

Victoria Technology, Inc.

2019 (YEAR 3) PERIODIC SITE REVIEW REPORT

Former Capitol Castings Facility
Tempe, Arizona
ADEQ VRP Site Code: 504426-00

November 5, 2019

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2019 (YEAR 3) PERIODIC SITE REVIEW REPORT



Matthew Monte, R.G.
Staff Geologist

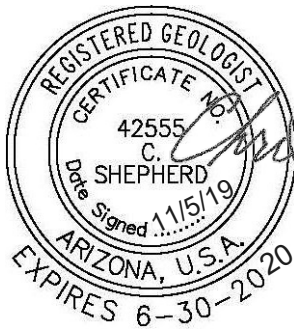
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Prepared for:
Victoria Technology, Inc.



Alex Carpenter,
Project Geologist

Prepared by:
Arcadis U.S., Inc.
410 N. 44th Street
Suite 1000
Phoenix
Arizona 85008
Tel 602 438 0883
Fax 602 438 0102



Christopher Shepherd, R.G.
Principal Hydrogeologist

Our Ref.:
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Date:
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ACRONYMS AND ABBREVIATIONS

1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
1,1,1-TCA	1,1,1-trichloroethane
A.A.C.	Arizona Administrative Code
A.R.S.	Arizona Revised Statute
ADEQ	Arizona Department of Environmental Quality
AMA	Active Management Area
amsl	above mean sea level
Arcadis	Arcadis U.S., Inc.
AWQS	Aquifer Water Quality Standard
bgs	below ground surface
COC	constituent of concern
COT	City of Tempe
CSM	Conceptual Site Model
CVOC	chlorinated volatile organic compounds
ERD	enhanced reductive dechlorination
ESRV	Eastern Salt River Valley
FS	Feasibility Study
GAC	granular activated carbon
GPL	groundwater protection level
GWMR	Annual Groundwater Monitoring Report
IRZ	in-situ reactive zone
LUST	Leaking Underground Storage Tank
MCL	maximum contaminant level
PDB	passive diffusion bag
PRAP	Proposed Remedial Action Plan
PSR Report	2019 (Year 3) Periodic Site Review Report
RI	remedial investigation
ROD	Record of Decision

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ROs	remedial objectives
SRL	soil remediation level
SRP	Salt River Project
the facility	former Capitol Castings facility
the site	former Capital Castings facility in Tempe, Arizona
USEPA	United States Environmental Protection Agency
VRP	Voluntary Remediation Program
VTI	Victoria Technologies, Inc
µg/L	micrograms per liter

EXECUTIVE SUMMARY

The 2019 (Year 3) Periodic Site Review Report (PSR Report) has been developed to confirm the effectiveness and adequacy of the remedy in achieving the remedial objectives (ROs) with respect to the 1,1-dichloroethene (1,1-DCE) affected groundwater related to the site. On behalf of Victoria Technologies, Inc. (VTI), Arcadis prepared the PSR Report as required by the Arizona Department of Environmental Quality's (ADEQ's) Record of Decision (ROD) dated October 19, 2016 and corrected on February 1, 2017 (ADEQ 2016, 2017).

The selected remedy for the 1,1-dichloroethene (1,1-DCE) affected groundwater consists of groundwater monitoring with a contingency remedy of controlled migration consisting of groundwater extraction and granular activated carbon (GAC) treatment.

The assessment of this PSR found:

- The remedy has been implemented as specified in the ROD and no deficiencies occurred
- The current action level is Based Level (Section 4.3) and no active remediation or contingency actions were required during this PSR period in accordance with the Proposed Remedial Action Plan (PRAP) and ROD
- The 1,1-DCE will continue to advect and potentially increase in certain downgradient wells as accounted for in the ADEQ-approved Final Feasibility Study (FS) Report and PRAP (Arcadis 2014a, 2016). This is most likely to occur at sentinel wells downgradient from monitoring well MW-26D2 and MW-28D2 where 1,1-DCE concentrations are elevated compared to the downgradient sentinel wells (e.g., MW-38D2). The remaining sentinel monitoring wells are not expected to increase significantly further based on the reported data and trends.
- ME Global uses have not changed and are not expected to change in the foreseeable future
- City of Tempe's (COT) uses have not changed, but, COT expects to expand COT's recharge facility at the Ken McDonald Golf Course approximately 1 mile south of the facility
- Salt River Project's (SRP) groundwater current and future potential uses remain unchanged. SRP expects the future uses of the canal water(s) to also include municipal potable uses. The action levels established in the PRAP and ROD account for future potable uses of the canals. Therefore, no change to the PRAP is required for SRP's planned change of use
- ME Global and SRP's well uses have not been adversely affected by the 1,1-DCE and are not current threatened
- The USEPA maximum contaminant level (MCL), the Aquifer Water Quality Standard (AWQS), and the Arizona water quality standards (Arizona Administrative Code [A.A.C.] R-18-11 Appendix A) for 1,1-DCE have not changed since the PRAP and ROD were issued. Therefore, the 1,1-DCE action levels remain protective
- The site currently meets all ROs. The remedy is currently protective of human health and the environment and those exposure pathways that could result in unacceptable risks are being controlled

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- The ROs continue to be protective of human health and the environment and the remedy is capable of ensuring the ROs for the site (i.e., protecting each municipal, agricultural, industrial or other beneficial use of groundwater pumped from ME Global's and SRP's groundwater supply wells)
- The nature and extent of the 1,1-DCE groundwater plume is adequately defined and its migration is generally consistent with predictions and the groundwater modeling presented in the Final FS Report (Arcadis 2014a, 2014b)
- Based on the nature of the 1,1-DCE affected groundwater, the conceptual site model (CSM), the gradual changes in 1,1-DCE concentrations, the selected remedy, the annual groundwater monitoring, reporting, and threat assessments, the receptor exposure pathways, a periodic review period of five years is appropriate for the site. Therefore, the next PSR Report will be submitted to the ADEQ in five years (2024). The report will be based on groundwater monitoring results from 2019 through 2023.

Review of the site remedy demonstrates that it is currently protective of human health and the environment and those exposure pathways that could potentially result in unacceptable risks are being controlled. The groundwater monitoring activities conducted in accordance with the PRAP are effective at monitoring the 1,1-DCE groundwater plume, assessing potential future threats, and protecting groundwater receptors.

1. INTRODUCTION

Arcadis U.S., Inc. (Arcadis), on behalf of Victoria Technologies, Inc. (VTI), has prepared this 2019 (Year 3) Periodic Site Review Report (PSR Report) for the former Capitol Castings facility (the facility) located in Tempe, Arizona (the site, see Figure 1). The Arizona Department of Environmental Quality (ADEQ) Voluntary Remediation Program (VRP) Site Code is 504426-00.

The PSR Report was prepared in accordance with the Proposed Remedial Action Plan (PRAP, Arcadis 2016), the Record of Decision (ROD; ADEQ 2016, 2017), and Arizona Administrative Code (A.A.C.) R18-16-410(B)(8) for the 1,1-dichloroethene (1,1-DCE) affected groundwater. The purpose of the PSR Report is “to confirm the effectiveness and adequacy of the implemented remedy in meeting the [remedial objectives]” (ADEQ 2016).

The report is organized into the following sections:

- Section 2 – Site chronology
- Section 3 – Background
- Section 4 – Remedial actions
- Section 5 – Progress since remedy implementation
- Section 6 – Periodic site review process and findings
- Section 7 – Technical assessment
- Section 8 – Issues
- Section 9 – Recommendations and follow-up actions
- Section 10 – Protectiveness statement
- Section 11 – Next periodic review
- Section 12 – References

2. SITE CHRONOLOGY

This section summarizes the site chronology for the 1,1-DCE issue and includes notable events and documents to-date.

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Site Chronology

Event	Date
Operation of the facility began as a secondary steel foundry that produced various steel castings used primarily by the mining industry for wear-resistant and structural applications	1953
A vehicle maintenance area of the facility used 1,1,1-trichloroethane (TCA) to degrease equipment. The spent degreasing liquids were reportedly washed with water into an unlined pond (near monitoring well MW-22) and began to degrade to 1,1-DCE via hydrolysis in the warmer pond water. Time period is uncertain	~1950s to 1980s
Unlined pond was removed and replaced by an oil-water separator connected to a leach line	1987
CRA Limited (now Rio Tinto) purchased the facility	1988
Investigation activities began for the leaking gasoline underground storage tank (LUST)	1989
The oil-water separator leach line was removed and the oil-water separator outlet sealed. Since then, all related wastes have been transported from the facility	1993
Investigation of the LUST led to the discovery of chlorinated volatile organic compounds (CVOCs, primarily 1,1-DCE) in groundwater. Began investigations of the 1,1-DCE	1993
Began operation of a 1,1-DCE source area groundwater extraction system, operated as part of the LUST corrective actions. Note, 1,1-DCE also was fortuitously treated prior to its discovery	1993
Soil, soil vapor, and groundwater investigations began to investigate the source area. Investigations were phase/stepwise and continued until 2015. Groundwater monitoring is ongoing	1993
ME International purchased the facility. ME International's successor in interest, ME Elecmetal (ME Global), currently owns and operates the facility as a metals casting facility. VTI (a subsidiary of Rio Tinto) retained responsibility for some environmental issues	1994
Groundwater investigations and monitoring of 1,1-DCE downgradient and cross-gradient of the facility begins	1999
Groundwater extraction and treatment system ended. 1,1-DCE concentrations in the S-Zone groundwater were reduced by one order of magnitude	2000
Site entered into VRP	2001
Enhanced reductive dechlorination (ERD) carbon substrate injections using in-situ reactive zone (IRZ) technology began as interim action to remediate groundwater containing the highest detected 1,1-DCE concentrations in the D-Zone	2002
The former leach line was closed (clean closure) under the Aquifer Protection Permit Program	2003
ERD injections using IRZ technology end	2006
Land and Water Use Study was approved by ADEQ	2006
Remedial Objectives Report approved by ADEQ	2010
Final Remedial Investigation Report approved by ADEQ	2011
Phase II Groundwater Flow and Solute Transport Model Report approved by ADEQ	2011
Last monitoring wells installed	2014

Event	Date
Final Feasibility Study (FS) Report approved by ADEQ	2014
PRAP detailing the groundwater monitoring with contingencies remedy for affected groundwater was approved by ADEQ	2016
ROD issued by the ADEQ	2016
Implementation of groundwater monitoring with contingencies remedy begins	2017
ROD groundwater monitoring and annual reporting	2017 to 2018

Details related to the site chronology were provided in the following reports:

- Land and Water Use Study (Arcadis 2006)
- Remedial Investigation (RI)/ RO Report (Arcadis 2010, ADEQ 2011a)
- Final FS Report (Arcadis 2014a)
- PRAP (Arcadis 2016)
- Fourth Quarter Groundwater Monitoring Report (Arcadis 2017)
- 2017 and 2018 Annual Groundwater Monitoring Reports (Arcadis 2018, 2019).

3. BACKGROUND

This section presents a physical description of the site, land and resource use, history of contamination, and the basis for taking action.

3.1 Physical Description

The site is located in the western half of Section 3, Township 1 South, Range 4 East of the Gila & Salt River Baseline and Meridian system and encompasses the monitoring well network (Figure 2), the 1,1-DCE affected groundwater (Figures 3 through 5), and the former Capitol Castings facility.

The facility is located at 5857 South Kyrene Road in Tempe, Arizona. It is bounded more or less by the Western Canal and Kiwanis Park to the north and east, Kyrene Road to the west, and Guadalupe Road to the south. Beyond Kyrene Road are industrial and commercial properties (Figure 1).

The facility elevation is approximately 1,190 feet above mean sea level (amsl) and encompasses an area of approximately 27 acres, of which roughly one-half is developed. The developed portion of the facility is predominantly on the southern half of the property while the northern half is mostly undeveloped.

Operation of the facility began in 1953 as a secondary steel foundry that produced various steel castings used primarily by the mining industry for wear-resistant and structural applications. VTI owned and operated the facility from 1988 until 1994, when the facility was purchased by ME International, who's successor in interest, ME Global, currently owns and operates the facility as a metals casting facility.

3.1.1 Geology and Hydrogeology

The site is located in the western portion of the Eastern Salt River Valley (ESRV) sub-basin, which is part of Arizona's Basin and Range physiographic province. The ESRV is a typical alluvial basin of the province and is surrounded by block-faulted mountain ranges, including the Phoenix, South, Superstition, and Santan Mountains and the Tempe pediments. Ground surface elevations and the depth to bedrock in the area generally dip away from the more proximal South Mountain and the Tempe pediments. The South Mountain range and the Tempe pediments are located approximately 2 miles west and 3.5 miles north of the site, respectively.

The ESRV basin fill is comprised of Quaternary to Tertiary alluvial deposits, Tertiary volcanic rocks and Tertiary to Precambrian crystalline rocks. The alluvial deposits are regionally divided into Upper, Middle, and Lower Units (Laney and Hahn 1986, ADWR 2009). The Upper, Middle, and Lower Alluvial Units are all present at the site.

The site hydrogeology consists of a multi-layered aquifer system with five water-bearing zones (the S- and the four D-Zones). These zones are separated by fine grained sediments, which effectively act as aquitards (two A-Zones). The S-Zone is a perched aquifer system and the four D-Zones are considered to be the primary aquifers at the site. The D- and A-Zones are further divided into more distinct zones¹:

- D-Zone (112 to 138 feet below ground surface [bgs])
- A-Zone (138 to 174 feet bgs)
- D2-Zone (174 to 207 feet bgs)
- A2-Zone (207 to 250 feet bgs)
- D3-Zone (250 to 335 feet bgs) and the
- D4-Zone (335 feet bgs to ~600 feet bgs)

The D4-Zone is a sedimentary rock aquifer (breccia/conglomerate).

The groundwater elevations decrease significantly between the S- and D-Zone, the D- and D2-Zone, and between D2- and D3-Zone. The differences in groundwater elevations between D3- and D4-Zones are generally negligible. The aquitard or confining layers between the aquifers are significant hydraulic barriers, contributing to the large vertical gradients and limiting the vertical movement of constituents of concern (COC) affected groundwater. The groundwater flow directions at the site vary by aquifer; however, they are generally to the south (varying from southeast to southwest), consistent with the regional groundwater flow near the site. The groundwater flow directions and magnitude are influenced by recharge from Kiwanis Lake and the Western Canal, regional pumping, and local groundwater pumping. The D2-, D3-, and the D4-Zones are the most influenced by local groundwater pumping and the S-Zone is primarily influenced by recharge. Appendix A presents the groundwater elevation potentiometric surface maps for the S-, D-, D2-, and D3-Zones for groundwater elevations measured between 2016 and 2019.

¹ The ranges provided are based on average depths at the site.

Additional information concerning the site's regional geology and hydrogeology are available in the ADEQ-approved RI Report and ADEQ-approved Final FS Report.

There are 72 groundwater wells within six of the hydrogeological zones and 40 of these wells are being used to monitor the 1,1-DCE affected groundwater (Figure 2). Well construction information, including the screen intervals, well depth, and screened hydrogeological zones, is summarized in Table 1.

A detailed Conceptual Site Model (CSM) was provided in the PRAP and included a discussion of site hydrogeology, nature and extent of 1,1-DCE affected groundwater, and groundwater flow and transport modeling (Arcadis 2016). Additional information concerning the site's hydrogeology and the CSM are available in the ADEQ-approved RI Report (ADEQ 2011a, Arcadis 2010a), the Final FS Report (Arcadis 2014a), and the ADEQ-approved Phase II and the Phase III Groundwater Flow and Solute Transport Model Report (ADEQ 2011b, 2014; Arcadis 2008, 2014b).

3.2 Land and Resource Use

A land and water use study was conducted (Arcadis 2006). The current use of the facility is industrial (metals castings). Land (soil) was not impacted outside of the facility; therefore, the property uses beyond the facility boundary were not evaluated. Further, previous investigations indicate that the soils near the suspected source area did not contain 1,1-DCE concentrations greater than the residential soil remediation level (SRL) or the minimum groundwater protection level (GPL).

Water uses were also evaluated. Five active water supply wells were identified within 0.5 miles of the site (study area; Figure 1 and 2). Two of the wells are owned and are located on the facility by ME Elecmetal (the current facility operator). One of the wells is used for industrial purposes, primarily as a fire suppression back-up water supply. The other ME Elecmetal well was abandoned in November 2012. The other three water supply wells are owned and operated by the Salt River Project (SRP) and supply irrigation water to the Western Canal and the High Line Canal.

The SRP stated that the City of Phoenix has proposed to construct a drinking water treatment plant on the downstream end of the Western Canal (timing unknown). The SRP also stated that it could potentially install new water supply wells within the study area in the next 100 years giving preference to areas near existing canal infrastructure, but did not state it had plans or intentions to install any new water supply wells within the study area.

The City of Tempe (COT) stated it had one monitoring well and one water supply well within the study area. However, on further inspection it was noted that the COT water supply well was located outside the study area. The COT stated it may install two additional recharge wells at the Ken McDonald Golf Course within or south of the study area.

Recently the Arizona Department of Water Resources restricted the installation of new water supply wells in certain areas (Arizona Revised Statutes § 45-454). The restriction prevents the installation of non-municipal water supply wells in Active Management Areas (AMAs) with an existing water supply distribution system. The site and the study area are included in the Phoenix AMA restricted groundwater use area.

Current water uses are summarized in Section 6.2.

3.3 History of Contamination

3.3.1 Contaminants of Concern

Groundwater at the site is affected by a chlorinated volatile organic compound (CVOC) release and a gasoline LUST release. Based on the historical evaluations, 1,1-DCE, 1,2-dichloroethane (1,2-DCA) and benzene are the primary COCs. These three compounds are detected above their respective Arizona Aquifer Water Quality Standards (AWQS)² and the maximum concentrations are typically two times greater than their respective AWQS, based on previous site investigations. The 1,2-DCA and benzene are related to the LUST release and the 1,1-DCE is related to the CVOC release. The LUST affected groundwater was closed with a No Further Action in 2019 (ADEQ 2019). The 1,1-DCE is the only constituent in groundwater present beyond the facility boundary greater than the AWQS and is addressed by the PRAP and the ROD. Historical information regarding the site and the 1,1-DCE is available in the ADEQ-approved Final FS Report (Arcadis 2014a).

3.3.2 Nature and Extent of 1,1-DCE Affected Groundwater

Groundwater monitoring of the 1,1-DCE affected groundwater has been ongoing since 1993 and the monitoring well network has been expanded to cover the four primary groundwater aquifers (S-, D-, D2-, and D3-Zones). 1,1-DCE has not been detected in the deeper D3b-Zone (lower D3-Zone) or D4-Zone. The most recent distribution of 1,1-DCE among the aquifers is depicted in Figures 3 through 5 (October 2018³) and the analytical results are summarized in Table 2. The vertical distribution of 1,1-DCE along the primary north-south axis is depicted in Figure 6.

The horizontal and vertical extent of the 1,1-DCE plume has been heavily influenced by regional pumping in the deeper aquifers. Pumping by SRP well 21.5E-1.0S has had the greatest influence on the migration of the plume (Arcadis 2008, 2010) (see Figures 4 and 5). SRP well 21.5E-1.0S is screened in the D2-, A2-, and D3-Zones as well as the unaffected D4-Zone.

3.3.2.1 S-Zone

No groundwater samples were collected from the S-Zone during the second and fourth quarter 2018. However, one groundwater sample was collected from monitoring well MW-22S in the former source area in 2017 and was less than the 1,1-DCE AWQS of 7 micrograms per liter (µg/L) (Table 2). S-Zone 1,1-DCE concentrations have been generally declining for the last decade (Appendix B).

3.3.2.2 D-Zone

No groundwater samples were collected from the D-Zone during the second and fourth quarter 2018. However, the 2017 results indicate 1,1-DCE concentrations are highest at monitoring well MW-15D (390 µg/L; Figure 3). 1,1-DCE concentrations in the D-Zone have been declining over time (Appendix B). 1,1-

² A.A.C. R18-11-405

³ The groundwater monitoring event conducted in 2018, was the most comprehensive sampling event and therefore, provides the most complete accurate depiction of the 1,1-DCE distribution.

DCE concentrations in the D-Zone are higher than in the S-, the D2-, and the D3-Zones but it is more limited in extent (Figure 3).

3.3.2.3 D2-Zone

Five monitoring wells screened in the D2-Zone (MW-24D2, MW-33D2, MW-34D2, MW-36D2, and MW-38D2) were sampled during the fourth quarter 2018. 1,1-DCE concentrations ranged from less than 0.5 µg/L to 36 µg/L (MW-38D2, fourth quarter). 1,1-DCE was detected at a maximum concentration of 36 µg/L in the groundwater sample collected from monitoring well MW-38D2 (Table 2, Figure 4). This was the only groundwater sample from the D2-Zone with a concentration of 1,1-DCE greater than the AWQS in 2018.

The concentrations observed at monitoring wells MW-34D2 and MW-38D2 were greater than the concentrations observed in November 2017 and the two-year averages (Table 2). Based on the results, the groundwater plume extent may have increased slightly in the vicinity of MW-38D2 compared to 2017. However, due to the limited data set associated with the fourth quarter 2018 sampling, the estimated distribution of 1,1-DCE in groundwater in the D2-Zone was based on the most recent available data (2017 to 2018; Figure 4) for mass flux evaluation purposes (Section 6.4.2). 1,1-DCE concentrations have fluctuated in the D2-Zone over time but are currently less than historical concentrations with the exception of monitoring well MW-38D2 (Appendix B).

3.3.2.4 D3-Zone

Five monitoring wells screened in the D3-Zone (MW-24D3, MW-33D3, MW-34D3, MW-36D3, and MW-38D3) were sampled during the second and fourth quarters 2018. 1,1-DCE concentrations ranged from less than 0.5 µg/L to 25 µg/L (MW-38D3, second quarter). 1,1-DCE was detected greater than the AWQS in groundwater samples collected from monitoring wells MW-24D3, MW-34D3, MW-36D3, and MW-38D3 (Table 2, Figure 5).

The concentrations observed at in monitoring wells MW-24D3, MW-34D3, MW-36D3, and MW-38D3 were greater than the concentrations observed in November 2017 and the two-year averages (Table 2). 1,1-DCE was detected at concentrations less than the AWQS or not detected at the reporting limit in groundwater samples collected from monitoring wells MW-33D3 and MW-34D3 (second quarter only) (Figure 5). 1,1-DCE concentrations have fluctuated in the D3-Zone over time but are currently less than historical concentrations (Appendix B).

3.3.2.5 A2- and D4-Zones

Monitoring wells MW-36A2 and MW-33D4 are the only wells screened in the A2- and D4-Zones and were not sampled in 2018 (Figures 4 and 5, respectively). 1,1-DCE concentrations in monitoring wells MW-36A2 and MW-33D4 have historically been less than the laboratory reporting limits and the AWQS and were less than the 0.5 µg/L reporting limit in 2017 (Figure 4 and 5, respectively).

3.3.2.6 Long-term Trends

The groundwater monitoring studies established that 1,1-DCE concentrations have been declining with time (Arcadis 2015). The peak 1,1-DCE concentrations have declined from:

- 16,000 µg/L in 1994 to 4.7 µg/L in 2017 in the S-Zone,
- 2,300 µg/L in 2002 to 390 µg/L in 2017 in the D-Zone,
- 530 µg/L in 2004 to 85 µg/L in 2017 in the D2-Zone, and
- 56 µg/L in 2004 to 25 µg/L in 2018 the D3-Zone.

These declines are attributed to natural attenuation of the 1,1-DCE, the source removal, and enhanced reductive dechlorination in-situ reactive zone treatment, described in Section 3.4.

Select monitoring wells exhibit increasing or stable/fluctuating trends along the plume boundaries of the 1,1-DCE affected groundwater (e.g. MW-28D2). This is the result of advective transport⁴ of the 1,1-DCE, predominantly due to the SRP well pumping, and some increases in 1,1-DCE concentrations in the downgradient wells were anticipated as indicated in the Final FS Report, the PRAP, and the groundwater flow and 1,1-DCE transport modeling (Section 3.3.3).

3.3.3 Groundwater Flow and 1,1-DCE Transport Modeling

The groundwater flow and solute transport model for the site (Phase III Model, appendix to the Final FS Report [Arcadis 2014b]) predicted that 1,1-DCE would advect downgradient but that the nearby water supply wells would not be adversely affected.

The Phase III model predicts that any 1,1-DCE in the discharge from SRP well 21.5E-1.0S into Western Canal would never exceed 4 µg/L, based on the most likely (average) pumping rates for SRP well 21.5E-1.0S; and that this peak concentration would occur in approximately 2080. SRP well 21.5E-1.0S is screened from the D2-Zone to the upper D4-Zone.

The Phase III Model predicts that any 1,1-DCE in the sentinel monitoring wells along Orion Street, hydraulically upgradient of SRP well 21.5E-1.0S, would never exceed 120 µg/L in the D2-Zone and 50 µg/L in the D3-Zone, based on the most likely (average) pumping rates for SRP well 21.5E-1.0S; and that these peaks would occur between 2035 and 2075.

The Phase III Model predicts that any 1,1-DCE in the discharges from other water supply wells would never exceed laboratory reporting limits (0.5 to 1.0 µg/L), based on the most likely (average) pumping rates for the wells. This includes SRP well 20.6E-1.1S and ME Global well WS-1. SRP well 20.6E-1.1S is located approximately 2,700 feet to the west-southwest of the MW-38 well cluster (see Figure 1) and is potentially downgradient from the 1,1-DCE affected groundwater. ME Global well WS-1 is located on the ME Global facility north of and upgradient from the 1,1-DCE affected groundwater (Figure 1) and is used for industrial (non-potable) purposes, primarily as a fire suppression backup water supply. A more detailed explanation and summary of the modeling can be found in the ADEQ-approved Final FS Report.

In general groundwater flow is to the south, southwest, and or south east depending on the aquifer (zone). 2019 groundwater potentiometric surfaces are depicted in Appendix A and groundwater measurements are summarized in Table 3.

⁴ In some areas, the advective transport rate exceeds the natural attenuation rate.

3.4 Interim and Historical Remedial Actions

The former unlined rinse pond was removed in 1987 and replaced by an oil-water separator connected to a leach line. This leach line was then removed in 1993 and the oil-water separator outlet sealed. All related wastes since 1993 have been transported and disposed off-facility. The former leach line was closed (clean closure) under the Aquifer Protection Permit Program in 2003 (Arcadis 2002, ADEQ 2003).

A 1,1-DCE source area groundwater extraction system operated as part of the LUST corrective actions from 1991 to 2000 using monitoring wells MW-10 and MW-11 and, to a lesser extent, other proximal extraction wells. These wells are located on the southern facility boundary near the former vehicle maintenance area (see Figure 2) and screened in the S-Zone and upper portion of the D-Zone. As a result, the 1,1-DCE concentrations in the S-Zone decreased by one order of magnitude and the groundwater extraction system was terminated in October 2000. An estimated 316 pounds of 1,1-DCE were removed from the groundwater in this manner.

ERD IRZ carbon substrate injections were conducted from 2002 to 2006 to remediate groundwater containing the highest detected 1,1-DCE concentrations, in the D-Zone, hydraulically downgradient of the facility (near monitoring well MW-25D). The ERD IRZ treatment involved the injection of a natural, degradable carbohydrate solution, with surplus electron acceptors, into the D-Zone using two injection wells, IW-01 and IW-02, that were installed upgradient of MW-25D. The carbohydrate injections amplified the reducing conditions in the D-Zone, which accelerated the reductive dechlorination of 1,1-DCE to ethane by microbes naturally occurring in the groundwater. At the commencement of the ERD IRZ treatment, in November 2002, the highest concentrations in the D-Zone were approximately 1,500 to 2,000 µg/L. By the end of 2004, 1,1-DCE concentrations in the vicinity of the injection wells decreased 50 to 70 percent. The carbohydrate injections continued until June 2006. 1,1-DCE concentrations in groundwater in the vicinity of the injection wells currently range between 120 and 390 µg/L.

Currently, the highest 1,1-DCE concentrations remain in the D-Zone aquifer in the vicinity of MW-15D (hydraulically upgradient of the former IRZ treatment area), with a concentration of 390 µg/L in October 2017 when it was last sampled (Figure 3). The current 1,1-DCE concentrations in the D-Zone are on average approximately one fifth of the historical peak concentrations.

3.5 Basis for Taking Action

Pursuant to Arizona Revised Statute (A.R.S.) § 49-175(B)(4), A.A.C. R18-16-406, and R18-16-407, VTI completed the Final RI Report in 2010 (Arcadis 2010) and the Final FS Report in 2014 (Arcadis 2014b). The Final RI Report:

- Established the nature and extent of the contamination and the determinable sources thereof
- Identified current and potential impacts to public health, welfare and the environment
- Identified current and reasonable foreseeable uses of land and waters of the state, and
- Obtained and evaluated information necessary for identification and comparison of alternative remedial actions.

Pursuant to A.A.C. R18-16-410, the ROD is the final administrative decision as defined under A.R.S. § 41-1092(5). The remedy of continued groundwater monitoring and the contingency remedy of controlled

migration consisting of groundwater extraction and granular activated carbon (GAC) treatment coupled with continued groundwater monitoring were selected because they meet the following criteria pursuant to A.R.S. § 49-282.06(A):

- Assure the protection of public health and welfare and the environment
- To the extent practicable, provide for the control, management and cleanup of the 1,1-DCE in order to allow the maximum beneficial use of the groundwater, and
- Are reasonable, necessary, cost-effective, and technically feasible.

Groundwater monitoring of the 1,1-DCE affected groundwater has been ongoing since 1993. The monitoring well network has been expanded over the years and currently covers five groundwater aquifers (S-, D-, D2-, D3-, and D4-Zones) and extends approximately 2,400 feet beyond the facility boundary (Figure 2).

Concentrations of 1,1-DCE in groundwater greater than 7 µg/L currently extend approximately 2,200 feet hydraulically downgradient from the facility and has a maximum width of approximately 2,000 feet near Orion Street (Figures 3 through 5). Concentrations of 1,1-DCE in groundwater greater than the AWQS of 7 µg/L extend from approximately 65 feet below the ground surface (perched S-Zone aquifer) to a maximum depth of approximately 285 feet below the ground surface (upper D3-Zone). Concentrations of 1,1-DCE have not been detected above the laboratory reporting limits in the deeper D3b-Zone (lower D3-Zone) or D4-Zone. The concentrations of 1,1-DCE are highest in the D-Zone, at approximately 390 µg/L in 2017, and generally decrease with depth in the underlying aquifers (Arcadis 2014a). The D2-Zone and the D3-Zone are significantly influenced by nearby groundwater pumping (most notably SRP wells) and are considered the primary groundwater migration pathways.

Five active water supply wells were identified within one-half mile of the site boundary, including four SRP wells and two ME Global wells (Arcadis 2010, 2014a). Of these six wells, one ME Global well (WS-2) was abandoned in 2013, and two of the SRP wells (21.1E-0.0S and 21.5E-1.5S; Figure 1) were determined not to be threatened by the 1,1-DCE plume (Arcadis 2014b). The remaining three wells (one owned by ME Global and two owned by SRP) could be threatened from the 1,1-DCE in groundwater. The two wells owned and operated by SRP are wells 20.6E-1.1S and 21.5E-1.0S (Figure 1), which supply irrigation water to the Highline Canal and the Western Canal, respectively. The final well, located on the site (WS-1; Figure 1), is owned and operated by ME Global and is used for industrial (non-potable) purposes, primarily as a fire suppression backup water supply.

The established ROs in the RI are:

- To protect against a loss or impairment of each industrial use of groundwater pumped from ME Global's groundwater supply wells that is threatened to be lost or impaired as a result of the 1,1-DCE, while such threat exists; and
- To protect against a loss or impairment of each municipal, agricultural, industrial or other beneficial use of groundwater pumped from SRPs groundwater supply wells that is threatened to be lost or impaired as a result of the 1,1-DCE, while such threat exists.

Based upon VTI's groundwater flow and solute transport modeling (Phase III Model; Arcadis 2014b), ME Global's industrial use of the groundwater is not threatened (i.e., the discharge of WS-1 would never

exceed 0.5 µg/L to 1.0 µg/L). VTI's Phase III Model indicates that the 1,1-DCE plume would affect SRP well 21.5E-1.0S and concentrations of 1,1-DCE in the discharge would peak around year 2080 but remain less than 4 µg/L. VTI's Phase III Model indicates that concentrations of 1,1-DCE in the discharge from SRP well 20.6E-1.1S into the Highline Canal would never exceed 0.5 µg/L to 1.0 µg/L reporting limit; however, SRP well 20.6E-1.1S is potentially located downgradient from the 1,1-DCE-affected groundwater. As such, SRP well 20.6E-1.1S and SRP well 21.5E-1.0S are the only wells identified to have the potential to be affected by the 1,1-DCE plume.

Current and foreseeable industrial uses of groundwater pumped from the ME Global well (Figure 1 and Figure 2) are not threatened to be lost or impaired as a result of the 1,1-DCE. There are no current or foreseeable municipal, agricultural, or recreational uses of groundwater pumped from ME Global wells (Arcadis 2016, Section 6.2).

Current agricultural, industrial, and recreational uses of groundwater pumped from SRP wells 20.6E-1.1S and 21.5E-1.0S are not potentially threatened to be lost or impaired as a result of the 1,1-DCE. There are no current municipal uses of groundwater pumped from SRP wells 20.6E-1.1S or 21.5E-1.0S; however, municipal uses of the Western Canal and Highline Canal water are considered foreseeable as identified in the Land and Water Use Study and Section 6.2. Based on the foregoing, the Final RI Report, Final FS Report, the PRAP, and the ROD, the foreseeable municipal use of groundwater pumped from SRP water supply wells 21.5E-1.0S and 20.6E-1.1S (Figure 1) could potentially be lost or impaired as a result of the 1,1-DCE in groundwater; however, it is not probable.

4. REMEDIAL ACTIONS

4.1 Remedy Selection – Record of Decision

The Final FS Report was prepared in 2014 to evaluate remedial alternatives for the 1,1-DCE affected groundwater. The Final FS was prepared in accordance with A.A.C. R18-16-407 and relied upon the data contained in the Final RI Report (Arcadis 2014b).

The remedy for the 1,1-DCE affected groundwater, selected in the Final FS Report and developed in the PRAP, consists of groundwater monitoring with a contingency remedy of controlled migration consisting of groundwater extraction and GAC treatment coupled with continued groundwater monitoring. Groundwater monitoring data will be used to determine whether there develops a threat of loss or impairment of any municipal, agricultural, industrial or other beneficial use of groundwater pumped from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S as a result of the 1,1-DCE, which would be a trigger for the implementation of the contingency remedy. If met, the contingency remedy would trigger the requirement to complete the design and construction of, as well as operate, a groundwater treatment system while continuing groundwater monitoring. The goal of controlled migration and treatment will be to ensure the concentration of any 1,1-DCE in the discharge from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S is no greater than 90 percent of the most stringent 1,1-DCE numeric water quality standard for the currently applicable designated use or future designated use of the canal water into which the SRP wells discharge.

Groundwater monitoring data will also be used to determine whether there is a threat of loss or impairment of industrial use of groundwater pumped from ME Global well WS-1 as a result of the 1,1-

DCE. Since ME Global's industrial use of the groundwater is not threatened (i.e., the maximum groundwater concentration is less than the most conservative, applicable numeric water quality standard), no contingency actions have been established for this well. If ME Global's use of the groundwater changes, VTI will evaluate and employ additional remedial strategies to safeguard ME Global's use of this well.

