RECORD OF DECISION
SOUTH MESA WQARF REGISTRY SITE
MESA AND GILBERT, ARIZONA

Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

ADEQ
Arizona Department
of Environmental Quality

June, 2016

South Mesa WQARF Registry Site
Record of Decision

APPROVAL PAGE

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1.0 DECLARATION

1.1 Site Name and Location

This Record of Decision (ROD) is for the South Mesa Water Quality Assurance Revolving Fund (WQARF) Registry Site (SMWRS), located in Mesa and Gilbert, Maricopa County, Arizona. The SMWRS is bounded by Southern Pacific Company railroad tracks to the south and Union Pacific Railroad tracks to the west, on the east by Stapley Road/Cooper, and on the north by Broadway Road; however, the area of impact is currently limited to the former Applied Metallics Incorporated (AMI) facility at the southeast corner of the intersection of Baseline Road and McQueen Road in Gilbert, Arizona (see Figure 1). The SMWRS was placed on the WQARF Registry in August 1998 with an eligibility and evaluation score of 26 out of a possible 120.

1.2 Purpose

This ROD presents the selected remedial action for volatile organic contaminants (VOCs) in groundwater at the SMWRS in accordance with Arizona Revised Statutes (A.R.S.) §49-287.04. The decision in this ROD is based upon previous activities and investigations conducted and performed for this Site and documented in ADEQs Administrative Records file. The State of Arizona, acting by and through the Arizona Department of Environmental Quality (ADEQ), has selected the remedy detailed in this document.

1.3 Assessment of the Site

Volatile organic compounds (VOCs) historically detected in groundwater samples collected within the boundaries of the Site were PCE, trichloroethene (TCE), cis-1,2-dichloroethene (c-1,2-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,-dichloroethene (1,1,-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-DCA, 1,2-dichloropropane (1,2-DCP) and toluene. However, PCE has been detected in the highest concentrations and is the most widespread VOC. Currently only PCE exceeds the AWQS of 5 micrograms per liter (µg/L).

Remedial investigation and groundwater monitoring activities conducted since 1983 indicated that soil and groundwater at the SMWRS had been impacted by tetrachloroethene or PCE, which is a chlorinated solvent used primarily as a degreaser. Based on the Phase I and II Investigations and the Preliminary Assessment/Site Investigation work conducted by ADEQ, a potential source of the VOC impact was identified as a drywell located at the former AMI facility at 1545 North McQueen Road,

Gilbert, Arizona, located south of the intersection of McQueen Road and Baseline Road (Figure 1). A Site Plan for the former AMI facility is shown on Figure 2. As shown on Figure 2, the property is occupied by an approximate 2,000-square foot building that has a concrete floor slab. The remainder of the property is paved with asphalt and concrete. AMI leased the property from 1979 to 1990 and operated a facility that produced metal plated electronic parts. Parts were plated with tin, copper, chromium, nickel and zinc. The plating process used acids (chromic, nitric, sulfuric and hydrochloric) and cyanide (copper plating process). Acids (nitric, sulfuric, hydrochloric, acetic and phosphoric) and chlorinated solvents were also used to clean/degrease parts prior to plating. AMI used a chemical called *Perclene*, which contained 99 percent PCE (Water Resources Associates [WRA], 1991).

Remedial actions, in the form of Early Response Actions (ERAs), were conducted at the SMWRS from 1993 to 2008. The ERAs included pumping of impacted groundwater by Salt River Project (SRP) well and performance of soil vapor extraction (SVE) at the former AMI facility. These ERAs removed a majority of the released PCE; however, as of the date of this ROD, dissolved PCE still remains in the groundwater above the Arizona Aquifer Water Quality Standard (AWQS) of 5.0 µg/L, though the extent of the impact is limited to the immediate area of the former AMI facility (see Figure 1). The impact is also limited to the Upper Alluvial Unit (UAU), which has a thickness in the area from ground surface to approximately 240 feet below ground surface (bgs). There are also two SRP wells located within the area, identified as 28E-0N and 28.5E-1N. The locations of SRP wells 28E-0N and 28.5E-1N relative to the former AMI facility are shown on Figure 1.

1.4 Description of the Selected Remedy

The selected remedy for the SMWRS is groundwater sampling and monitoring with well-head treatment contingency, to allow unrestricted use of SRP wells 28E-0N and 28.5E-1N. Monitoring operation of SRP Wells 28E-0N and 28.5E-1N will be conducted to ensure that PCE concentrations do not exceed concentrations that restrict SRP water use from these wells and will also monitor for migration of the plume to the northeast if SRP Well 28.5E-1N is also pumped (Figure 1). Since there are no monitoring wells screened entirely in the Middle Alluvial Unit (MAU) (greater than 240 feet bgs) in the area, monitoring of groundwater extracted from appropriate City of Mesa (COM) (Mesa Wells No. 10, No. 13, and No. 14) and Town of Gilbert (TOG) municipal well (SRP 29E-1N) (Figure 1) would be conducted to evaluate the potential future impact of the SMWRS plume on these MAU

water supplies. If PCE is detected at SRP wells at concentrations that would restrict water use, then ADEQ will institute wellhead treatment as a contingency to allow unrestricted water use by SRP.

The contingency to supplement the selected remedy, is based on the potential that PCE concentrations in water samples collected from the SRP wells exceed the risk-based PCE concentration of 33 µg/L for irrigation use or 5.0 µg/L if SRP changes the water use designation to drinking water. The contingency includes a wellhead treatment program. Groundwater monitoring will continue while wellhead treatment is implemented at the SRP wells using a series of GAC vessels to treat SRP well effluent. This is a feasible and cost effective approach to achieve the remedial objectives (ROs) and closure of the SMWRS.

1.5 Statutory Determinations

In June 2013, ADEQ completed the Remedial Investigation (RI) report (AMEC, 2013a) and in April 2014 the Feasibility Study (FS) report (AMEC, 2014a) was completed pursuant to Arizona Revised Statutes (A.R.S.) §49-287.03. The RI report:

- Established the nature and extent of the contamination and the 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;
- Obtained and evaluated information necessary for identification and comparison of alternative remedial actions.

