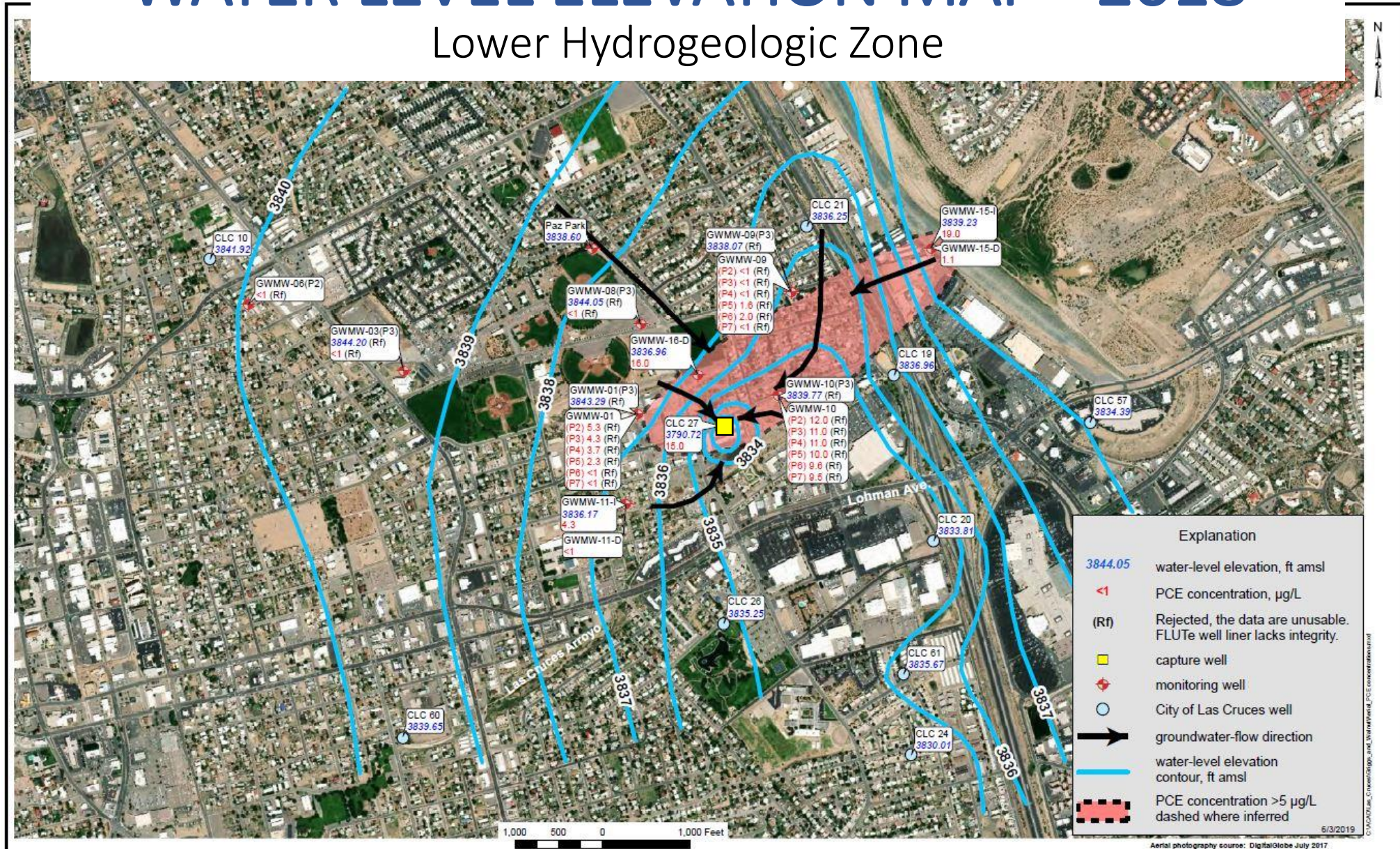
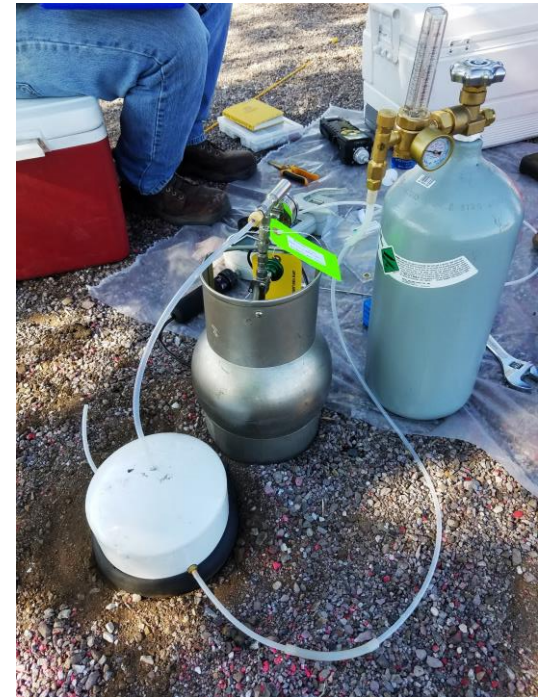