4.2 Remedy Implementation

The groundwater monitoring data is used to determine if the implementation of the contingency remedy of controlled migration coupled with continued groundwater monitoring is triggered. The approach to such a determination involves an escalation of remedial activities in a phased manner, depending on the groundwater monitoring data, and include elements such as increased groundwater monitoring, sampling and analysis; increased reporting; installation of additional monitoring wells; updates of the groundwater flow and solute transport model; and, if necessary, installation of contingency groundwater extraction wells and implementation of the contingency remedy. The approach provides sufficient time to determine whether there develops a threat of loss or impairment of any municipal, agricultural, industrial or other beneficial use of groundwater pumped from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S as a result of the 1,1-DCE.

The remedy requires monitoring of specific groundwater monitoring wells, as well as SRP wells 20.6E-1.1S and 21.5E-1.0S. Groundwater monitoring data is collected on an established frequency (Attachment A) and enables a determination over the long term of whether:

- There develops a threat of loss or impairment of any municipal, agricultural, industrial or other beneficial use of groundwater pumped from SRP well 21.5E-1.0S or SRP well 20.6E-1.1S as a result of the 1,1-DCE, which would be a trigger for the implementation of the contingency remedy of controlled migration coupled with continued groundwater monitoring, or
- There develops a threat of loss or impairment of any industrial use of groundwater pumped from ME Global well WS-1 as a result of the 1,1-DCE.

The contingency remedy includes controlled migration coupled with continued groundwater monitoring with an escalation or de-escalation of remedial activities in a phased manner. The escalation of remedial activities in a phased manner would be based on specific analytical data and would include elements such as increased groundwater monitoring, sampling and analysis; increased reporting; installation of additional monitoring wells; updates of the groundwater flow and solute transport model; and, if necessary, installation of contingency groundwater extraction wells and implementation of the contingency remedy.

The approach is depicted in Figures 16 and 17 of the PRAP and described in sections 4.2.1 through 4.2.3 of the PRAP.

4.2.1 Groundwater Monitoring Program

Groundwater monitoring wells have been placed throughout the site to delineate the extent of the 1,1-DCE plume and evaluate 1,1-DCE concentration trends and advective transport over the years. A

focused group of wells were selected for the remedial action monitoring and are organized for the following purposes:

- CSM wells – are used to monitor the core area of the 1,1-DCE affected groundwater
- Key wells – are used to monitor 1,1-DCE primary transport pathways
- Sentinel wells – are used to monitor the 1,1-DCE primary transport pathways upgradient of SRP water supply wells 21.5E-1.0S and 20.6E-1.1S
- Water supply (SRP) wells – SRP water supply wells 21.5E-1.0S and 20.6E-1.1S are used to monitor for any presence of 1,1-DCE in the discharges from those wells, and
- Water-level (WL) wells – are used only to measure water levels to support the groundwater flow and 1,1-DCE transport assessments.

The designated wells are depicted on Figure 2 and Table 4 summarizes the monitoring program. Groundwater monitoring activities consist of the following:

- Measurement of water levels, including continuous water-level monitoring using data logging pressure transducers in a select number of wells
- Collection of groundwater samples from monitoring wells and laboratory analysis of the samples for 1,1-DCE using United States Environmental Protection Agency (USEPA) Method 8260B
- Collection of water supply well discharge samples and laboratory analysis of the samples for 1,1-DCE using USEPA Method 524.2, and
- Monitoring of water supply well pumping.

The groundwater monitoring (1,1-DCE sampling and water level) frequency varies based on the level of monitoring and the purpose of the well (Table 4). These monitoring frequencies may be increased (or decreased), as described in Section 4.2 of the PRAP (Arcadis 2016). Groundwater monitoring data is assessed annually to evaluate the need for additional monitoring or contingencies (action levels) as described in the PRAP. The current action level is specified and in Section 4.4.

The groundwater monitoring data are assessed and reported to the ADEQ annually by March 31st of the following year. The assessment includes verification of:

- i. ME Global's industrial use of the groundwater
- ii. the designated uses of the canal water into which SRP water supply well 21.5E-1.0S discharges (Western Canal and Kiwanis Park Lake), and
- iii. the designated uses of the canal water into which SRP water supply well 20.6E-1.1S discharges (High Line Canal).

The current and future water uses of groundwater are further evaluated in Section 6.2.

4.2.2 Reporting

Results from the groundwater monitoring activities completed in 2016, 2017, and 2018 were reported in the Second and Fourth Quarter 2016 Groundwater Monitoring Reports (Arcadis 2016, 2017), 2017 DCE

Annual Groundwater Monitoring Report (Arcadis 2018), and 2018 DCE Annual Groundwater Monitoring Report (Arcadis 2019). These reports were reviewed and approved by the ADEQ (ADEQ 2016, 2017, 2018, 2019).

Annual reports will continue to be submitted to the ADEQ by March 31 in accordance with the PRAP and ROD.

4.3 Current Action Level

Action levels describe the groundwater monitoring actions and/or contingency remedial actions warranted based on the groundwater conditions and potential threat to nearby water supply wells at the site, as described in the ADEQ-approved PRAP. The action levels include the Base Level (default) and four action levels (1-4) that may be triggered depending on the groundwater conditions relative to the scenario-based criteria (see PRAP).

The current action level is the Base Level, based on the groundwater monitoring completed through 2018 and the results of the scenario criteria evaluations provided in the ADEQ-approved 2017 and 2018 Groundwater Monitoring Reports (ADEQ 2018, 2019; Arcadis 2018, 2019). None of the action levels have been triggered to-date and Base Level monitoring was implemented in 2019. An action level assessment is completed annually based on the groundwater analytical results and hydrogeologic data and presented in the annual Groundwater Monitoring Reports.

5. PROGRESS SINCE REMEDY IMPLEMENTATION

The remedy (groundwater monitoring) was initiated in 2017 and is ongoing. The groundwater monitoring activities and results for 2017 and 2018 were summarized in the 2017 Annual Groundwater Monitoring Report (GWMR) and 2018 Annual GWMR, respectively. The following remedial activities were completed from 2017 to 2018:

- Depth-to-water measurements, including continuous water level monitoring using data loggers were collected quarterly in 2017 and 2018 in accordance with the PRAP
- Groundwater samples were collected during the 2nd and 4th quarters of 2017 and 2018 in accordance with the PRAP
- An evaluation of low-flow-purging and sampling, and no-purge (i.e., passive diffusion bad [PDB] samplers) sampling methodologies (Arcadis 2018a)
- Collection of water supply well discharge samples
- Monitoring of water supply pumping
- Evaluation of the criterion to determine whether to implement contingency actions or remedy
- Submission of 2017 and 2018 Annual Groundwater Monitoring Reports.

The remedy has been implemented as agreed upon in the ROD and no deficiencies occurred.

To assess the progress since the remedy was implemented, Arcadis evaluated the activities that were completed compared to what was proposed in the PRAP, and 1,1-DCE concentration trends in

groundwater. The activities completed in 2017 and 2018 were consistent with what was proposed in the PRAP (groundwater monitoring and reporting). The analytical results and concentration trends are evaluated and discussed in Section 7.2.1.2.

6. PERIODIC SITE REVIEW PROCESS AND FINDINGS

The following sections describe the process of data gathering for this PSR Report.

6.1 Administrative Components

This PSR Report was prepared by Arcadis on behalf of VTI and included community notification and involvement (questionnaires), document review, and data review. Arcadis routinely visits the site at least twice per year and maintains communication with the current facility owner (ME Global), COT, and SRP. The SRP well discharge analytical results are provided to SRP following the sampling event as requested by SRP.

This PSR was prepared following an approximately three-year term in accordance with the ROD (ADEQ 2016). Arcadis, Rio Tinto, and ADEQ will determine the appropriate time for the next review, which is anticipated to be five years (Section 11).

The components of the PSR process are discussed in the following sections: community involvement, document review, and data review.

6.2 Community Involvement/Questionnaires

A PSR questionnaire was sent to ME Global, SRP, and COT on April 26, 2019. Copies of the completed questionnaires are included in Appendix C.

- ME Global, COT, and SRP's current and foreseeable groundwater uses have not changed since the FS, PRAP, and ROD were approved
 - ME Global's groundwater use is for industrial (back-up fire suppression)
 - SRP's current groundwater uses included agricultural and recreational uses. SRP's groundwater supply wells discharge to Highline Canal and the Western Canal that supply water to their customers for the stated uses. SRP anticipates future canal water uses will include potable (municipal) used.
 - COT water supply wells are located greater than ½ mile from the 1,1-DCE affected groundwater
- COT plans to expand the existing groundwater recharge operations at Ken McDonald Golf Course located approximately 1 mile south of the facility in the future.

The responses from questionnaires, as applicable, was considered during the data review and technical assessment in following sections.

A copy of the PSR will be submitted to the local groundwater users (ME Global, SRP, and COT) and a public notice will be issued in a local newspaper following ADEQ approval of the PSR.

6.3 Document Review

Background documents selected for review focused primarily on action taken during the period of this PSR, to evaluate the site status, details of the remedy implementation, and progress toward the goals and achieving the ROs. The evaluated reports included the FS Report, PRAP, Fourth Quarter 2016 Groundwater Monitoring Report (Arcadis 2017), 2017 Annual Groundwater Monitoring Report (Arcadis 2018b), and 2018 Annual Groundwater Monitoring Report (Arcadis 2019a).

6.4 Data Review

The data and analytical results in the Second and Fourth Quarter 2016 Groundwater Monitoring Reports (Arcadis 2017), 2017 Annual Groundwater Monitoring Report (Arcadis 2018b), and 2018 Annual Groundwater Monitoring Report (Arcadis 2019a) were reviewed and evaluated.

6.4.1 Evaluation of Remedial Objective Metrics

The ROs are detailed in Section 3.5 and assessed in 7.2.4 of this PSR. The ROs were met for this review period. The current action level is the Base Level and none of the action levels have been triggered to-date.

6.4.2 Operation, Maintenance, and Monitoring Results

The current action level is the Base Level and none of the action levels have been triggered to-date. No active remediation or contingency actions (level 1 through 4) were required during this PSR period in accordance with the PRAP and ROD, as described in Section 4.3.

The distribution of 1,1-DCE in groundwater in the D-, D2-, and D3-Zones shown on Figure 3 through 5 indicate the extent of the 1,1-DCE greater than the AWQS does not extend to the SRP well 20.5E-1.1S but could extend to SRP well 21.5E-1.0S. However, SRP 21.5E-1.0S discharge concentrations are less than 1 µg/L and below the AWQS, as predicted. The distribution of 1,1-DCE changed slightly from 2016 to 2018 as shown in Figures 3 through 5:

- D-Zone:
 - No change but possible reduced footprint due to declining concentrations
- D2-Zone:
 - Slight expansion on the central-east side of the plume where 1,1-DCE concentrations increased at monitoring well MW-32D2 from 3.8 to 14 µg/L and on the southwest toe-end of the plume where 1,1-DCE concentrations increased at monitoring well MW-38D2 from 15 to 36 µg/L
- D3-Zone:
 - Slight expansion on the central portion of the plume where 1,1-DCE concentrations increased at monitoring well MW-34D3 from 1.6 to 5.2 µg/L and slight contraction on the southwest toe-end of the plume where 1,1-DCE concentrations decreased at monitoring well MW-38D3 from 40 to 23 µg/L

Groundwater analytical results provided in the 2017 and 2018 Annual GWMRs were used to calculate the mass discharge and estimate the expected future concentration of 1,1-DCE present in the water discharged from each of the SRP wells (Arcadis 2018b, 2019a). Additionally, groundwater samples were collected from both wells to determine the actual concentration of 1,1-DCE in the discharge and evaluate concentration trends over time. Both the calculated expected concentrations and actual sample concentrations remain well below the AWQS indicating the SRP wells uses have not been threatened (Arcadis 2018b, 2019a).

1,1-DCE concentration trends at SRP sentinel monitoring wells in the D2- and D3-Zones (MW-34, MW-36, and MW-33 for SRP well 21.5E-1.0S and MW-24, MW-38, and MW-34 for SRP well 20.6E-1.1S), are presented in Appendix B. The 1,1-DCE concentration trend graphs indicate the following:

- SRP well 21.5E-1.0S sentinel wells:
 - D2-Zone
 - Monitoring wells MW-34D2 and MW-36D2 1,1-DCE concentrations have declined and are less than the AWQS
 - Monitoring well MW-33D2 1,1-DCE concentrations remain less than the laboratory reporting limit and the AWQS
 - D3-Zone:
 - Monitoring well MW-34D3 1,1-DCE concentrations have fluctuated greater than and less than the AWQS with no apparent trend, but, are currently less than the AWQS
 - Monitoring well MW-36D3 1,1-DCE concentrations increased in 2013 greater than the AWQS and have remained stable (flat) since
 - Monitoring well MW-33D3 1,1-DCE concentrations remain less than the laboratory reporting limit and the AWQS
- SRP well 20.6E-1.1S sentinel wells:
 - D2-Zone
 - Monitoring well MW-24D2 1,1-DCE concentrations remained stable and less than the detection limit and the AWQS
 - Monitoring well MW-36D2 1,1-DCE concentrations fluctuated but remained less than the AWQS
 - Monitoring well MW-38D2 1,1-DCE concentrations increased since 2016
 - D3-Zone:
 - Monitoring well MW-24D3 has fluctuated greater than and less than the AWQS with no apparent trend
 - Monitoring well MW-36D3 increased in 2013 greater than the AWQS and has stayed flat since
 - Monitoring well MW-38D3 has no apparent trend and remains greater than the AWQS

The 1,1-DCE will continue to advect and potentially increase in certain downgradient wells as discussed and accounted for in the ADEQ-approved FS and PRAP (Arcadis 2014a, 2016). This is most likely to occur at sentinel wells downgradient from monitoring well MW-26D2 and MW-28D2 where 1,1-DCE concentrations are elevated compared to the downgradient sentinel wells (e.g., MW-38D2). The remaining sentinel monitoring wells are not expected to increase significantly further based on the reported data and trends.

7. TECHNICAL ASSESSMENT

The following is a technical assessment of the site based on the findings of this PSR. This assessment answers three basic questions:

- Question A: Is the remedy functioning as intended by the decision documents?
- Question B: Are the COCs, exposure assumptions, toxicity data, cleanup levels, and ROs used at the time of the ROD still valid?
- Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

7.1 Question A: Is the Remedy Functioning as Intended by the ROD

Based on review of the documents, data, interviews, and monitoring, the selected remedy is functioning as intended by the PRAP and ROD. The PRAP was designed to account for changes in conditions and accounts for the advection of 1,1-DCE described in Section 6.4.

7.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Objectives Used at the Time of the ROD Still Valid

The exposure assumptions, toxicity data, cleanup levels, and ROs are still valid and as indicated in the following sections.

7.2.1 Exposure Assumptions

Several studies have been conducted at the site in order to evaluate the exposure pathways of 1,1-DCE to human receptors. The Final FS Report provided a human health assessment that identified and evaluated the potential exposure pathways for human receptors. As part of the site review, these exposure scenarios and associated assumptions were reviewed to assess whether they are still valid or require modifications. If modifications to the assumptions or new assumptions are warranted, they are presented in the following sections. The following sections summarize the evaluation and its findings for the two potential exposure pathways (soil and groundwater).

7.2.1.1 Soil Pathway

The FS concluded 1,1-DCE in the soil does not pose a current or reasonably foreseeable risk to human health based on the historical investigations that demonstrated 1,1-DCE concentrations were less than the Arizona residential SRL and the Arizona minimum GPLs. There are no new data or activities at the site that would change this conclusion and it remains valid.

7.2.1.2 Groundwater Pathway

There are three active water supply wells that create a potential exposure pathway between 1,1-DCE in groundwater and human receptors. One water supply well is owned and operated by ME Global (WS-1) and the other two water supply wells are owned and operated by SRP (20.6E-1.1S and 21.5E-1.0S).

Water supply well WS-1 is located on the ME Global facility. The well is used for industrial (non-potable) purposes, primarily as a fire suppression back-up water supply. The FS concluded, the 1,1-DCE in the groundwater does not pose an appreciable risk to human health as a result of water from the well being used for industrial purposes and back-up fire suppression. As discussed in Section 6.2, the responses from ME Global to the questionnaire show the well is currently used for back-up fire suppression only and its use is not anticipated to change in the future. Additionally, ME Global does not have plans to install any other wells on their property. The peak 1,1-DCE concentrations in groundwater are less than the Arizona full body contact standard and have decreased over time (Section 3.3.2 and 6.4.2) further reducing potential for adverse exposure. Therefore, the FS exposure assumptions remain valid and ME Global's well use is not considered potentially threatened.

The other two water supply wells are SRP well 21.5E-1.0S which discharges into the Western Canal and SRP well 20.6E-1.1S which discharges into the High Line Canal. Water from both canals is presently used for irrigation purposes (Appendix C). Based on the available groundwater data, groundwater modeling, declining 1,1-DCE concentration trends, and the CSM, the FS concluded, the 1,1-DCE in the groundwater does not pose an appreciable risk to human health as a result of water being discharged from the wells into the canals, the irrigation use of water from the canals, or trespasser activity in the canals.

Current and future groundwater uses along with groundwater data collected through 2018 were evaluated to assess the conclusion and assumptions from the FS. The results of the evaluation are as follows:

- As discussed in Section 6.2, the responses from SRP to the questionnaire show well use has not changed and water from the canals is used for irrigation purposes. SRP anticipates groundwater use will change from irrigation to irrigation and potable water sometime in the future. SRP does not have plans to install any new wells within 1 mile of the site in the next 5 years.
- The action level for the SRP wells is already based on the AWQS; therefore, the conclusion and exposure assumptions from the FS and PRAP with respect to well water usage remains unchanged and valid. Thus, the SRP's groundwater uses are not threatened.
- The potential threat to SRP wells will continue to be assessed annually in accordance with the PRAP and ROD as well as during future PSRs.

7.2.2 Toxicity Data

The USEPA maximum contaminant level (MCL), the AWQS, and the water quality standards (A.A.C. R-18-11 Appendix A) for 1,1-DCE have not changed since the PRAP and ROD were issued. The current toxicity data indicate 1,1-DCE is not a carcinogen and the USEPA 0.1 and 1.0 target hazard quotient tap (drinking) water screening levels are 28 ug/L and 280 ug/L, respectively (USEPA 2019). Thus, the current 7 ug/L USEPA MCL and AWQS are overly protective.

7.2.3 Clean-up Levels

The clean-up levels are based on the uses of groundwater (see Section 3.2 and 6.2). SRP well groundwater is currently used for irrigation, but, may include drinking water (potable) use in the future (Appendix C). The AWQS has not changed. Therefore, the 7 ug/L AWQS (USEPA MCL) established for the SRP well discharge water clean-up level in the PRAP is still valid. 1,1-DCE concentrations in SRP well discharges are currently less than the AWQS. ME Global's groundwater use is for industrial purposes and the current maximum groundwater concentration is less than the current, 46,667 ug/L Arizona full body contact standard (A.A.C. R-18-11 Appendix A). There are no anticipated changes to ME Global's groundwater uses (Appendix C). Therefore, the 46,667 ug/L Arizona full body contact standard for ME Global's groundwater use is still valid.

7.2.4 Remedial Objectives

The ROs for the site (ADEQ 2009, 2010) are:

- To protect against a loss or impairment of each industrial use of groundwater pumped from ME Global's groundwater supply wells that is threatened to be lost or impaired as a result of the 1,1-DCE, while such threat exists; and
- To protect against a loss or impairment of each municipal, agricultural, industrial or other beneficial use of groundwater pumped from Salt River Project's (SRP's) groundwater supply wells that is threatened to be lost or impaired as a result of the 1,1-DCE, while such threat exists.

These ROs are the basis of the ADEQ-approved remedy and ADEQ-approved contingency remedy for the 1,1-DCE affected groundwater (Arcadis 2014a, ADEQ 2014). The approved remedy and contingency remedy are, respectively, continued groundwater monitoring, and controlled migration coupled with continued groundwater monitoring.

The ROs continue to be protective of human health and the environment.

7.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy

There is no information that calls into question the protectiveness of the selected remedy. The groundwater analytical results, groundwater flow data, action level assessments (Arcadis 2018b, 2019a), and responses from the stakeholders to the questionnaires (Appendix C) confirm the remedy is working and it protective.

8. ISSUES

No issues were identified that adversely impact the protectiveness of the remedy.

9. RECOMMENDATION AND FOLLOW-UP ACTIONS

This PSR Report recommends the following:

- Continued groundwater monitoring in accordance with the PRAP (currently Base Level).
- Submission of annual groundwater monitoring reports that include an annual assessment of potential threats and the action levels. The action level may change depending on the threat level assessment.
- Maintain communication with the ADEQ, ME Global, SRP, and COT regarding future land and water use plans (e.g., installation of a new SRP water supply well) on a periodic basis.
- Submission of PSR Reports every five years to evaluate the protectiveness of the selected remedy and recommend changes, if warranted.

10. PROTECTIVENESS STATEMENT

Review of the site remedy demonstrates that it is currently protective of human health and the environment and those exposure pathways that could result in unacceptable risks are being controlled. The groundwater monitoring activities conducted in accordance with the PRAP and ROD are effective at monitoring the 1,1-DCE groundwater plume, assessing potential future threats, and protecting groundwater receptors. The nature and extent of the 1,1-DCE groundwater plume is adequately defined and its migration is generally consistent with predictions and the groundwater modeling presented in the Final FS Report.

11. NEXT PERIODIC REVIEW

Based on the nature of the 1,1-DCE affected groundwater, the CSM, the gradual changes in 1,1-DCE concentrations, the selected remedy, the annual threat assessments, the receptor exposure pathways, a periodic review period of five years is appropriate for the site. Therefore, the next PSR Report will be submitted to the ADEQ in five years (2024). The report will be based on groundwater monitoring results from 2019 through 2023.

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TABLES



Table 1
Well Information
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well Identification	Installation Date	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)	Current MP Elevation (ft amsl)	ADWR Registration Number	Aquifer Zone	Comments
CC-01	6/22/1989	60	90	4	1184.42	55-525561	S	Estimated screen intervals
MW-02	9/18/1989	60	90	4	1183.16	55-525850	S	-
MW-03	9/19/1989	60	90	4	1183.72	55-525851	S	-
MW-04	9/20/1989	60	90	4	1183.93	55-525852	S	-
MW-05	12/20/1989	60	90	4	1183.72	55-525853	S	-
MW-06	12/20/1989	60	90	4	1183.78	55-525854	S	-
MW-07	2/2/1990	60	100	4	1183.49	55-525855	S	-
MW-08	2/10/1990	60	100	4	1183.65	55-526726	S	-
MW-09	3/24/1990	55	95	4	1183.68	55-526727	S	Damaged casing/pipe in well: replaced w/ MW-9B
MW-09B	11/8/1995	51	91	4	1182.57	55-552510	S	MW-9 Replacement Well
MW-10	10/30/1990	70	110	4	1183.64	55-529919	S/D	-
MW-11	1/6/1991	70 & 95	85 & 110	6	1183.38	55-530403	S	Two screens 70-85 & 95-110
MW-12	1/30/1991	100	110	6	-	55-530414	S/D	Abandoned 2/26/96, due to submerged screen
MW-12B	6/20/1995	50	80	4	1184.34	Unknown	S	MW-12 Replacement Well
MW-13	1/29/1991	70 & 100	85 & 110	6	-	55-530401	S/D	Abandoned 2/26/96, due to submerged screen; two screens
MW-13B	4/11/1995	50	80	4	1183.19	55-548181	S	MW-13 Replacement Well
MW-14	3/20/1991	55	90	4	1182.81	55-530402	S	-
MW-15	8/13/1993	50	90	2	1183.98	55-540429	S	-
MW-15D	10/10/2005	107	127	2.5	1183.98	55-903111	D	-
MW-15D2	10/10/2005	165	195	2.5	1183.99		D2	-
MW-16	1/5/1994	60	90	4	1181.79	55-541805	S	-
MW-17	1/4/1994	60	90	4	1182.25	55-541804	S	-
MW-18	2/17/1994	50	80	4	1183.21	55-542274	S	Abandoned on 1/26/2006, due to issuance of AST NFA
MW-19	11/10/1995	50	90	4	1183.20	55-552511	S	-
MW-20	4/2/1999	60	110	4	1183.48	55-573231	S/D	-
MW-21	4/4/1999	120	130	4	1184.07	55-573230	D	-
MW-22S	4/14/1999	70	89	2	1183.19	55-573228	S	-
MW-22M	4/14/1999	100	110	2	1183.38		M	-
MW-22D	4/14/1999	120	130	2	1183.38		D	-
MW-23	4/7/1999	50	110	4	1183.60	55-573229	S/D	-
MW-24D	8/24/2006	107.5	137.5	0.75	1189.23	55-573228	D	Piezometer Well
MW-24D2	8/24/2006	178	203	2.5	1189.23		D2	-
MW-24D3	8/24/2006	254.5	279.5	2.5	1189.22		D3	-

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Well Information
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well Identification	Installation Date	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)	Current MP Elevation (ft amsl)	ADWR Registration Number	Aquifer Zone	Comments
MW-25S	7/13/1999	60	80	2	1183.98	55-573232	S	-
MW-25D	7/13/1999	110	130	2	1183.98		D	-
MW-26S	7/14/1999	60	80	2	1184.64	55-573233	S	-
MW-26D	7/14/1999	110	130	2	1184.65		D	-
MW-26D2	1/6/2004	179	199	2.5	1184.60	55-201142	D2	-
MW-26D3	1/6/2004	251	271	2.5	1184.62		D3	-
MW-27S	2/8/2000	60	80	2	1187.13	55-577384	S	-
MW-27D	2/8/2000	110	130	2	1187.14		D	-
MW-28D	8/22/2001	110	130	2	1183.03	55-582829	D	-
MW-28D2	8/22/2001	177	197	2	1183.11		D2	-
MW-28D3	8/22/2001	260	280	2	1183.09		D3	-
MW-29D	10/22/2001	110	130	2	1183.87	55-588789	D	-
MW-29D2	10/22/2001	175	195	2	1183.90		D2	-
MW-29D3	10/22/2001	260	280	2	1183.76		D3	-
MW-29D3b	12/18/2003	328	338	5	1183.62	55-201144	D3b	Formerly documented as MW-29D4
MW-30D	6/25/2002	110	130	2	1184.13	55-588557	D	Modified & replaced by MW-31D
MW-30D2	6/25/2002	175	195	2	1184.16		D2	Collapsed at ~77' bgs replaced by MW-31D2
MW-30D3	6/25/2002	259	279	2	1184.09		D3	-
MW-31D	8/22/2003	110	140	2	1183.99	55-593906	D	Modified MW-30D replacement well
MW-31D2	8/22/2003	175	195	2	1183.98		D2	Replaced collapsed MW-30D2 well
MW-32D	9/29/2005	107	137	4	1185.33	55-903112	D	-
MW-32D2	1/31/2004	180	200	2.5	1185.57	55-201143	D2	-
MW-32D3	1/31/2004	250	280	2.5	1185.60		D3	-
MW-33D2	1/27/2004	185	205	2.5	1183.51	55-201145	D2	-
MW-33D3	1/27/2004	255	285	2.5	1183.49		D3	-
MW-33D4	12/8/2003	340	370	5	1183.36	55-201146	D4	-
MW-34D2	9/23/2005	184	214	2.5	1186.47	55-903110	D2	-
MW-34D3	9/23/2005	250	280	2.5	1186.46		D3	-
MW-35D	10/5/2005	115	135	2.5	1183.92	55-903113	D	-
MW-35D2	10/5/2005	166	196	2.5	1183.92		D2	-

Table 1
Well Information
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well Identification	Installation Date	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)	Current MP Elevation (ft amsl)	ADWR Registration Number	Aquifer Zone	Comments
MW-36D	8/29/2008	114	134	2.5	1186.69	55-909493	D	-
MW-36A2	8/29/2008	213	218	2.5	1186.69		A2	-
MW-36D2	8/20/2008	175	195	2.5	1186.72	55-909492	D2	-
MW-36D3	8/20/2008	226	256	2.5	1186.66		D3	-
MW-37	1/22/2011	61.5	76.5	4	1183.58	55-912868	S	-
MW-38D	11/23/2013	125.0	145.0	1	1191.17	55-222693	D	Piezometer Well
MW-38D2	11/23/2013	191.0	221.0	2.5	1191.15		D2	-
MW-38D3	11/23/2013	255.0	285.0	2.5	1191.12		D3	-
MW-39D2	11/30/2013	175.0	205.0	2.5	1186.52	55-222692	D2	-
MW-39D3	11/30/2013	250.0	280.0	2.5	1186.56		D3	-
IW-01	6/28/2002	110	150	4	1183.79	55-586731	D	Injection Well, abandoned 11/2/2018
IW-02	6/27/2002	110	150	4	1184.02	55-588552	D	Injection Well, abandoned 11/2/2018
IW-03	1/23/2011	61.5	76.5	4	1183.93	55-912869	S	Injection Well
EW-01	11/7/1995	50	90	4	1183.17	55-552509	S	Extraction Well
EW-02	11/11/1995	50	91	4	1182.37	55-552512	S	Extraction Well
POC-1	12/14/2015	45	85	4	1185.92	55-918956	S	ME Global Point of Compliance Well
VE-1	7/23/1993	11	31	4	-	55-540271	S	Vapor Extraction Well
VE-2S	10/21/1994	10	30	2	-	NA	S	Abandoned on 1/26/2006, due to issuance of AST NFA
VE-2D	10/21/1994	38	58	2	-	NA	S	Abandoned on 1/26/2006, due to issuance of AST NFA
VE-3	7/15/1996	5	33	4	-	NA	S	Abandoned on 1/26/2006, due to issuance of AST NFA
WS-1	1952	236	276	10	-	55-603925	D3	ME Water Supply Well: 320 GPM (onsite), 6" cone screen
WS-2	1955	-	-	-	1184.13	55-603924	unknown	Abandoned on 11/2012, former ME Water Supply Well
SRP 21.5E-1.0S	1946	190	362	24	1184.8	55-617853	D2/D3/D4	Guadalupe & Western Canal (2,500 GPM)
SRP 20.6E-1.1S	2005	240 & 280	260 & 440	20	1218.0	55-208409	D2/D3	Guadalupe & Hardy (formerly 20.5E-1.0S), two screens
SRP 21.1E-0.1S	8/3/1949	130	250	20	-	55-617852	D/D2	Baseline & Western Canal (1,460 GPM)
SRP 21.5E-1.5S	3/12/1949	185	400	20	-	55-617854	unknown	Western Canal & APS Power Plant
COT MW-5	11/16/2006	100	165	5	-	55-582989	unknown	Recharge monitoring well @ Ken McDonald Golf Course

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Well Information
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well Identification	Installation Date	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Casing Diameter (in)	Current MP Elevation (ft amsl)	ADWR Registration Number	Aquifer Zone	Comments
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Notes:

Table only includes site wells and known active wells within the Land and Water Use study area

Aquifer (zone) definitions (describes which zone(s) wells are screened within):

S = S-Zone	M = lower S-Zone
D = D-Zone	D2 = D2-Zone
A2 = A2-Zone	D3 = D3-Zone
D3b = D3b-Zone	D4 = D4-Zone

Italicized = Approximated

ADWR = Arizona Department of Water Resources

amsl = above mean sea level (City of Tempe Vertical Datum)

AST = Above Ground Storage Tank

bgs = below ground surface

CC = capitol castings monitoring well

COT = City of Tempe Groundwater Monitoring Well

EW = Groundwater Extraction Well

ft = feet

in = inches

IW = Injection Well

ME = ME Global

MP = Measuring Point

MW = Monitoring Well

NA = not applicable

NFA = No Further Action

SRP = Salt River Project Groundwater Supply Well

VE = Vapor Extraction Well

WS = Groundwater Supply Well

Table 2
2016 - 2019 1,1-Dichloroethene Analytical Results
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Analyte				1,1-Dichloroethene
Unit				(µg/l)
CAS Number				75-35-4
AWQS				7
Well ID	Sample Date	Sample ID	Sample Type	
MW-15D	11/14/2016	MW15D-111416	N	560
MW-15D	10/18/2017	MW15D-101817	N	390
MW-15D	10/18/2017	MW15D-101817-PDB(117)	N	370
MW-15D2	11/14/2016	MW15D2-111416	N	28
MW-15D2	11/14/2016	DUP-111416	FD	29
MW-15D2	10/18/2017	MW15D2-101817	N	24
MW-15D2	10/18/2017	MW15D2-101817-PDB(180)	N	25
MW-22D	10/24/2017	MW22D-102417	N	9.1
MW-22S	10/24/2017	MW22S-102417	N	4.7
MW-24D	10/20/2017	MW24D-102017	N	< 0.50
MW-24D2	11/11/2016	MW24D2-111116	N	< 1.0
MW-24D2	4/17/2017	MW24D2-041717	N	< 0.50
MW-24D2	4/17/2017	MW24D2-041717-PDB (190.5)	N	< 0.50
MW-24D2	4/17/2017	DUP-041717	FD	< 0.50
MW-24D2	10/20/2017	MW24D2-102017	N	< 0.50
MW-24D2	10/20/2017	MW24D2-102017-PDB(190.5)	N	< 0.50
MW-24D2	10/11/2018	MW24D2-101118	N	< 0.50
MW-24D3	11/11/2016	MW24D3-111116	N	13
MW-24D3	11/11/2016	DUP-111116	FD	15
MW-24D3	4/17/2017	MW24D3-041717	N	10
MW-24D3	4/17/2017	MW24D3-041717-PDB (260.75)	N	14
MW-24D3	4/17/2017	MW24D3-041717-PDB (273.25)	N	12
MW-24D3	10/20/2017	MW24D3-102017	N	13
MW-24D3	10/20/2017	MW24D3-102017-PDB(260.75)	N	13
MW-24D3	10/20/2017	MW24D3-102017-PDB(273.25)	N	12
MW-24D3	10/20/2017	DUP-102017	FD	13
MW-24D3	5/24/2018	MW24D3-052418	N	14
MW-24D3	10/11/2018	MW24D3-101118	N	16
MW-24D3	10/11/2018	DUP2-101118	FD	15
MW-24D3	4/25/2019	MW24D3-042519	N	3.9
MW-24D3	4/25/2019	DUP-042519	FD	4.4
MW-26D	11/14/2016	MW26D-111416	N	270
MW-26D	10/18/2017	MW26D-101817	N	230
MW-26D	10/18/2017	MW26D-101817-PDB(120)	N	210
MW-26D2	11/14/2016	MW26D2-111416	N	59
MW-26D2	10/18/2017	MW26D2-101817	N	85
MW-26D2	10/18/2017	MW26D2-101817-PDB(189)	N	86
MW-26D2	10/18/2017	DUP-101817	FD	82
MW-26D3	11/14/2016	MW26D3-111416	N	9.3