Based on this information, the FS evaluated three different remedial options and identified the remedy for use at the Site. The FS:

- Provided for the development of a reference remedy and at least two alternative remedies which were capable of achieving all of the remedial objectives;
- Insured that the reference remedy was based upon best engineering, geological, or hydrogeological judgment;
- Provided one alternative remedy that was more aggressive than the reference remedy; and
- Provided one alternative remedy that was less aggressive than the reference remedy.

In accordance with A.R.S. §49-287.04, the Proposed Remedial Action Plan (PRAP) discussed the reference remedy recommended by the FS and provided costs to implement the reference remedy (AMEC, 2014b). Public comments on the selected remedy were solicited but none were received. The PRAP:

- Identified the boundaries of the Site;
- Identified results of the RI and FS;

- Proposed the selected remedy and its cost; and
- Described how the remedial goals and selection factors were evaluated.

Pursuant to ARS §49-287.04(H), this ROD is the final administrative decision as defined under ARS §41-1092. MNA with contingencies is selected as the remedy for the SMWRS because it meets the following criteria:

- Adequately assures the protection of public health and welfare of the environment;
- To the extent practicable, provides for the control, management and cleanup of the PCE maximizing beneficial use of the groundwater; and
- Is reasonable, necessary, cost-effective and technically feasible.

2.0 SITE BACKGROUND

2.1 Site Description

The Site is located within the boundaries of the former WQARF South Mesa Phase I Study Area and the former WQARF Phase II-A Hydrogeologic Study Area. The SMWRS is generally bounded on the south and west by railroad tracks, on the east by Cooper/Stapley Road, and on the north by Broadway Road (Figure 1). Based on the most recent groundwater data, the SMWRS contaminant plume encompasses a smaller area described as being in the immediate vicinity of the former AMI facility at 1545 North McQueen Road, Gilbert. The original WQARF investigation was prompted by the 1983 discovery of VOC contamination in two irrigation wells owned and operated by SRP (Wells 28E-0N and 28.5E-1N).

In 1987, ADEQ began to investigate the nature and extent of the contamination identified in the SRP wells. The VOCs historically detected in groundwater samples collected within the boundaries of the Site were PCE, trichloroethene (TCE), cis-1,2-dichloroethene (c-1,2-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1,-dichloroethene (1,1,-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-DCA, 1,2-dichloropropane (1,2-DCP) and toluene. However, PCE has been detected in the highest concentrations and is the most widespread VOC. Currently only PCE exceeds the AWQS.

2.2 Chronology of Events

A detailed history of site investigations and Early Response Actions (ERAs) completed at the SMWRS is provided in the RI Report (AMEC, 2013a) and the FS Report (AMEC, 2014a). The following provides a brief summary of the main events and investigative/ERA milestones for the SMWRS:

Table 1.
Chronology of Major Events
South Mesa WQARF Registry Site

Date	Event
1919	SRP Well 28E-0N drilled.
1940	SRP Well 28E-0N deepened to current depth. Water in 1945 reported at 56 feet bgs.
1951	SRP Well 28.5E-1N drilled. Water is reported at 140 feet bgs.

Table 1.
Chronology of Major Events
South Mesa WQARF Registry Site

Date	Event
1979-1990	AMI operated a metal plating facility at 1545 North McQueen Road. A drywell was used to dispose of wastes.
1983	ADWR reported first groundwater in South Mesa area was greater than 200 feet deep.
1983	SRP conducted region-wide sampling of their production well system. PCE was detected in SRP Wells 28E-0N and 28.5E-1N. Water was reported at 274.2 feet bgs in SRP Well 28E-0N. SRP subsequently took Well 28E-0N off-line.
1987-1988	Kleinfelder performed Phase I Investigation of South Mesa WQARF Area. The AMI facility, located near the intersection of Baseline Road and McQueen Road, was identified as a possible source.
1989	Western Technologies, Inc. (WTI) performed an initial assessment of AMI.
1990-1991	Kleinfelder performed Phase II Hydrogeological Investigation, installed 9 monitoring wells and drilled 2 exploratory borings. Depth to water ranged from 138 feet bgs to 164 feet bgs.
1991	WRA identified a dry well at AMI and installed a single monitoring well (MW-AM-8S). Soil samples were collected to 60 feet bgs and concentrations of PCE below the Groundwater Protection Level (GPL) are reported.
1991	SRP conducted a risk assessment and determined a risk-based PCE discharge level of 33 µg/L for SRP Well 28E-0N. PCE in water pumped from SRP Well 28E-0N exceeded 700 µg/L and PCE in water pumped from SRP Well 28.5E-1N ranged from 30-33 µg/L.
1993	A wellhead treatment system was installed on SRP Well 28E-0N and the well was placed back on-line.
1994	SRP Well 28.5E-1N was taken off-line.
1995	Earth Technologies, Incorporated (Earth Tech) performed a soil vapor investigation at AMI. Fifteen samples were collected. Highest PCE concentration reported was 110 ug/L near the northeast corner of the site structure and approximately 100 feet from the dry well. A septic tank was present on the west side of the site.
1995	Earth Tech installed 3 vapor extraction wells (VW-1, VW-3, and VW-4) and a SVE system at the site. Soil samples were collected during drilling of VW-1 and VW-3 and PCE concentrations were below the GPL.

