ADEQ
Arizona Department of Environmental Quality

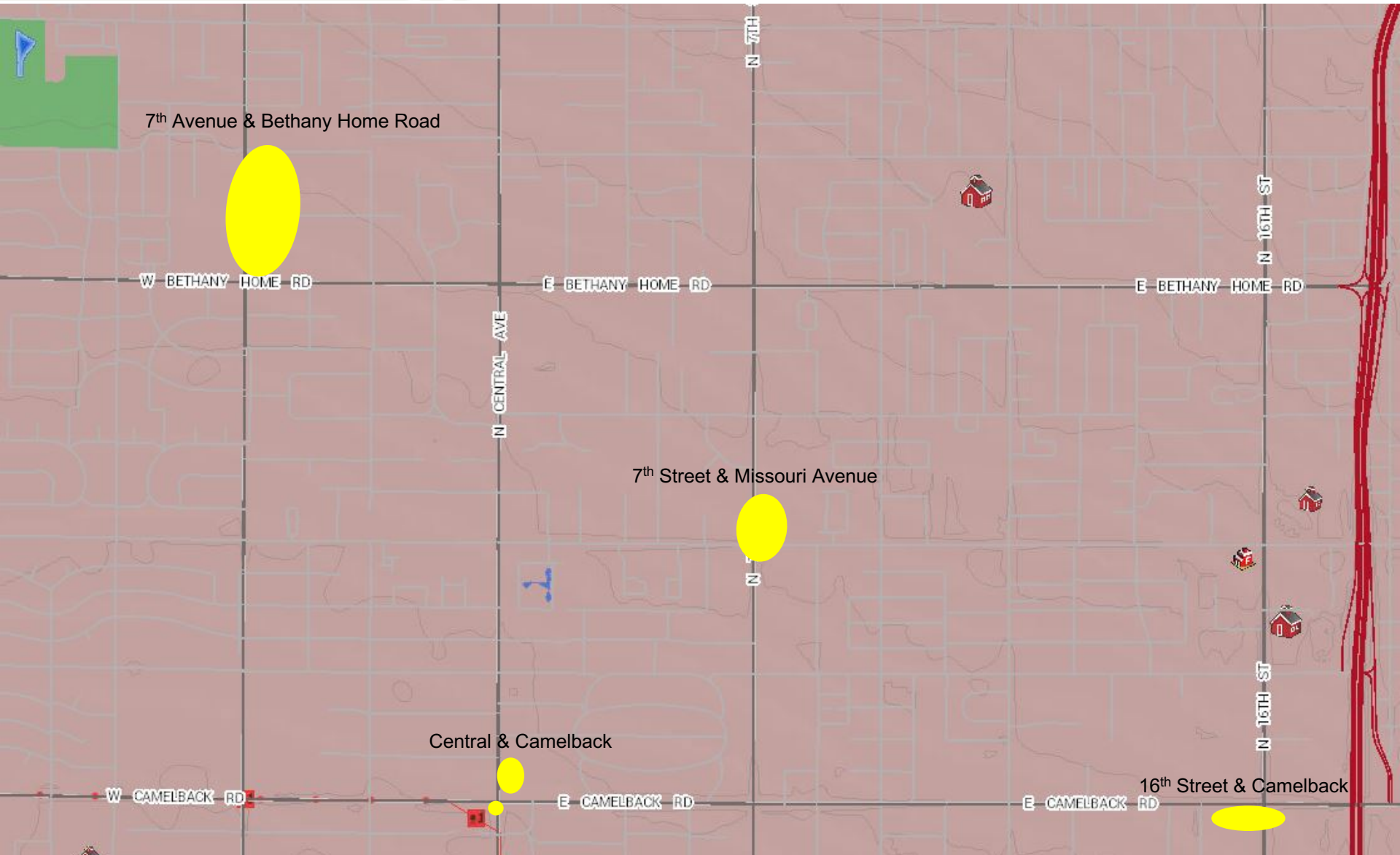
Central Phoenix Water Quality Assurance Revolving Fund (WQARF) Sites Community Advisory Board (CAB) Presentation

Kevin Snyder, Project Manager

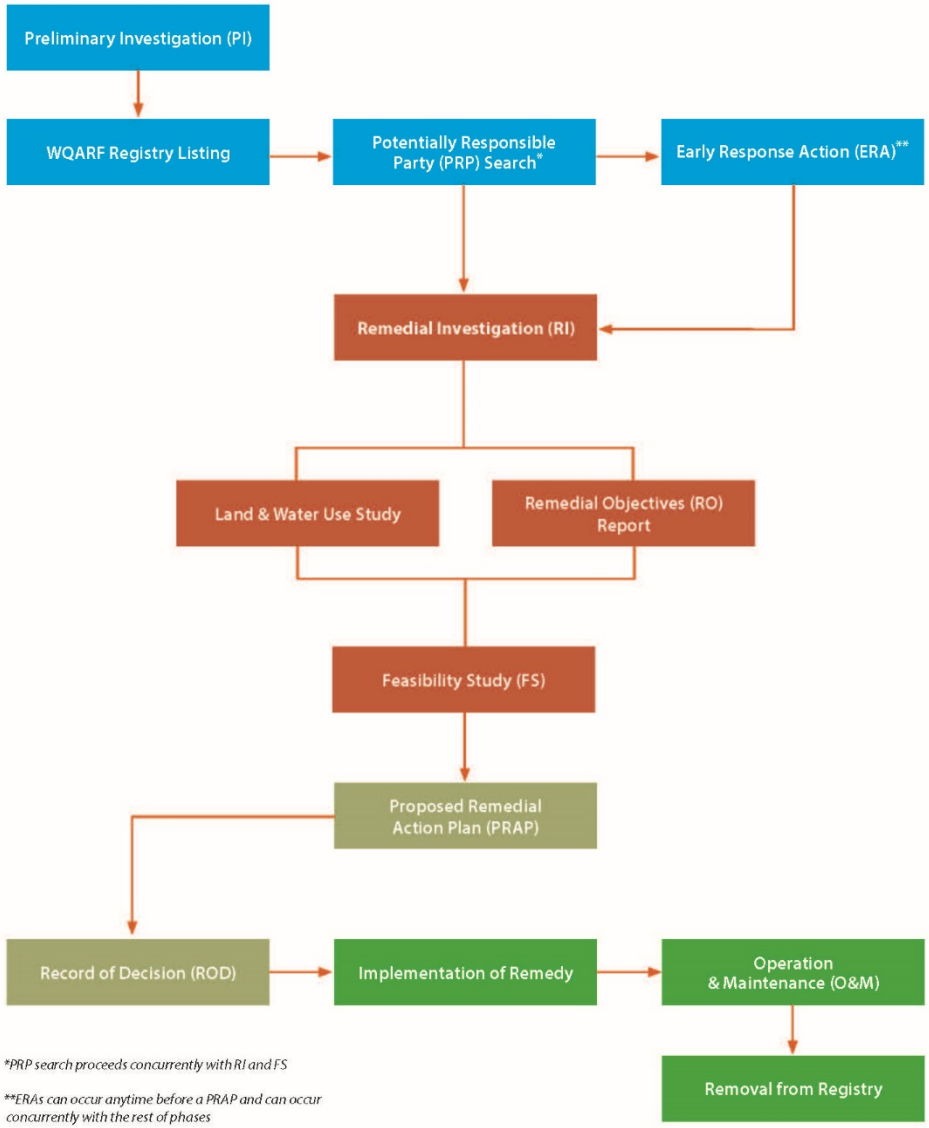
Wendy Flood, Community Involvement Coordinator