Table 2
2016 - 2019 1,1-Dichloroethene Analytical Results
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Analyte				1,1-Dichloroethene
Unit				(µg/l)
CAS Number				75-35-4
AWQS				7
Well ID	Sample Date	Sample ID	Sample Type	
MW-26D3	10/18/2017	MW26D3-101817	N	17
MW-26D3	10/18/2017	MW26D3-101817-PDB(261)	N	8.0
MW-28D2	11/10/2016	MW28D2-111016	N	50
MW-28D2	10/23/2017	MW28D2-102317	N	41
MW-29D	11/9/2016	MW29D-110916	N	< 1.0
MW-29D	10/20/2017	MW29D-102017	N	< 0.50
MW-29D2	11/9/2016	MW29D2-110916	N	< 1.0
MW-29D2	10/20/2017	MW29D2-102017	N	< 0.50
MW-29D3	11/9/2016	MW29D3-110916	N	3.8
MW-29D3	11/9/2016	DUP-110916	FD	4.0
MW-29D3	10/20/2017	MW29D3-102017	N	5.3
MW-29D3b	10/20/2017	MW29D3b-102017	N	< 0.50
MW-32D	11/10/2016	MW32D-111016	N	< 1.0
MW-32D	10/19/2017	MW32D-101917	N	< 0.50
MW-32D2	11/10/2016	MW32D2-111016	N	3.8
MW-32D2	11/10/2016	DUP-111016	FD	3.7
MW-32D2	10/19/2017	MW32D2-101917	N	14
MW-32D2	10/19/2017	MW32D2-101917-PDB (190)	N	8.7
MW-32D3	11/10/2016	MW32D3-111016	N	1.5
MW-32D3	10/19/2017	MW32D3-101917	N	2.6
MW-32D3	10/19/2017	MW32D3-101917-PDB (265)	N	2.9
MW-33D2	11/8/2016	MW33D2-110816	N	< 1.0
MW-33D2	4/14/2017	MW33D2-041417	N	< 0.50
MW-33D2	10/17/2017	MW33D2-101717	N	< 0.50
MW-33D2	10/11/2018	MW33D2-101118	N	< 0.50
MW-33D3	11/8/2016	MW33D3-110816	N	< 1.0
MW-33D3	4/14/2017	MW33D3-041417	N	< 0.50
MW-33D3	10/17/2017	MW33D3-101717	N	< 0.50
MW-33D3	5/24/2018	MW33D3-052418	N	< 0.50
MW-33D3	10/11/2018	MW33D3-101118	N	< 0.50
MW-33D3	4/24/2019	MW33D3-042419	N	< 0.50
MW-33D4	11/8/2016	MW33D4-110816	N	< 1.0
MW-33D4	11/8/2016	DUP-110816	FD	< 1.0
MW-33D4	10/17/2017	MW33D4-101717	N	< 0.50
MW-34D2	11/11/2016	MW34D2-111116	N	< 1.0
MW-34D2	4/18/2017	MW34D2-041817	N	< 0.50
MW-34D2	4/18/2017	MW34D2-041817-PDB (199)	N	< 0.50
MW-34D2	10/23/2017	MW34D2-102317	N	< 0.50
MW-34D2	10/23/2017	MW34D2-102317-PDB (199)	N	0.50

Table 2
2016 - 2019 1,1-Dichloroethene Analytical Results
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Analyte				1,1-Dichloroethene
Unit				(µg/l)
CAS Number				75-35-4
AWQS				7
Well ID	Sample Date	Sample ID	Sample Type	
MW-34D2	10/11/2018	MW34D2-101118	N	1.1
MW-34D3	11/11/2016	MW34D3-111116	N	1.6
MW-34D3	4/18/2017	MW34D3-041817	N	2.2
MW-34D3	4/18/2017	MW34D3-041817-PDB (265)	N	1.3
MW-34D3	4/18/2017	DUP-041817-PDB	FD	1.2
MW-34D3	10/23/2017	MW34D3-102317	N	13
MW-34D3	10/23/2017	MW34D3-102317-PDB(265)	N	11
MW-34D3	10/23/2017	DUP-102317	FD	13
MW-34D3	5/24/2018	MW34D3-052418	N	5.8
MW-34D3	5/24/2018	DUP-052418	FD	5.0
MW-34D3	10/11/2018	MW34D3-101118	N	5.2
MW-34D3	4/24/2019	MW34D3-042419	N	8.4
MW-36A2	10/17/2017	MW36A2-101717	N	< 0.50
MW-36D2	11/11/2016	MW36D2-111116	N	< 1.0
MW-36D2	4/14/2017	MW36D2-041417	N	< 0.50
MW-36D2	4/14/2017	MW36D2-041417-PDB(185)	N	< 0.50
MW-36D2	10/17/2017	MW36D2-101717	N	0.78
MW-36D2	10/17/2017	MW36D2-101717-PDB(185)	N	0.63
MW-36D2	10/11/2018	MW36D2-101118	N	< 0.50
MW-36D3	11/11/2016	MW36D3-111116	N	24
MW-36D3	4/14/2017	MW36D3-041417	N	14
MW-36D3	4/14/2017	MW36D3-041417-PDB(231)	N	22
MW-36D3	4/14/2017	MW36D3-041417-PDB(241)	N	22
MW-36D3	4/14/2017	MW36D3-041417-PDB(251)	N	22
MW-36D3	4/14/2017	DUP-041417-PDB	FD	22
MW-36D3	10/17/2017	MW36D3-101717	N	18
MW-36D3	10/17/2017	MW36D3-101717-PDB(231)	N	17
MW-36D3	10/17/2017	MW36D3-101717-PDB(241)	N	19
MW-36D3	10/17/2017	MW36D3-101717-PDB(251)	N	20
MW-36D3	10/17/2017	DUP-101717	FD	17
MW-36D3	5/24/2018	MW36D3-052418	N	20
MW-36D3	10/11/2018	MW36D3-101118	N	19
MW-36D3	4/24/2019	MW36D3-042419	N	14
MW-38D2	11/9/2016	MW38D2-110916	N	15
MW-38D2	4/18/2017	MW38D2-041817	N	13
MW-38D2	4/18/2017	MW38D2-041817-PDB (196)	N	14
MW-38D2	4/18/2017	MW38D2-041817-PDB (206)	N	14
MW-38D2	4/18/2017	MW38D2-041817-PDB (216)	N	14
MW-38D2	10/19/2017	MW38D2-101917	N	23

Table 2
2016 - 2019 1,1-Dichloroethene Analytical Results
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Analyte				1,1-Dichloroethene
Unit				(µg/l)
CAS Number				75-35-4
AWQS				7
Well ID	Sample Date	Sample ID	Sample Type	
MW-38D2	10/19/2017	MW38D2-101917-PDB (196)	N	20
MW-38D2	10/19/2017	MW38D2-101917-PDB (206)	N	23
MW-38D2	10/19/2017	MW38D2-101917-PDB (216)	N	26
MW-38D2	10/19/2017	DUP2-101917	FD	22
MW-38D2	10/11/2018	MW38D2-101118	N	36
MW-38D3	11/9/2016	MW38D3-110916	N	40
MW-38D3	4/18/2017	MW38D3-041817	N	16
MW-38D3	4/18/2017	MW38D3-041817-PDB (260)	N	14
MW-38D3	4/18/2017	MW38D3-041817-PDB (270)	N	19
MW-38D3	4/18/2017	MW38D3-041817-PDB (280)	N	19
MW-38D3	10/19/2017	MW38D3-101917	N	19
MW-38D3	10/19/2017	MW38D3-101917-PDB (260)	N	13
MW-38D3	10/19/2017	MW38D3-101917-PDB (270)	N	17
MW-38D3	10/19/2017	MW38D3-101917-PDB (280)	N	19
MW-38D3	5/24/2018	MW38D3-052418	N	25
MW-38D3	10/11/2018	MW38D3-101118	N	23
MW-38D3	10/11/2018	DUP1-101118	FD	20
MW-38D3	4/24/2019	MW38D3-042419	N	20
MW-39D2	11/15/2016	MW39D2-111516	N	< 1.0
MW-39D2	10/23/2017	MW39D2-102317	N	< 0.50
MW-39D3	11/15/2016	MW39D3-111516	N	< 1.0
MW-39D3	10/23/2017	MW39D3-102317	N	1.0
SRP 20.6E-1.1S	10/19/2017	SRP20.6E1.15-101917	N	< 0.50
SRP 20.6E-1.1S	10/9/2018	SRP20.6E1.1S-100918	N	< 0.50
SRP 21.5E-1.0S	10/19/2017	SRP21.5E1.05-101917	N	< 0.50
SRP 21.5E-1.0S	10/19/2017	DUP1-101917	FD	< 0.50
SRP 21.5E-1.0S	10/9/2018	SRP21.5E1.0S-100918	N	0.74

Table 2
2016 - 2019 1,1-Dichloroethene Analytical Results
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Analyte				1,1-Dichloroethene
Unit				(µg/l)
CAS Number				75-35-4
AWQS				7
Well ID	Sample Date	Sample ID	Sample Type	

Notes:

BOLD = Concentration greater than the AWQS

< = less than the specified reporting limit

AWQS = Arizona numeric Aquifer Water Quality Standard (A.A.C R18-11-406)

CAS = Chemical Abstracts Service

FD = Field Duplicate

ID = Identification

µg/l = micrograms per liter

N = Normal Sample

PDB = Passive Diffusion Bag

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-12B	1184.34	S	50	80	1134	1104	11/04/2016	66.66	1117.68
MW-12B	1184.34	S	50	80	1134	1104	01/18/2017	66.68	1117.65
MW-12B	1184.34	S	50	80	1134	1104	04/19/2017	66.45	1117.88
MW-12B	1184.34	S	50	80	1134	1104	07/26/2017	67.42	1116.92
MW-12B	1184.34	S	50	80	1134	1104	10/27/2017	66.32	1118.02
MW-12B	1184.34	S	50	80	1134	1104	01/17/2018	66.84	1117.50
MW-12B	1184.34	S	50	80	1134	1104	05/25/2018	67.33	1117.01
MW-12B	1184.34	S	50	80	1134	1104	07/26/2018	67.91	1116.43
MW-12B	1184.34	S	50	80	1134	1104	10/15/2018	62.63	1121.71
MW-12B	1184.34	S	50	80	1134	1104	01/16/2019	62.18	1122.16
MW-13B	1183.19	S	50	80	1133	1103	11/04/2016	65.34	1117.85
MW-13B	1183.19	S	50	80	1133	1103	01/18/2017	65.64	1117.55
MW-13B	1183.19	S	50	80	1133	1103	04/19/2017	65.57	1117.62
MW-13B	1183.19	S	50	80	1133	1103	07/26/2017	65.99	1117.19
MW-13B	1183.19	S	50	80	1133	1103	10/27/2017	65.53	1117.65
MW-13B	1183.19	S	50	80	1133	1103	01/17/2018	66.24	1116.94
MW-13B	1183.19	S	50	80	1133	1103	05/25/2018	66.57	1116.62
MW-13B	1183.19	S	50	80	1133	1103	07/26/2018	66.83	1116.36
MW-13B	1183.19	S	50	80	1133	1103	10/15/2018	62.09	1121.10
MW-13B	1183.19	S	50	80	1133	1103	01/16/2019	60.84	1122.35
MW-14	1182.81	S	55	90	1128	1093	11/04/2016	64.80	1118.01
MW-14	1182.81	S	55	90	1128	1093	01/18/2017	64.91	1117.90
MW-14	1182.81	S	55	90	1128	1093	04/19/2017	64.63	1118.18
MW-14	1182.81	S	55	90	1128	1093	07/26/2017	65.47	1117.34
MW-14	1182.81	S	55	90	1128	1093	10/27/2017	64.47	1118.34
MW-14	1182.81	S	55	90	1128	1093	01/17/2018	65.00	1117.81
MW-14	1182.81	S	55	90	1128	1093	05/25/2018	65.82	1116.99
MW-14	1182.81	S	55	90	1128	1093	07/26/2018	66.12	1116.69

Table 3
2016 - 2019 Groundwater Elevations
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Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-14	1182.81	S	55	90	1128	1093	10/15/2018	60.76	1122.05
MW-14	1182.81	S	55	90	1128	1093	01/16/2019	59.79	1123.02
MW-15D	1183.98	D	107	127	1077	1057	11/04/2016	87.63	1096.35
MW-15D	1183.98	D	107.00	127.00	1076.98	1056.98	01/18/2017	--	--
MW-15D	1183.98	D	107	127	1077	1057	04/19/2017	86.53	1097.44
MW-15D	1183.98	D	107	127	1077	1057	10/27/2017	86.03	1097.94
MW-15D	1183.98	D	107	127	1077	1057	05/25/2018	86.03	1097.94
MW-15D	1183.98	D	107	127	1077	1057	10/15/2018	85.69	1098.28
MW-15D2	1183.99	D2	165	195	1019	989	11/04/2016	94.45	1089.53
MW-15D2	1183.99	D2	165.00	195.00	1018.99	988.99	01/18/2017	--	--
MW-15D2	1183.99	D2	165	195	1019	989	04/19/2017	91.42	1092.57
MW-15D2	1183.99	D2	165	195	1019	989	10/27/2017	92.26	1091.72
MW-15D2	1183.99	D2	165	195	1019	989	05/25/2018	92.52	1091.46
MW-15D2	1183.99	D2	165	195	1019	989	10/15/2018	90.51	1093.47
MW-22D	1183.38	D	120	130	1063	1053	11/04/2016	86.91	1096.47
MW-22D	1183.38	D	120.00	130.00	1063.38	1053.38	01/18/2017	--	--
MW-22D	1183.38	D	120	130	1063	1053	04/19/2017	85.78	1097.60
MW-22D	1183.38	D	120	130	1063	1053	10/27/2017	85.16	1098.22
MW-22D	1183.38	D	120	130	1063	1053	05/25/2018	85.40	1097.98
MW-22D	1183.38	D	120	130	1063	1053	10/15/2018	85.05	1098.33
MW-22S	1183.19	S	70	89	1113	1094	11/04/2016	65.83	1117.36
MW-22S	1183.19	S	70	89	1113	1094	01/18/2017	66.02	1117.17
MW-22S	1183.19	S	70	89	1113	1094	04/19/2017	65.70	1117.49
MW-22S	1183.19	S	70	89	1113	1094	07/26/2017	66.45	1116.74
MW-22S	1183.19	S	70	89	1113	1094	10/27/2017	65.62	1117.57
MW-22S	1183.19	S	70	89	1113	1094	01/17/2018	66.23	1116.96
MW-22S	1183.19	S	70	89	1113	1094	05/25/2018	66.68	1116.51
MW-22S	1183.19	S	70	89	1113	1094	07/26/2018	67.19	1116.00

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-22S	1183.19	S	70	89	1113	1094	10/15/2018	61.31	1121.88
MW-22S	1183.19	S	70	89	1113	1094	01/16/2019	64.39	1118.80
MW-24D	1189.23	D	108	138	1082	1052	11/04/2016	93.01	1096.22
MW-24D	1189.23	D	107.50	137.50	1081.73	1051.73	01/18/2017	--	--
MW-24D	1189.23	D	108	138	1082	1052	04/19/2017	91.16	1098.07
MW-24D	1189.23	D	108	138	1082	1052	10/27/2017	91.43	1097.80
MW-24D	1189.23	D	108	138	1082	1052	05/25/2018	91.48	1097.75
MW-24D	1189.23	D	108	138	1082	1052	10/15/2018	91.18	1098.05
MW-24D2	1189.23	D2	178	203	1011	986	11/04/2016	102.01	1087.22
MW-24D2	1189.23	D2	178.00	203.00	1011.23	986.23	01/18/2017	--	--
MW-24D2	1189.23	D2	178	203	1011	986	04/19/2017	97.57	1091.66
MW-24D2	1189.23	D2	178	203	1011	986	10/27/2017	98.48	1090.75
MW-24D2	1189.23	D2	178	203	1011	986	05/25/2018	98.79	1090.44
MW-24D2	1189.23	D2	178	203	1011	986	10/15/2018	96.69	1092.54
MW-24D3	1189.22	D3	255	280	935	910	11/04/2016	105.51	1083.71
MW-24D3	1189.22	D3	254.50	279.50	934.72	909.72	01/18/2017	--	--
MW-24D3	1189.22	D3	255	280	935	910	04/19/2017	99.45	1089.77
MW-24D3	1189.22	D3	255	280	935	910	10/27/2017	100.54	1088.68
MW-24D3	1189.22	D3	255	280	935	910	05/25/2018	101.32	1087.90
MW-24D3	1189.22	D3	255	280	935	910	10/15/2018	98.23	1090.99
MW-25S	1183.98	S	60	80	1124	1104	11/04/2016	66.49	1117.48
MW-25S	1183.98	S	60.00	80.00	1123.98	1103.98	01/18/2017	--	--
MW-25S	1183.98	S	60	80	1124	1104	04/19/2017	67.26	1116.71
MW-25S	1183.98	S	60	80	1124	1104	10/27/2017	67.80	1116.17
MW-25S	1183.98	S	60	80	1124	1104	05/25/2018	68.93	1115.04
MW-25S	1183.98	S	60	80	1124	1104	10/15/2018	59.50	1124.47
MW-26D	1184.65	D	110	130	1075	1055	11/04/2016	88.47	1096.18
MW-26D	1184.65	D	110.00	130.00	1074.65	1054.65	01/18/2017	--	--

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
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Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-26D	1184.65	D	110	130	1075	1055	04/19/2017	87.37	1097.28
MW-26D	1184.65	D	110	130	1075	1055	10/27/2017	86.89	1097.76
MW-26D	1184.65	D	110	130	1075	1055	05/25/2018	86.88	1097.77
MW-26D	1184.65	D	110	130	1075	1055	10/15/2018	86.58	1098.07
MW-26D2	1184.60	D2	179	199	1006	986	11/04/2016	95.46	1089.13
MW-26D2	1184.60	D2	179.00	199.00	1005.60	985.60	01/18/2017	--	--
MW-26D2	1184.60	D2	179	199	1006	986	04/19/2017	92.13	1092.47
MW-26D2	1184.60	D2	179	199	1006	986	10/27/2017	93.00	1091.60
MW-26D2	1184.60	D2	179	199	1006	986	05/25/2018	93.25	1091.35
MW-26D2	1184.60	D2	179	199	1006	986	10/15/2018	91.23	1093.37
MW-26D3	1184.62	D3	251	271	934	914	11/04/2016	99.50	1085.12
MW-26D3	1184.62	D3	251.00	271.00	933.62	913.62	01/18/2017	--	--
MW-26D3	1184.62	D3	251	271	934	914	04/19/2017	94.39	1090.23
MW-26D3	1184.62	D3	251	271	934	914	10/27/2017	95.55	1089.07
MW-26D3	1184.62	D3	251	271	934	914	05/25/2018	96.35	1088.27
MW-26D3	1184.62	D3	251	271	934	914	10/15/2018	93.08	1091.54
MW-27D	1187.14	D	110	130	1077	1057	11/04/2016	91.03	1096.11
MW-27D	1187.14	D	110.00	130.00	1077.14	1057.14	01/18/2017	--	--
MW-27D	1187.14	D	110	130	1077	1057	04/19/2017	90.09	1097.05
MW-27D	1187.14	D	110	130	1077	1057	10/27/2017	89.45	1097.69
MW-27D	1187.14	D	110	130	1077	1057	05/25/2018	89.51	1097.63
MW-27D	1187.14	D	110	130	1077	1057	10/15/2018	89.37	1097.77
MW-28D	1183.03	D	110	130	1073	1053	11/04/2016	87.12	1095.91
MW-28D	1183.03	D	110.00	130.00	1073.03	1053.03	01/18/2017	--	--
MW-28D	1183.03	D	110	130	1073	1053	04/19/2017	87.84	1095.19
MW-28D	1183.03	D	110	130	1073	1053	10/27/2017	85.35	1097.68
MW-28D	1183.03	D	110	130	1073	1053	05/25/2018	85.38	1097.65
MW-28D	1183.03	D	110	130	1073	1053	10/15/2018	85.03	1098.00

Table 3
2016 - 2019 Groundwater Elevations
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Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-28D2	1183.11	D2	177	197	1007	987	11/04/2016	94.44	1088.66
MW-28D2	1183.11	D2	176.50	196.50	1006.61	986.61	01/18/2017	--	--
MW-28D2	1183.11	D2	177	197	1007	987	04/19/2017	90.09	1093.02
MW-28D2	1183.11	D2	177	197	1007	987	10/27/2017	90.79	1092.32
MW-28D2	1183.11	D2	177	197	1007	987	05/25/2018	91.06	1092.05
MW-28D2	1183.11	D2	177	197	1007	987	10/15/2018	89.20	1093.90
MW-28D3	1183.09	D3	260	280	923	903	11/04/2016	99.87	1083.22
MW-28D3	1183.09	D3	260.00	280.00	923.09	903.09	01/18/2017	--	--
MW-28D3	1183.09	D3	260	280	923	903	04/19/2017	92.93	1090.15
MW-28D3	1183.09	D3	260	280	923	903	10/27/2017	93.98	1089.11
MW-28D3	1183.09	D3	260	280	923	903	05/25/2018	94.92	1088.17
MW-28D3	1183.09	D3	260	280	923	903	10/15/2018	91.59	1091.50
MW-29D	1183.87	D	110	130	1074	1054	11/04/2016	87.44	1096.43
MW-29D	1183.87	D	110.00	130.00	1073.87	1053.87	01/18/2017	--	--
MW-29D	1183.87	D	110	130	1074	1054	04/19/2017	86.65	1097.22
MW-29D	1183.87	D	110	130	1074	1054	10/27/2017	86.05	1097.82
MW-29D	1183.87	D	110	130	1074	1054	05/25/2018	86.05	1097.82
MW-29D	1183.87	D	110	130	1074	1054	10/15/2018	85.88	1097.99
MW-29D2	1183.90	D2	175	195	1009	989	11/04/2016	94.29	1089.61
MW-29D2	1183.90	D2	175.00	195.00	1008.90	988.90	01/18/2017	--	--
MW-29D2	1183.90	D2	175	195	1009	989	04/19/2017	90.04	1093.86
MW-29D2	1183.90	D2	175	195	1009	989	10/27/2017	90.49	1093.41
MW-29D2	1183.90	D2	175	195	1009	989	05/25/2018	90.69	1093.21
MW-29D2	1183.90	D2	175	195	1009	989	10/15/2018	89.19	1094.71
MW-29D3	1183.76	D3	260	280	924	904	11/04/2016	101.95	1081.81
MW-29D3	1183.76	D3	260.00	280.00	923.76	903.76	01/18/2017	--	--
MW-29D3	1183.76	D3	260	280	924	904	04/19/2017	94.03	1089.73
MW-29D3	1183.76	D3	260	280	924	904	10/27/2017	95.15	1088.61

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-29D3	1183.76	D3	260	280	924	904	05/25/2018	96.11	1087.65
MW-29D3	1183.76	D3	260	280	924	904	10/15/2018	92.55	1091.21
MW-29D3b	1183.62	D3b	328	338	856	846	11/04/2016	101.62	1082.00
MW-29D3b	1183.62	D3b	328.00	338.00	855.62	845.62	01/18/2017	--	--
MW-29D3b	1183.62	D3b	328	338	856	846	04/19/2017	93.83	1089.79
MW-29D3b	1183.62	D3b	328	338	856	846	10/27/2017	94.98	1088.64
MW-29D3b	1183.62	D3b	328	338	856	846	05/25/2018	95.93	1087.69
MW-29D3b	1183.62	D3b	328	338	856	846	10/15/2018	92.41	1091.21
MW-30D3	1184.09	D3	259	279	925	905	11/04/2016	98.34	1085.75
MW-30D3	1184.09	D3	259.00	279.00	925.09	905.09	01/18/2017	--	--
MW-30D3	1184.09	D3	259	279	925	905	04/19/2017	93.97	1090.12
MW-30D3	1184.09	D3	259	279	925	905	10/27/2017	94.80	1089.29
MW-30D3	1184.09	D3	259	279	925	905	05/25/2018	95.60	1088.49
MW-30D3	1184.09	D3	259	279	925	905	10/15/2018	92.32	1091.77
MW-32D	1185.33	D	107	137	1078	1048	11/04/2016	89.23	1096.10
MW-32D	1185.33	D	107.00	137.00	1078.33	1048.33	01/18/2017	--	--
MW-32D	1185.33	D	107	137	1078	1048	04/19/2017	88.09	1097.24
MW-32D	1185.33	D	107	137	1078	1048	10/27/2017	87.57	1097.76
MW-32D	1185.33	D	107	137	1078	1048	05/25/2018	87.58	1097.75
MW-32D	1185.33	D	107	137	1078	1048	10/15/2018	87.35	1097.98
MW-32D2	1185.57	D2	180	200	1006	986	11/04/2016	98.07	1087.50
MW-32D2	1185.57	D2	180.00	200.00	1005.57	985.57	01/18/2017	--	--
MW-32D2	1185.57	D2	180	200	1006	986	04/19/2017	93.18	1092.39
MW-32D2	1185.57	D2	180	200	1006	986	10/27/2017	94.05	1091.52
MW-32D2	1185.57	D2	180	200	1006	986	05/25/2018	94.32	1091.25
MW-32D2	1185.57	D2	180	200	1006	986	10/15/2018	92.30	1093.27
MW-32D3	1185.60	D3	250	280	936	906	11/04/2016	102.75	1082.85
MW-32D3	1185.60	D3	250.00	280.00	935.60	905.60	01/18/2017	--	--

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-32D3	1185.60	D3	250	280	936	906	04/19/2017	95.38	1090.22
MW-32D3	1185.60	D3	250	280	936	906	10/27/2017	96.85	1088.75
MW-32D3	1185.60	D3	250	280	936	906	05/25/2018	97.71	1087.88
MW-32D3	1185.60	D3	250	280	936	906	10/15/2018	94.39	1091.21
MW-33D2	1183.51	D2	185	205	999	979	11/04/2016	97.77	1085.74
MW-33D2	1183.51	D2	185.00	205.00	998.51	978.51	01/18/2017	--	--
MW-33D2	1183.51	D2	185	205	999	979	04/19/2017	91.31	1092.20
MW-33D2	1183.51	D2	185	205	999	979	10/27/2017	92.16	1091.35
MW-33D2	1183.51	D2	185	205	999	979	05/25/2018	92.45	1091.06
MW-33D2	1183.51	D2	185	205	999	979	10/15/2018	90.25	1093.26
MW-33D3	1183.49	D3	255	285	928	898	11/04/2016	104.24	1079.25
MW-33D3	1183.49	D3	255.00	285.00	928.49	898.49	01/18/2017	--	--
MW-33D3	1183.49	D3	255	285	928	898	04/19/2017	94.12	1089.37
MW-33D3	1183.49	D3	255	285	928	898	10/27/2017	95.21	1088.28
MW-33D3	1183.49	D3	255	285	928	898	05/25/2018	96.34	1087.15
MW-33D3	1183.49	D3	255	285	928	898	10/15/2018	92.41	1091.08
MW-33D4	1183.36	D4	340	370	843	813	11/04/2016	105.08	1078.28
MW-33D4	1183.36	D4	340.00	370.00	843.36	813.36	01/18/2017	--	--
MW-33D4	1183.36	D4	340	370	843	813	04/19/2017	94.07	1089.29
MW-33D4	1183.36	D4	340	370	843	813	10/27/2017	95.14	1088.22
MW-33D4	1183.36	D4	340	370	843	813	05/25/2018	96.32	1087.04
MW-33D4	1183.36	D4	340	370	843	813	10/15/2018	92.29	1091.07
MW-34D2	1186.47	D2	184	214	1002	972	11/04/2016	98.88	1087.59
MW-34D2	1186.47	D2	184.00	214.00	1002.47	972.47	01/18/2017	--	--
MW-34D2	1186.47	D2	184	214	1002	972	04/19/2017	94.48	1091.98
MW-34D2	1186.47	D2	184	214	1002	972	10/27/2017	95.10	1091.37
MW-34D2	1186.47	D2	184	214	1002	972	05/25/2018	95.68	1090.78
MW-34D2	1186.47	D2	184	214	1002	972	10/15/2018	93.63	1092.84

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-34D3	1186.46	D3	250	280	936	906	11/04/2016	102.38	1084.08
MW-34D3	1186.46	D3	250.00	280.00	936.46	906.46	01/18/2017	--	--
MW-34D3	1186.46	D3	250	280	936	906	04/19/2017	97.08	1089.38
MW-34D3	1186.46	D3	250	280	936	906	10/27/2017	97.90	1088.56
MW-34D3	1186.46	D3	250	280	936	906	05/25/2018	99.38	1087.08
MW-34D3	1186.46	D3	250	280	936	906	10/15/2018	95.74	1090.72
MW-36A2	1186.69	A2	213	218	974	969	11/04/2016	100.41	1086.28
MW-36A2	1186.69	A2	213.00	218.00	973.69	968.69	01/18/2017	--	--
MW-36A2	1186.69	A2	213	218	974	969	04/19/2017	94.06	1092.63
MW-36A2	1186.69	A2	213	218	974	969	10/27/2017	94.57	1092.12
MW-36A2	1186.69	A2	213	218	974	969	05/25/2018	94.84	1091.85
MW-36A2	1186.69	A2	213	218	974	969	10/15/2018	92.24	1094.45
MW-36D2	1186.72	D2	175	195	1012	992	11/04/2016	98.41	1088.31
MW-36D2	1186.72	D2	175.00	195.00	1011.72	991.72	01/18/2017	--	--
MW-36D2	1186.72	D2	175	195	1012	992	04/19/2017	92.91	1093.81
MW-36D2	1186.72	D2	175	195	1012	992	10/27/2017	93.76	1092.96
MW-36D2	1186.72	D2	175	195	1012	992	05/25/2018	94.06	1092.66
MW-36D2	1186.72	D2	175	195	1012	992	10/15/2018	91.98	1094.74
MW-36D3	1186.66	D3	226	256	961	931	11/04/2016	103.59	1083.07
MW-36D3	1186.66	D3	226.00	256.00	960.66	930.66	01/18/2017	--	--
MW-36D3	1186.66	D3	226	256	961	931	04/19/2017	95.54	1091.12
MW-36D3	1186.66	D3	226	256	961	931	10/27/2017	96.68	1089.98
MW-36D3	1186.66	D3	226	256	961	931	05/25/2018	97.75	1088.91
MW-36D3	1186.66	D3	226	256	961	931	10/15/2018	94.04	1092.62
MW-38D2	1191.15	D2	191	221	1000	970	11/04/2016	104.08	1087.07
MW-38D2	1191.15	D2	191.00	221.00	1000.15	970.15	01/18/2017	--	--
MW-38D2	1191.15	D2	191	221	1000	970	04/19/2017	99.67	1091.48
MW-38D2	1191.15	D2	191	221	1000	970	10/27/2017	100.63	1090.52

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
MW-38D2	1191.15	D2	191	221	1000	970	05/25/2018	100.99	1090.16
MW-38D2	1191.15	D2	191	221	1000	970	10/15/2018	98.86	1092.29
MW-38D3	1191.12	D3	255	285	936	906	11/04/2016	107.31	1083.81
MW-38D3	1191.12	D3	255.00	285.00	936.12	906.12	01/18/2017	--	--
MW-38D3	1191.12	D3	255	285	936	906	04/19/2017	101.55	1089.57
MW-38D3	1191.12	D3	255	285	936	906	10/27/2017	102.67	1088.45
MW-38D3	1191.12	D3	255	285	936	906	05/25/2018	103.49	1087.63
MW-38D3	1191.12	D3	255	285	936	906	10/15/2018	100.37	1090.75
MW-39D2	1186.52	D2	175	205	1012	982	11/04/2016	100.78	1085.74
MW-39D2	1186.52	D2	175.00	205.00	1011.52	981.52	01/18/2017	--	--
MW-39D2	1186.52	D2	175	205	1012	982	04/19/2017	94.92	1091.60
MW-39D2	1186.52	D2	175	205	1012	982	10/27/2017	95.75	1090.77
MW-39D2	1186.52	D2	175	205	1012	982	05/25/2018	96.17	1090.35
MW-39D2	1186.52	D2	175	205	1012	982	10/15/2018	93.90	1092.62
MW-39D3	1186.56	D3	250	280	937	907	11/04/2016	105.77	1080.79
MW-39D3	1186.56	D3	250.00	280.00	936.56	906.56	01/18/2017	--	--
MW-39D3	1186.56	D3	250	280	937	907	04/19/2017	97.39	1089.17
MW-39D3	1186.56	D3	250	280	937	907	10/27/2017	98.76	1087.80
MW-39D3	1186.56	D3	250	280	937	907	05/25/2018	99.98	1086.58
MW-39D3	1186.56	D3	250	280	937	907	10/15/2018	95.98	1090.58

Table 3
2016 - 2019 Groundwater Elevations
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well ID	Well Measuring Point Elevation (ft amsl)	Aquifer Zone	Top of Screen Depth (ft bgs)	Bottom of Screen Depth (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Measurement Date	Depth to Groundwater (ft bgs)	Groundwater Elevations (ft amsl)
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Notes:

amsl = above mean sea level (City of Tempe datum)

bgs = below ground surface

ft = feet

Aquifer (zone) in which the well is screened:

D = D-Zone

A2 = A2-Zone

D2 = D2-Zone

D3 = D3-Zone

D3b = D3b-Zone

D4 = D4-Zone

S = S-Zone

Table 4
PRAP and Contingency Groundwater Monitoring Schedule
2019 (Year 3) Periodic Site Review Report
Former Capitol Castings Facility
Tempe, Arizona

Well Identification	Aquifer (Zone)	PRAP Use Designation	Groundwater Sampling Frequency					Water Level Monitoring
			Base Level	Level 1	Level 2	Level 3	Level 4	
MW-12B	S	WL	--	--	--	--	--	●
MW-13B	S	WL	--	--	--	--	--	●
MW-14	S	WL	--	--	--	--	--	●
MW-15D	D	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-15D2	D2	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-22S	S	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-22D	D	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-24D	D	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-24D2	D2	Sentinel	1/yr	2/yr	4/yr	4/yr	4/yr	●
MW-24D3	D3	Sentinel#	2/yr	2/yr	4/yr	4/yr	4/yr	●
MW-25S	S	WL	--	--	--	--	--	●
MW-26D	* D	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-26D2	D2	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-26D3	D3	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-27D	D	WL	--	--	--	--	--	●
MW-28D	D	WL	--	--	--	--	--	●
MW-28D2	D2	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-28D3	D3	WL	--	--	--	--	--	●
MW-29D	D	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-29D2	D2	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-29D3	D3	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-29D3b	D3	CSM	1/4yrs	1/3yrs	1/3yrs	1/2yrs	1/2yrs	●
MW-30D3	D3	WL	--	--	--	--	--	●
MW-32D	D	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-32D2	D2	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-32D3	D3	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-33D2	D2	Sentinel	1/yr	2/yr	4/yr	4/yr	4/yr	●
MW-33D3	D3	Sentinel#	2/yr	2/yr	4/yr	4/yr	4/yr	●
MW-33D4	D4	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-34D2	D2	Sentinel	1/yr	2/yr	4/yr	4/yr	4/yr	●
MW-34D3	D3	Sentinel#	2/yr	2/yr	4/yr	4/yr	4/yr	●
MW-36A2	A2	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-36D2	D2	Sentinel	1/yr	2/yr	4/yr	4/yr	4/yr	●
MW-36D3	D3	Sentinel#	2/yr	2/yr	4/yr	4/yr	4/yr	●
MW-38D2	D2	Sentinel	1/yr	2/yr	4/yr	4/yr	4/yr	●
MW-38D3	D3	Sentinel#	2/yr	2/yr	4/yr	4/yr	4/yr	●
MW-39D2	D2	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
MW-39D3	D3	Key	1/2yrs	1/yr	1/yr	2/yr	2/yr	●
Contingency Wells	D2/D3	Contingency	--	--	4/yr	4/yr	4/yr	●
SRP Well 20.6E-1.1S	A2-D3	SRP	1/yr	1/yr	2/yr	2/yr	4/yr	◇
SRP Well 21.5E-1.0S	D2-D4	SRP	1/yr	1/yr	2/yr	2/yr	4/yr	◇

Notes:

Groundwater samples will be collected low-flow purge or using a no-purge sampler per PRAP

All groundwater samples will be analyzed for 1,1-dichloroethene using method USEPA 8260B

Groundwater Monitoring Frequencies:

1/4yrs = once every 4 years

1/3yrs = once every 3 years

1/2yrs = once every 2 years

1/yr = once a year

2/yr = twice a year

4/yr = four times a year

2017 was the first year of groundwater monitoring; therefore, groundwater samples will next be collected from wells designated as 1/2yrs, 1/3yrs, and 1/4yrs in 2019, 2020, and 2021, respectively.