Table 1.
Chronology of Major Events
South Mesa WQARF Registry Site

Date	Event
1995-1996	On June 30, 1995, Earth Tech began operation of the SVE system. The SVE system was operated until June 10, 1996, over which time approximately 1,053 pounds of VOCs were reportedly removed from the vadose zone.
1996	EMCON installed two additional vapor wells at AMI: VW-5 (located near the soil vapor sample location reported with 110 µg/L PCE) and VW-6 (located near the former dry well). Detectable concentrations of PCE were not reported in the soil samples.
1996	Concentrations of PCE in water pumped from SRP Well 28E-0N were consistently less than 33 µg/L. SRP subsequently removed the wellhead treatment system.
1997	VW-6 was incorporated into the SVE system. The SVE system operated from February 13, 1997 through June 12, 1997, over which time an additional 54 pounds (lbs) of VOCs were extracted. The SVE system was then shut-down due to low extraction rates. A total of 1,107 lbs or approximately 85 gallons of VOCs were removed from the vadose zone between 1995 and 1997.
1997	SRP determined that water from SRP Well 28E-0N was no longer needed. The well was taken off-line and operated only for periodic maintenance and sampling between 1997 and present. The bottom 150 feet of SRP Well 28.5-1N was abandoned to protect downgradient supply wells.
1991-1998	ADEQ conducted periodic sampling of the South Mesa wells.
March 2000 – February 2001	Compiled data for the Site, prepared a Conceptual Site Model and identified data gaps. Obtained records that a septic tank and a 60-foot deep seepage pit were located on the west side of the former AMI site. The seepage pit was not investigated during previous investigations.
May 2001 – July 2001	A geophysical survey and passive soil gas survey were performed at the former AMI facility.
August 2001 – September 2001	Characterized the nature and vertical extent of vadose zone and groundwater impact at the former AMI facility. Ten additional groundwater monitoring points were installed.
June 2002	Installed four additional groundwater monitoring points in a nested monitoring well in the vicinity of 9th Avenue and Horne Drive in Mesa, Arizona to define the downgradient extent of PCE impact at the Site.
June 2002	Indoor air quality samples were collected at the 1545 North McQueen Road building to assess migration of VOC vapors from the vadose zone into the building.

Table 1.
Chronology of Major Events
South Mesa WQARF Registry Site

Date	Event
July 2002	Three additional passive soil vapor samples were collected at the former AMI facility to define the areal extent of soil vapor impact to the west.
July 2002	Depth-specific groundwater samples were collected from SRP Well 28E-0N to obtain a vertical contaminant profile.
July 2002	Groundwater monitoring of the Site wells.
December 2002	Collected a second round of indoor air quality samples at the 1545 North McQueen Road building.
January 2004	ADEQ requested AMEC to implement soil vapor extraction as an ERA to mitigate the vapor intrusion into the 1545 N. McQueen Road Building. A bi-annual groundwater monitoring program was also implemented.
June 2004	Baseline groundwater sampling event for the ERA. Nested vapor well VW-7A, VW-7B, and VW-7C was installed at the former AMI facility.
July 2004	The SVE system was connected to vapor wells VW-5 and VW-7.
September 2004 – May 2008	Operated SVE system as ERA.
December 2004 – September 2008	Periodically conducted groundwater sampling.
May 2008	SVE system was decommissioned and removed from Site.
October 2008	Installed four additional groundwater monitoring points in a nested monitoring well (MW-14) east of the intersection of McQueen Road and Melody Drive in Gilbert, Arizona to evaluate groundwater conditions to the south of the former AMI facility.
March 2011	Draft RI Report submitted to ADEQ.
July 2011	Draft RI Report made available for public comment.
April-May 2012	Performance of FS support activities including a groundwater monitoring event and collection of an indoor air quality sample from Suite 1 of the 1545 North McQueen Road building.
June 2012	Final FS Work Plan submitted to ADEQ.
December 2012	Performance of annual groundwater sampling event in support of FS.

Table 1.
Chronology of Major Events
South Mesa WQARF Registry Site

Date	Event
February 2013	RO Report presented to the public for comment and then finalized.
June 2013	Final RI and RO Reports are submitted with public comments and responsiveness summaries.
October 2013 and November 2014	Performance of groundwater sampling events in support of FS and PRAP.
April 2014	Final FS Report is submitted to ADEQ.
November 2014	Final PRAP is submitted to ADEQ.
November 2015	PRAP Presented to the public for comment and then finalized.

2.3 Soil, Soil Vapor and Groundwater Conditions

The only compounds that were found to exceed risk-based cleanup levels in soil, soil vapor, and/or groundwater were PCE and TCE. PCE and TCE were not detected in soil samples collected at the former AMI facility above risk-based soil cleanup levels. PCE was the only analyte present in soil samples at concentrations above laboratory reporting limits. PCE concentrations reportedly ranged from 0.04 milligrams per kilogram (mg/kg) to 0.28 mg/kg in samples collected between 25 and 60 feet in depth.

During May 1995, The Earth Technology Corporation (Earth Tech) completed a 15-point soil vapor survey at the former AMI facility. The soil vapor samples were collected at selected areas around the property perimeter and at locations believed to be near potential source areas. Soil gas samples were collected from approximately two feet bgs and analyzed for 1,1-DCE, TCE, and PCE. PCE was the only analyte reported at concentrations above the analytical laboratory's reporting limit. The highest reported pre-SVE system operation PCE concentration in soil gas was 110 µg/l from SG-6 (estimated to be approximately 25 feet east and 10 feet north of the northwestern corner of the building) (Figure 2). In 1995, Earth Tech installed a soil vapor extraction (SVE) system at the former AMI facility. System operation began on June 30, 1995. Initial PCE concentrations in the extracted vapors were reported as follows: 490 µg/l from VW-1; 1,000 µg/l from VW-3; and, 15,000 µg/l

from VW-4. The SVE system operated until June 1997, at which time the highest total VOC concentrations was reported in VW-4, at approximately 85 µg/l. Between June 30, 1995 and June 12, 1997, Earth Tech estimated that approximately 1,107 lbs of VOCs had been extracted from the subsurface. By June 12, 1997, Earth Tech estimated that approximately 0.51 lbs of VOCs were being removed per day.

As indicated previously, ERAs have been performed and were completed in 2008. Since that time, the only VOC detected in groundwater samples above Arizona AWQSs is PCE until March 2014 when c-1,2-DCE was detected at BARCAD well MW-10-170. The c-1,2-DCE appears to be limited in extent to the vicinity of the BARCAD well and no longer exceeds the AWQS of 70 µg/L. The maximum PCE concentration detected in a groundwater sample collected at the Site since 2001 is 18 µg/L, which is above the AWQS and the groundwater cleanup goal for the Site of 5.0 µg/L. The February 2016 PCE concentrations and estimated PCE distribution are shown on Figure 7. As shown on Figure 7, PCE above the AWQS of 5.0 µg/L is limited to monitoring wells located at the former AMI facility.