August 30, 2016 5:30pm

Central Phoenix WQARF Sites



WQARF PHASES

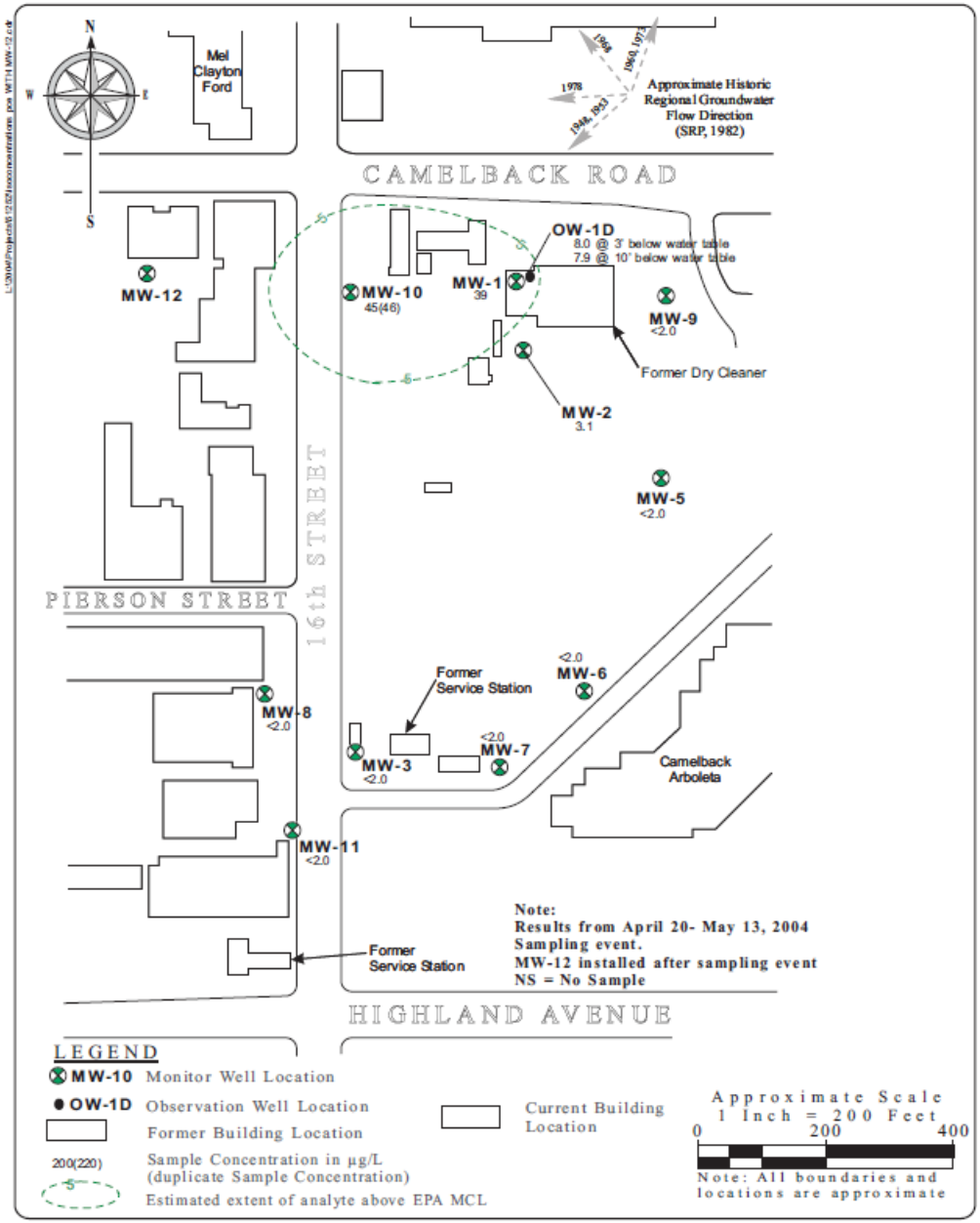


*PRP search proceeds concurrently with RI and FS

**ERAs can occur anytime before a PRAP and can occur concurrently with the rest of phases

16th Street and Camelback WQARF Site

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



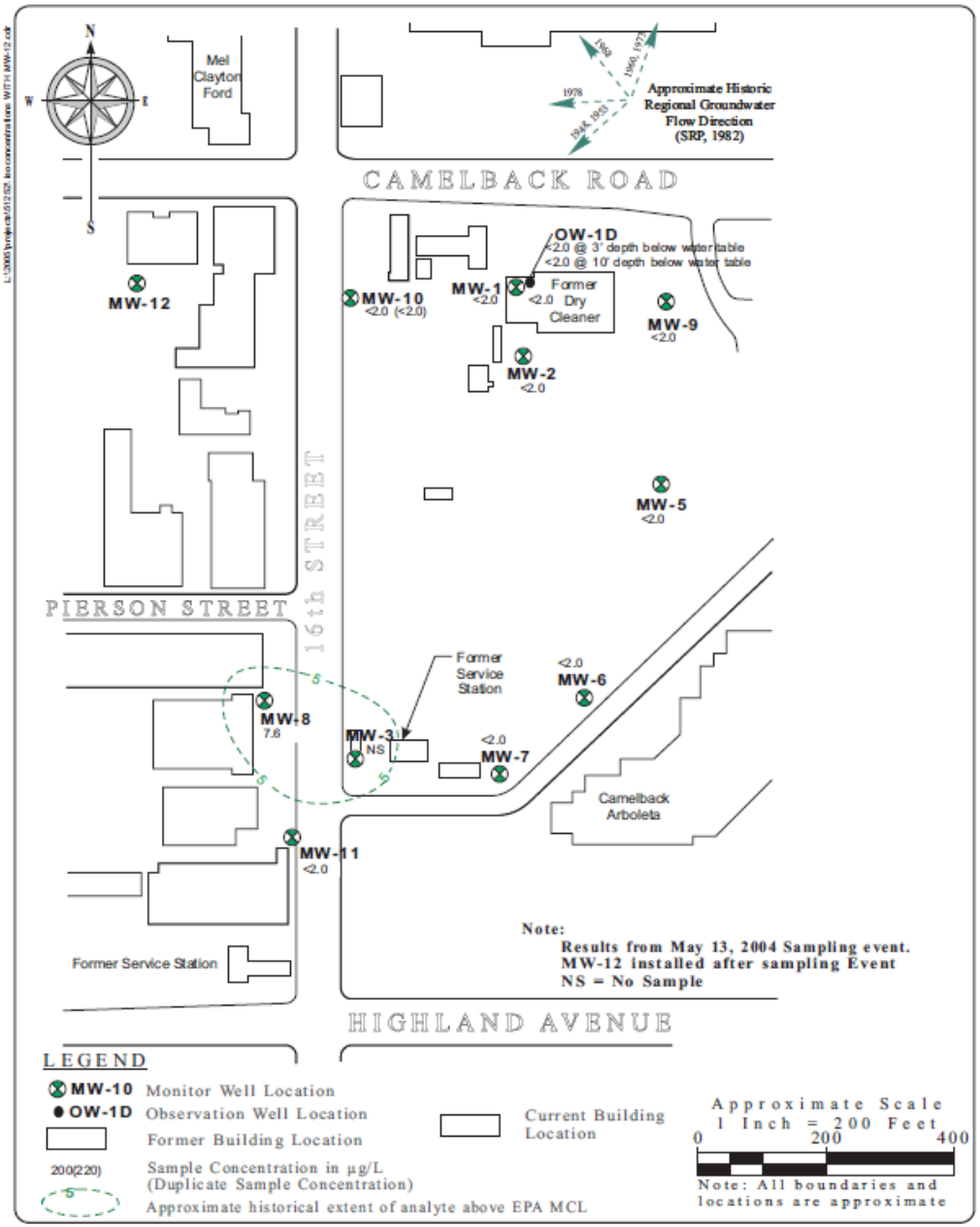
KLEINFELDER

Project Number 51252 January 2005

Arizona Department of Environmental Quality
16th Street and Camelback Road WQARF Site
Phoenix, Arizona