Figure 9. Aerial photograph showing December 2018 water-level elevation contours and PCE concentrations for the Lower Hydrogeologic Zone, Griggs and Walnut Site, Las Cruces, New Mexico.



SOIL GAS SURVEY



AIR SAMPLE RESULTS

- SUB-SLAB – PCE CONCENTRATIONS
 - Ranged from 150 to 920 $\mu\text{g/L}$
- INDOOR/OUTDOOR AIR - PCE CONCENTRATIONS
 - Ranged from 0.026 $\mu\text{g/m}^3$ (outdoor sample) to 0.96 $\mu\text{g/m}^3$ (indoor sample)
- INDOOR/OUTDOOR AIR - TCE CONCENTRATIONS
 - Ranged from 0.029 $\mu\text{g/m}^3$ (outdoor sample) to 0.22 $\mu\text{g/m}^3$ (indoor samples)

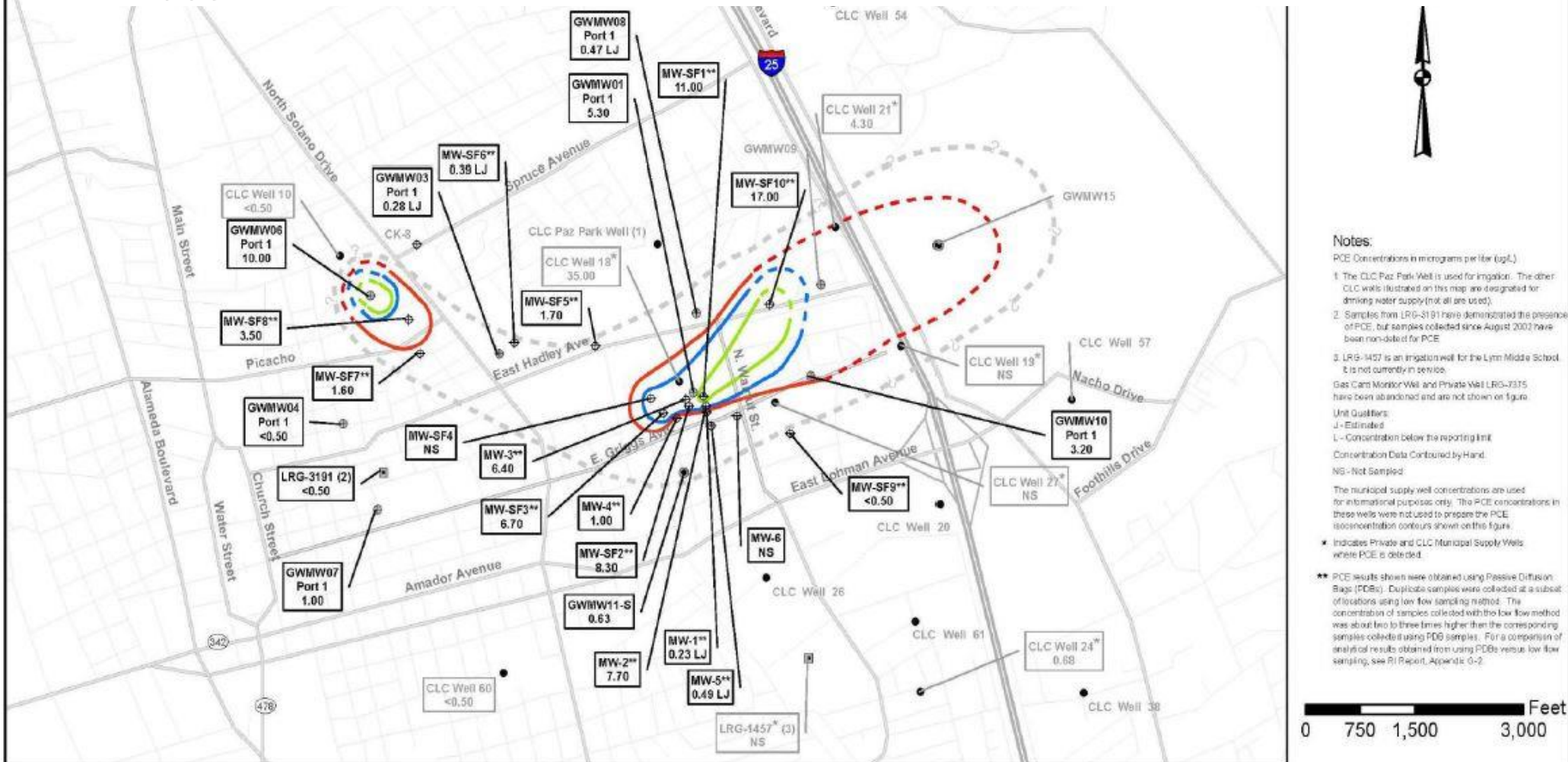
INDOOR AIR SCREENING LEVELS

TCE = 0.48 $\mu\text{g/m}^3$

PCE = 11.0 $\mu\text{g/m}^3$

HORIZONTAL DISTRIBUTION OF PCE IN GROUND WATER

EPA 2005



Notes:
 PCE Concentrations in micrograms per liter (ug/L)
 1. The CLC Paz Park Well is used for irrigation. The other CLC wells illustrated on this map are designated for drinking water supply (not all are used).
 2. Samples from LRG-3191 have demonstrated the presence of PCE, but samples collected since August 2002 have been non-detect for PCE.
 3. LRG-1457 is an irrigation well for the Lynn Middle School. It is not currently in service.
 Gas Card Monitor Well and Private Well LRG-7375 have been abandoned and are not shown on figure.
 Unit Qualifiers:
 J-- Estimated
 L-- Concentration below the reporting limit
 Concentration Data Contoured by Hand.
 NS-- Not Sampled
 The municipal supply well concentrations are used for informational purposes only. The PCE concentrations in these wells were not used to prepare the PCE isocentration contours shown on the figure.