3.0 SELECTED REMEDY

3.1 Remedy Determination

The proposed remedy that was selected by the FS and carried forward to the Proposed Remedial Action Plan (PRAP) consisted of the following (AMEC, 2014b):

- Natural attenuation; and,
- Monitoring with contingencies, if necessary.

The FS was prepared in April 2014 (AMEC, 2014a) to evaluate remedial alternatives for VOCs in groundwater at the SMWRS. The FS was prepared in accordance with Arizona Administrative Code (A.A.C.) R18-16-407 and relied upon the data contained in the RI report. The remedial alternatives were developed to meet the ROs (ADEQ, 2013).

Monitored natural attenuation (MNA) with contingencies was selected as the remedy for the SMWRS. ERAs conducted at the AMI property have removed the majority of the released PCE however, as of the date of this ROD, dissolved PCE still remains in the groundwater above the Arizona Aquifer Water Quality Standard (AWQS) of 5.0 µg/L. Contaminant concentrations in groundwater have been declining over time and with distance from the source area. Based on these findings, it is apparent that Site conditions exist in which natural attenuation is reducing the concentrations of the VOCs through a combination of reductive dechlorination and dilution.

Based on human health risk screening, the exposure pathways that influence land use ROs at the SMWRS are direct contact with impacted soil and intrusion of PCE vapors into the on-site building at the former AMI facility (AMEC, 2013b). ERAs using SVE have been conducted at the former AMI facility and addressed both the concentrations of contaminants in soil and soil vapor to the extent that exposure pathways have been mitigated. On this basis, the ROs for land use have been achieved. Therefore, no further development of remedies for land use ROs is necessary.

3.2 Remedy Determination-Groundwater

The reference remedy of MNA as identified by the FS and PRAP has been selected as the remedy for the SMWRS. The selected remedy requires monitoring and sampling of groundwater monitoring wells and obtaining analytical data from SRP wells if/when pumped. This remedy will monitor PCE migration and attenuation as contaminant mass is dissolved/degraded from the UAU. Groundwater sampling will be performed twice annually, in January and July of each year at monitoring wells. This will capture water quality data during winter and summer pumping schedules. Water levels will

also be measured quarterly to evaluate seasonal changes in groundwater flow direction. This should be a sufficient time period to evaluate changes in groundwater concentrations in the UAU if/when the SRP wells are pumping.

Currently concentrations of PCE in the SRP irrigation wells 28E-0N and 28.5E-1N are non-detect as of the last sampling round conducted in January of 2015. As a contingency to this remedy, in the event PCE concentrations in water samples collected from the SRP wells exceed risk-based water use levels established by SRP of 33 µg/L for irrigation use or 5.0 µg/L if the use designation changes to drinking water during the five year monitoring period, a wellhead treatment program will be implemented. Groundwater monitoring will continue while wellhead treatment is implemented at the SRP wells using a series of granular activated carbon (GAC) vessels to treat SRP well effluent.

Groundwater monitoring will continue while wellhead treatment is implemented at the SRP wells using a series of GAC vessels to treat SRP well effluent. This contingency includes installation and service of a GAC wellhead treatment system with four HP1220SYS-S model treatment vessels, each containing 20,000 pounds of GAC and installation of concrete support pads. Based on historic operation of a wellhead treatment system at the SMWRS, this contingency is scoped and costed for a period of five years. An increase in contaminant concentrations or change in water use is very unlikely during the remedy period but this scenario has been anticipated and costed.

At the end of the selected remedy the groundwater monitor wells will be abandoned and the SMWRS will be delisted. Costs for abandonment and delisting are presented below.

3.3 Demonstration of Compliance with A.R.S. §49-282.06

MNA has been selected as the remedy for the Site. Based on a comparison with the reference remedy and more aggressive remedy in the FS report, the less aggressive remedy (MNA):

1. Adequately assures the protection of public health, welfare, and the environment.
2. To the extent practicable, provides for the control, management and cleanup of PCE contamination, maximizing beneficial use of the groundwater use; and
3. Is reasonable, necessary, cost-effective, and technically feasible.

The remedy is consistent with A.R.S. §49-282.06 as it provides protection to the public by providing control of hazardous substances with natural attenuation and monitoring with contingencies. Future use of groundwater by private or municipal well owners in the area is not anticipated based on the Land and Water Use Study.

3.4 Consistency with General Land Use Plans

The Site is located in mixed commercial area of the COM and TOG and is projected to remain as such for the foreseeable future. There is no indication that they will change the current land use of the former AMI facility from the current commercial use, specifically changing the current land use to one that is residential. For this reason, the remedy is consistent with land use planning.

3.5 Consistency with Water Use Plans

The selected remedy is capable of achieving the ROs for groundwater use and is consistent with planned water uses at the SMWRS.

3.6 Remedy Commencement and Duration

The remedy will formally begin once this ROD is fully executed and entered into ADEQ's Administrative Record. Because contaminated groundwater is still present at the SMWRS slightly above AWQSs, the remedy will remain in place until contaminants are no longer present above respective AWQS or the Director determines that the conditions of A.R.S §49-282.06[D] have been met. Based on current groundwater data trends, for cost estimating purposes, ADEQ calculates the duration of this remedy is five years.

A 5-year, long-term groundwater monitoring program will be established for the SMWRS. It is assumed that the monitoring program would use the existing well network. The selected remedy requires monitoring and sampling of groundwater monitoring wells and obtaining sampling results from SRP if the SRP wells are pumped. This remedy will monitor PCE migration and attenuation as contaminant mass is dissolved/degraded from the UAU. Groundwater sampling will be performed twice annually, in January and July of each year at monitoring wells. This will capture water quality data during winter and summer pumping schedules. Water levels will also be measured quarterly to evaluate seasonal changes in groundwater flow direction. This should be a sufficient time period to evaluate changes in groundwater concentrations in the UAU if/when the SRP wells are pumping. There are a total of 31 monitoring wells to be sampled. This monitoring network may be reduced as judged appropriate as the areal extent of the plume decreases with progression of the remedy.