ISOCONCENTRATION CONTOUR MAP FOR PCE

PLATE 5



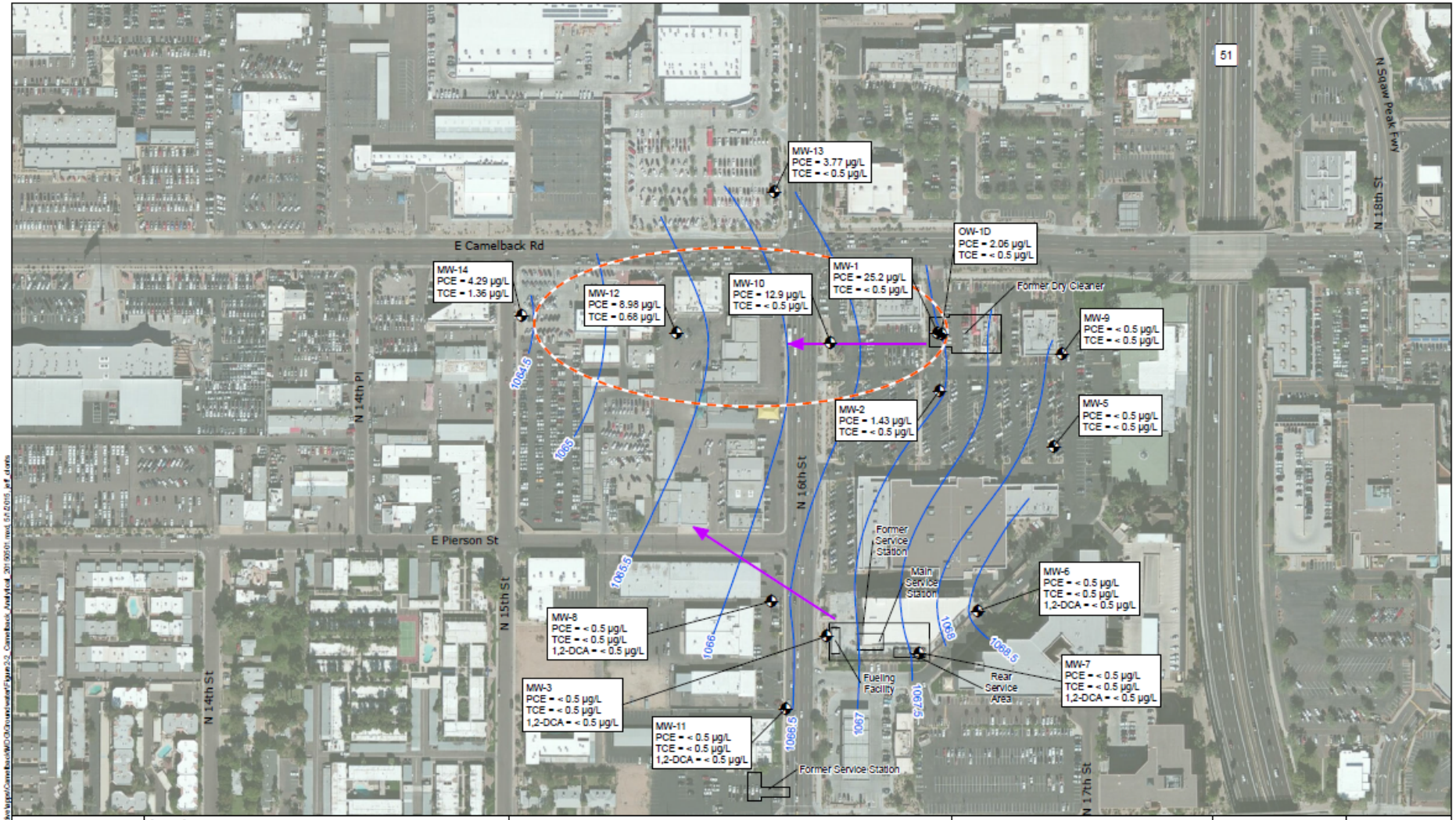
KLEINFELDER

Project Number 51252 January 2005

Arizona Department of Environmental Quality
16th Street & Camelback Road WQARF Site
Phoenix, Arizona

ISOCONCENTRATION CONTOUR MAP FOR 1,2-DCA

PLATE 4



Drawn By: JML

QC'd By:

Drawing Date: 5/1/2015

Legend

- Monitoring Well
- Groundwater Potentiometric Contour
- Approximate Plume Boundary for PCE at AWQS of 5 ug/L
- Groundwater Flow Direction
- Former Buildings

Notes:
AWQS for PCE = 5 µg/L; TCE = 5 µg/L

All 1,2-DCA results are < 0.5 µg/L at north plume wells

Analytical Results from Groundwater Sampling
16th Street & Camelback Road
WQARF Site

February and March 2015 Sampling Event

ADEQ Arizona Department of Environmental Quality

Matrix Environmental

CALIBRE

0 100 200 Feet

Figure 2-2

F:\E:\Gis_projects\ADEQ\active\pgs\Camelback\WQ\Groundwater\Figure 2-2_Camelback_Analytical_20150501_rev1_5-5-2015_jeff_diaria

Historical and Current Contaminant Data