Aquifer (zone) definitions (describes which zone(s) wells are screened within):

S = S-Zone

D2 = D2-Zone

D3 = D3-Zone

D = D-Zone

A2 = A2-Zone

D4 = D4-Zone

-- = not scheduled for monitoring

= D3-Zone sentinel wells monitored 2/yr during Base Level monitoring

* - piezometer well - sample using bailer

● = water level measurement frequency based on sentinel well monitoring frequency (e.g. 1/yr at Level 0)

◇ = water levels (as allowable) and pumping monitoring

CSM = conceptual site model well as designated in the PRAP

Key = key monitoring well as designated in the PRAP

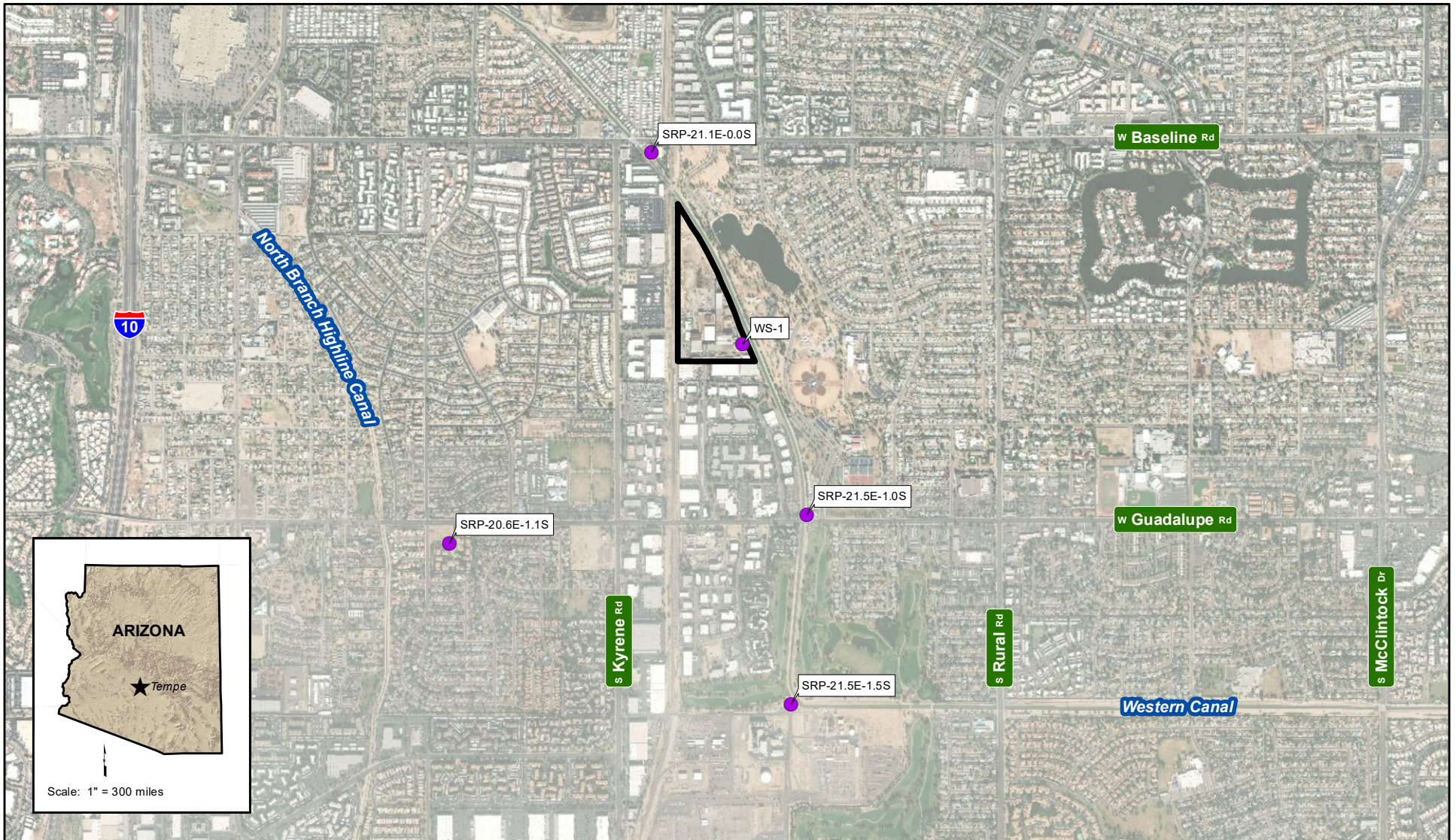
Sentinel = sentinel monitoring well as designated in the PRAP

Contingency = contingency sentinel/extraction well as designated in the PRAP



WL = water levels only monitoring well as designated in the PRAP

FIGURES



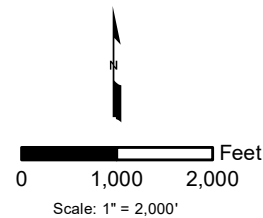


LEGEND

-  Former facility boundary
-  Water supply well
(within 1/2 mile of the Site)

NOTES

- Aerial photo source: ESRI World Imagery.

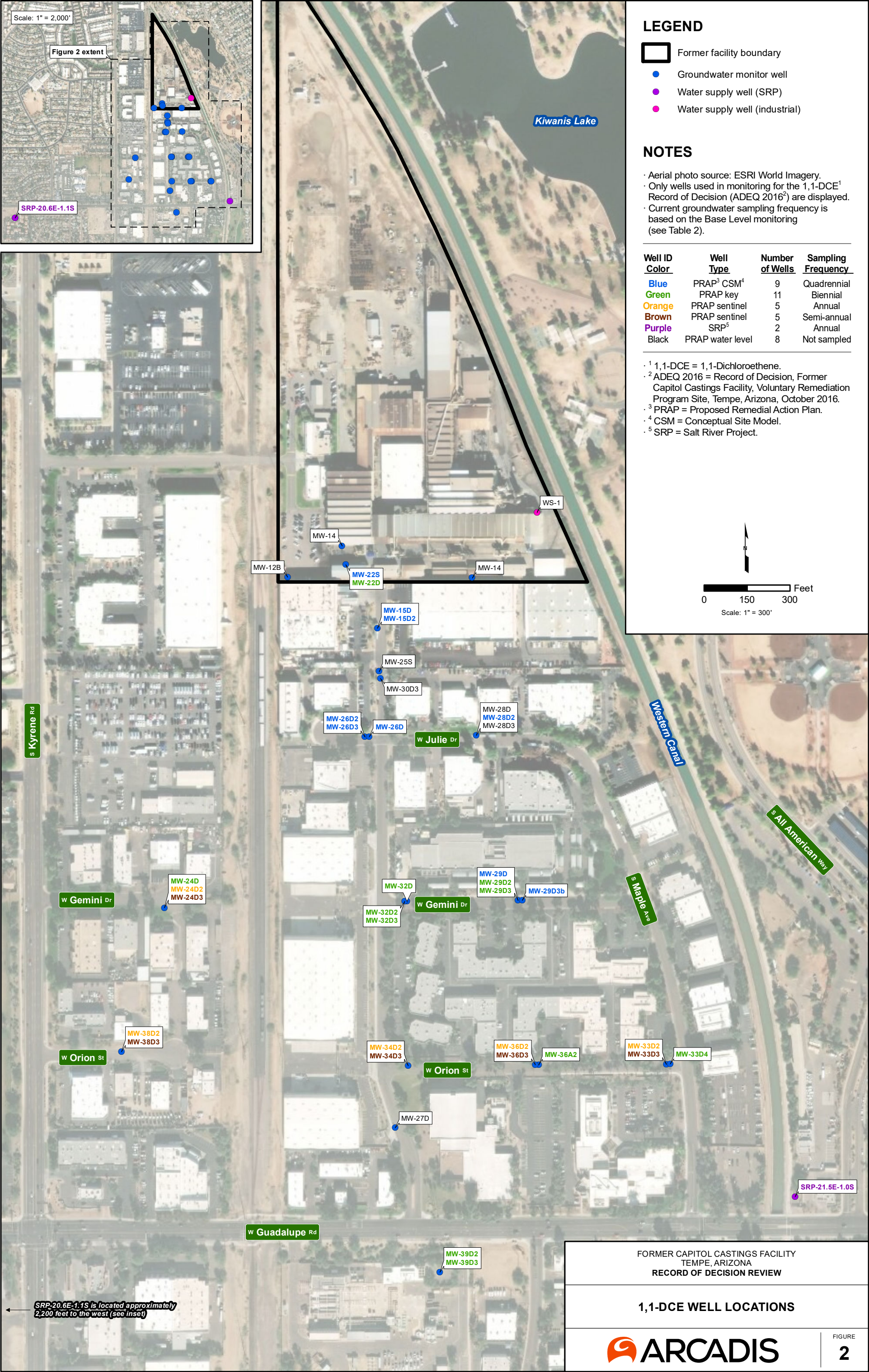


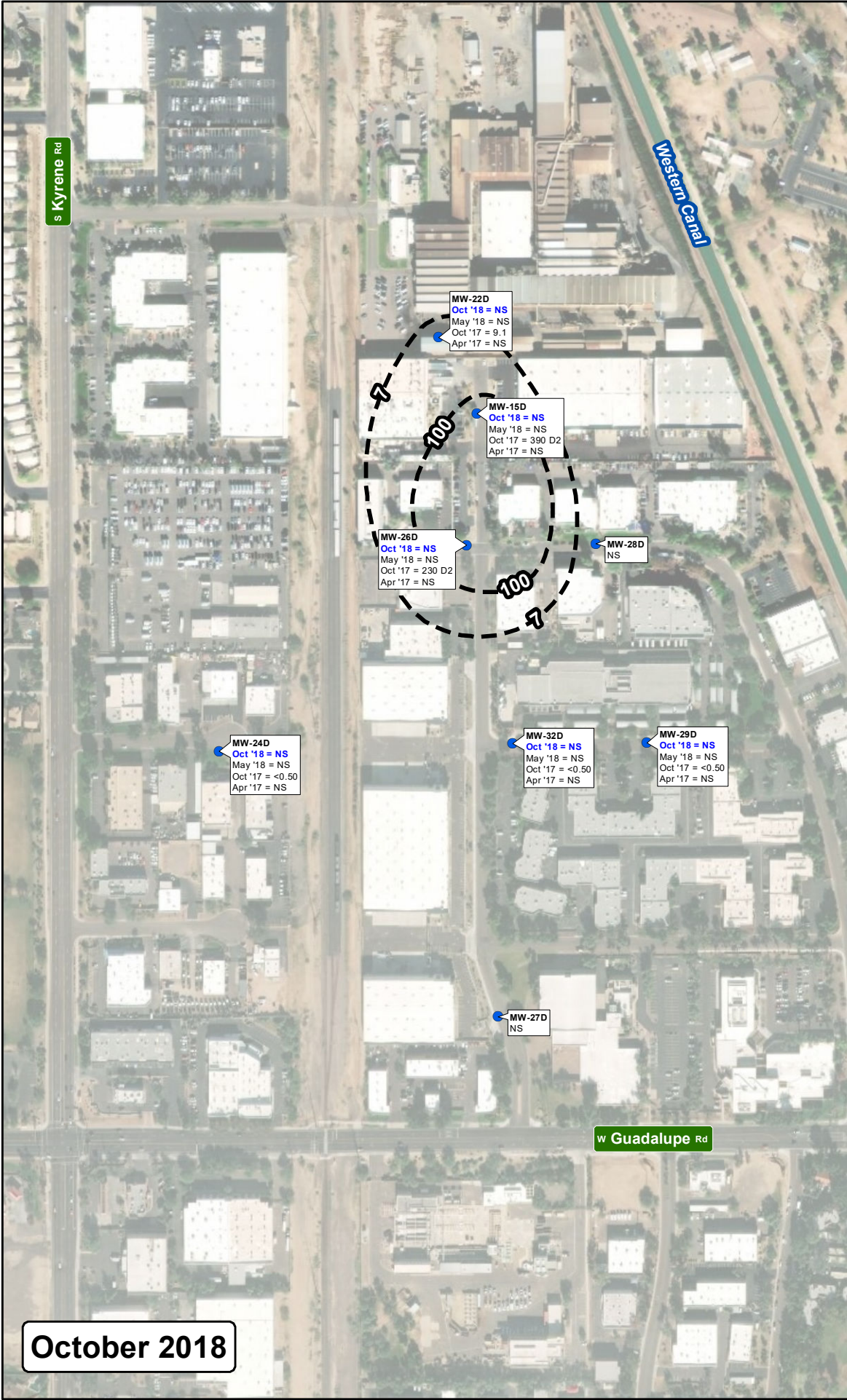
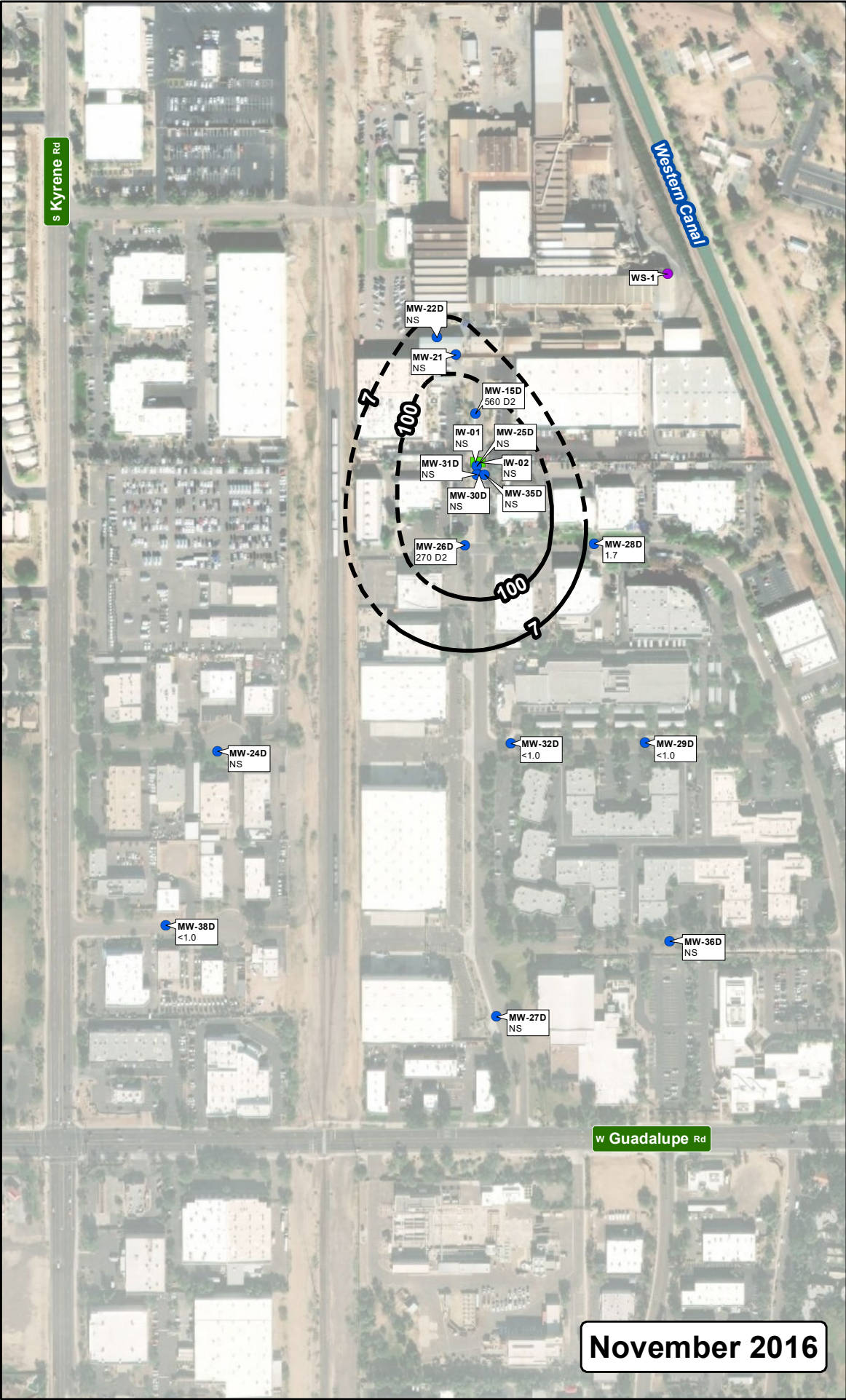
FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA
RECORD OF DECISION REVIEW

FACILITY LOCATION



FIGURE
1



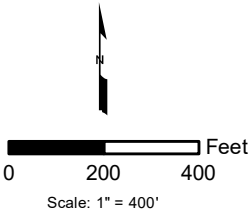


LEGEND

- Groundwater monitor well
- Groundwater injection well
- Groundwater extraction well
- 1,1-DCE concentration contour (if applicable; dashed where inferred)
- Well ID and 1,1-DCE concentrations (October 2018 monitoring event in blue)
MW-03
Oct '18 = 7.0
May '18 = 66
- Well ID and 1,1-DCE concentrations (deeper screen construction; not used in contouring)
MW-11
May '18 = <1.0
Oct '17 = <0.50
- <1.0 1,1-DCE not detected above indicated laboratory detection limit
- D2 Sample required dilution due to high concentration of target analyte
- NS Well not sampled in past two years

NOTES

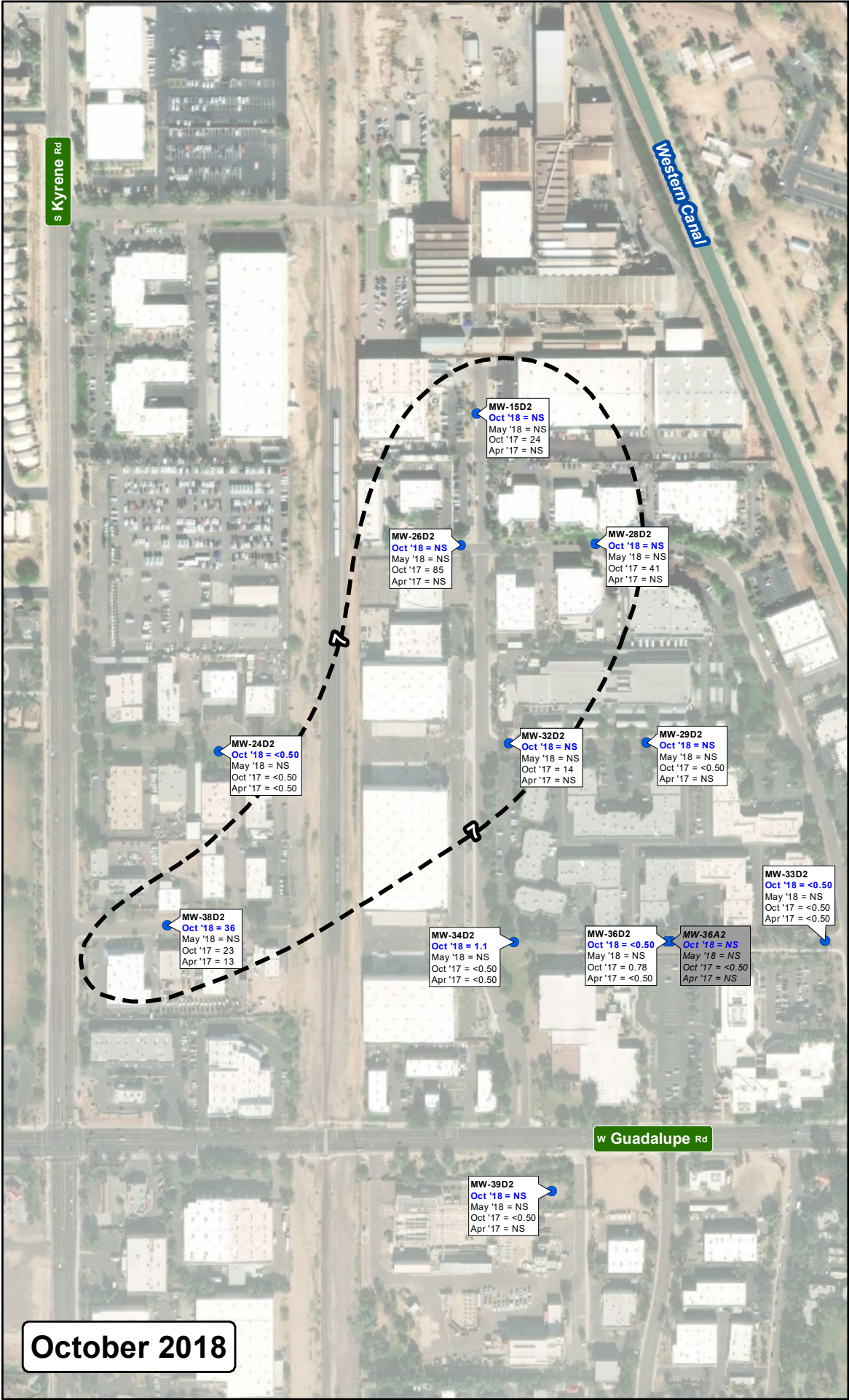
- Aerial photo source: ESRI World Imagery.
- 1,1-dichloroethene (1,1-DCE) concentrations are expressed in micrograms per liter (µg/L).
- Results from the most recent sampling event (October 2018) are displayed in blue, while historical results are displayed in black.
- Arizona Aquifer Water Quality Standard (AWQS) for 1,1-DCE = 7 µg/L.
- 1,1-DCE concentration contours are considered approximate and were used for comparison and mass flux purposes; when no data was available for the evaluated period, the closest temporal result was used.

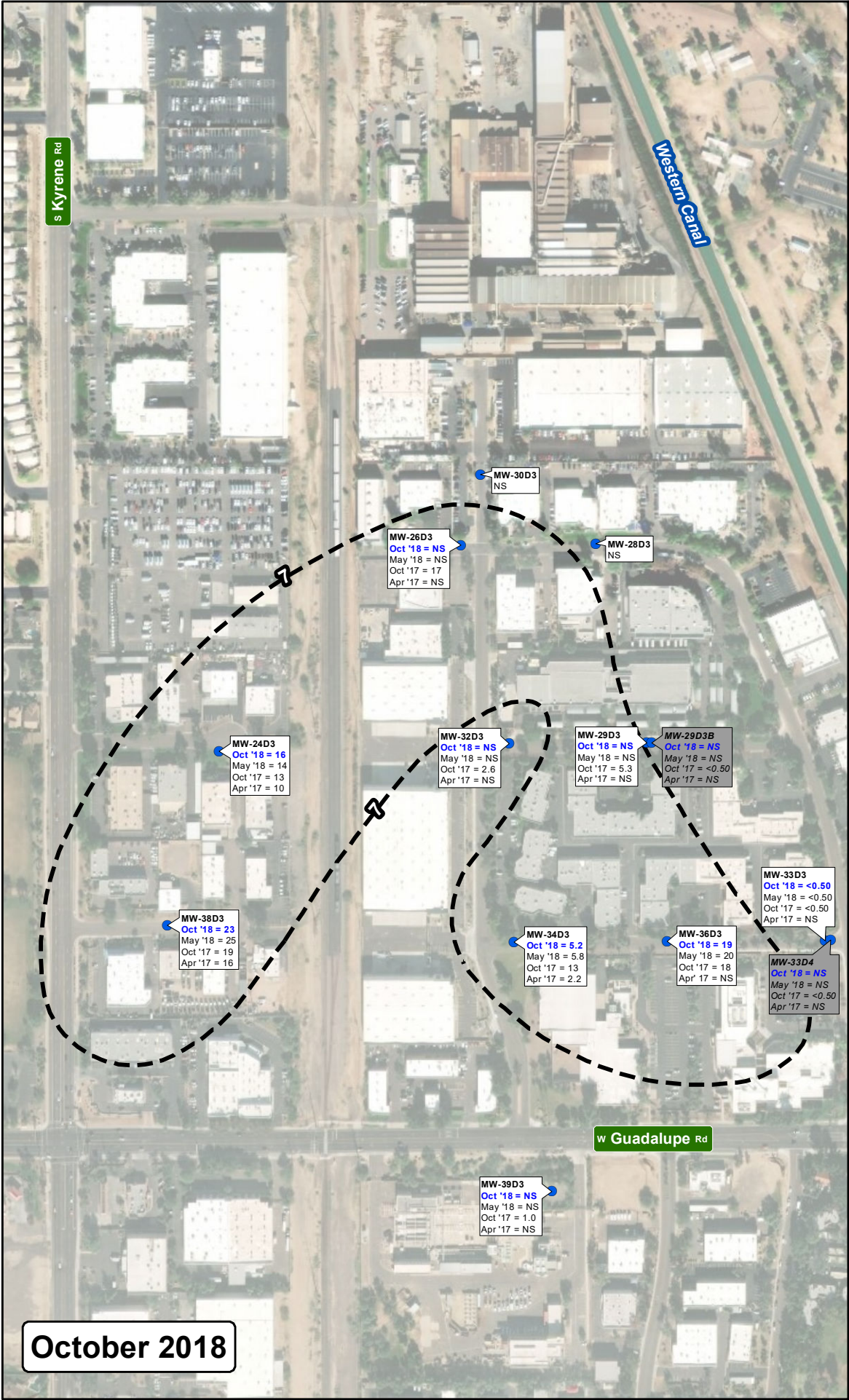
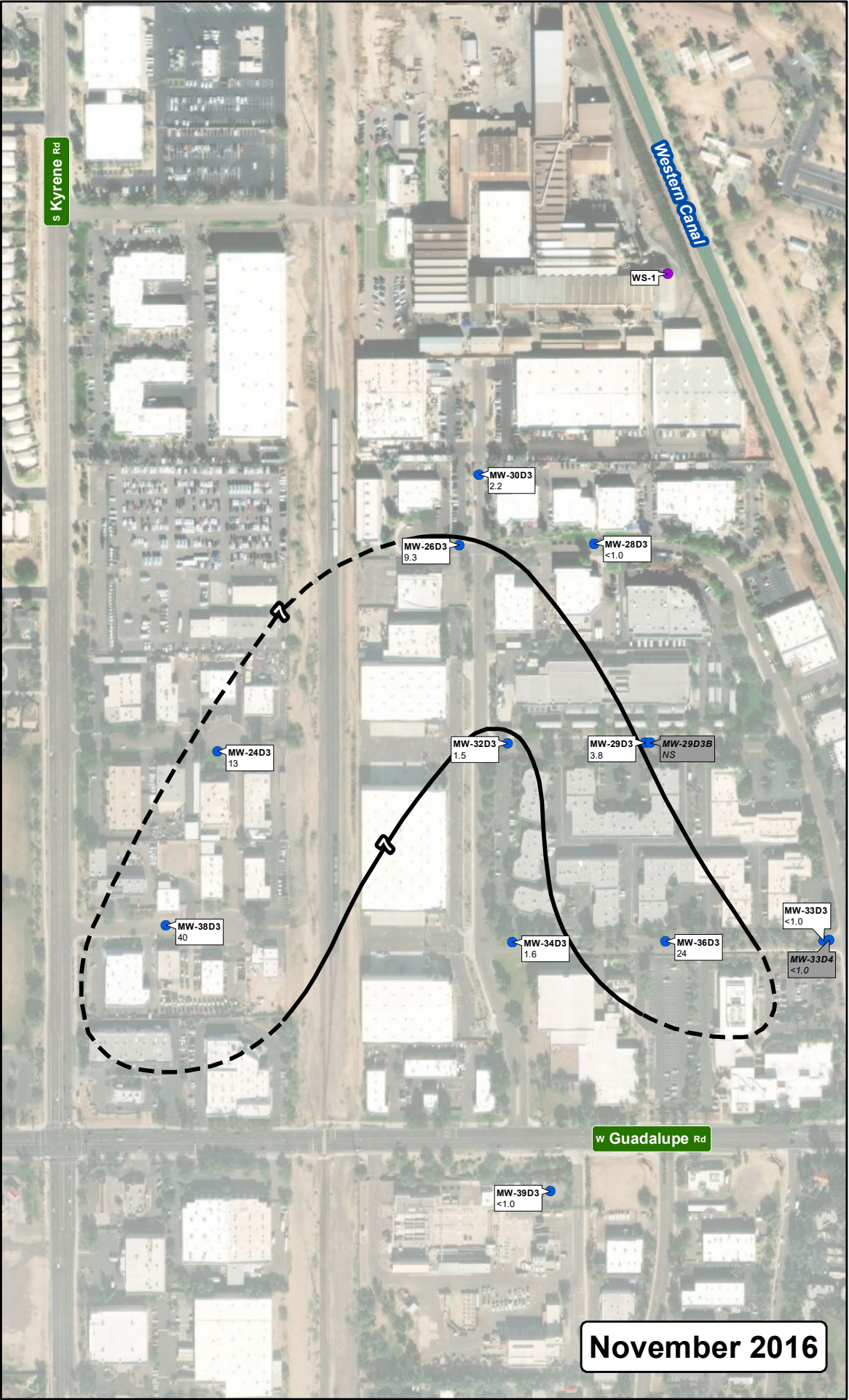


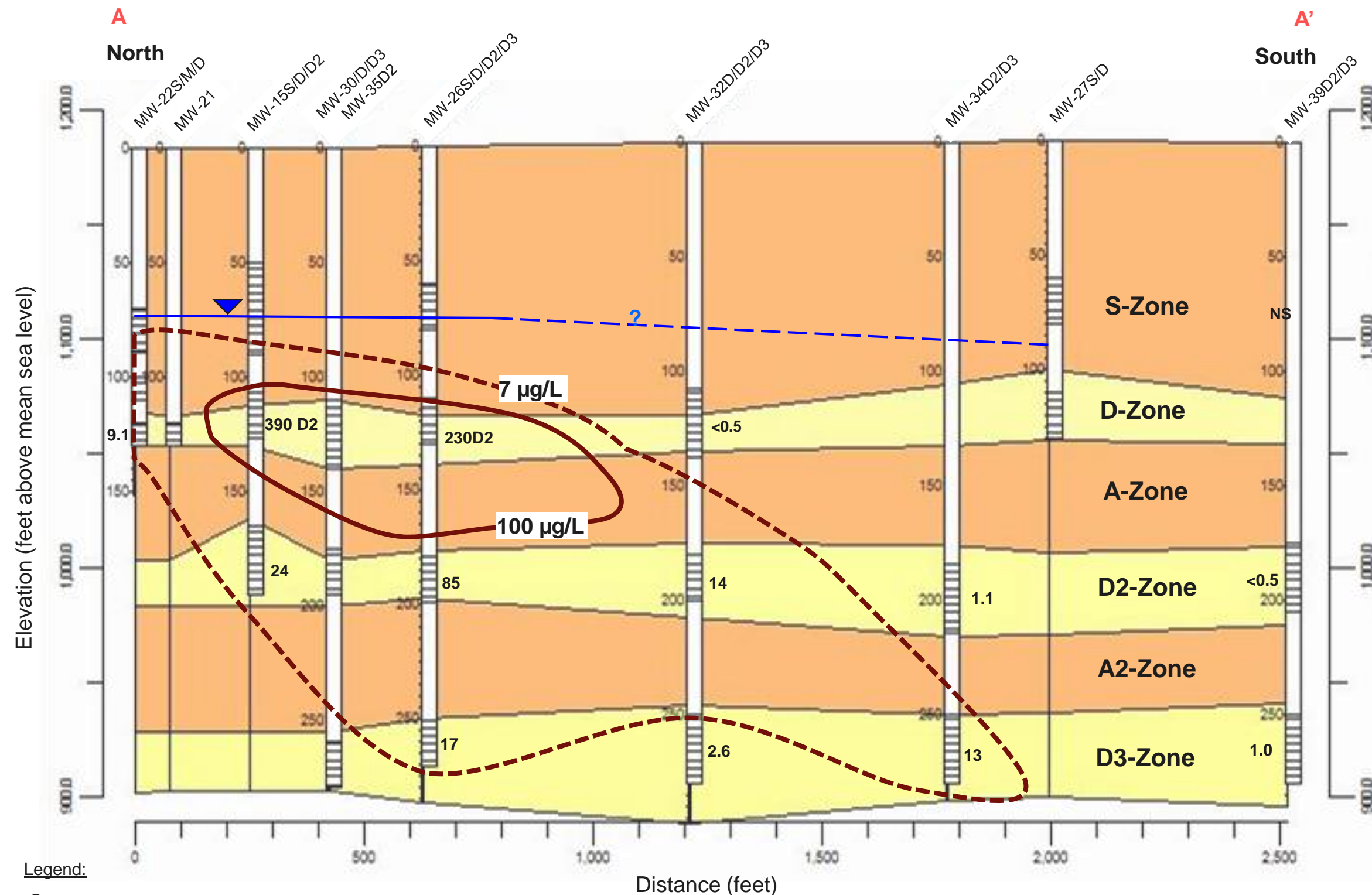
FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA
RECORD OF DECISION REVIEW

**DISTRIBUTION OF 1,1-DCE IN THE D-ZONE
NOVEMBER 2016 VERSUS OCTOBER 2018**





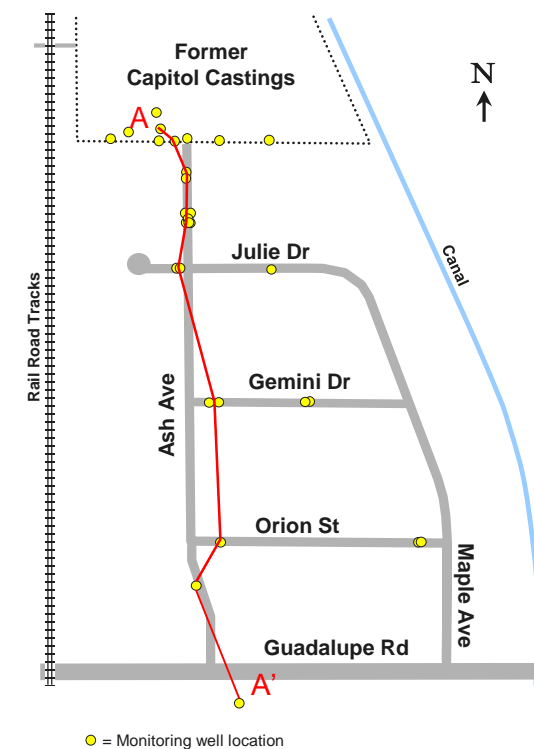




Legend:

- = Monitoring Well
- = Concentration of 1,1-DCE in ug/L (Max 2017-2018)
- = Less than the laboratory reporting limit
- 1,1-DCE = 1,1-dichloroethene
- µg/L = Micrograms per liter
- S, D, A = Designated hydrostratigraphic zone
- 7 µg/L = Arizona aquifer water quality standard
- = 1,1-DCE isoconcentration contour (dashed where inferred)
- = Approximate water table
- = Aquifer
- = Aquitard

Cross-Section Location:



FORMER CAPITOL CASTINGS
TEMPE, ARIZONA

**HYDROGEOLOGIC CROSS-SECTION
AND DISTRIBUTION OF 1,1-DCE**

ARCADIS Design & Consultancy
for natural and built assets

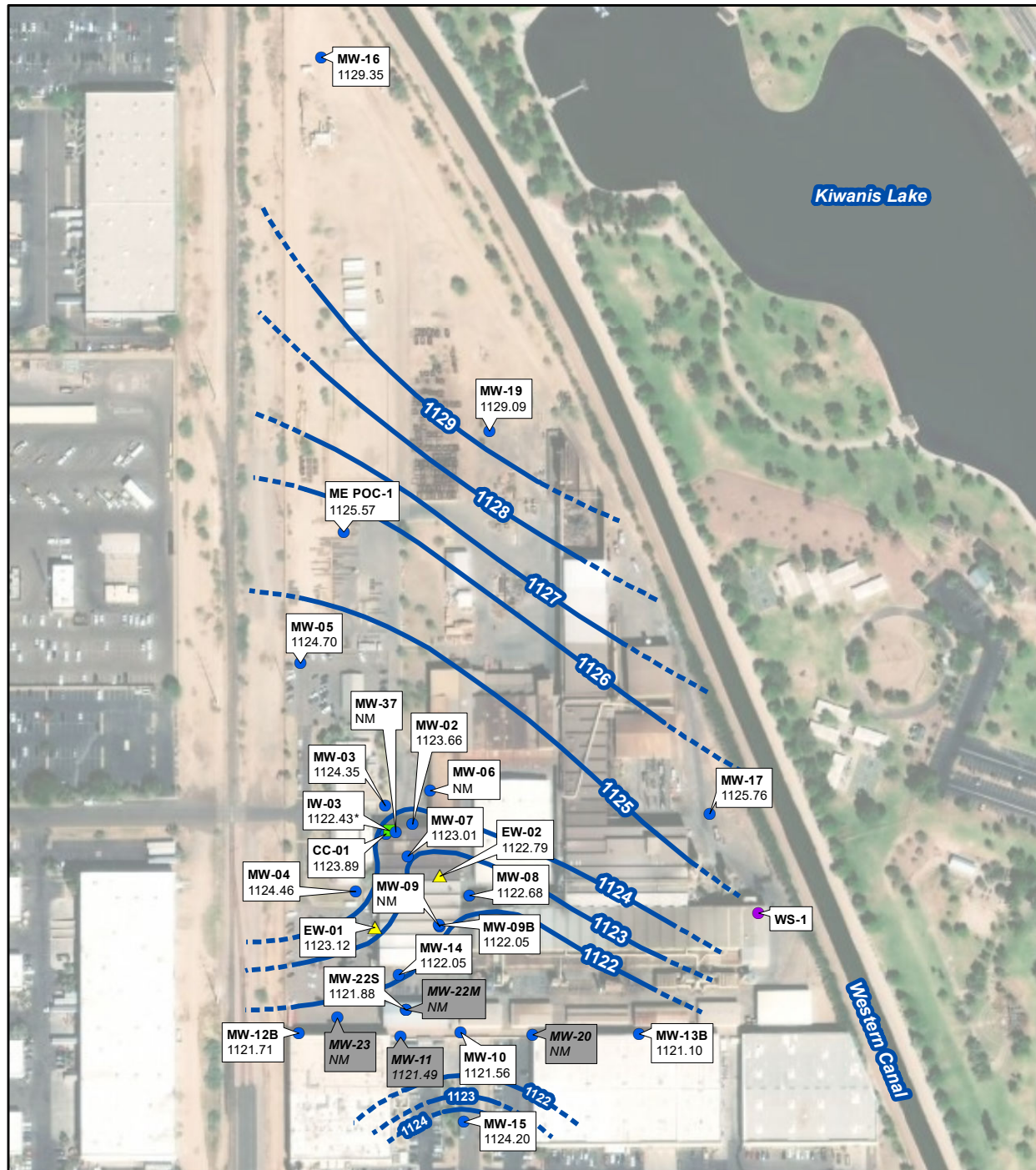
FIGURE
6

Vertical Exaggeration = 4:1

APPENDIX A

Groundwater Elevation Contours D-, D2-, and D3-Zones – 2016 to 2019



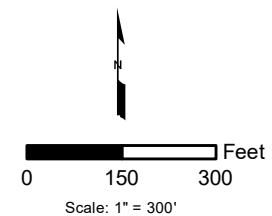


LEGEND

- Groundwater monitor well
- Groundwater injection well
- ▲ Groundwater extraction well
- Water supply well
- Groundwater elevation contour (approximate; dashed where inferred)
- MW-05
1124.70 Well ID and groundwater elevation
- MW-11
1121.49 Well ID and groundwater elevation (deeper screen construction; not used in contouring)
- NM Groundwater elevation not measured

NOTES

- Aerial photo source: ESRI World Imagery.
- Groundwater elevations are expressed in feet above mean sea level (ft amsl) in City of Tempe Vertical Datum.
- Depths to groundwater were measured on 10/15/2018.
- ME POC-1 is an ME Global monitoring well.
- * = groundwater elevation is considered to be anomalous and is not used in contouring.