During the 5-year groundwater monitoring period, a Periodic Site Review will be performed at year three (2019) to confirm the effectiveness and adequacy of the implemented remedy in meeting the remedial objectives. As part of each Periodic Site Review, a groundwater use survey of the SMWRS

Community Involvement Area (CIA) will be performed to identify potential changes to groundwater usage by the public.

3.7 Cleanup and Performance Standards

Table 2.
Groundwater Cleanup Levels for Contaminant of Concern
South Mesa WQARF Registry Site

Chemical of Concern	Cleanup Level	Basis for Cleanup Level
Tetrachloroethene (PCE)	5.0 µg/L, 33 µg/L	AWQS, SRP

3.8 Community Involvement and Acceptance

ADEQ has completed the required community involvement and public comment requirements for the SMWRS. The SMWRS has been the subject of public involvement dating back to 1983, when contaminated groundwater was discovered in SRP wells 28E-0N and 28.5E-1N.

Table 3.
Community Involvement Activities
South Mesa WQARF Registry Site

Community Involvement Activities	Regulatory Citation/Rule	Date
Establish Community Involvement Area (CIA)	A.R.S. § 49-289.02(A)	September 7, 1999 October 3, 2000
Notice of the site listing on the Registry	A.R.S. § 49-287.01 A.R.S. § 49-289.03(A)	June 22, 1998
Hazardous substance contamination notice and fact sheet	A.R.S. § 49-289.02(B) A.R.S. § 49-287.03(B) A.A.C. R18-16-404(C)(1)(i)	May 24, 1999
Community Involvement Plan (CIP)	A.R.S. § 49-287.03(D) A.R.S. § 49-289.03(C) A.A.C. R18-16-403(E) A.A.C. R18-16-404(C)	July 2003
Establish Community Advisory Board (CAB) selection committee	A.R.S. § 49-289.03(D)	May 12, 2000
Establish CAB	A.R.S. § 49-289.03(C) A.R.S. § 49-289.03(F)(1)	January 23, 2001
Notice of Remedial Investigation (RI) scope of work, fact sheet, and outline of CIP	A.R.S. § 49-287.03(B) A.R.S. § 49-287.03(C) A.A.C. R18-16-403(F) A.A.C. R18-16-403(G)	May 5, 2000
Establish information repository	A.R.S. § 49-289.03(B)	June 2000
Questionnaires mailed for draft Land and Water Use Study	A.A.C. R18-16-404	October 2002
Notice of opportunity to comment on draft RI report	A.A.C. R18-16-404(C)(1)(b) A.A.C. R18-16-406(F)	May 30, 2011
Public meeting to establish Remedial Objectives (ROs)	A.A.C. R18-16-404(C)(1)(b) A.A.C. R18-16-406(I)	July 20, 2011
Notice of opportunity to comment on proposed RO report.	A.A.C. R18-16-404(C)(1)(c) A.A.C. R18-16-406(I)	February 4, 2013
Public meeting(s) to discuss proposed/revised RO report if needed	A.A.C. R18-16-406(I)(5)	NA
Notice of availability of final RI and RO reports	A.A.C. R18-16-406	June 2013
Notice of availability of the Feasibility Study (FS) work plan	A.A.C. R18-16-404(C)(1)(d)	June 2012
Issue notice of availability and opportunity to comment on the Proposed Remedial Action Plan (PRAP)	A.R.S. § 49-287.04(B) A.A.C. R18-16-404(C)(1)(e)	November 2015
Notice of Record of Decision (ROD) & Responsiveness Summary Availability	A.R.S. § 49-287.04 (G) A.A.C. R18-16-404(C)(1)(f)	Notice will be published

In addition, the community has been kept advised of investigative and cleanup activities at the SMWRS site through presentations by ADEQ, Community Advisory Board (CAB) meetings and various public notices.

Notice of the availability of the PRAP was made available on November 12, 2015. The 90-day public comment period for the PRAP is an opportunity for the public to provide input on the proposed remedial alternatives for the SMWRS. No comments were received during the public comment period.

3.9 Remedy Review

Current data trends indicate that the ROs will be met in an estimated 5 years. At that time, groundwater monitor wells will be abandoned and the SMWRS delisted. However, should current degradation progress be affected by changing groundwater conditions such as changes in groundwater pumpage or degradation parameters, then a 10-year MNA contingency is predicted and scoped for the selected remedy.

Also as a contingency to the selected remedy, in the event PCE concentrations in water samples collected from the SRP wells exceeds the risk-based PCE concentration of 33 µg/L for irrigation use or 5.0 µg/L if SRP changes the water use designation to drinking water, a wellhead treatment program will be implemented. Groundwater monitoring will continue while wellhead treatment is implemented at the SRP wells using a series of GAC vessels to treat SRP well effluent. This contingency includes installation and service of a GAC wellhead treatment system with four HP1220SYS-S model treatment vessels, each containing 20,000 pounds of GAC and installation of concrete support pads. Based on historic operation of a wellhead treatment system at the SMWRS, this contingency is scoped and costed for a period of five years. An increase in contaminant concentrations or change in water use is very unlikely during the remedy period but this scenario has been anticipated and costed.

4.0 RESPONSIVENESS SUMMARY

As per A.A.C. R18-16-410(B)(2) and A.R.S. 49-287.04(F), a comprehensive responsiveness summary shall be prepared by the director regarding all comments received on the PRAP after the conclusion of all public comment periods. A 90-day comment period for the PRAP was held starting on November 12, 2015. No comments were received during this public notice/comment period and therefore no responsiveness summary is included.