 * Indicates Private and CLC Municipal Supply Wells where PCE is detected.
 ** PCE results shown here obtained using Passive Diffusion Bags (PDBs). Duplicate samples were collected at a subset of locations using low flow sampling method. The concentration of samples collected with the low flow method was about two to three times higher than the corresponding samples collected using PDB samples. For a comparison of analysis of results obtained from using PDBs versus low flow sampling, see R1 Report, Appendix G-2.

LEGEND

<ul style="list-style-type: none"> ⊕ Water Table Monitor Well (screen depths of these wells range from 101 to 204 feet bgs.) ● City of Las Cruces (CLC) Municipal Water Supply Wells (screen depths of these wells range from 281 to 1,050 feet bgs.) ■ Private Water Supply Wells (screen depths of these wells range from 150 to 280 feet bgs, depth of screen information is not available for LRG-1457) ⊞ Multi-Port Monitor Well (screen depth of these wells range from 90 to 640 feet bgs) 	<ul style="list-style-type: none"> ⊙ Nested Monitor Well (screen depths of these wells range from 180 to 580 ft bgs) ⊞ Monitor Well ID, Port Number & PCE Concentration ⊞ Indicates Uncertainty of Extent of GWP-Related PCE Detections ⊞ Estimated Extent of GWP-Related PCE Detections 	<p>PCE Concentration Levels (Dashed Where Inferred)</p> <ul style="list-style-type: none"> — 2.5 ug/L — 5 ug/L — 10 ug/L — 20 ug/L
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Figure 4-10
 Horizontal Distribution of PCE in
 the Upper Hydrologic Zone (December 2005)
 Griggs & Walnut Ground Water Plume Site
 Las Cruces, New Mexico

HORIZONTAL DISTRIBUTION OF PCE IN SOIL GAS

EPA 2005 REMEDIAL INVESTIGATION