- PCE is currently the only contaminant of concern detected in groundwater at the site at concentrations greater than the Aquifer Water Quality Standard (AWQS) of 5 micrograms per liter (ug/L).

Contaminant	December 1999	August 2007	April 2014	February 2015	April 2016
PCE	160 ug/l	20 ug/l	11.4 ug/l	25.2? ug/l	16 ug/l
1,2-DCA	400 ug/l	<2.0 ug/l	0.62 ug/l	<0.5 ug/l	NS
1,2-DCP	15 ug/l	<2.0 ug/l	<0.5 ug/l	<0.5 ug/l	NS

Proposed Remedial Action Plan (PRAP)

- ADEQ completed the PRAP. Currently available for public review and comment.
- Because contaminants are declining in concentration and present no risk to human health and the environment, the planned remedial option is *Monitored Natural Attenuation* (MNA).
- MNA will involve monitoring and sampling groundwater.
- ADEQ will abandon groundwater monitor wells at former southern plume location.

Proposed Remedial Action Plan (PRAP)

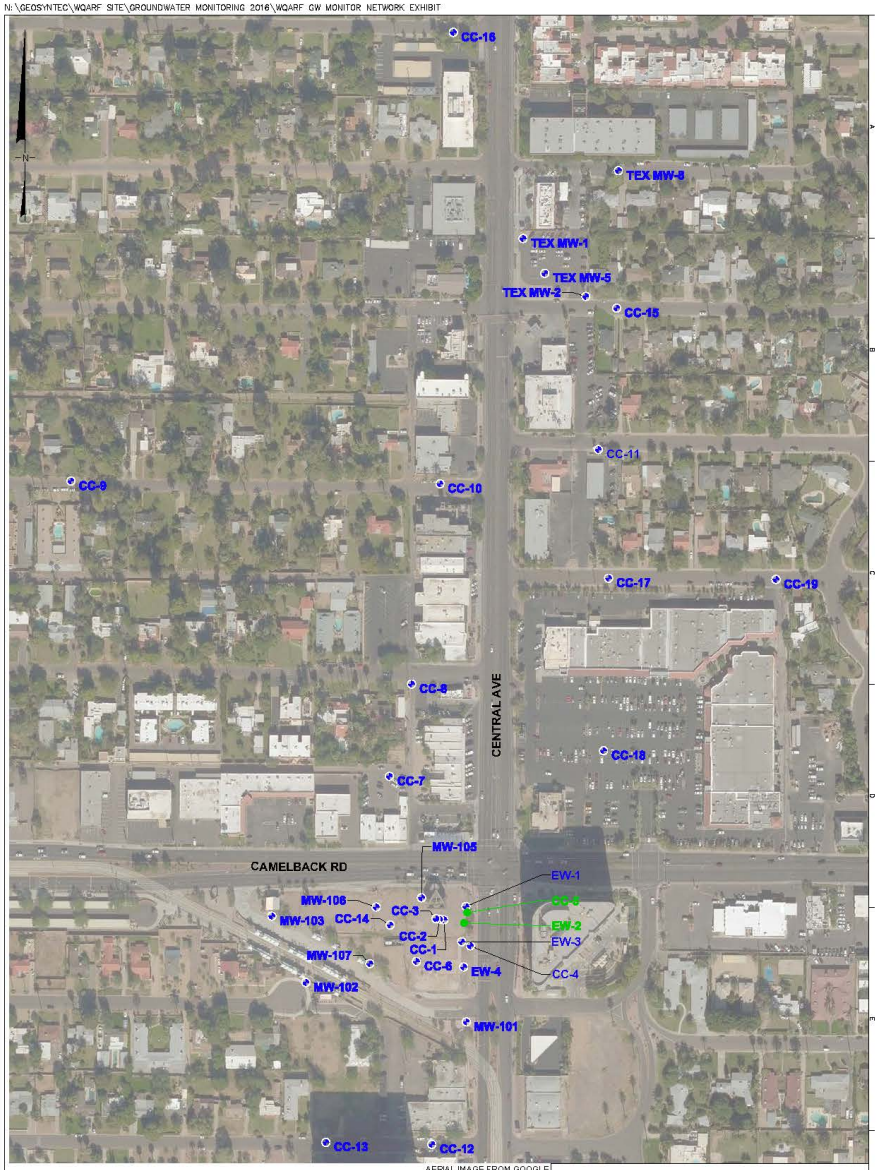
- Conducted an enhanced reductive de-chlorination (ERD) injection to see if it can economically enhance current contaminant degradation taking place at site.
- ERD is included as a contingency in PRAP.