5.0 COST ESTIMATE FOR SELECTED REMEDY

The estimated costs of the remedy shall include recoverable remedial action costs incurred by the State and projected future remedial action costs. As required in A.A.C. R18-16-410(C), the following are costs for the site characterization and ERAs excluding non-recoverable costs incurred by ADEQ and projected future remedial action costs.

5.1 Historic Costs

Groundwater contamination was discovered in SRP wells in 1983. Investigation of the SMWRS by ADEQ began in 1987 and will continue as the proposed remedy is implemented. ERAs were conducted at the SMWRS from 1993 to 2008 and were instrumental in reducing contaminant concentrations and risk of exposure. Significant costs have been incurred by ADEQ and SRP during characterization of the site and the implementation of the ERAs. These activities to date have cost ADEQ $3,207, 945.01.

5.2 Future Costs

The selected remedy is cost-effective for mitigating the risks posed by PCE in contaminated groundwater at the SMWRS. The selected remedy requires groundwater monitoring and sampling of monitor wells and collecting data from SRP, if the SRP wells are pumped, until PCE concentrations are below the AWQS of 5 which is calculated to be five years based on degradation trends.

For cost estimation purposes, the monitoring program will consist of the following:

- Depth to water in wells will be measured quarterly each year (July, October, January and April in accordance with ADEQ fiscal year) (Table 4).
- Groundwater samples will be collected in July and January of each ADEQ fiscal year from conventional monitoring wells (Table 4). Effluent sampling results will be requested from SRP of SRP wells 28E-0N and 28.5E-1N. A total of 38 samples, including duplicate samples, will be collected. The groundwater samples will be analyzed for VOCs using Environmental Protection Agency Method 8260B.

The cost breakdown for completing the remedy and site delisting is for 5 years. The costs for years 1 through 5 are as follows:

- Groundwater Monitoring and Sampling - $190,000
- Data Management and Reporting - $75,000

- Project Management and Administrative - $30,000
- Well Abandonment and Site Delisting – $175,000
- Total Cost years 1 through 5 - $470,000

If groundwater conditions change and the contaminant degradation process is stalled then a contingency for the selected remedy to be extended for ten years has been scoped and costed. The costs for the contingency of years 6 through 15 are as follows:

- Groundwater Monitoring and Sampling - $380,000
- Data Management and Reporting - $150,000
- Project Management and Administrative - $60,000
- Additional Total Cost years 6 through 15 – $590,000

Also, as previously mentioned, if contaminant concentrations increase or current groundwater use changes, then a contingency for SRP wellhead treatment has been scoped and costed for a five year remedy period. These contingency costs are as follows:

- Wellhead Treatment System Installation - $2,480,000
- GAC Replacement - $350,200
- Monitoring, Profiling, and Oversight - $375,000
- Groundwater Monitoring and Sampling - $190,000
- Data Management and Reporting - $157,000
- Project Management and Administrative - $60,400
- Additional Total Cost – $3,612,600

The total cost for remedy implementation is $4,672,600.

6.0 CONCLUSIONS

The chosen remedy for VOCs in groundwater associated with the SMWRS is monitoring and sampling groundwater and obtaining effluent sample results of the SRP wells from SRP. A contingency for changes in groundwater conditions and well head treatment is also part of the selected remedy. The remedy selected is necessary because it provides protection to the public by preventing exposure to the contaminated groundwater and meets the ROs in a reasonable, cost-effective, and technically feasible manner.

7.0 REFERENCES

ADEQ, 2013. *Final Remedial Objectives Report, South Mesa Area WQARF Registry Site, Mesa and Gilbert, Arizona.* February 15, 2013.

AMEC, 2013a. *Final Remedial Investigation Report, South Mesa WQARF Registry Site, Mesa, Arizona.* June 7, 2013.

AMEC, 2013b. *Groundwater Monitoring Report, December 2012 Sampling Event, South Mesa WQARF Registry Site, Mesa, Arizona.* May 23, 2013.

AMEC, 2014a. *Final Feasibility Study Report, South Mesa WQARF Registry Site, Mesa and Gilbert, Arizona.* April 4, 2014.

AMEC, 2014b. *Draft Proposed Remedial Action Plan, South Mesa WQARF Registry Site, Mesa and Gilbert, Arizona.* May x, 2014.

MACTEC, 2007. *Land and Water Use Study Report, South Mesa WQARF Registry Site, Mesa, Arizona.* June 5, 2007.

Water Resources Associates, Inc. (WRA), 1991. *"Site Investigation Results For work Conducted At Applied Metallics, Inc. Gilbert, Arizona".*

TABLES

Table 4 Wells to be Monitored and/or Sampled

Well I.D	Well Type	Casing Size and Material	Measuring Point	Measuring Point Elevation (ft. AMSL)	Well Depth (ft.)	Screened Interval Depth (ft.)	Screened Interval Elevation (ft. AMSL)	Zone	Monitored	Sampled
MW-1S	Monitor	4.5" PVC	Top of well cap	1,212.67	175	120-170	1092–1042	UAU2	Yes	Yes
MW-1D	Monitor	4.5" PVC	Top of well cap	1,212.81	260	235-255	977-957	UAU4	Yes	Yes
MW-2S	Monitor	4.5" PVC	Top of well cap	1,224.69	175	120-170	1105-1055	UAU1	Yes	Yes
MW-2D	Monitor	4.5" PVC	Top of well cap	1,226.36	260	165-255	1061-971	UAU3	Yes	Yes
MW-3S	Monitor	4.5" PVC	Top of well cap	1,221.92	232	177-227	1045-995	UAU3	Yes	Yes
MW-4S	Monitor	4.5" PVC	Top of well cap	1,221.55	194	129-189	1093-1033	UAU2	Yes	Yes
MW-5S	Monitor	4.5" PVC	Top of well cap	1,216.27	180	125-175	1091-1041	UAU2	Yes	Yes
MW-5D	Monitor	4.5" PVC	Top of well cap	1,216.25	239	204-234	1012-982	UAU3	Yes	Yes
MW-6D	Monitor	4.5" PVC	Top of well cap	1,210.91	300	265-295	946-916	MAU	Yes	No
MW-7D1	Monitor	4.5" PVC	Top of well casing	Not measured	225	190-220	1025-995	UAU3	Yes	Yes
MW-AM-8S	Monitor	4.5" Steel	Top of well cap	1,211.16	172	127-167	1086-1046	UAU2	Yes	Yes
MW-9-130	BARCAD	1" PVC	Top of well casing	1,211.05	133	130-133	1081-1078	UAU1	Yes	Yes
MW-9-175	BARCAD	1" PVC	Top of well casing	1,211.09	176	173-176	1038-1035	UAU2	Yes	Yes
MW-9-205	BARCAD	1" PVC	Top of well casing	1,211.12	208	205-208	1006-1003	UAU3	Yes	Yes
MW-9-235	BARCAD	1" PVC	Top of well casing	1,211.11	236	233-236	978-975	UAU4	Yes	Yes
MW-10-130	BARCAD	1" PVC	Top of well casing	1,211.31	131	128-131	1083-1080	UAU1	Yes	Yes
MW-10-170	BARCAD	1" PVC	Top of well casing	1,211.27	171	168-171	1043-1040	UAU2	Yes	Yes