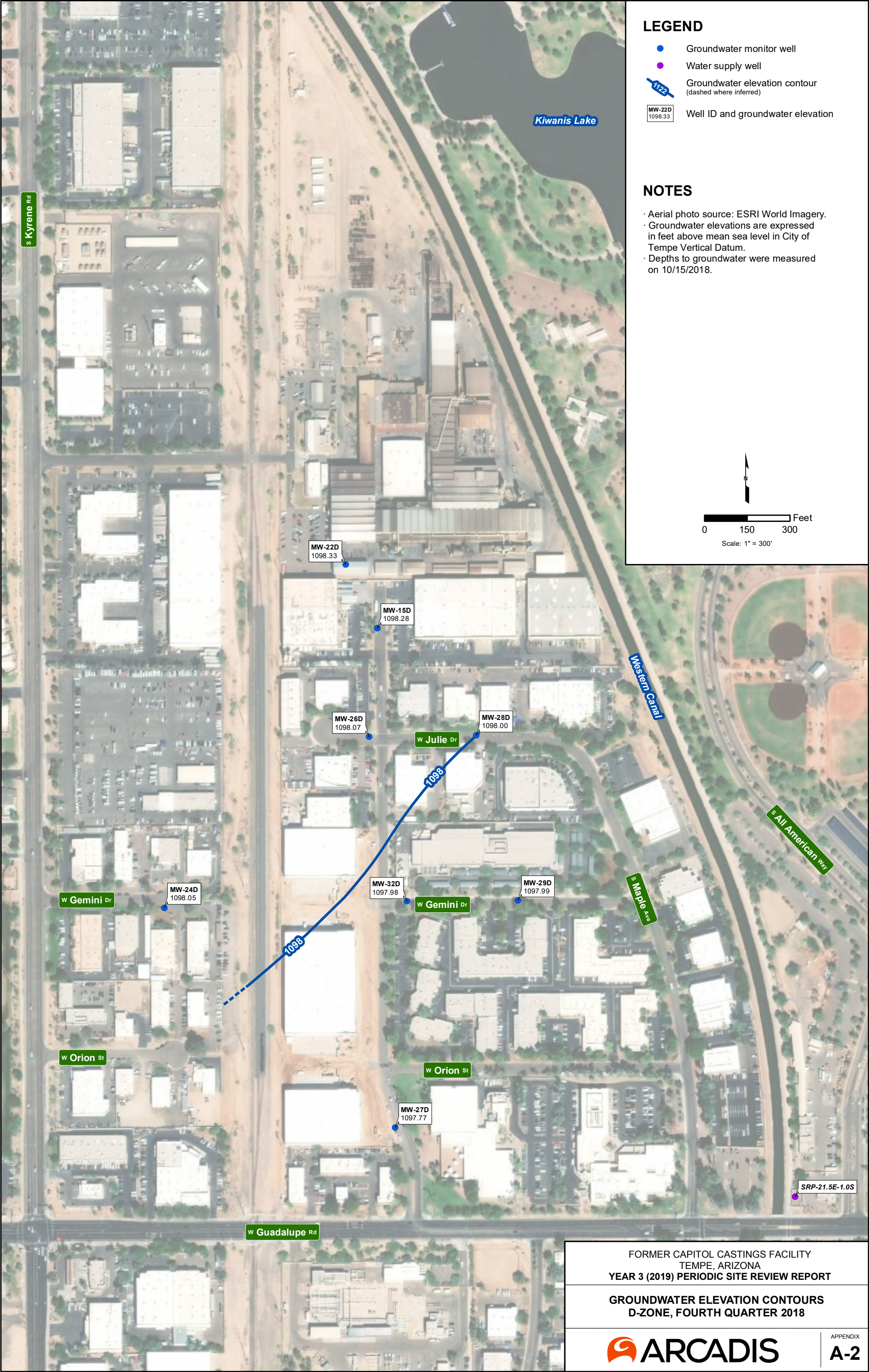


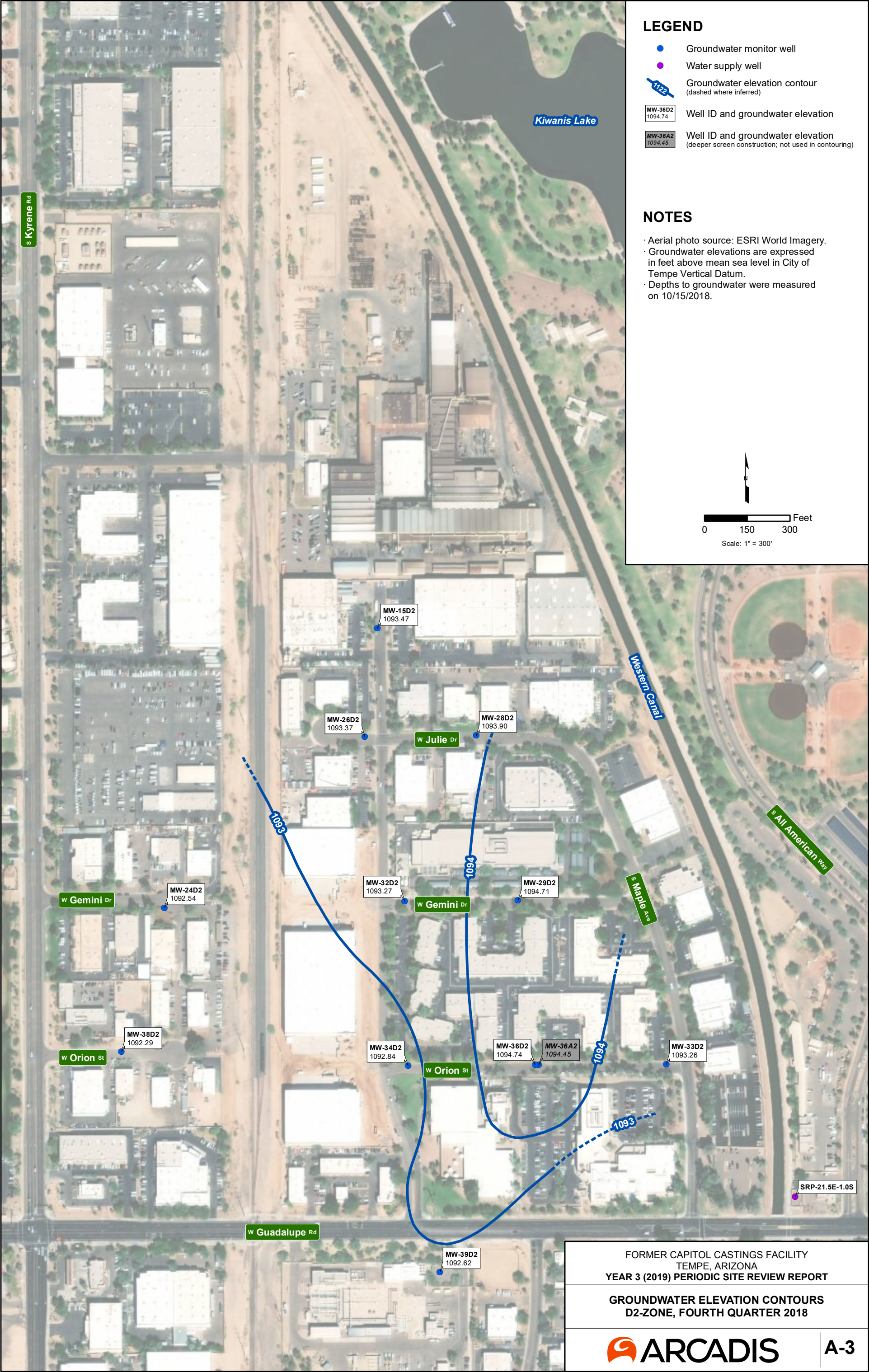
FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA
YEAR 3 (2019) PERIODIC SITE REVIEW REPORT

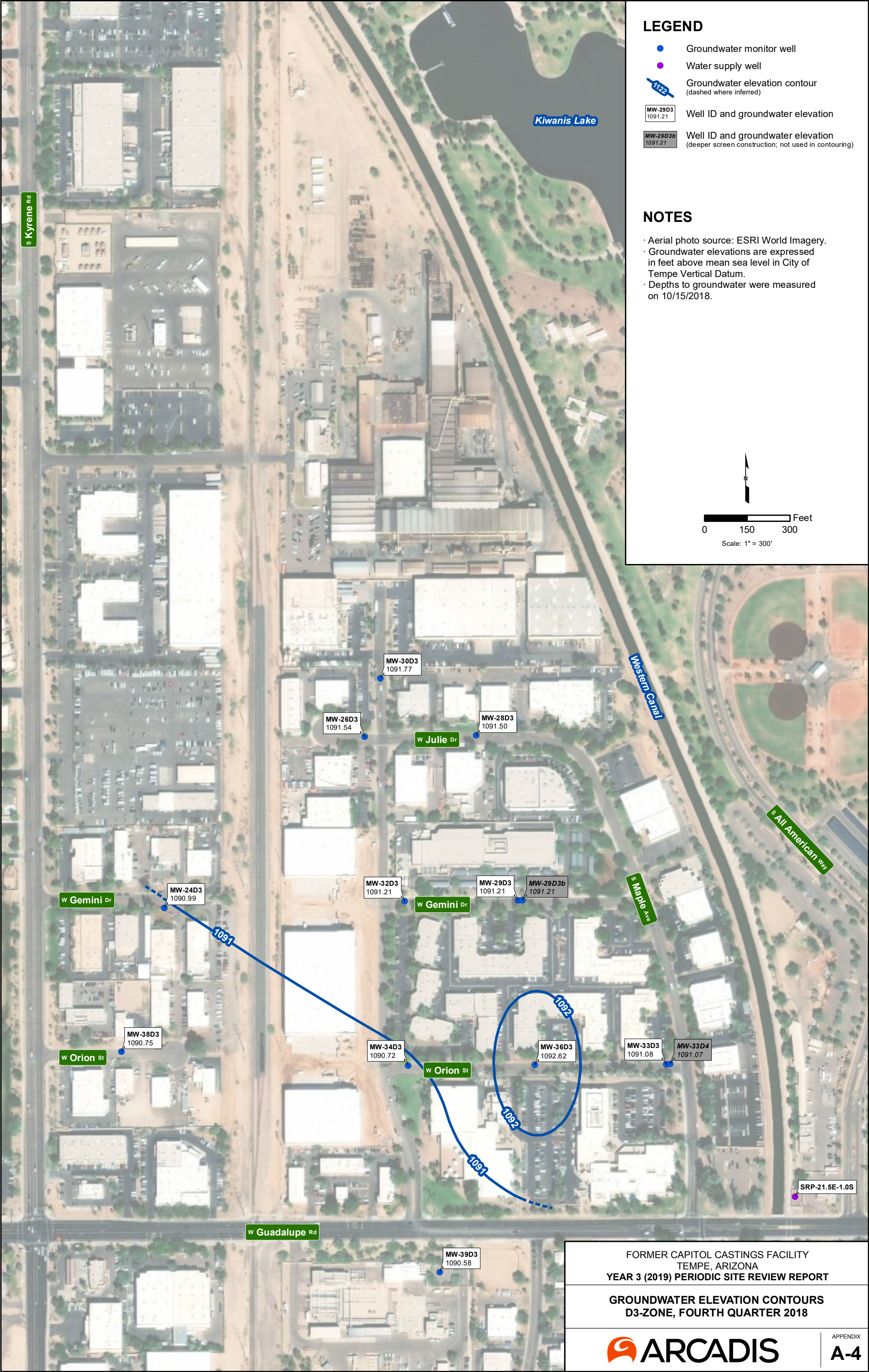
GROUNDWATER ELEVATION CONTOURS, S-ZONE
FOURTH QUARTER 2018



APPENDIX
A-1







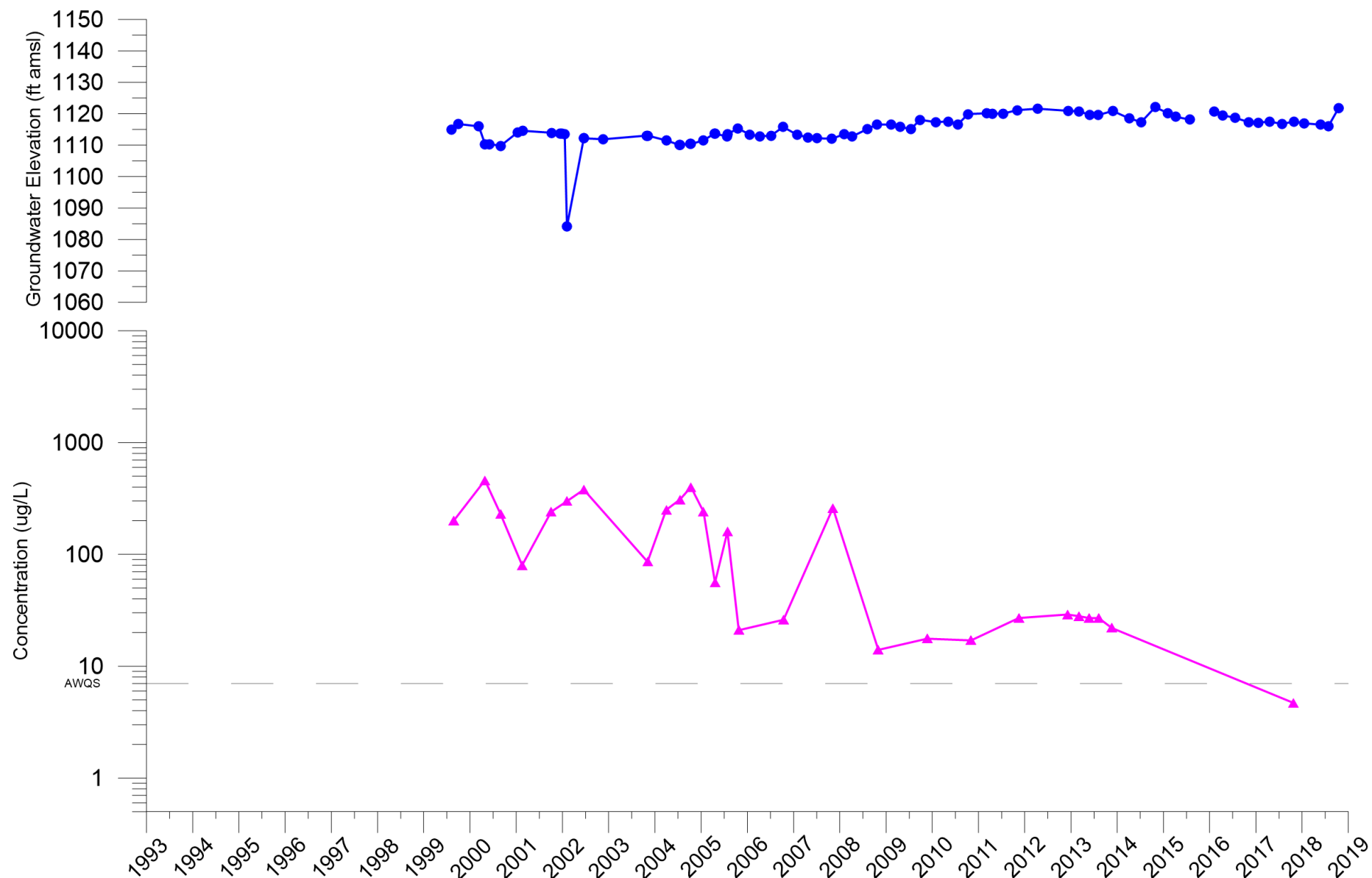
APPENDIX B

1,1-DCE Concentrations Versus Time – PRAP Wells



S-ZONE WELLS





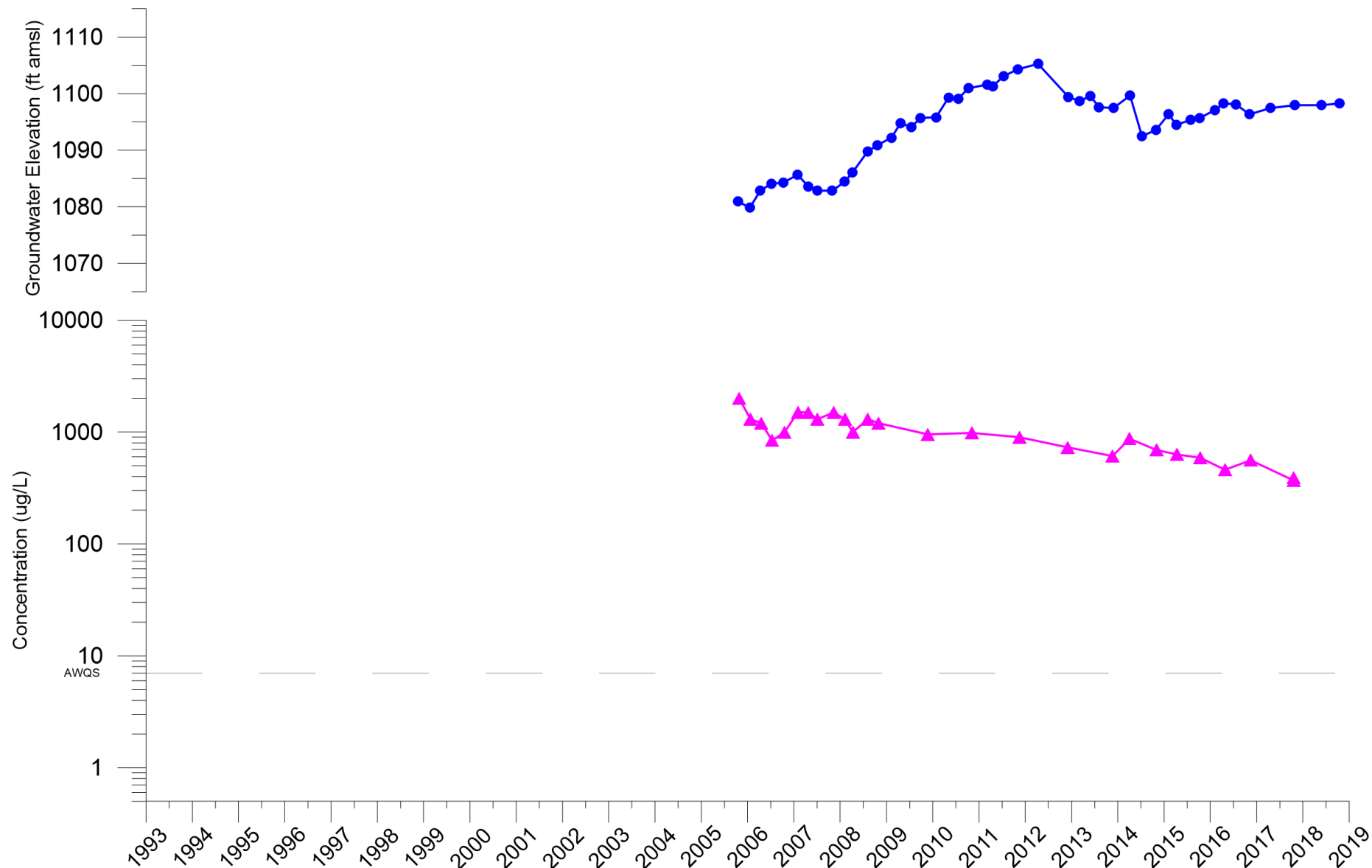
LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 AWQS
 7 ug/L
 amsl: above mean sea level
 ug/L: micrograms per liter

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-22S

D-ZONE WELLS

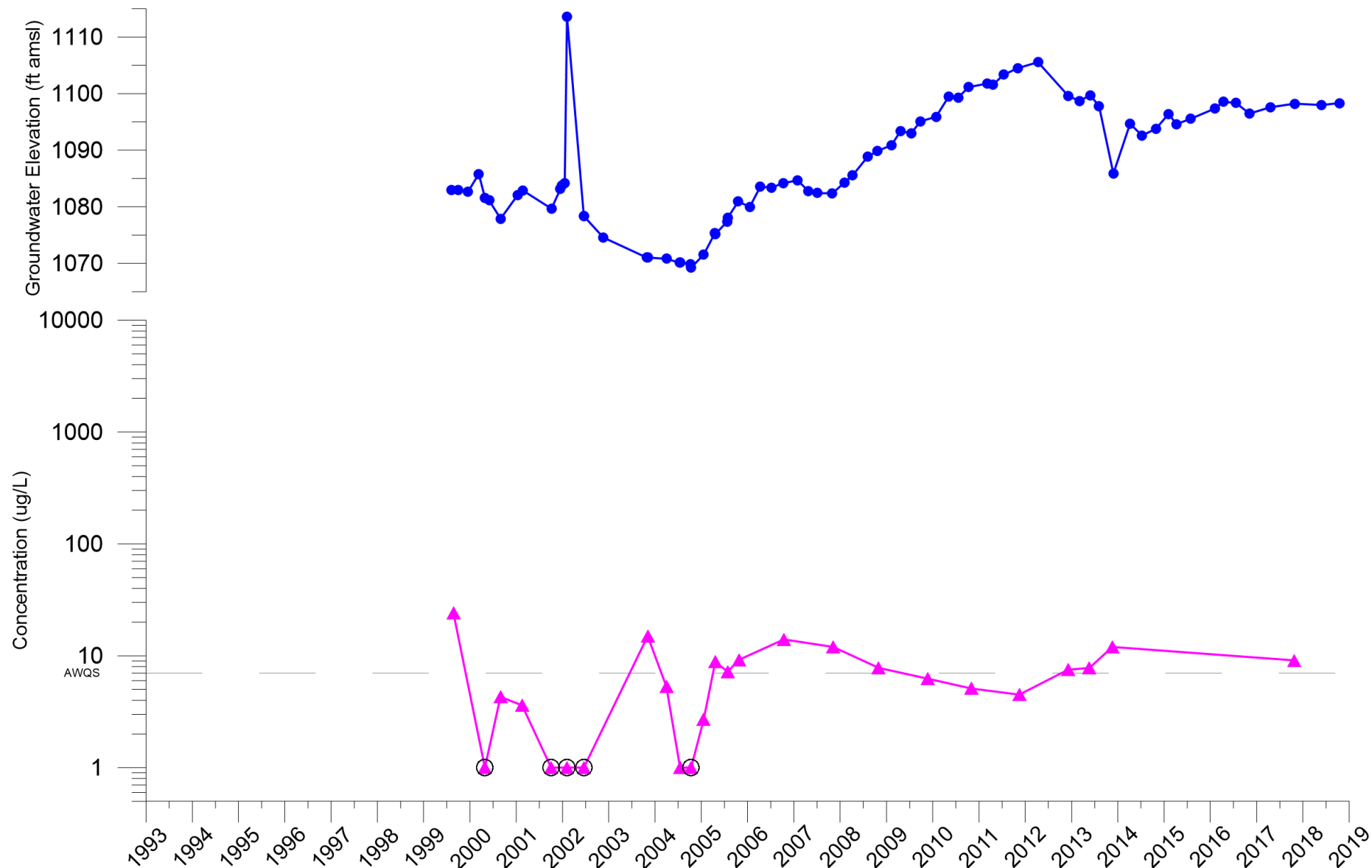




LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 AWQS 7 ug/L
 amsl: above mean sea level
 ug/L: micrograms per liter

**1,1-DICHLOROETHENE CONCENTRATIONS
 AND WATER-LEVEL ELEVATIONS**
 FORMER CAPITOL CASTINGS FACILITY
 TEMPE, ARIZONA

WELL
 MW-15D



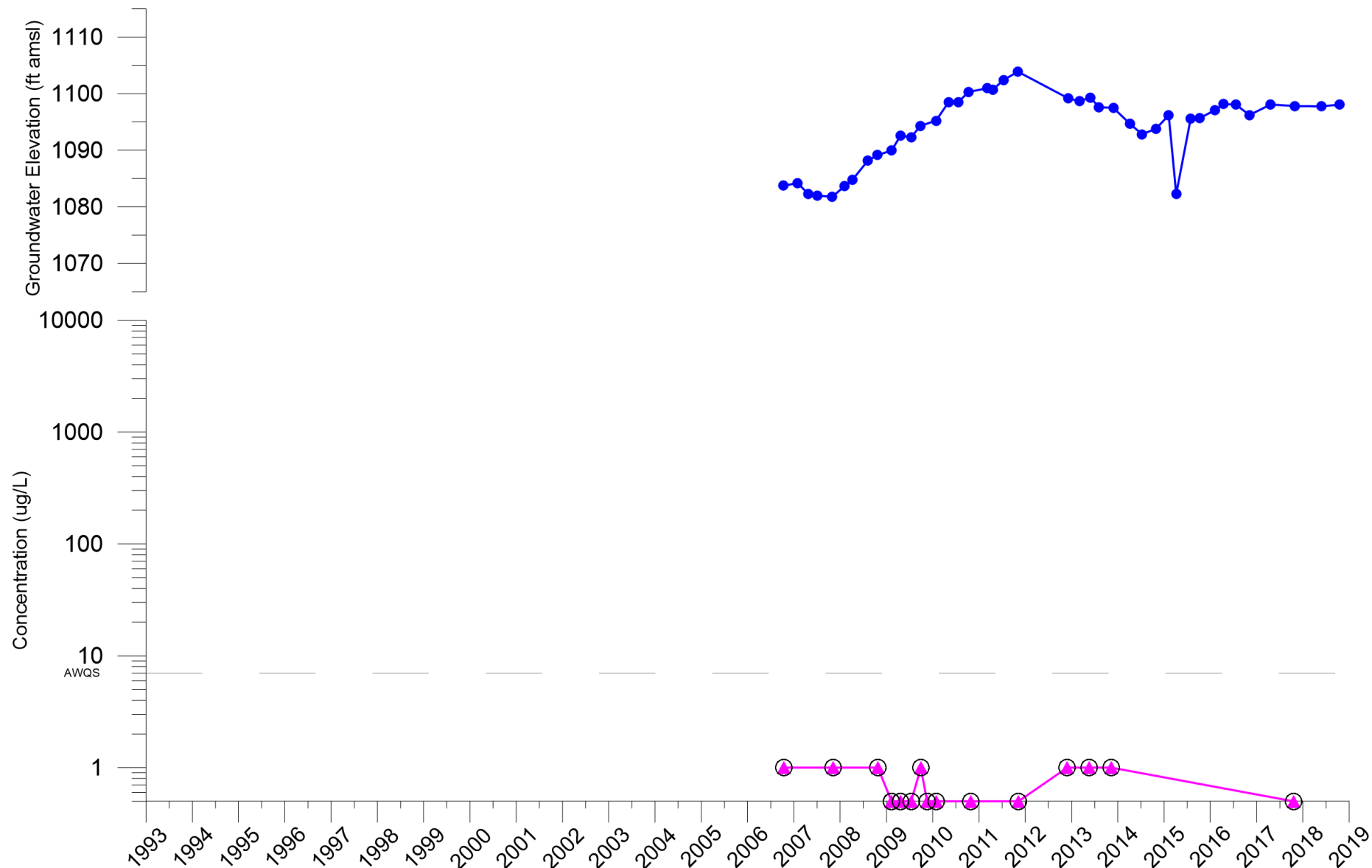
LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene

AWQS
 7 ug/L

amsl: above mean sea level
 ug/L: micrograms per liter

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-22D



LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene

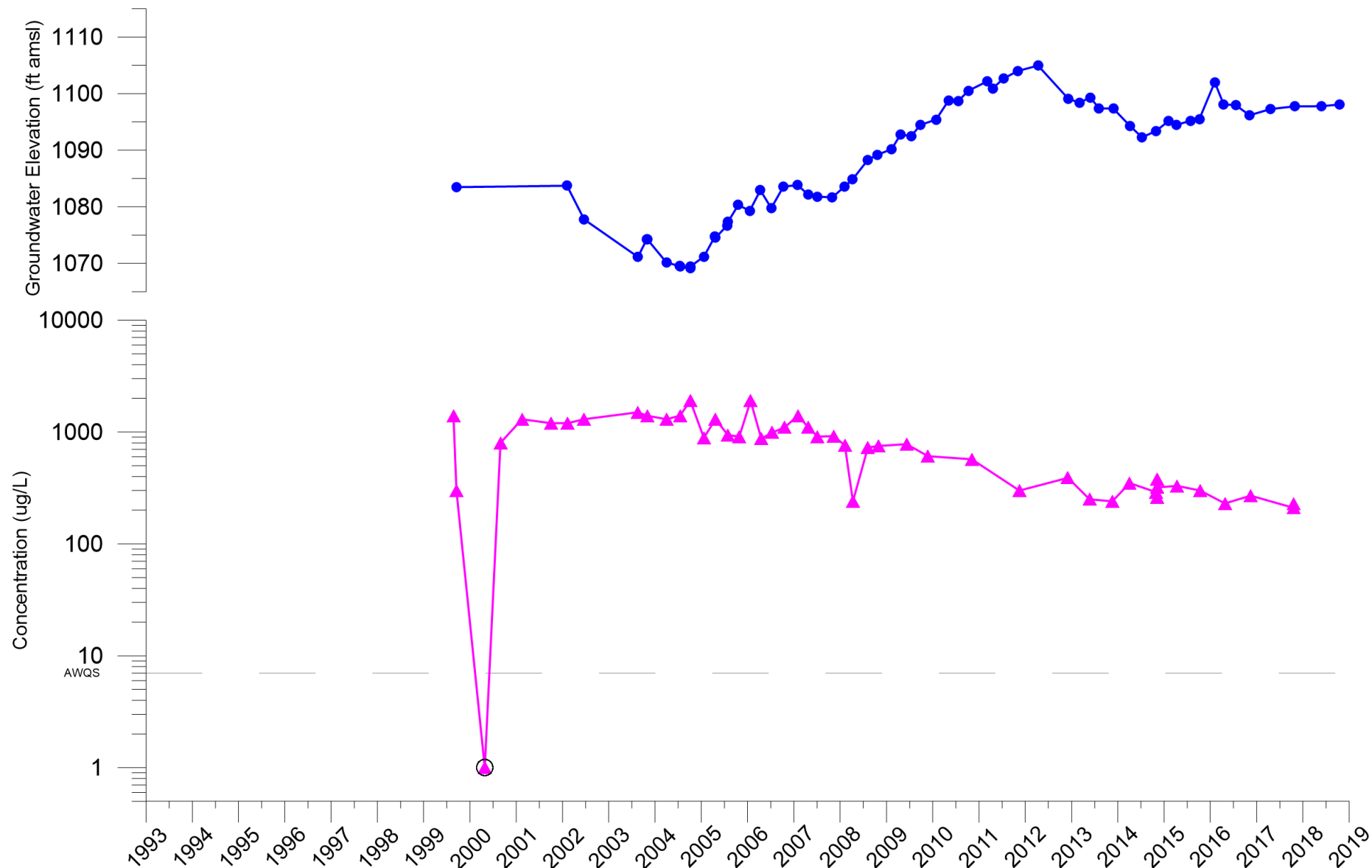
amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
 7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL

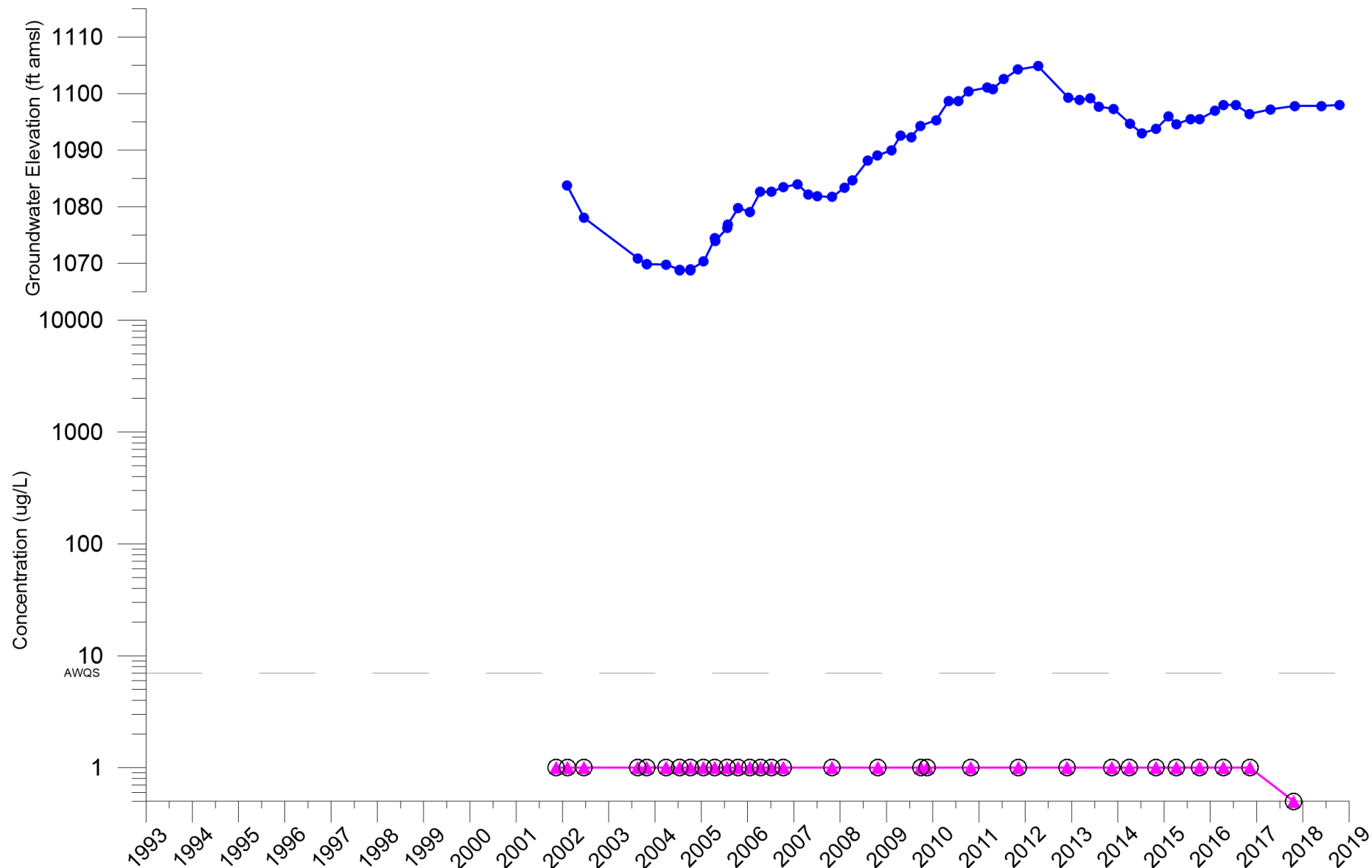
MW-24D



LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter
 AWQS
 7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-26D



LEGEND:

- Method Detection Limit
- Groundwater Elevation
- ▲ 1,1-Dichloroethene

AWQS
7 ug/L

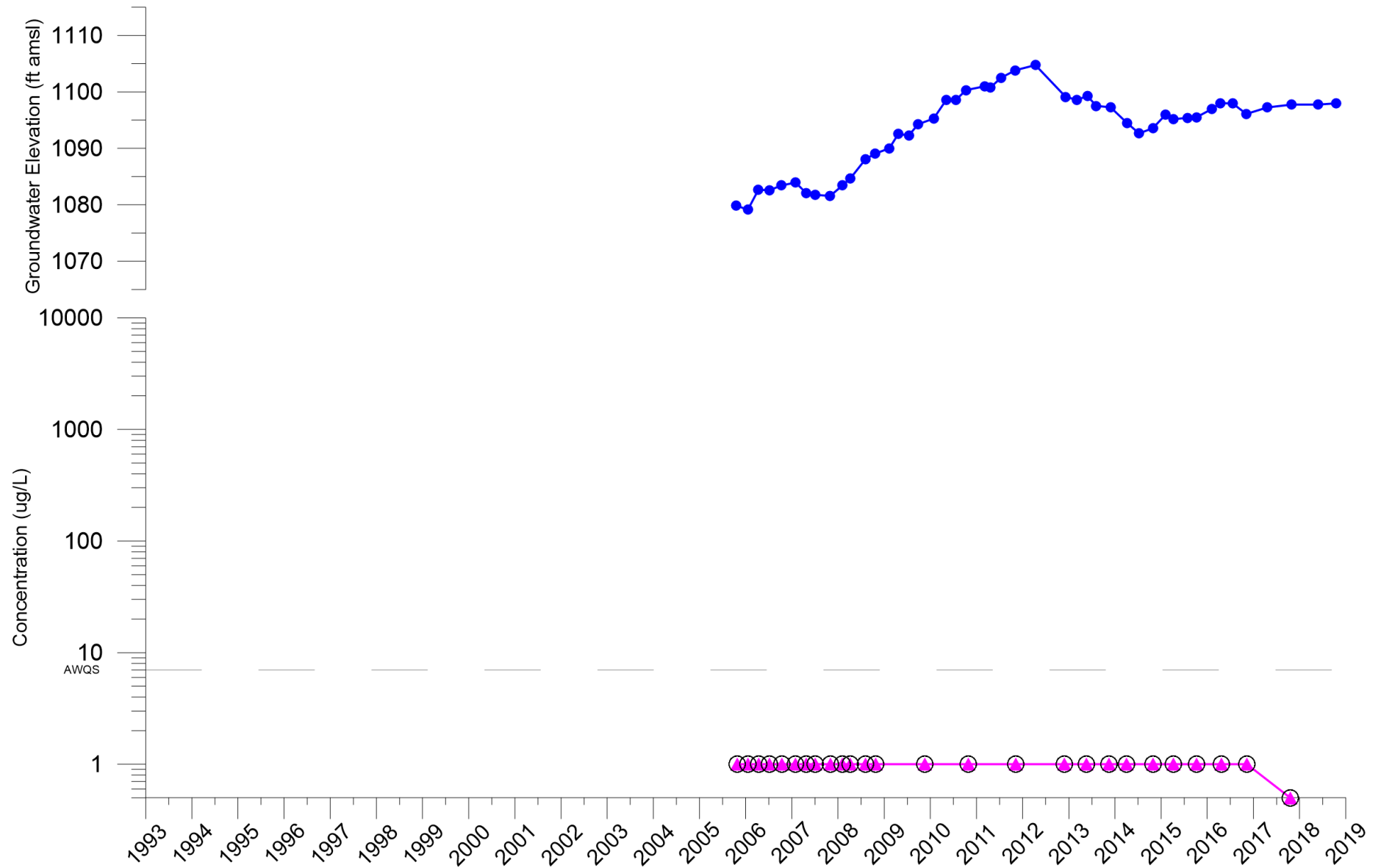
amsl: above mean sea level
ug/L: micrograms per liter

**1,1-DICHLOROETHENE CONCENTRATIONS
AND WATER-LEVEL ELEVATIONS**

FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA

WELL

MW-29D



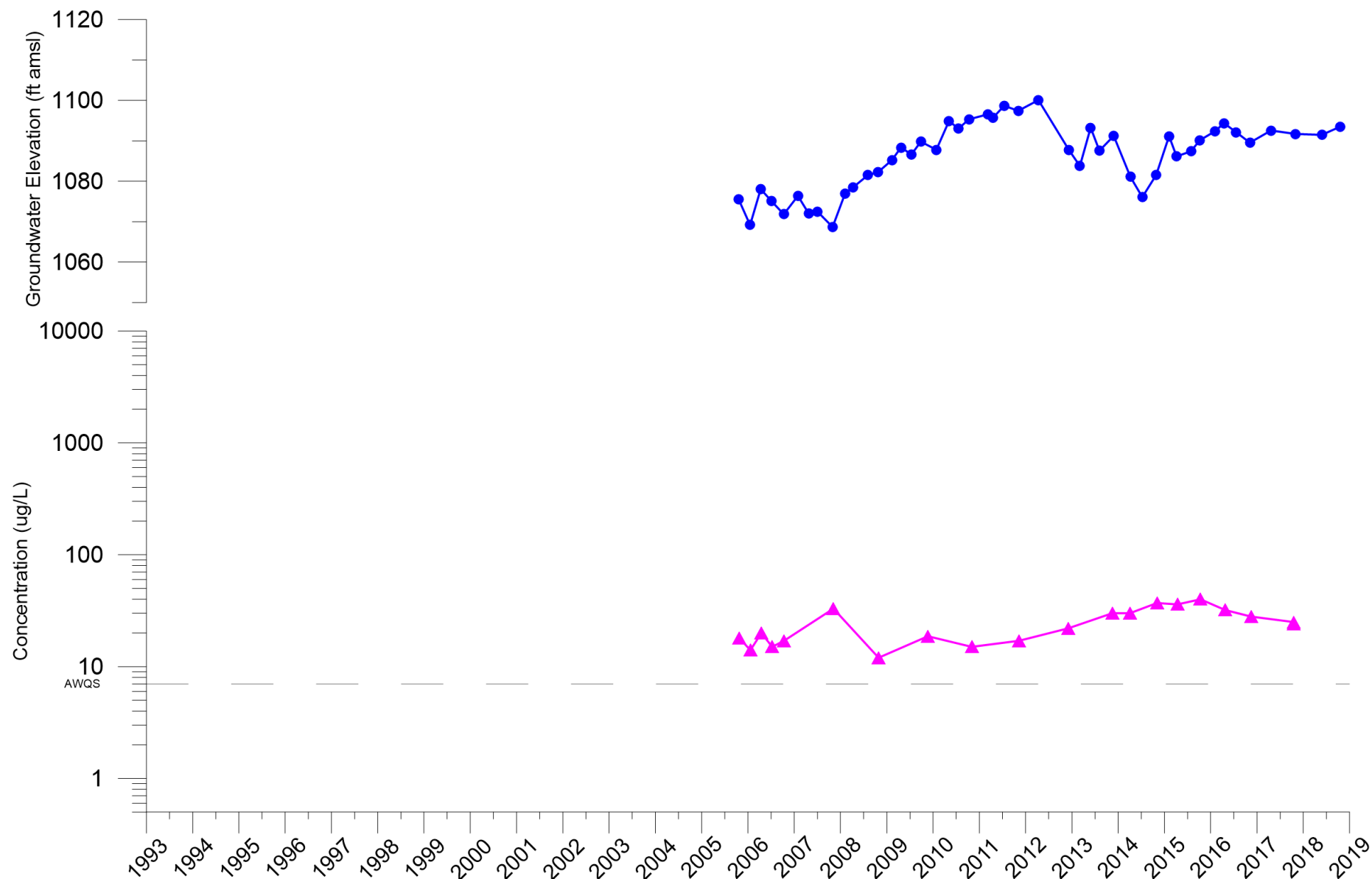
LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 AWQS 7 ug/L
 amsl: above mean sea level
 ug/L: micrograms per liter

**1,1-DICHLOROETHENE CONCENTRATIONS
 AND WATER-LEVEL ELEVATIONS**
 FORMER CAPITOL CASTINGS FACILITY
 TEMPE, ARIZONA

WELL
 MW-32D

D2-ZONE WELLS



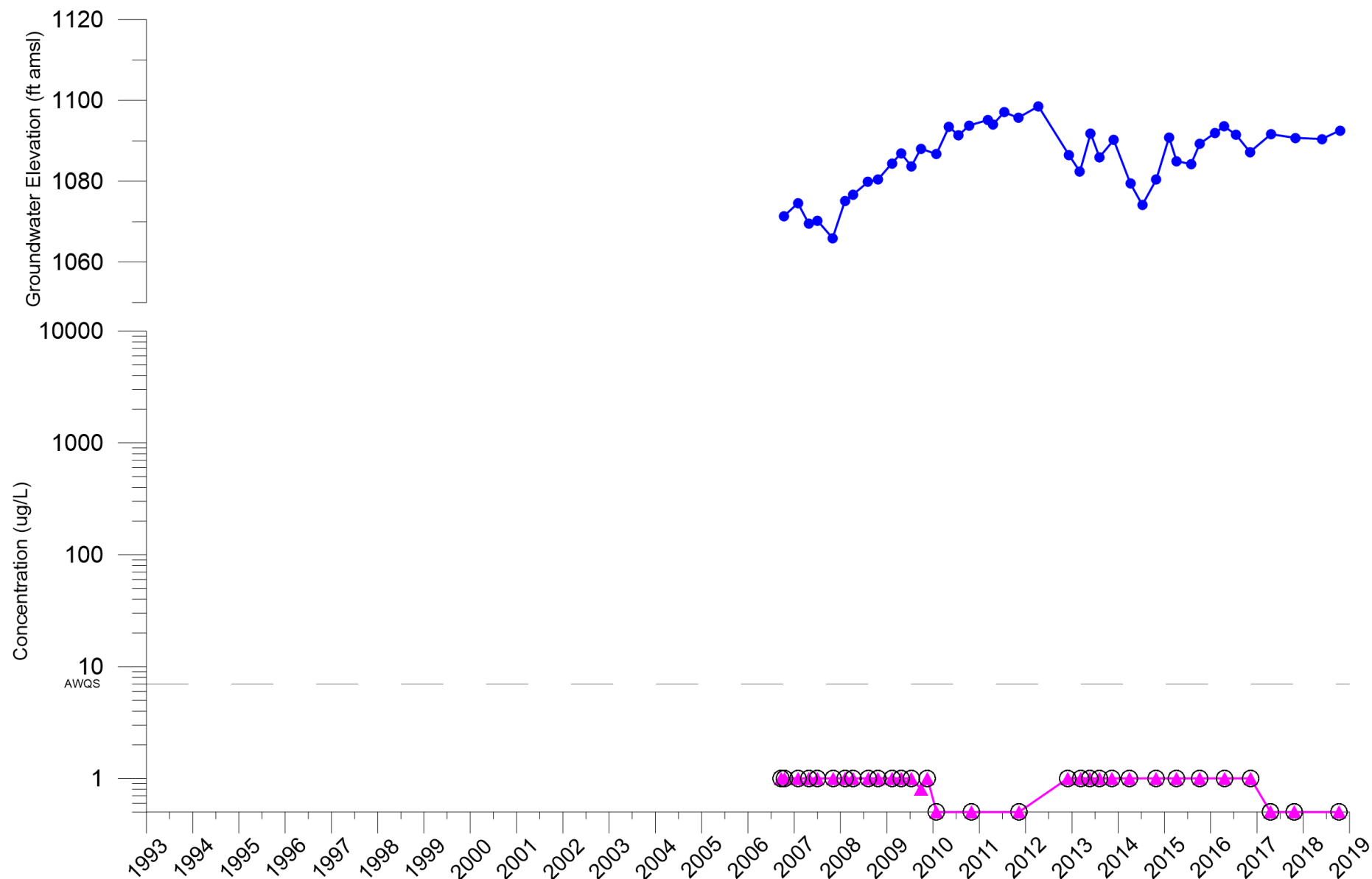


LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-15D2



LEGEND:

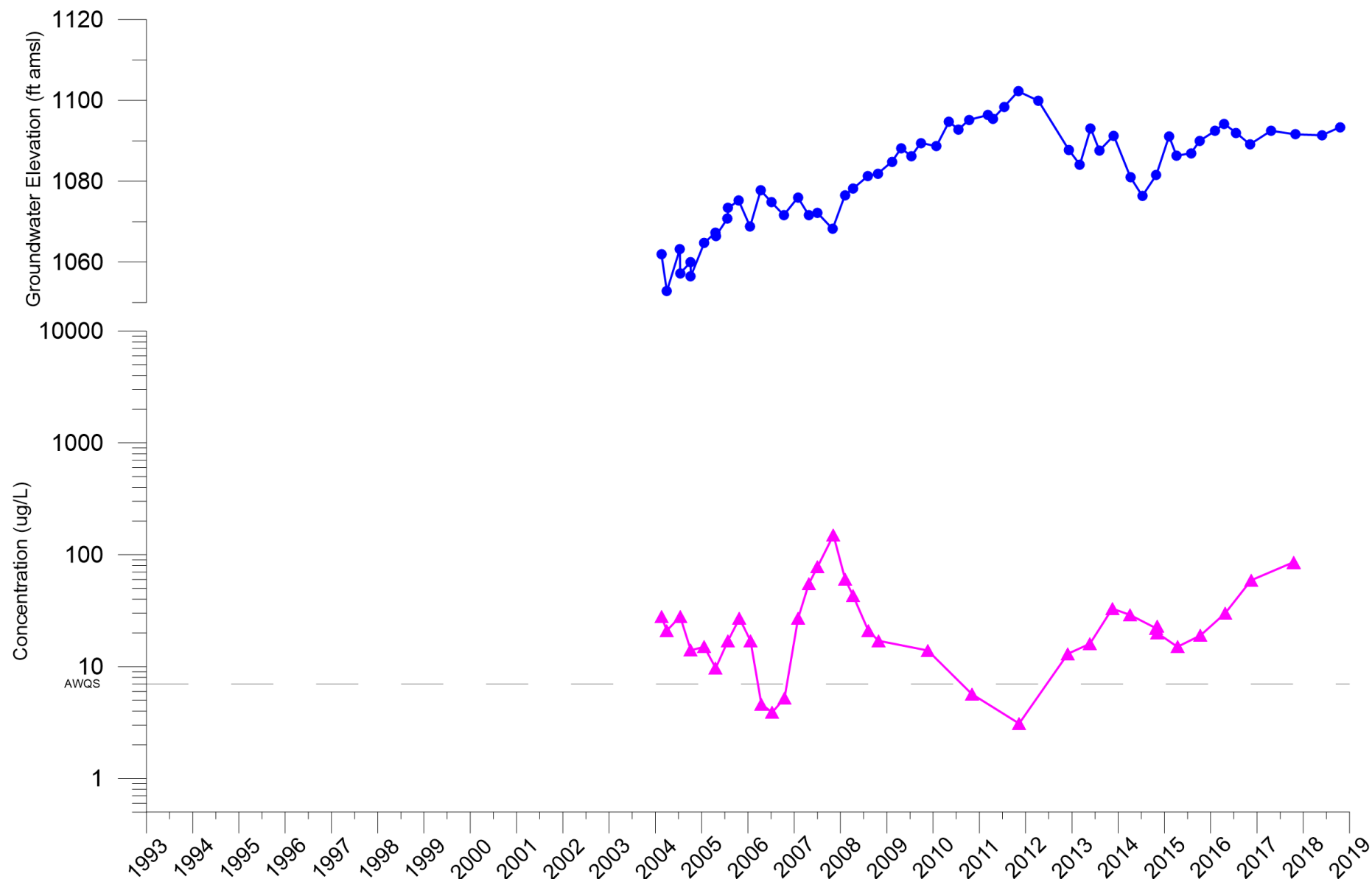
- Method Detection Limit
- Groundwater Elevation
- ▲ 1,1-Dichloroethene

AWQS
7 ug/L

amsl: above mean sea level
ug/L: micrograms per liter

**1,1-DICHLOROETHENE CONCENTRATIONS
AND WATER-LEVEL ELEVATIONS**
FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA

WELL
MW-24D2

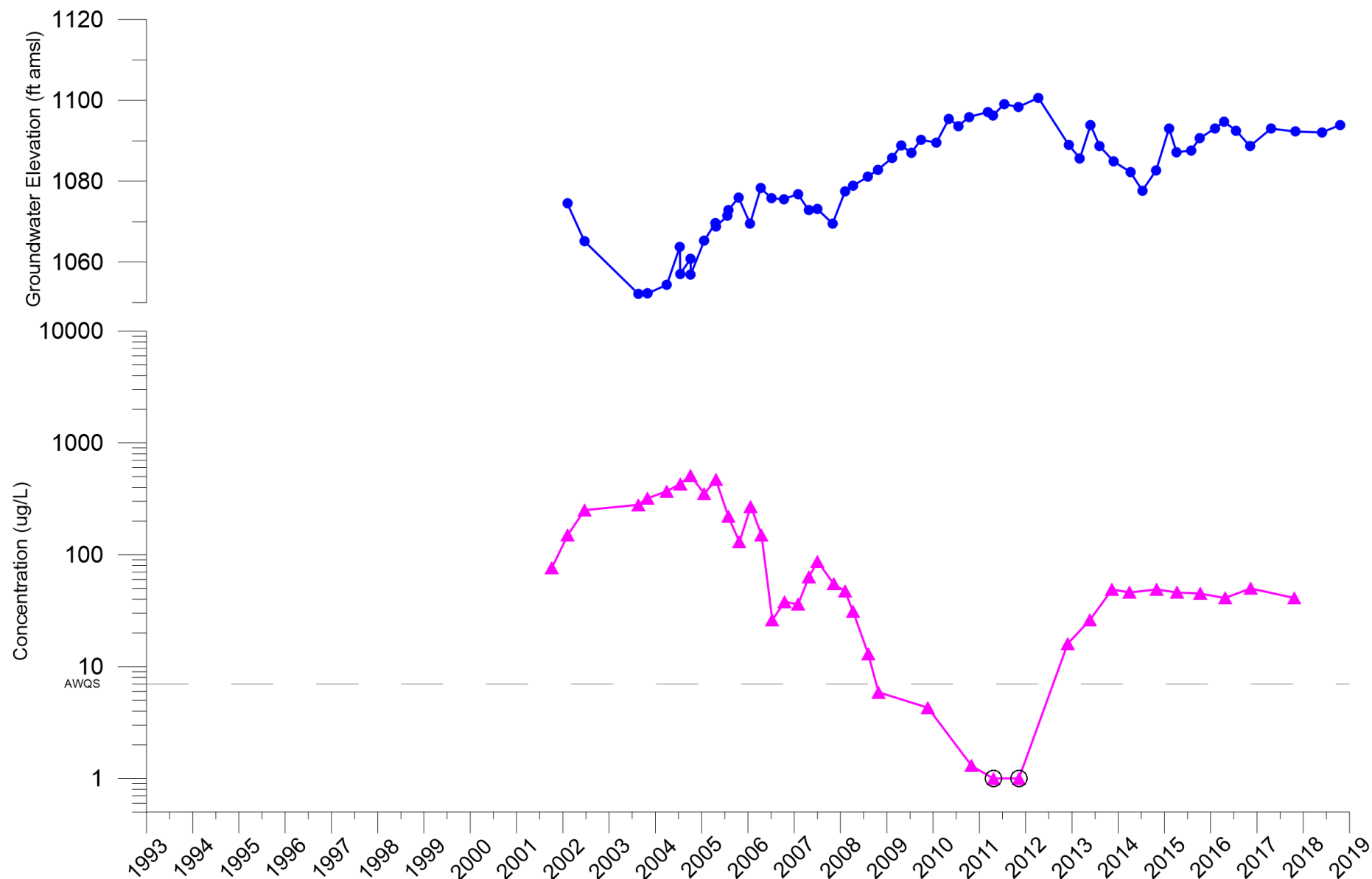


LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

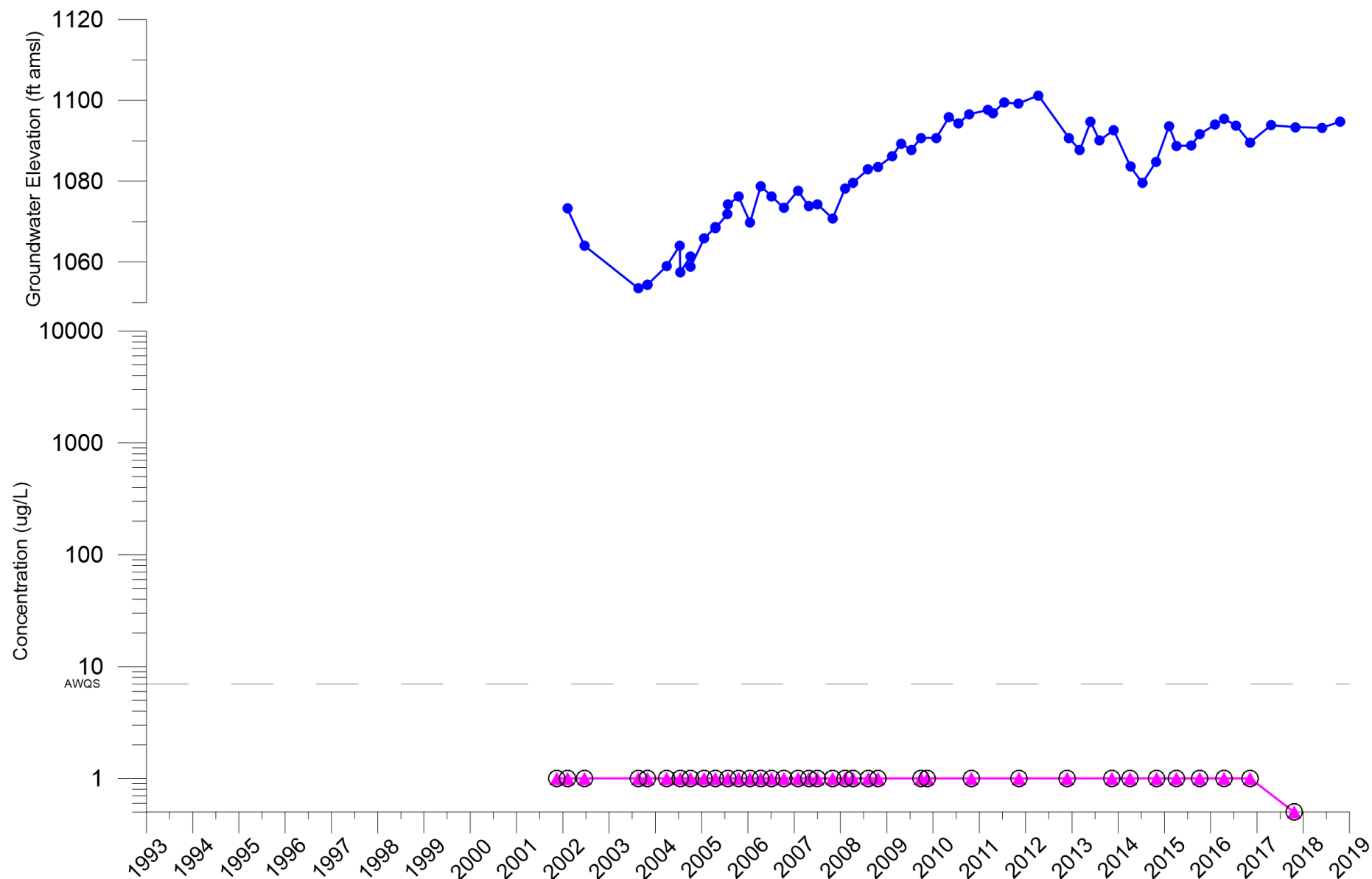
WELL
 MW-26D2



LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 AWQS
 7 ug/L
 amsl: above mean sea level
 ug/L: micrograms per liter

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-28D2



LEGEND:

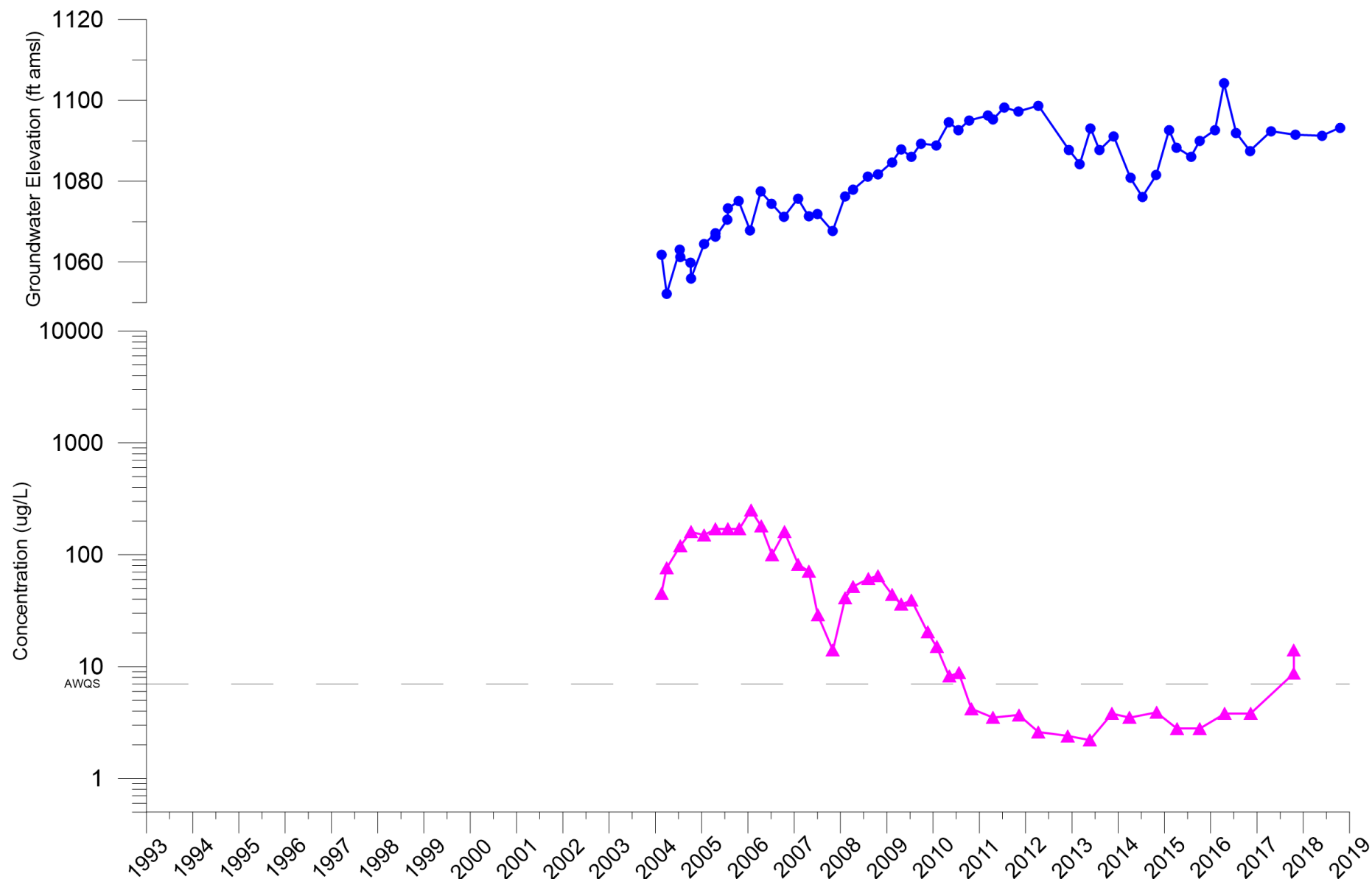
- Method Detection Limit
- Groundwater Elevation
- 1,1-Dichloroethene

AWQS
7 ug/L

amsl: above mean sea level
ug/L: micrograms per liter

**1,1-DICHLOROETHENE CONCENTRATIONS
AND WATER-LEVEL ELEVATIONS**
FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA

WELL
MW-29D2



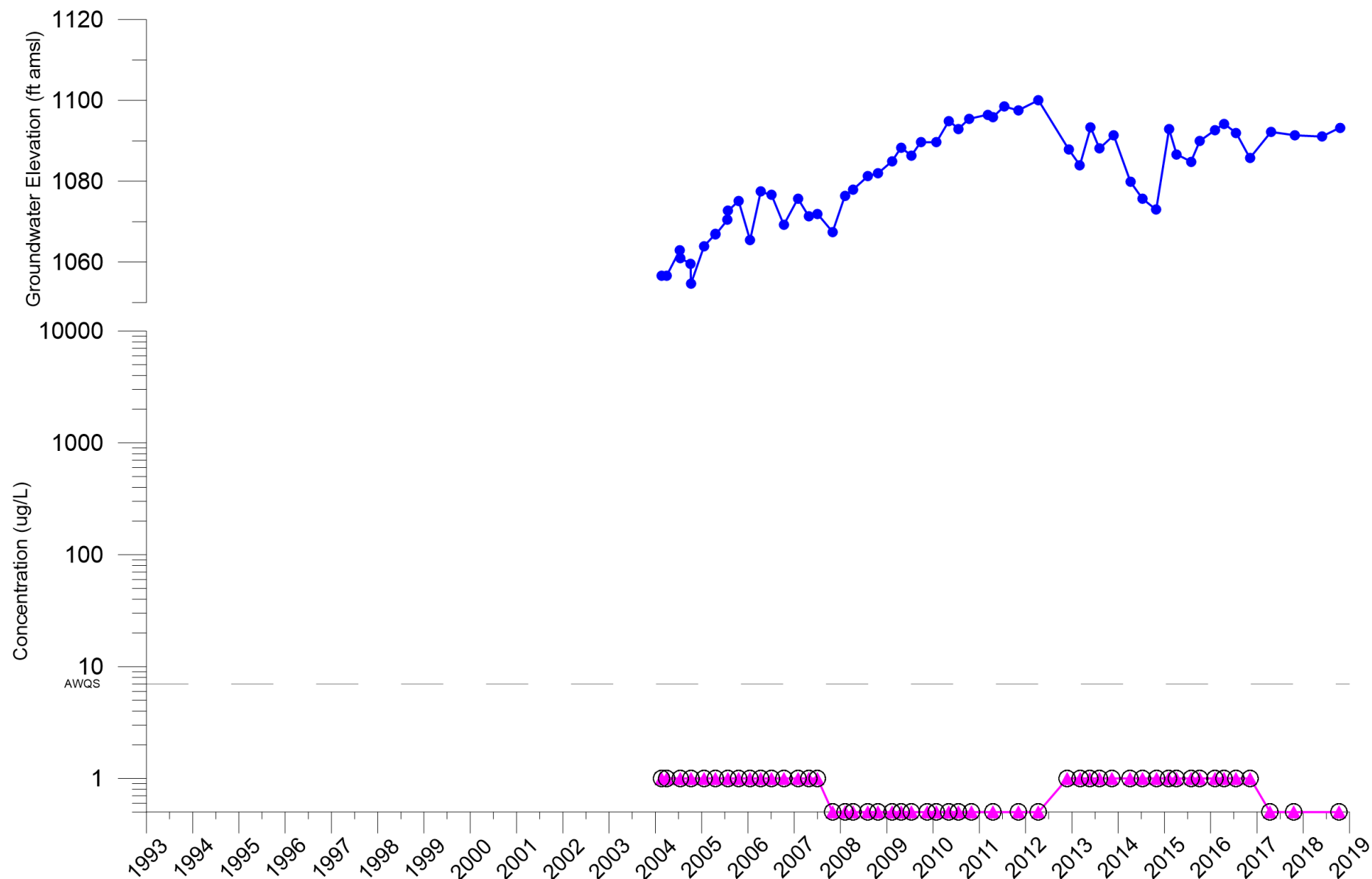
LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene

amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
 7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-32D2