Future Planned Work

- Finalize PRAP and prepare Record of Decision (ROD).
- Continue to monitor and sample groundwater.
- Abandon groundwater monitor wells at former southern plume location.

Central and Camelback WQARF Site

N:\GEOSYNTEC\WQARF SITE\GROUNDWATER MONITORING 2016\WQARF GW MONITOR NETWORK EXHIBIT



AERIAL IMAGE FROM GOOGLE

200' 100' 0 200 Feet

NOTES

Monitor Well

Extraction Well

GROUNDWATER MONITOR WELL NETWORK
2016

Central and Camelback WQARF Site
Phoenix, Arizona

Geosyntec consultants

Phoenix, AZ | May 2016

Figure
2

Groundwater Treatment Compound
EW-1
CC-5
EW-2
EW-3
SVE Compound
SVE-1
SVE-FC
EW-4
SVE-MP1
SVE-2S
SVE-2D
SVE-MP2

Events Since June 2015 CAB Meeting

- Finalizing the PRAP for public review and comment.
- The groundwater system has removed 294.7 lbs. of PCE from water as of June 2016.
- The Soil Vapor Extraction (SVE) system has removed 6,744 lbs. of PCE from soil as of June 2016.

Events Since June 2015 CAB Meeting

- Groundwater samples were collected from the extraction wells and groundwater treatment system quarterly and monthly, respectively. Vapor samples were collected from the SVE system monthly.

- Groundwater samples were collected from groundwater monitor wells in October 2015 and March 2016.

Analytical Results From Groundwater Treatment System Extraction Wells

- Currently only extraction wells CC-5 and EW-2 are operating and are sampled
  - Extraction Well EW-4 was shutdown on January 20, 2009
  - Extraction Well EW-3 was shutdown on May 6, 2009
  - Extraction Well EW-2 was shutdown on May 20, 2009 and restarted on October 29, 2009
  - Extraction Well EW-1 was shutdown on March 13, 2013

PCE Concentrations in Extraction Well Samples

Well Number	June 2015	September 2015	December 2015	March 2016	June 2016
CC-5	NS	32	31	33	30
EW-1	NS	NS	NS	NS	NS
EW-2	17	7.5	7.5	1.8	2.0
EW-3	NS	NS	NS	NS	NS
EW-4	NS	NS	NS	NS	NS

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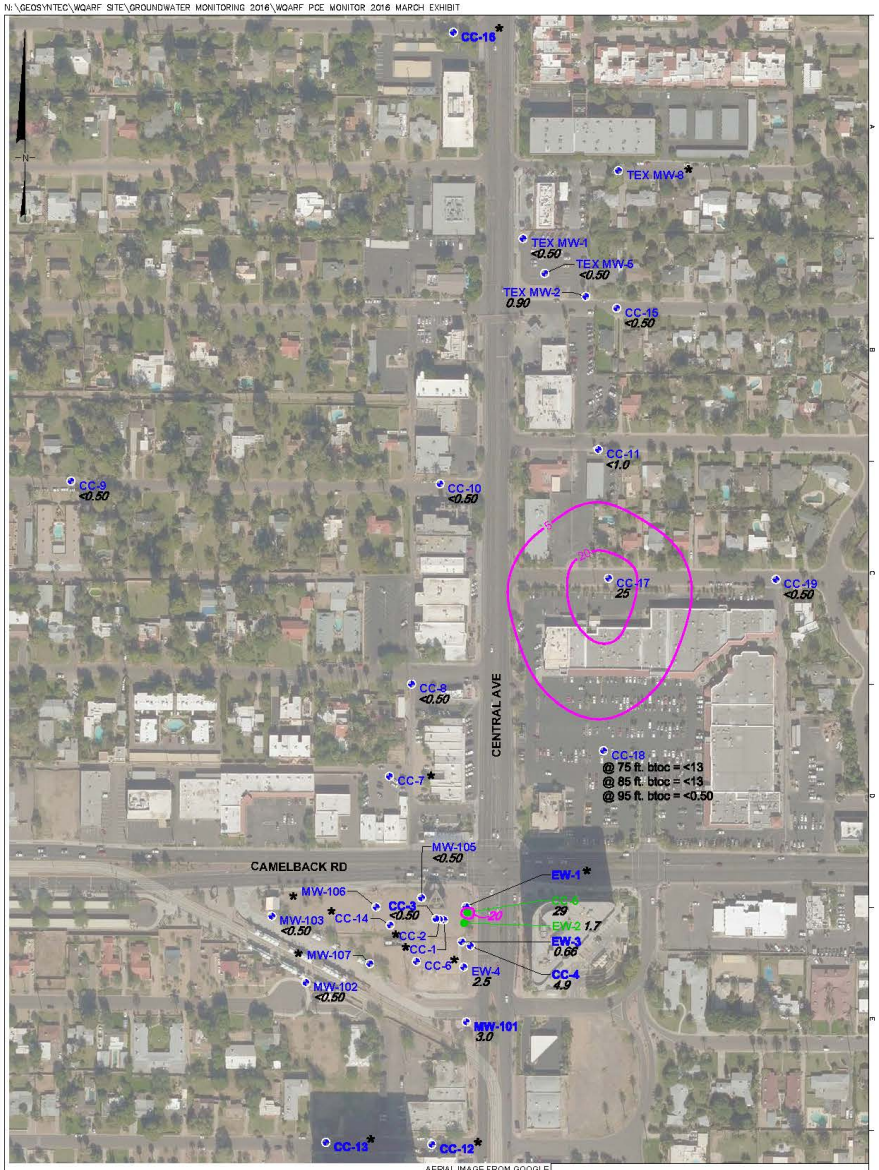


AERIAL IMAGE FROM GOOGLE

200' 100' 0 200 Feet

NOTES

- Monitor Well
- Extraction Well
- Tetrachloroethene (PCE) Concentration Contour in Micrograms Per Liter (µg/L)
- 2.4 PCE Concentrations in µg/L
- ★ Not Used for Contouring Purposes
- ft. btoc Feet Below top of Casing