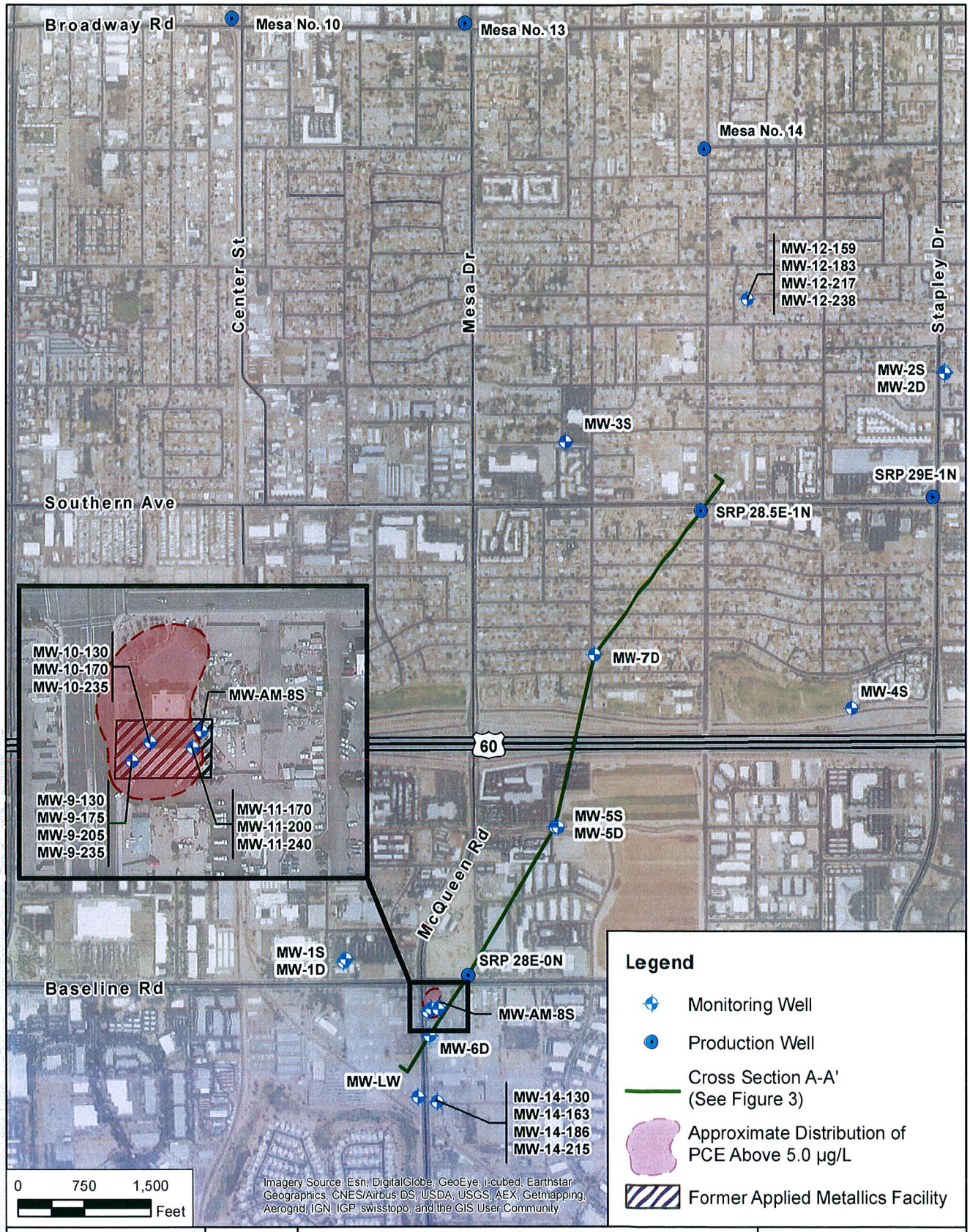
Note: 1. The well cap surveyed measuring point for MW-7D has been removed. Therefore, the groundwater elevation can not be calculated.
2. The number of wells monitored and sampled will be reduced as the plume shrinks in size.