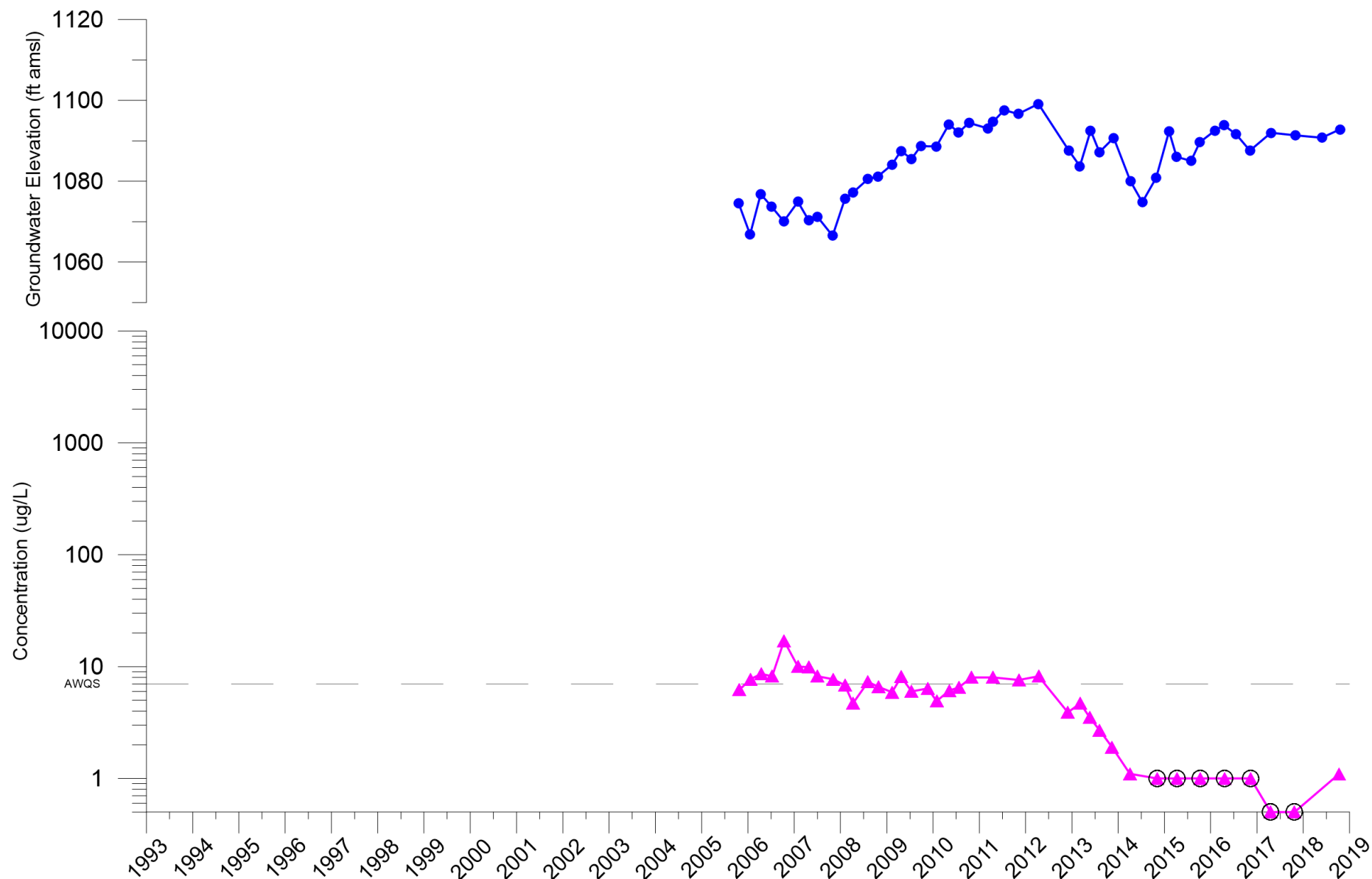
LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene

amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
 7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

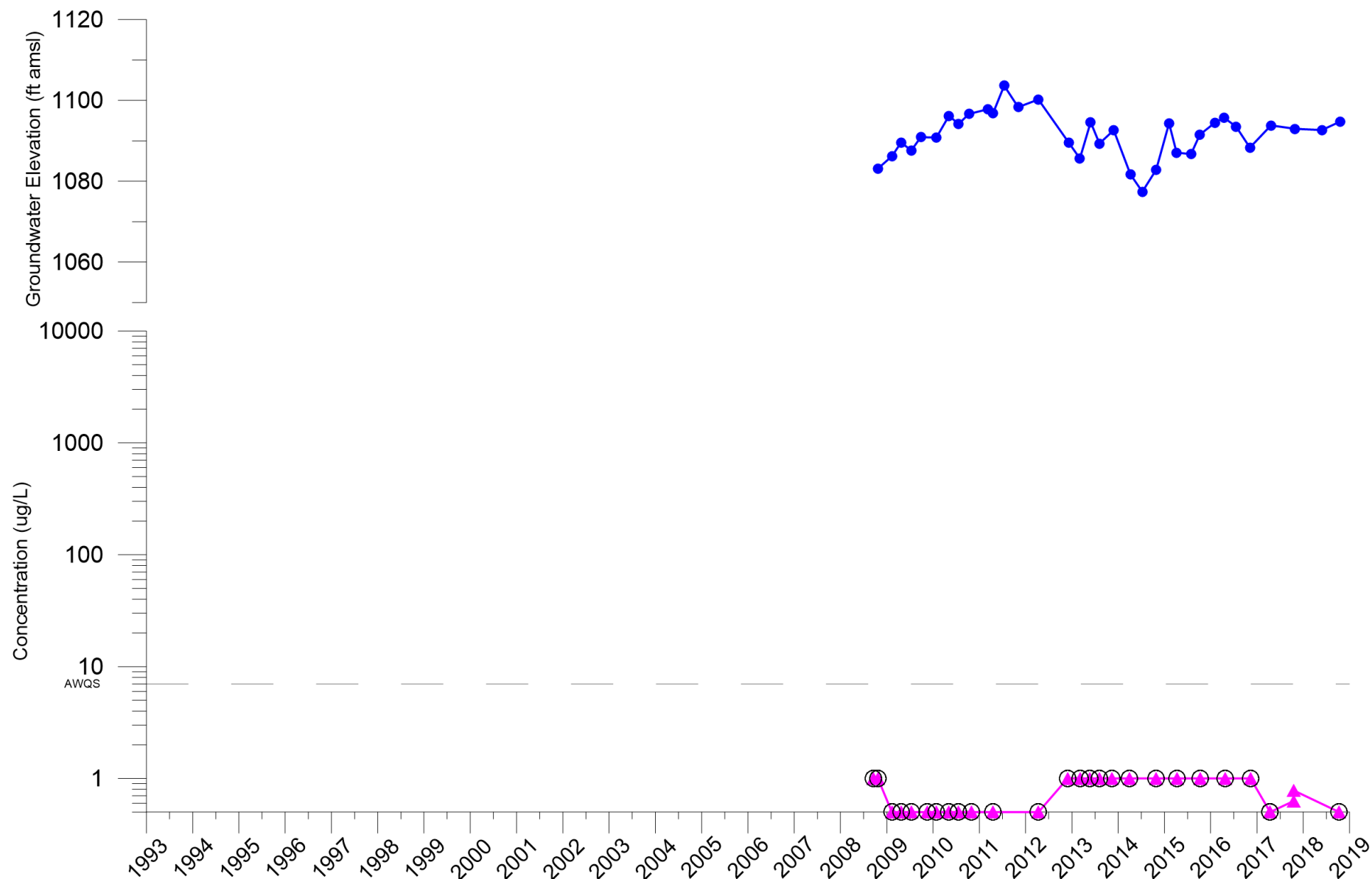
WELL
 MW-33D2



LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

**1,1-DICHLOROETHENE CONCENTRATIONS
 AND WATER-LEVEL ELEVATIONS**
 FORMER CAPITOL CASTINGS FACILITY
 TEMPE, ARIZONA

WELL
 MW-34D2



LEGEND:

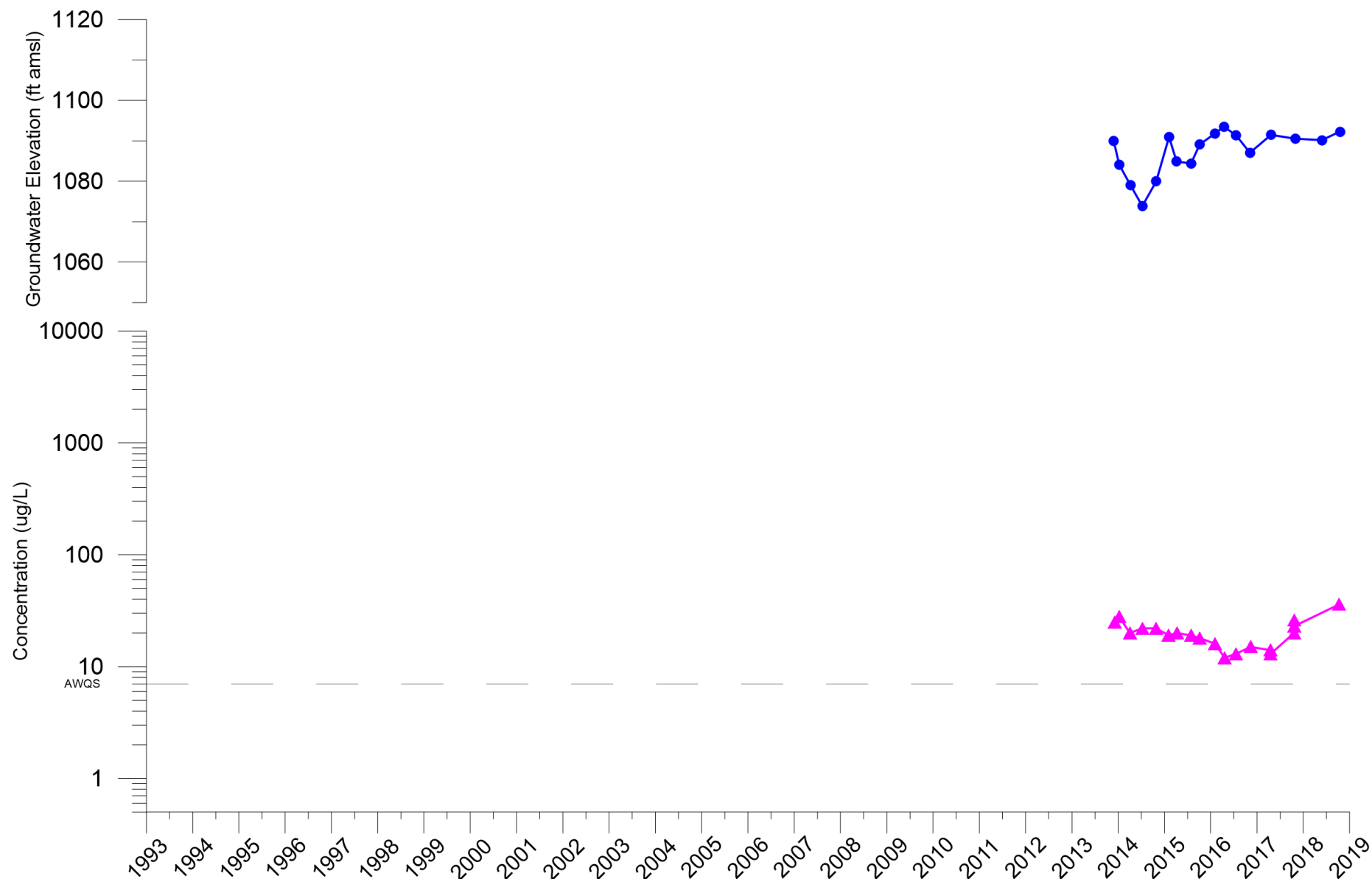
- Method Detection Limit
- Groundwater Elevation
- ▲ 1,1-Dichloroethene

AWQS
7 ug/L

amsl: above mean sea level
ug/L: micrograms per liter

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
MW-36D2

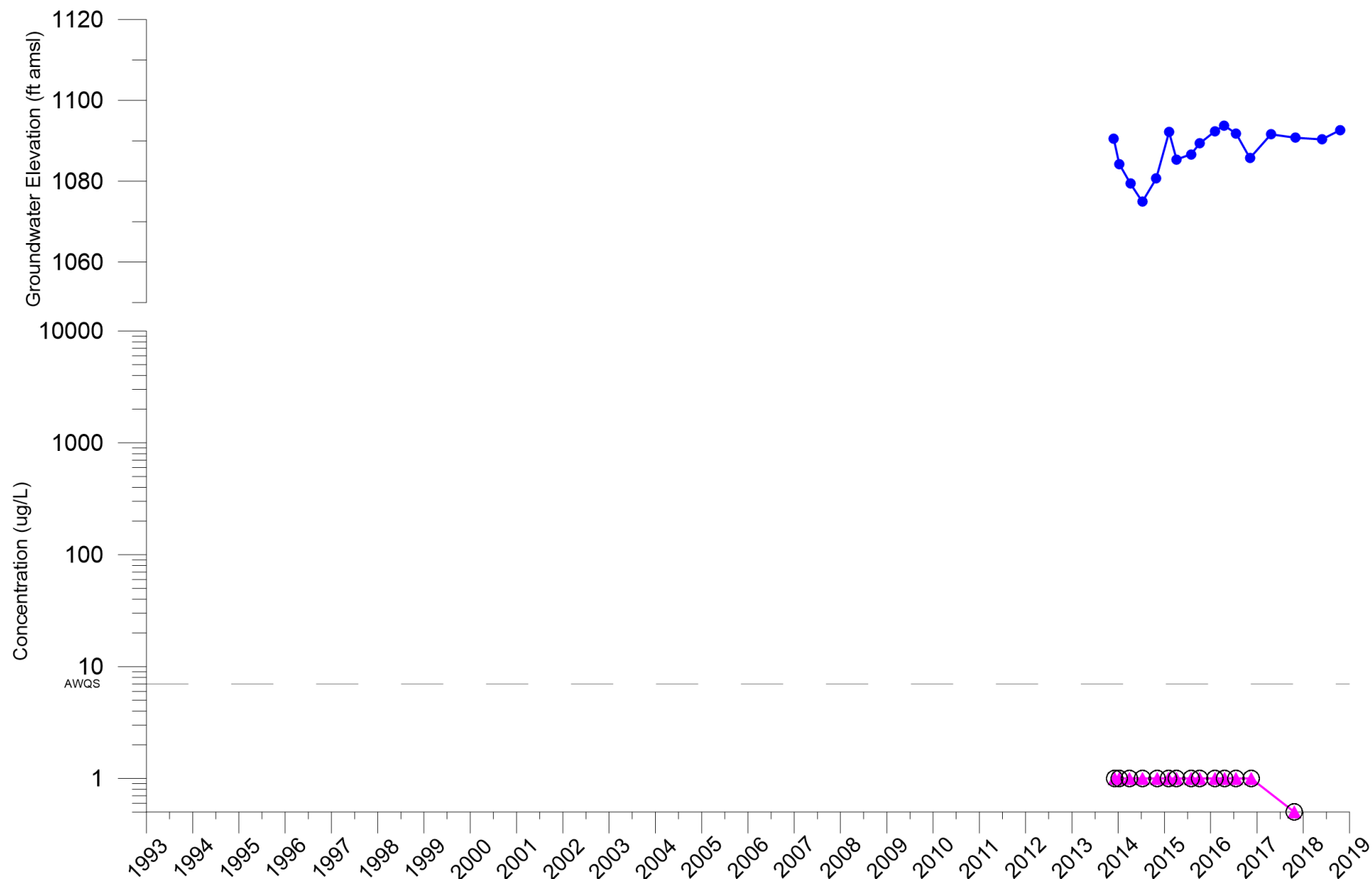


LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-38D2



LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

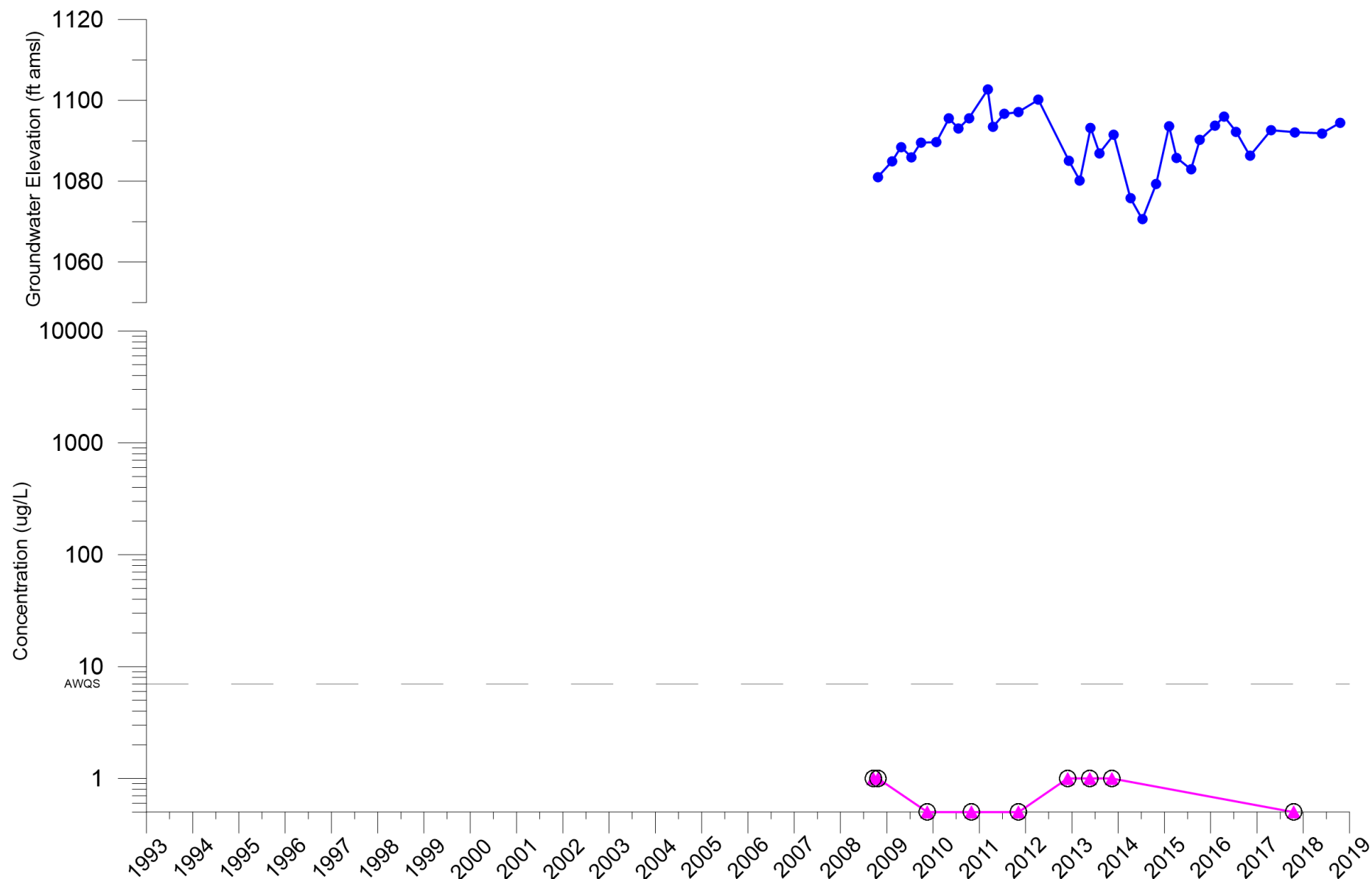
AWQS
7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-39D2

A2-ZONE WELLS



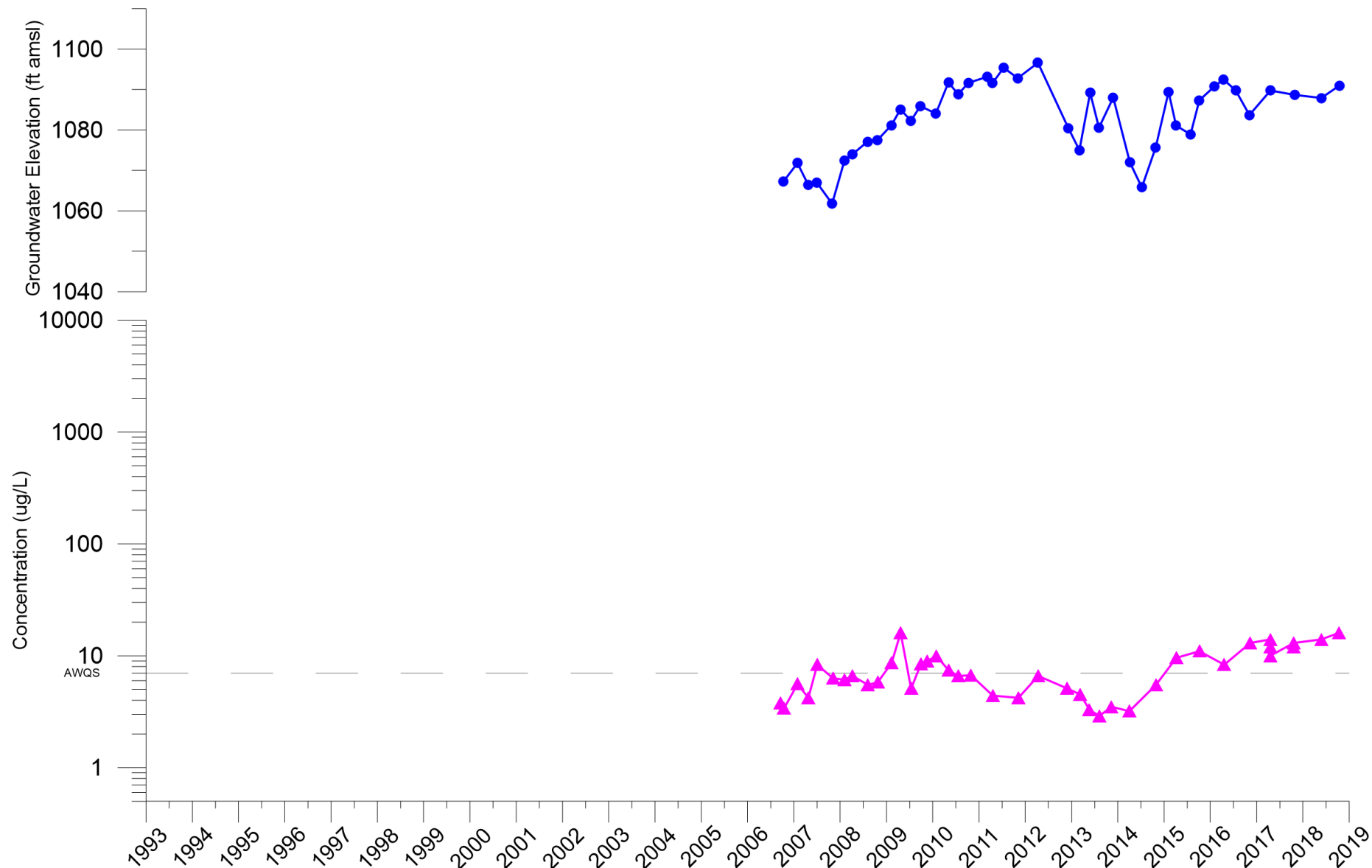


**1,1-DICHLOROETHENE CONCENTRATIONS
AND WATER-LEVEL ELEVATIONS**
 FORMER CAPITOL CASTINGS FACILITY
 TEMPE, ARIZONA

WELL
MW-36A2

D3 AND D4-ZONE WELLS





LEGEND:

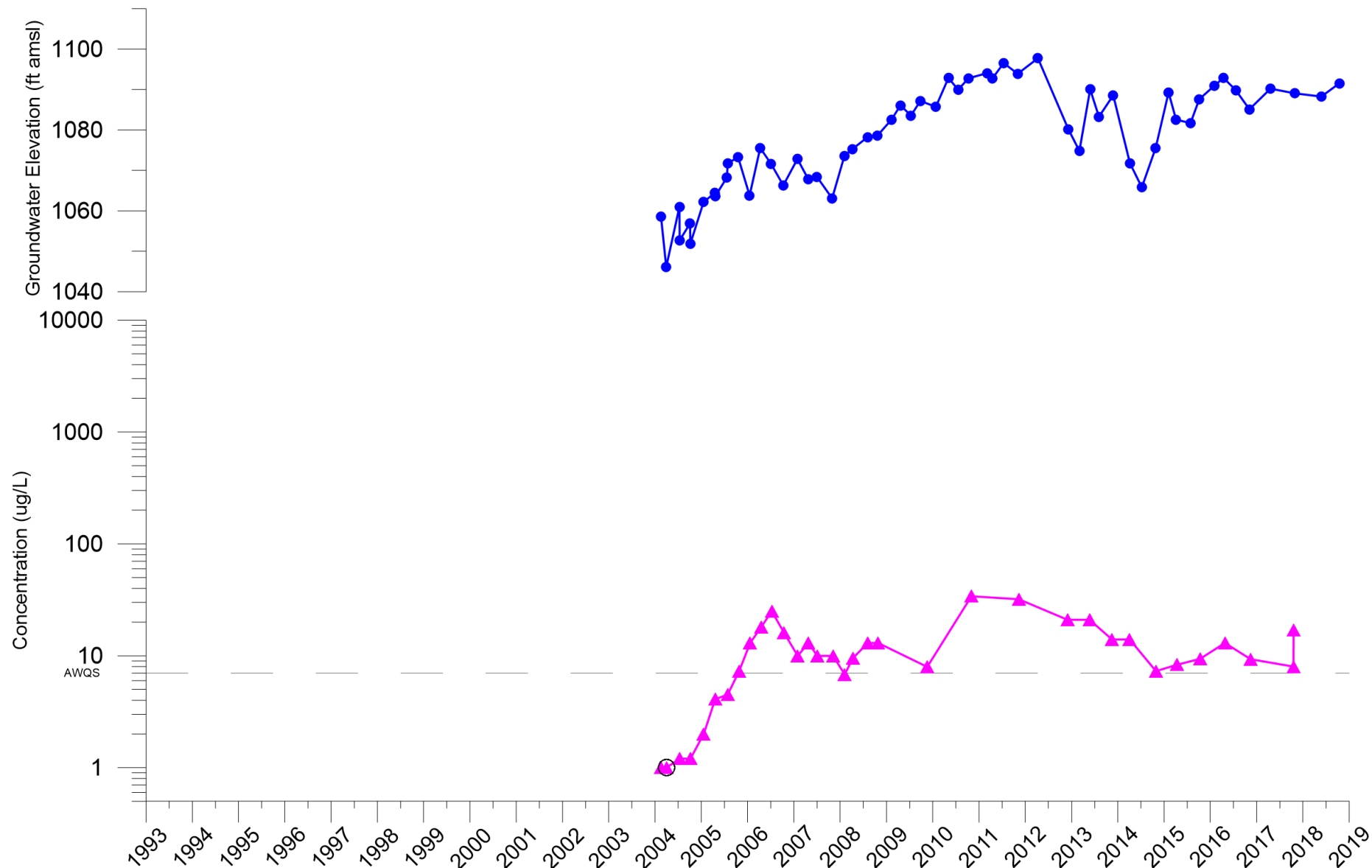
- Method Detection Limit
- Groundwater Elevation
- ▲ 1,1-Dichloroethene

amsl: above mean sea level
ug/L: micrograms per liter

AWQS
7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

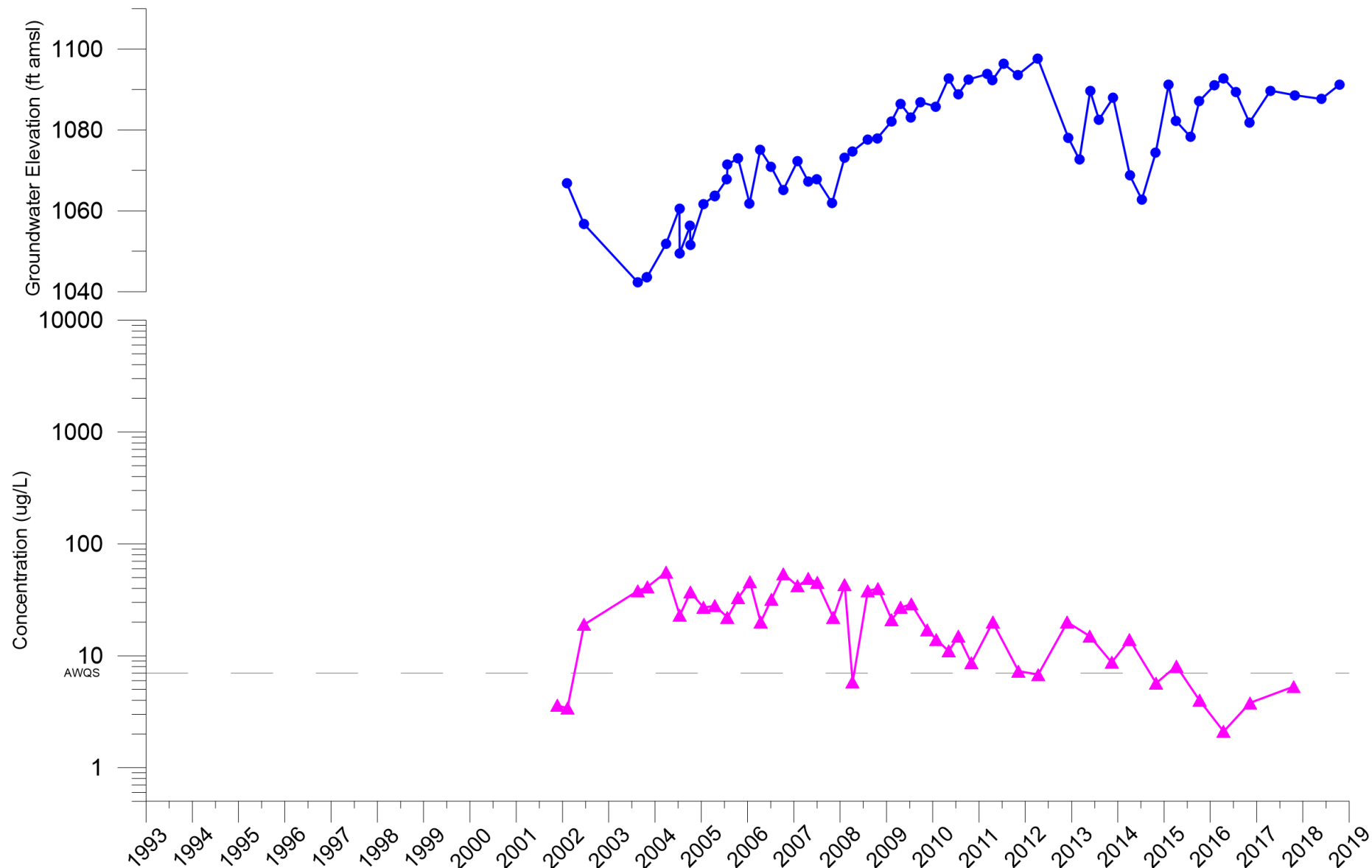
WELL
MW-24D3



LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-26D3

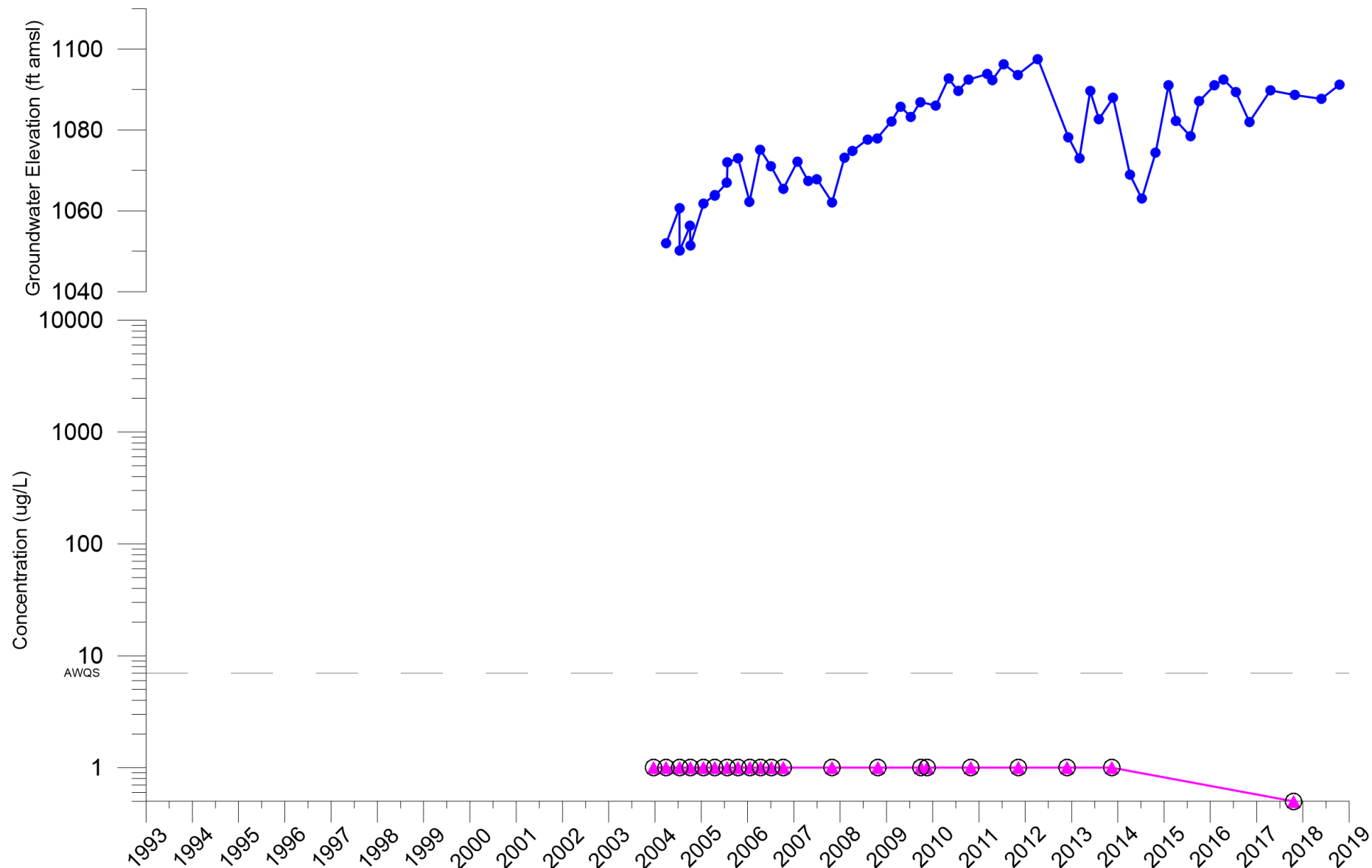


LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS
 AND WATER-LEVEL ELEVATIONS
 FORMER CAPITOL CASTINGS FACILITY
 TEMPE, ARIZONA

WELL
 MW-29D3



LEGEND:

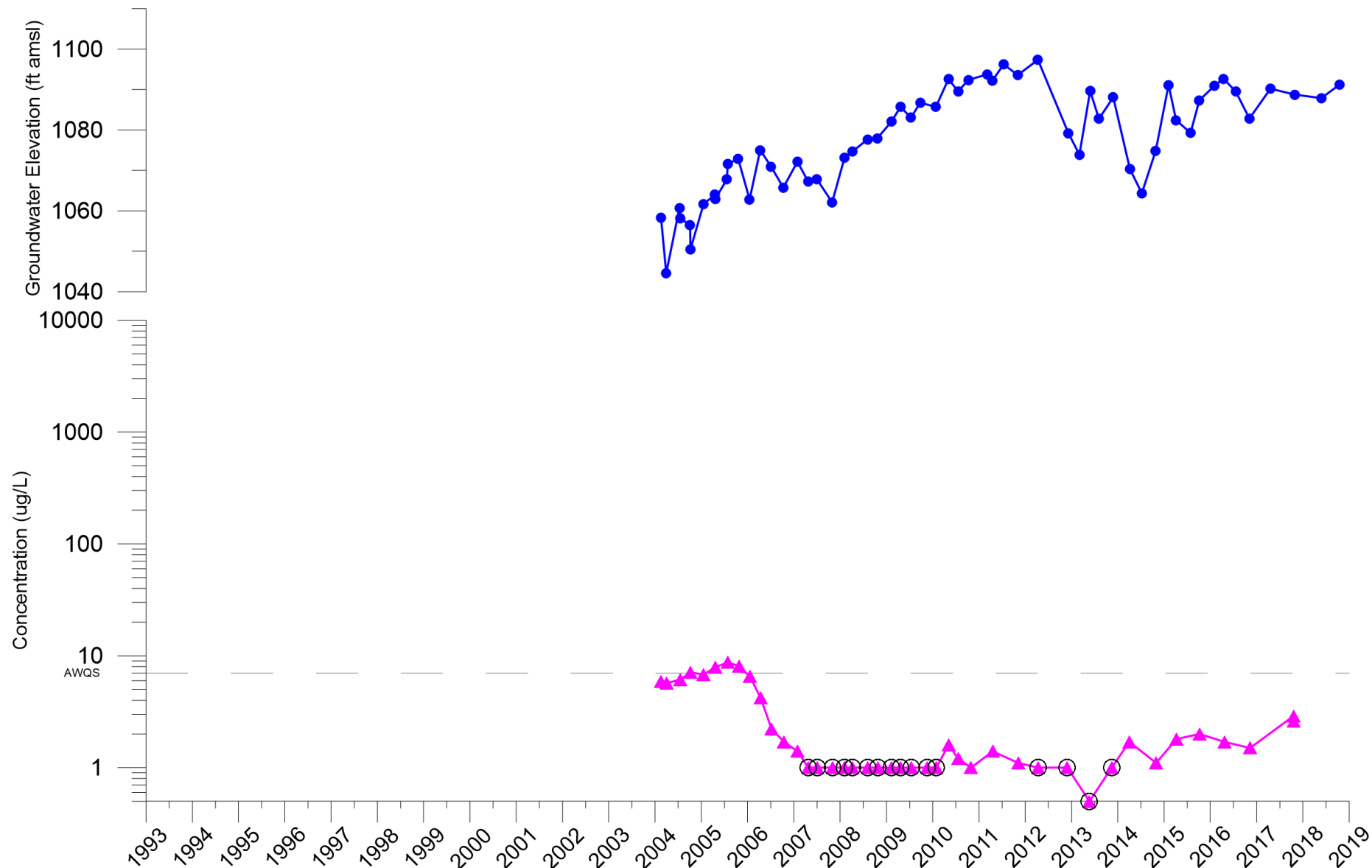
- Method Detection Limit
- Groundwater Elevation
- ▲ 1,1-Dichloroethene

AWQS
7 ug/L

amsl: above mean sea level
ug/L: micrograms per liter

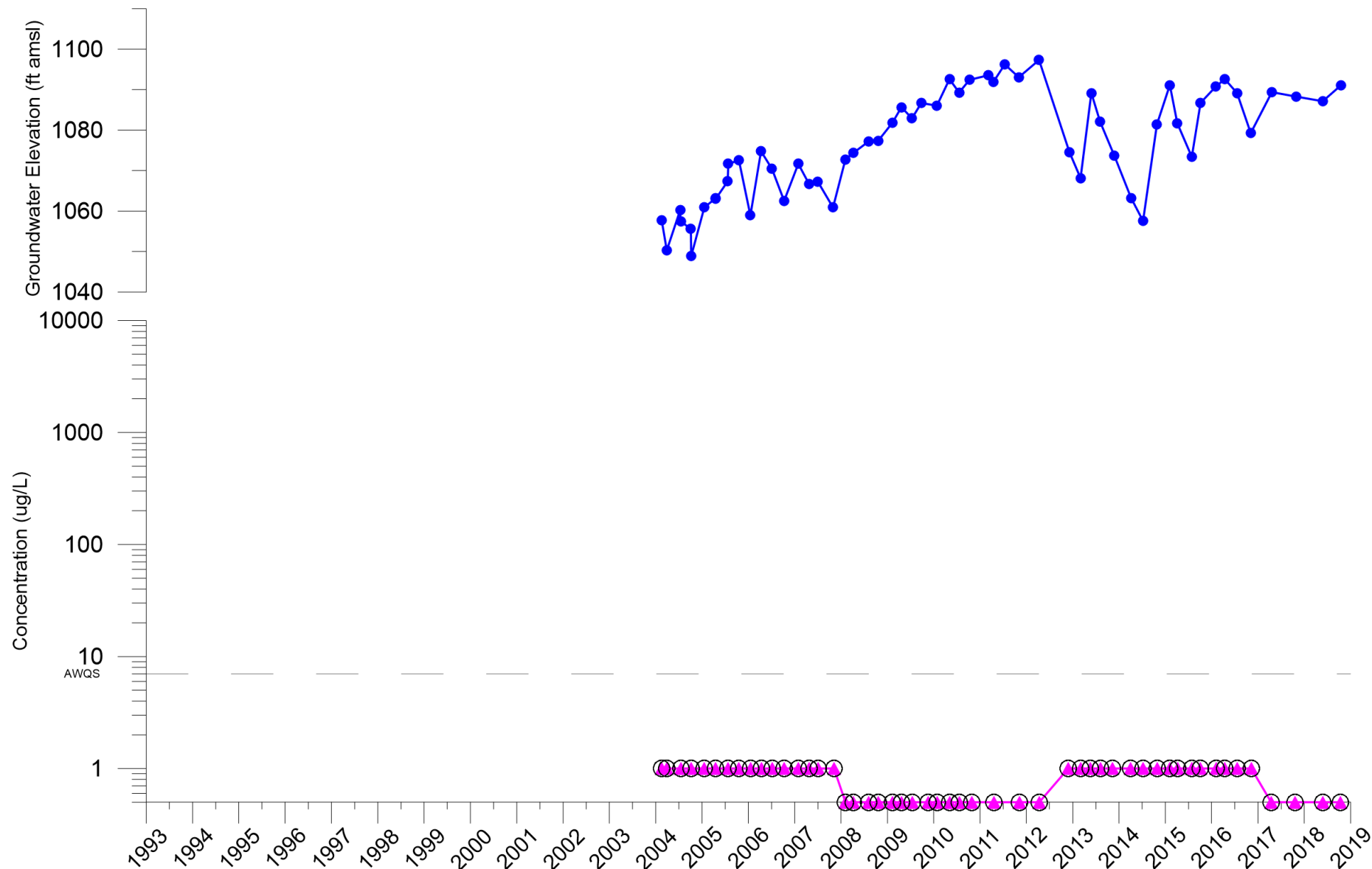
**1,1-DICHLOROETHENE CONCENTRATIONS
AND WATER-LEVEL ELEVATIONS**
 FORMER CAPITOL CASTINGS FACILITY
 TEMPE, ARIZONA

WELL
 MW-29D3B



**1,1-DICHLOROETHENE CONCENTRATIONS
AND WATER-LEVEL ELEVATIONS**
FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA

WELL
MW-32D3



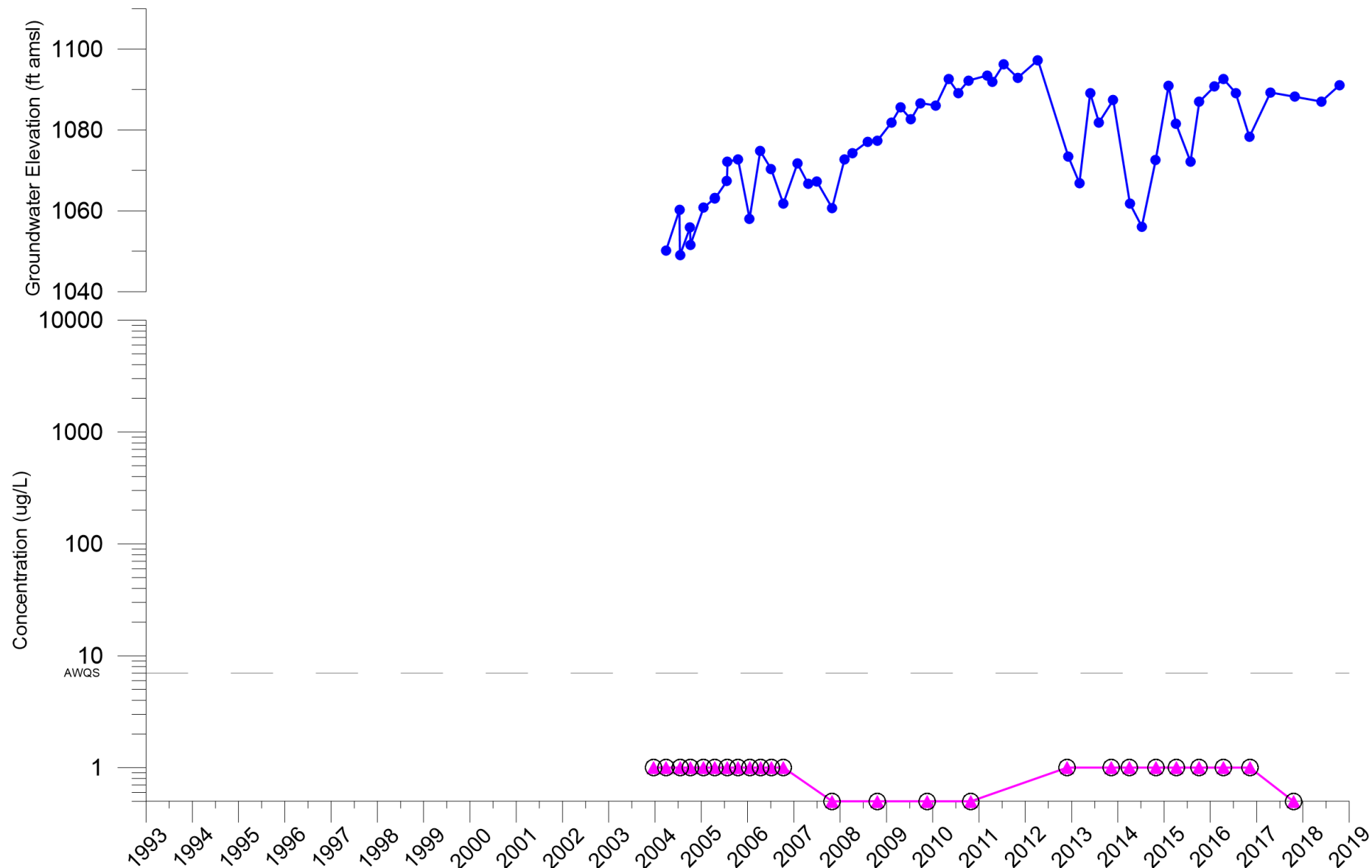
LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ◆ 1,1-Dichloroethene

amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
 7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-33D3



LEGEND:

- Method Detection Limit
- Groundwater Elevation
- ▲ 1,1-Dichloroethene

AWQS
7 ug/L

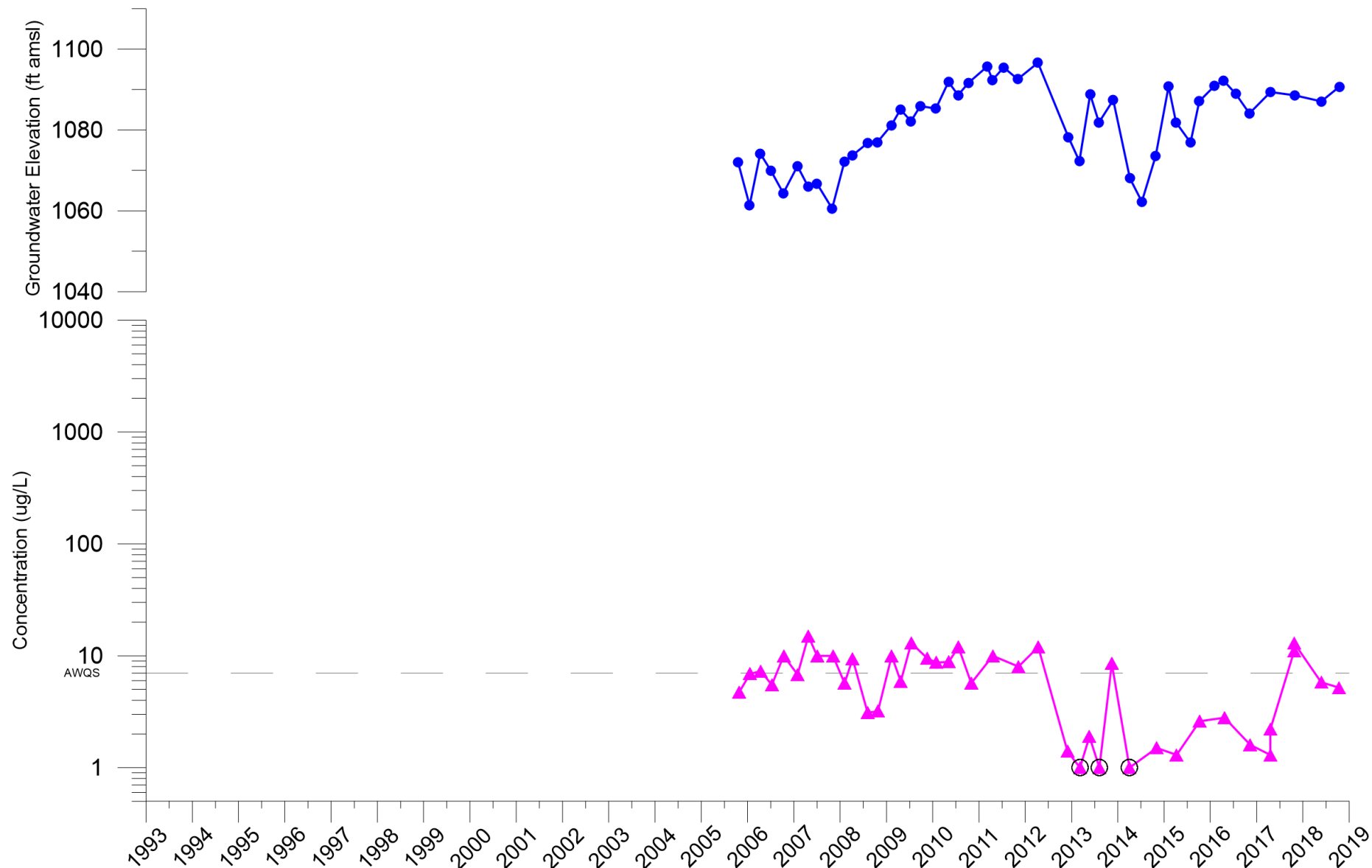
amsl: above mean sea level
ug/L: micrograms per liter

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS

FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA

WELL

MW-33D4



LEGEND:

- Method Detection Limit
- Groundwater Elevation
- ▲ 1,1-Dichloroethene

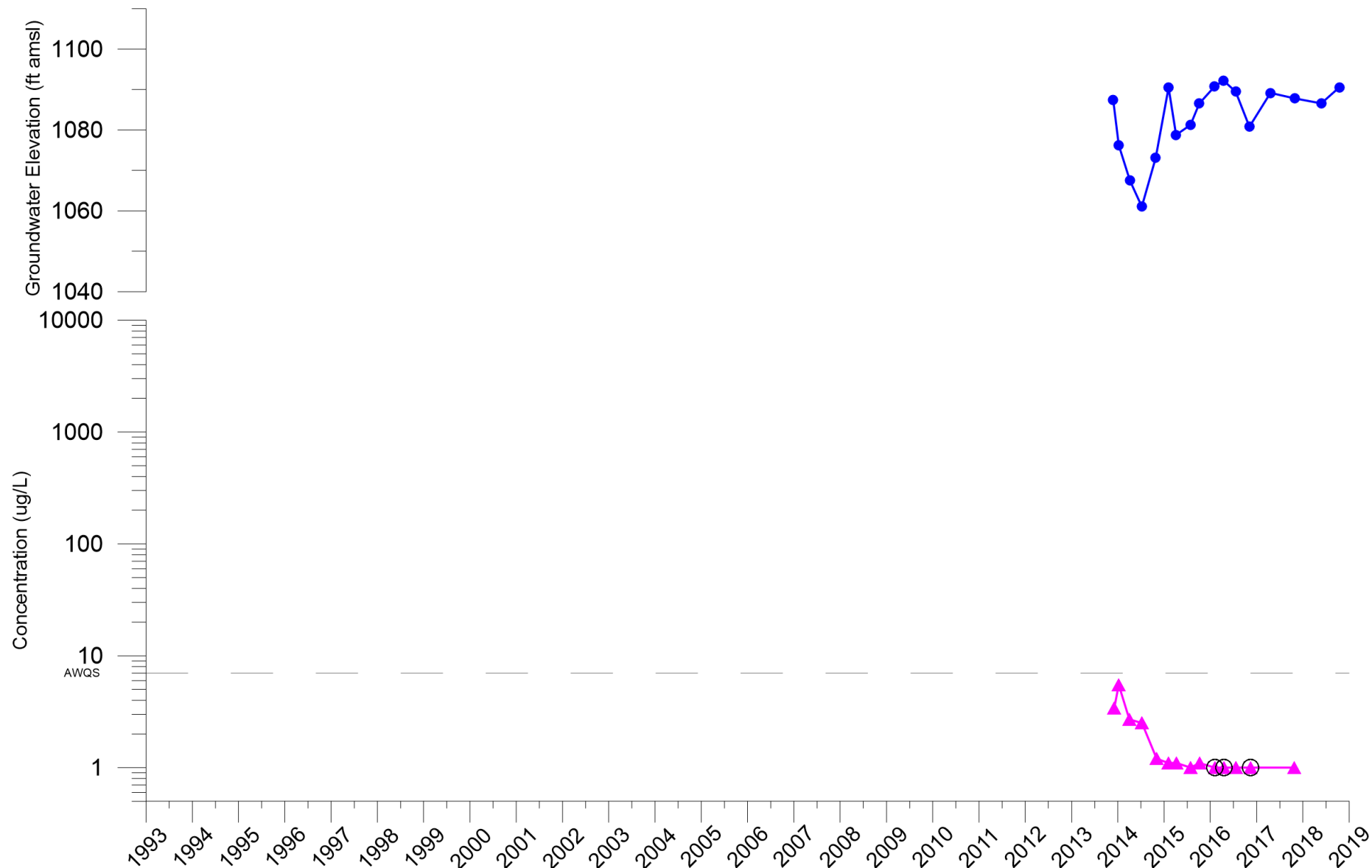
AWQS
7 ug/L

amsl: above mean sea level
ug/L: micrograms per liter

**1,1-DICHLOROETHENE CONCENTRATIONS
AND WATER-LEVEL ELEVATIONS**
FORMER CAPITOL CASTINGS FACILITY
TEMPE, ARIZONA

WELL

MW-34D3



LEGEND:
 ○ Method Detection Limit
 ● Groundwater Elevation
 ▲ 1,1-Dichloroethene
 amsl: above mean sea level
 ug/L: micrograms per liter

AWQS
7 ug/L

1,1-DICHLOROETHENE CONCENTRATIONS AND WATER-LEVEL ELEVATIONS FORMER CAPITOL CASTINGS FACILITY TEMPE, ARIZONA

WELL
 MW-39D3

APPENDIX C

Completed Stakeholder Questionnaires



Periodic Review Questions – ME Global

Former Capitol Castings Facility VRP Site

Tempe, Arizona

Name and Title: Greg Kramer, Corporate Environmental Engineer

Email and/or Phone: gkramer@meglobal.com (218)340-7698

Date: 4/29/19

1. Are you familiar with the Former Capitol Castings (FCC) Facility Voluntary Remediation Program (VRP and the 1,1-dichloroethene (1,1-DCE) affected groundwater (the FCC site)?
Yes
2. Are you aware of the FCC site information repository on the ADEQ website (<https://azdeq.gov/node/3572>)?
Yes
3. Are you familiar with the current status of 1,1-dichloroethene (1,1-DCE) impact to groundwater and the remedial action plan specified in the Record of Decision (ROD)?
Yes
4. Are you aware of the groundwater monitoring/remedial activities at the FCC site?
Yes
5. During the last 3 years have there been any changes to the ME Global's groundwater management program that may affect the FCC site remedy?

No
6. Does ME Global have any wells within 1-mile of the FCC site other than water supply well no. 1? A map showing the locations of wells within 1-mile of the 1,1-DCE -affected groundwater is attached as Figure 1.

No
7. What are the current uses of water in the wells within 1-mile of the FCC site (e.g., drinking water, industrial, fire suppression, monitoring, remediation, irrigation, recharge, etc.)?

Back-up fire suppression

Periodic Review Questions – ME Global

Former Capitol Castings Facility VRP Site

Tempe, Arizona

8. Are there any proposed changes to the wells or current uses of water from the nearby wells (within 1-mile) in the next 5 years? If yes, please describe the changes and the time frames for the proposed changes and any related agreements, permits or documents.

No

9. Is the property where these wells are located owned or leased?

The well is owned and located on the property at 5857 South Kyrene Road

10. If the property is leased, who is the owner of the property; how long is the lease term; and are there plans to renew the lease?

NA

11. Has ME Global ever detected 1,1-DCE in groundwater or other constituents that might have caused a problem in ME Global's well(s)?

This well has not been sampled in the last 20 years – no recent data is available.

12. Do you anticipate that ME Global will install any groundwater wells within 1-mile of the 1,1-DCE -affected groundwater in the next 5 years? If yes, what will the water be used for (e.g. drinking water, water supply, monitoring, remediation, irrigation, etc.), where will they be installed, and what aquifers/depths will be targeted?

No

13. Do you feel well informed about the FCC site activities and progress?

Yes

14. Have there been any complaints, or violations or other incidents attributed to the FCC site activities?

No

Periodic Review Questions – ME Global

Former Capitol Castings Facility VRP Site

Tempe, Arizona

15. Have there been any site visits, inspections, reporting activities conducted by ME Global related to FCC site? If so, please summarize.

No

16. Do you know of any changes in the Local, State, or Federal regulation requirements that may affect the FCC site remedy or remedial objectives as specified in the ROD?

No

17. Are you aware of any ongoing community concerns about the FCC site?

No

18. When you have had to contact/work with Victoria Technology or Arcadis, on the FCC site, were your questions and concerns adequately addressed?

Yes

19. What are the best ways for ADEQ, Victoria Technology, and Arcadis to continue to communicate with you?

Email or phone (above)

Periodic Review Questions - SRP

Former Capitol Castings Facility VRP Site

Tempe, Arizona

Name and Title: Andrea Martinez, Manager, Water Quality and Waste Management Services

Email and/or Phone: Andrea.Martinez@srpnet.com; (602) 236-2618

Date: June 6, 2019

1. Are you familiar with the Former Capitol Castings (FCC) Facility Voluntary Remediation Program (VRP) and the 1,1-dichloroethene (1,1-DCE)-affected groundwater (the FCC site)?

Yes. The FCC site is a monitored natural attenuation (MNA) site with relatively high concentrations of 1,1-DCE at or near the source area. Although the remedy for this site includes MNA with contingencies, SRP continues to be concerned about the concentrations of 1,1-DCE that remain in the groundwater at or near the source area with the potential to migrate towards SRP groundwater wells. SRP continues to believe that further actions are needed to reduce the source area concentrations.

2. Are you aware of the FCC site information repository on the ADEQ website (<https://azdeq.gov/node/3572>)?

Yes.

3. Are you familiar with the current status of 1,1-dichloroethene impact to groundwater and the remedial action plan specified in the Record of Decision (ROD)?

Yes. Please see response to Question #1.

4. Are you aware of the groundwater monitoring/remedial activities at the FCC site?

Yes. Please see response to Question #1.

5. During the last 3 years have there been any changes to the Salt River Project's (SRP's) groundwater management program that may affect the FCC site remedy?

No.

6. Does SRP have any wells within 1-mile of the FCC site other than 21.1E-0.0S, 21.5E-1.0S, 20.6E-1.1S, 21.5E-1.5S? A map showing the locations of wells within 1-mile of the 1,1-dichloroethene-affected groundwater (the FCC site) is attached as Figure 1.

There are no other active SRP groundwater wells within 1-mile of the FCC site in addition to the four SRP wells listed above.

Periodic Review Questions - SRP

Former Capitol Castings Facility VRP Site

Tempe, Arizona

7. What are the current uses of water in the SRP wells within 1-mile of the FCC site (e.g., drinking water, water supply, monitoring, remediation, irrigation, recharge, etc.)?

SRP wells within 1-mile of the FCC site are currently used for monitoring and irrigation purposes.

8. Are there any proposed changes to the wells or current uses of water from the nearby wells (within 1-mile) in the next 5 years? If yes, please describe the changes and the time frames for the proposed changes and any related agreements, permits or documents.

SRP anticipates that all its properties located near the subject area, including the groundwater supply wells and the conveyance structures (i.e., Western Canal), will remain in use for a significant duration of time. In the future, SRP wells are expected to transition from irrigation water supply to also include potable water supply. It is only a matter of time before the City of Phoenix constructs a municipal water treatment plant on the Western Canal. SRP is a critical water supplier and it must be able to assure the City that suitable water quality will be available to meet their anticipated demand.

9. Is the property where these wells are located owned or leased?

SRP-owned properties.

10. If the property is leased, who is the owner of the property; how long is the lease term; and are there plans to renew the lease?

Not applicable.

11. Do you conduct any groundwater monitoring within 1-mile area of the FCC site or review groundwater monitoring data? If so, can you share that data?

SRP conducts routine groundwater sampling of its wells. Water quality records are submitted electronically to the ADEQ groundwater database. If necessary, water quality records can be requested from SRP if there are data gaps in the ADEQ database.

12. Has the SRP ever detected 1,1-dichloroethene in groundwater or other constituents that might have caused a problem at the wells within 1-mile of the FCC site?

Periodic Review Questions - SRP

Former Capitol Castings Facility VRP Site

Tempe, Arizona

Yes, 1,1-dichloroethene (1,1-DCE) has been detected in three of the SRP wells noted in Question #6. From water quality records from 2000 to present, 1,1-DCE was detected in wells:

- **21.1E-0S** from 2009 to 2010, ranging from 0.56-0.7 µg/L.
- **21.5E-1S** from 2002 to 2004 (ranging 0.5-0.9 µg/L) and again in 2013 through 2018 (ranging 0.3-1.6 µg/L). The most recent sample was taken in October 2018 at 0.6 µg/L.
- **21.5E-1.5S** from 2014 to 2015 (ranging 1.1-1.6 µg/L). This well was most recently sampled in September 2016 with a 'below laboratory detection' result. Additional sampling may be needed to determine if levels of 1,1-DCE have rebound over time.

13. Do you anticipate that the SRP will install any groundwater wells within 1-mile of the FCC site in the next 5 years? If yes, what will the water be used for (e.g. drinking water, irrigation, monitoring, remediation, etc.), where will they be installed, and what aquifers/depths will be targeted?

There currently are no plans to install groundwater wells within 1-mile of the FCC site in the next 5 years. However, in the future, additional deep, groundwater supply wells may be needed to supply raw drinking water. SRP's water supply wells are a critical resource especially in drought conditions and it is very important to SRP that it have a reliable supply of water to meet customer and shareholder needs.

14. Have there been any complaints, or violations or other incidents attributed to the FCC site activities?

SRP is not aware of any recent complaints, violations, or other incidents.

15. Have there been any site visits, inspections, reporting activities conducted by SRP related to FCC site? If so, please summarize.

In September 2018, Arcadis requested assistance from SRP to complete the 4th Quarter 2018 sampling for the FCC site. SRP coordinated site access and preparation (well purging) for SRP wells 21.5E-1S and 20.6E-1.1S. Both wells were sampled on October 9, 2018. No other site visits, inspections, or reporting activities have been conducted otherwise.

16. Do you know of any changes in the Local, State, or Federal regulation requirements that may affect the FCC site remedy or remedial objectives as specified in the ROD?

No.

Periodic Review Questions - SRP

Former Capitol Castings Facility VRP Site

Tempe, Arizona

17. Do you feel well informed about the FCC site activities and progress?

Yes. SRP continues to support Arcadis and/or Victoria Technology in maintaining punctual and informative communication with SRP regarding FCC site activities and progress.

18. Are you aware of any ongoing community concerns about the FCC site?

No.

19. When you have had to contact/work with Victoria Technology or Arcadis, on the FCC site, were your questions and concerns adequately addressed?

Yes.

20. What are the best ways for ADEQ, Victoria Technology, and Arcadis to continue to communicate with you?

Email communication is the first preference, followed by phone communication. Please continue using Karis Nelson, Sr. Environmental Scientist (Karis.Nelson@srpnet.com; (602) 236-2916), as the point of contact for SRP.

Periodic Review Questions – City of Tempe

Former Capitol Castings Facility VRP Site

Tempe, Arizona

Justin Bern – Environmental Programs Supervisor for the City of Tempe

Justin_Bern@Tempe.gov / (480) 350-2860

May 31, 2019

1. Are you familiar with the Former Capitol Castings (FCC) Facility Voluntary Remediation Program (VRP) and the 1,1-dichloroethene (1,1-DCE) affected groundwater (the FCC site)?

The City of Tempe (COT) is familiar with the FCC VRP and the affected groundwater site.

2. Are you aware of the FCC site information repository on the ADEQ website (<https://azdeq.gov/node/3572>)?

COT is familiar with the FCC information repository on the ADEQ Website.

3. Are you familiar with the current status of 1,1-DCE impact to groundwater and the remedial action plan specified in the Record of Decision (ROD)?

COT is familiar with the current status of the remedial action plan in the ROD.

4. Are you aware of the groundwater monitoring/remedial activities at the FCC site?

COT is aware of the monitoring activities and “no-action” remedy for the FCC contamination in and around the FCC site.

5. During the last 3 years have there been any changes to the City of Tempe’s (COT’s) municipal groundwater management program that may affect the FCC site remedy?

COT is advancing plans toward fully implementing groundwater recharge at the Ken McDonald golf course (KMGC) in accordance with existing aquifer protection and groundwater storage facility permits. Phased construction of two new recharge wells are planned to provide needed redundancy to the existing recharge well to achieve optimal recharge at this facility.

The City is exploring the potential for expanding recharge capabilities at the KMGC facility. The FCC site remedy has the potential to impact the proposed recharge facility expansion. In addition to the existing wells listed here, COT is planning to develop two recharge wells in the next five years. They have not been built but will move forward with the ADEQ and ADWR-permitted wells. See response to Q.8., below.

Periodic Review Questions – City of Tempe

Former Capitol Castings Facility VRP Site

Tempe, Arizona

6. Does COT have any wells within 1-mile of the FCC site other than monitoring well MW-5? A map showing the locations of wells within 1-mile of the FCC site is attached as Figure 1.

COT does own wells within one mile of the FCC site. They are as follows:

- *Monitoring Wells (MW) 1 – 5 – **Monitoring Wells***
- *Recharge Well 1 – **Recharge Well***
- *Ken McDonald Golf Course Irrigation Well – **Irrigation Well***
- *EPDS Well 17 (SRP-owned and operated / Shared use with COT) – **Production Well***
- *Permitted Recharge Wells 2 & 3*

7. What are the current uses of water in any COT wells within 1-mile of the FCC site (e.g., drinking water, water supply, monitoring, remediation, irrigation, etc.)?

See answers to Question 6, above.

8. Are there any proposed changes to the wells or current uses of water from the nearby wells (within 1-mile) in the next 5 years? If yes, please describe the changes and the time frames for the proposed changes and any related agreements, permits or documents.

COT is planning to develop two recharge well in the next five years. They have not been built but will move forward with the ADEQ and ADWR-permitted wells. The Underground Storage Facility permit allows for up to six wells and all affiliated pipelines and appurtenances.

9. Is the property where these COT wells are located owned or leased?

COT uses MW2 and 3 which are located within the boundaries of the SRP K-7 facility. Well 17 (SRP22E-1.5S) is on SRP land and all others listed above are on COT-owned property

10. If the property is leased by COT, who is the owner of the property; how long is the lease term; and are there plans to renew the lease?

COT does not own any well on leased properties. There is currently an access agreement for MWs on SRP property.

11. Do you conduct any groundwater monitoring in a 1-mile area of the FCC site or review groundwater monitoring data? If so, can you share that data?

Periodic Review Questions – City of Tempe

Former Capitol Castings Facility VRP Site

Tempe, Arizona

COT does regularly monitor and groundwater within the 1-mile area of the FCC site and the data is available as a matter of public record.

12. Has the COT ever detected 1,1-DCE in groundwater or other constituents that might have caused a problem at the wells within 1-mile?

COT has not observed 1,1-DCE in SRP Well 17, KMGCRW and MW2. COT has not sampled for 1,1-DCE in the other wells, identified above, within the 1-mile perimeter.

13. Do you anticipate that the COT will install any groundwater wells within 1-mile of the FCC site in the next 5 years? If yes, what will the water be used for (e.g. drinking water, irrigation, monitoring, remediation, recharge, etc.), where will they be installed, and what aquifers/depths will be targeted?

COT plans to develop the long-term storage capacity for future recovery – AR Wells and install a possible replacement for irrigation well at KMGC.

14. Do you feel well informed about the FCC site activities and progress?

Yes, FCC has historically been proactive and provided information upon request.

15. Have there been any complaints, or violations or other incidents attributed to the FCC site activities?

COT is not aware of any complaints, violation or other incidents attributed to the FCC Site. Although, there is no known mechanism for Tempe become aware of complaints, violation or incidents if they weren't directly reported to Tempe.

16. Have there been any site visits, inspections, reporting activities conducted by COT related to FCC site? If so, please summarize.

COT has not conducted any environmental-related site visits, inspections or reporting activities related to the FCC site.

17. Do you know of any changes in the Local, State, or Federal regulation requirements that may affect the FCC site remedy or remedial objectives as specified in the ROD?

COT is not aware of any changes in local regulatory requirements that may affect the chosen FCC site remedy of "no action" as specified in the ROD.

18. Are you aware of any ongoing community concerns about the FCC site?

Periodic Review Questions – City of Tempe

Former Capitol Castings Facility VRP Site

Tempe, Arizona

COT is not aware of current community concerns about the FCC Site but we can assist this request by including a questionnaire in the Tempe residential water bills within a 2.5mile perimeter of the plume.

19. When you have had to contact/work with Victoria Technology or Arcadis, on the FCC site, were your questions and concerns adequately addressed?

COT questions and concerns have been adequately addressed for past conversations.

20. What are the best ways for ADEQ, Victoria Technology, and Arcadis to continue to communicate with you?

The COT contact for environmental regulatory matters is Justin Bern, Environmental Programs Supervisor.

Arcadis U.S., Inc.

410 N. 44th Street

Suite 1000

Phoenix, Arizona 85008

Tel 602 438 0883

Fax 602 438 0102

www.arcadis.com