PCE CONCENTRATIONS WITH CONCENTRATION ISOPLETHS
MARCH 2016

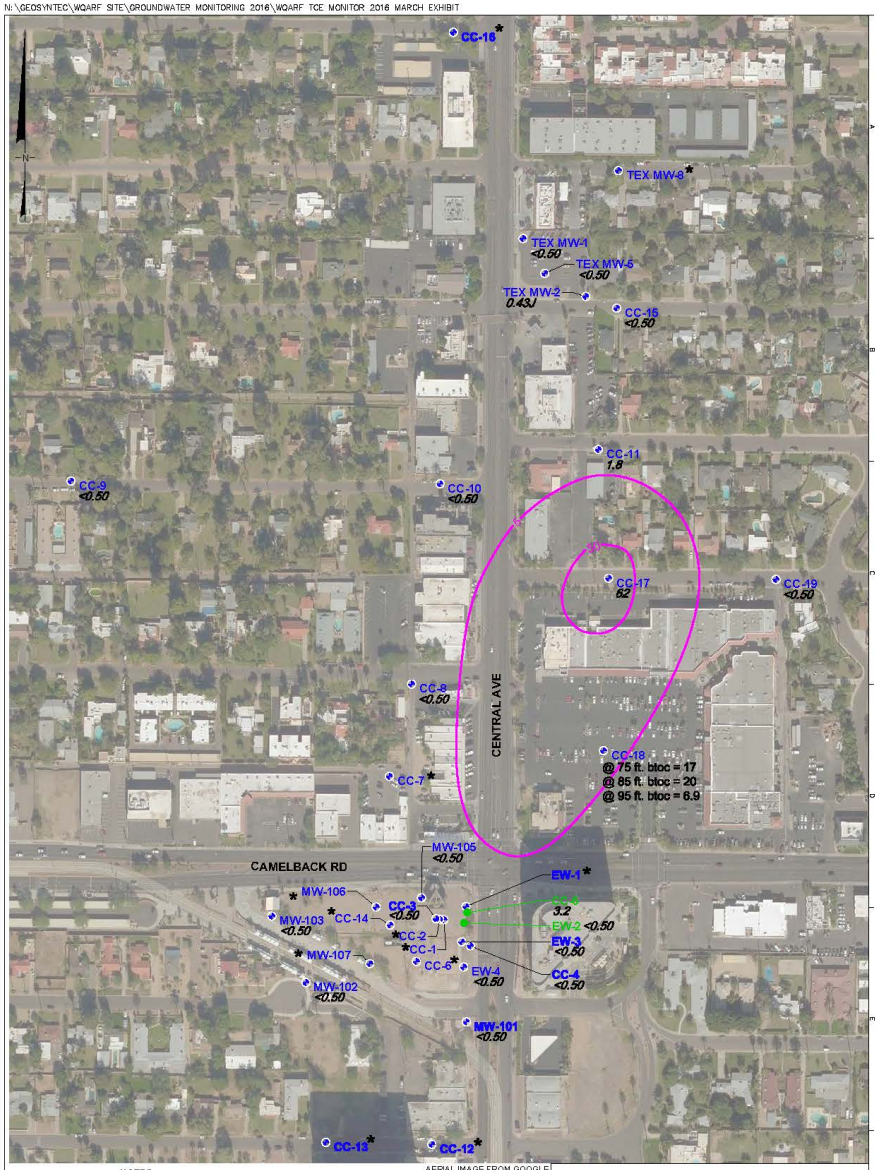
Central and Camelback WQARF Site
Phoenix, Arizona

Geosyntec consultants

Phoenix, AZ | April 2016

Figure 7

N:\GEOSYNTEC\WQARF SITE\GROUNDWATER MONITORING 2016\WQARF TCE MONITOR 2016 MARCH EXHIBIT



AERIAL IMAGE FROM GOOGLE

NOTES

- Monitor Well
- Extraction Well
- Trichloroethene (TCE) Concentration Contour in Micrograms Per Liter (µg/L)
- 2.2 TCE Concentrations in µg/L
- ★ Not Used for Contouring Purposes
- ft. btoc Feet Below top of Casing
- J Concentration estimated below laboratory minimum reporting level but above method detection limit

200' 100' 0 200 Feet

TCE CONCENTRATIONS WITH CONCENTRATION ISOPLETHS
MARCH 2016

Central and Camelback WQARF Site
Phoenix, Arizona

Geosyntec consultants

Phoenix, AZ | April 2016

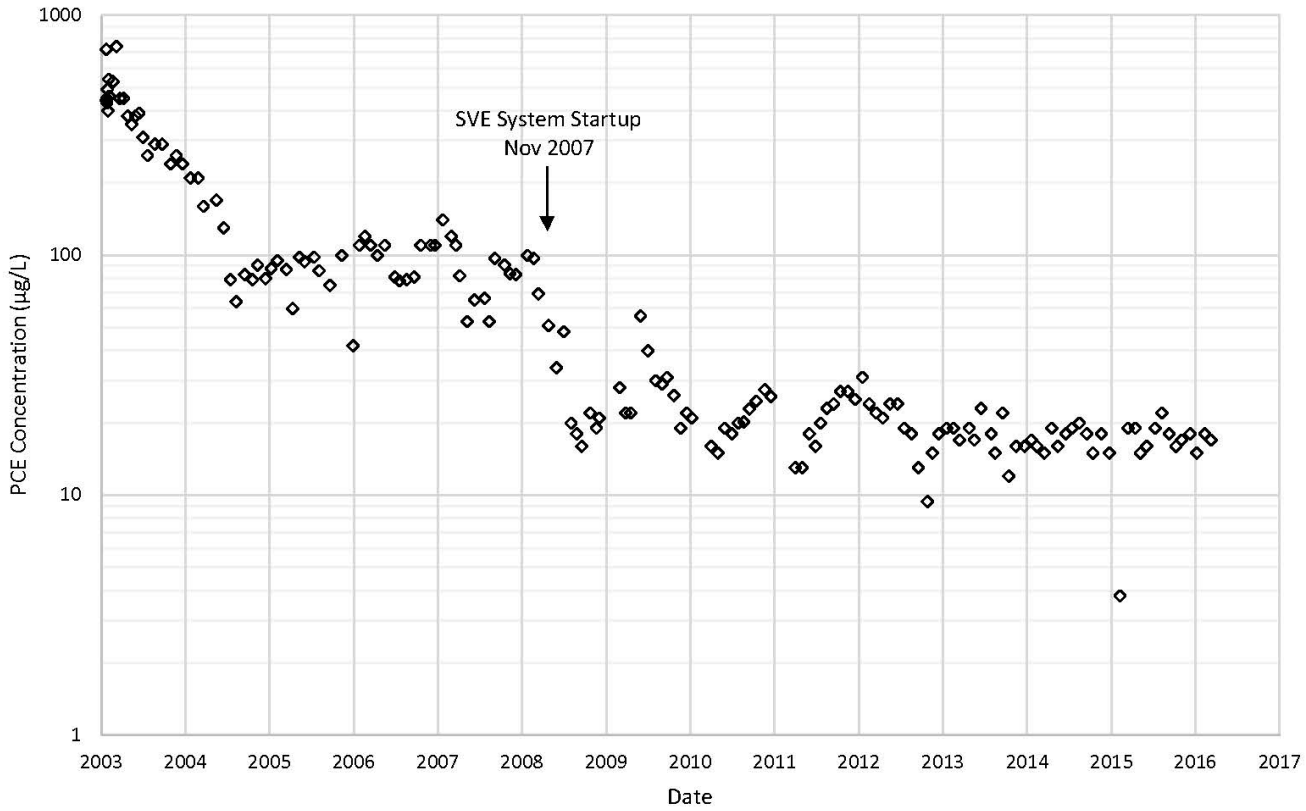
Figure 8

Operation & Maintenance Statistics for the GW Treatment System

Quarter	Gallons Treated	Percent Operational	VOC/PCE Removed (Lbs.)
3rd Qtr 2015	5,168,035	100%	1.16/0.85
4th Qtr 2015	4,955,720	100%	0.95/0.69
1st Qtr 2016	3,290,100	65%	0.66/0.46
2nd Qtr 2016	5,157,600	100%	1.01/0.76

Analyte	Range 1st & 2nd Quarter 2003	March 2016	June 2016	AWQS
Benzene	<0.50 – 0.54	<0.50	<0.50	5
Chloroform	1.8 – 2.8	3.3	2.9	100
PCE	350 - 740	17	16	5
TCE	9.7 – 16	1.9	1.2	5
Cis-1,2-DCE	8.5 - 20	0.42	0.29	70

Concentrations in micrograms per liter (ug/L)



Note:
Arizona Water Quality Standard (AWQS) for PCE is 5 µg/L

PCE Concentrations in Total Influent Samples

Central and Camelback WQARF Site, Phoenix, Arizona

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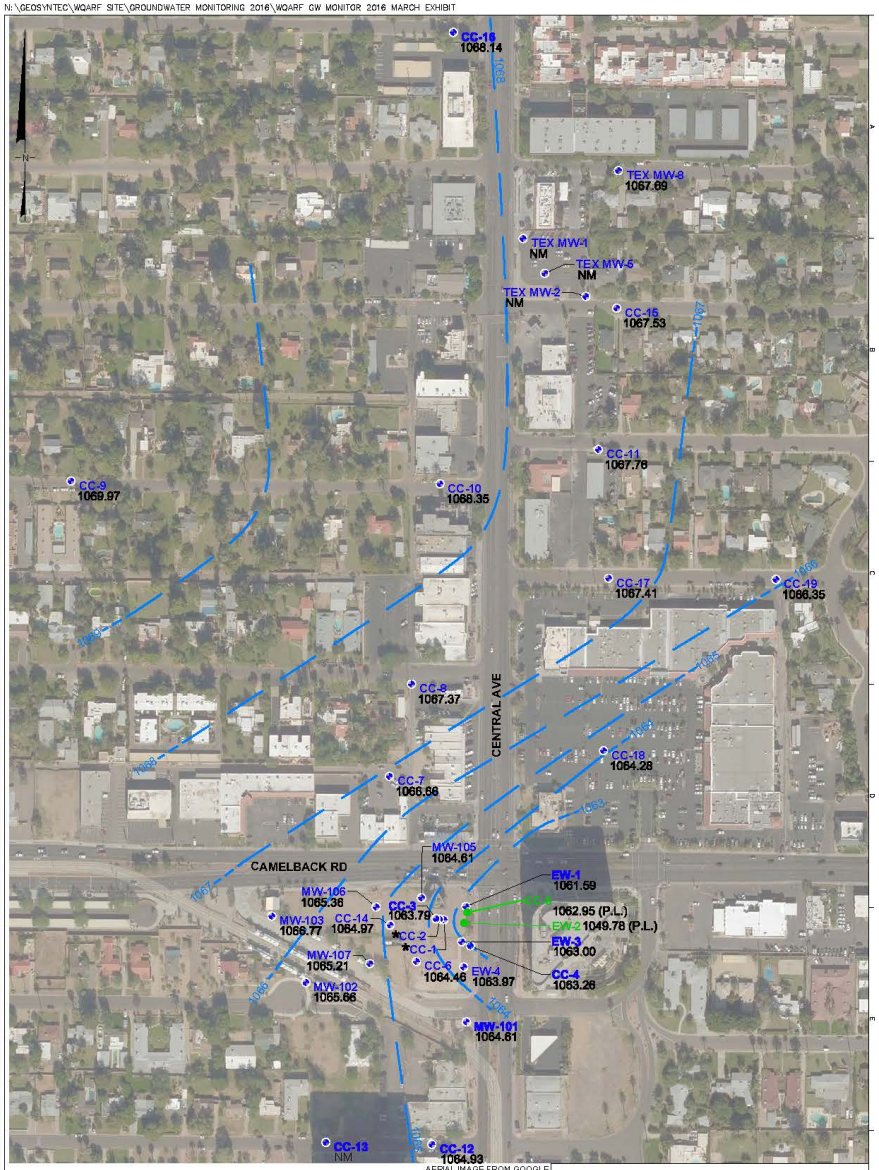
Phoenix, AZ | May 2016

Figure B.1

N:\GEOSYNTEC\WQARF SITE\GROUNDWATER MONITORING 2016\WQARF GW MONITOR 2016 MARCH EXHIBIT



AERIAL IMAGE FROM GOOGLE

200' 100' 0 200 Feet

NOTES

- Monitor Well
- Extraction Well
- Groundwater Elevation Contours (Feet Above Mean Sea Level (ft AMSL))
- 1102.27 Groundwater Elevations Estimated ft AMSL
- ★ Not Used for Contouring Purposes
- NM Not Measured

GROUNDWATER ELEVATIONS AND CONTOURS MARCH 2016

Central and Camelback WQARF Site
Phoenix, Arizona

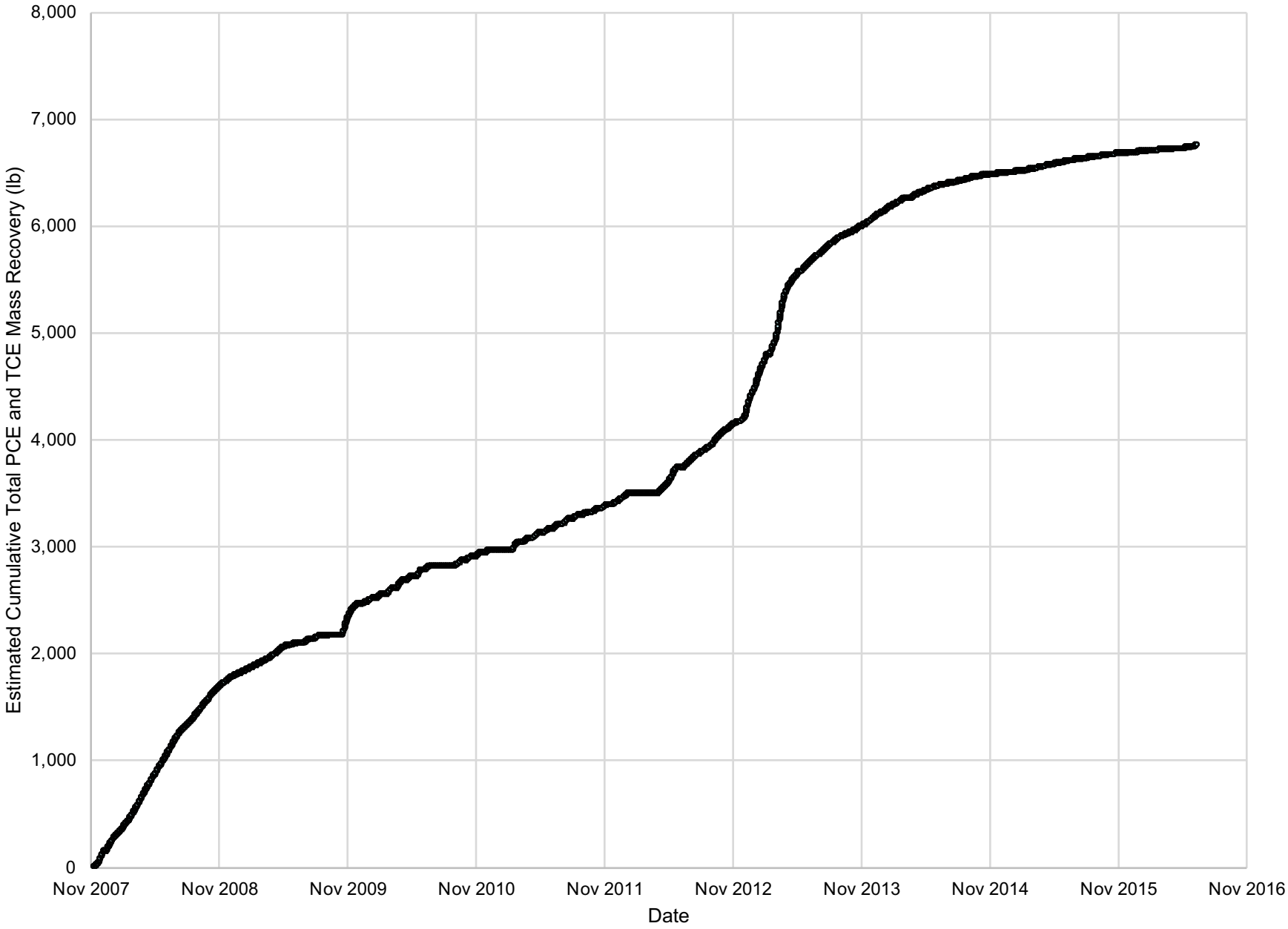
Geosyntec consultants

Phoenix, AZ | April 2016

Figure 6

Operation & Maintenance Statistics for the SVE system

Quarter	Percent Operational	PCE/TCE Removed (Lbs.)
3rd Qtr 2015	100%	44.9
4th Qtr 2015	98%	30.5
1st Qtr 2016	90%	25.9
2nd Qtr 2016	68%	31.9


8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Estimated Cumulative Total PCE and TCE Mass Recovery (lb)
Nov 2007
Nov 2008
Nov 2009
Nov 2010
Nov 2011
Nov 2012
Nov 2013
Nov 2014
Nov 2015
Nov 2016
Date

Future Planned Work

- Finalize PRAP and prepare ROD.
- Continue O&M activities for both SVE and GW systems.
- Monitor water levels quarterly and collect groundwater samples semiannually.

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7th Avenue & Bethany Home Road WQARF Site

Legend

- Shallow Monitoring Well
- Deep Monitoring Well
- SRP Well
- Private Well
- City of Phoenix Well 58 (55-626549)
- Estimated PCE Plume Boundary
- Dashed Where Inferred

N

0 300 600
Feet
1 in = 600 ft

Source:
Project Features: ARCADIS 2014
Imagery: Source: Esri, DigitalGlobe, GeoEye, Earthstar

Figure 1
Site Map with Existing Wells, and Estimated Plume Boundary
7th Ave & Bethany Home Rd
WQARF Site

Events Since June 2015 CAB Meeting

- ADEQ installed two groundwater monitor wells and an injection well.
- ADEQ completed ROD.
- Remedy is enhanced reductive de-chlorination (ERD) with eventual MNA.
- As a contingency, if SRP decides to change water use to domestic use at their well located at the downgradient edge of the site, ADEQ will add Wellhead Treatment to the well.
- ADEQ is currently installing seven nested injection wells at the Bayless Investment & Trading Co. property.

Future Planned Work

- Implement ROD.
- Install injection wells/remediation system at site and conducting periodic ERD injections.
- Monitoring and sampling groundwater monitor wells.

Contacts

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