Table 4 Wells to be Monitored and/or Sampled

Well I.D	Well Type	Casing Size and Material	Measuring Point	Measuring Point Elevation (ft. AMSL)	Well Depth (ft.)	Screened Interval Depth (ft.)	Screened Interval Elevation (ft. AMSL)	Zone	Monitored	Sampled
MW-10-235	BARCAD	1" PVC	Top of well casing	1,211.3	238	235-238	976-973	UAU4	Yes	Yes
MW-11-170	BARCAD	1" PVC	Top of well casing	1,211.32	168	165-168	1049-1046	UAU2	Yes	Yes
MW-11-200	BARCAD	1" PVC	Top of well casing	1,211.24	200	197-200	1014-1011	UAU3	Yes	Yes
MW-11-240	BARCAD	1" PVC	Top of well casing	1,211.4	240	237-240	974-971	UAU4	Yes	Yes
MW-12-159	BARCAD	1" PVC	Top of well casing	1,225.46	159	156-159	1069-1066	UAU1	Yes	No
MW-12-183	BARCAD	1" PVC	Top of well casing	1,225.66	183	180-183	1046-1043	UAU2	Yes	No
MW-12-217	BARCAD	1" PVC	Top of well casing	1,225.64	217	214-217	1012-1009	UAU3	Yes	No
MW-12-237	BARCAD	1" PVC	Top of well casing	1,225.68	237	234-237	992-995	UAU4	Yes	No
MW-14-130	BARCAD	1" PVC	Top of well casing	1,213.02	130	127-130	1086-1083	UAU1	Yes	Yes
MW-14-163	BARCAD	1" PVC	Top of well casing	1,213.13	163	160-163	1053-1050	UAU2	Yes	Yes
MW-14-186	BARCAD	1" PVC	Top of well casing	1,212.72	186	183-186	1030-1027	UAU3	Yes	Yes
MW-14-215	BARCAD	1" PVC	Top of well casing	1,212.94	215	212-215	1001 – 998	UAU4	Yes	Yes
SRP Well 28E-0N	Production	24" Steel	Not measured	NA	394	120-373	NA	NA	Yes	Yes
SRP Well 28.5E-1N	Production	16 - 20" Steel	Not measured	NA	549	190-495 512-549	NA	NA	Yes	Yes

Note: 1. The well cap surveyed measuring point for MW-7D has been removed. Therefore, the groundwater elevation can not be calculated.
2. The number of wells monitored and sampled will be reduced as the plume shrinks in size.

FIGURES



Job No.	1420132031
PM:	JNC
Date:	4/25/2016
Scale:	1" = 1500'

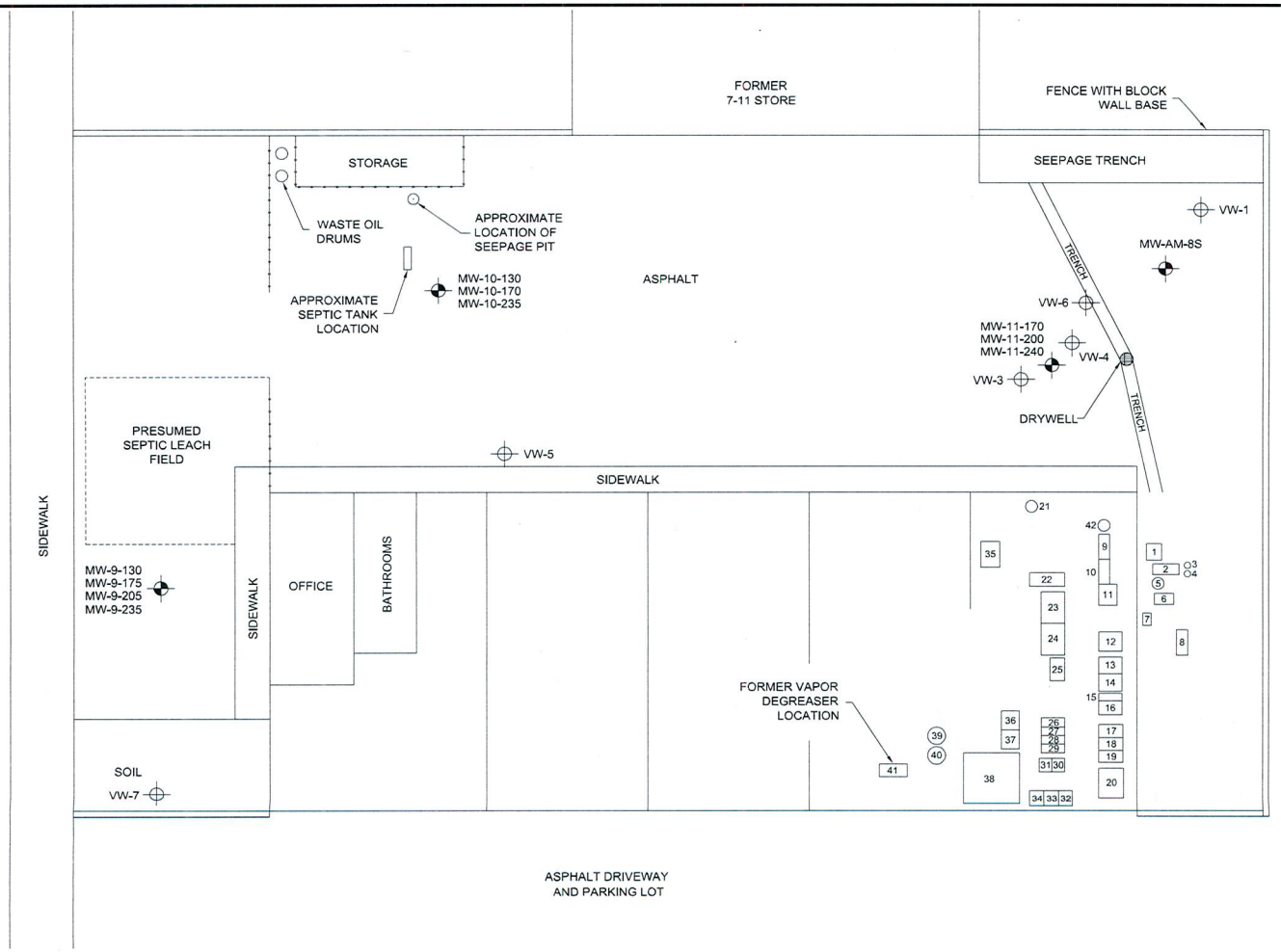
N

Record of Decision
South Mesa WQARF Registry Site
Mesa and Gilbert, Arizona

ADEQ Arizona Department of Environmental Quality

Site and Vicinity Plan

FIGURE 1



TANK IDENTIFICATION

1. TIN STRIP TANK - USED TO STRIP TIN AND CLEAN PARTS
2. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 1, 3 AND 4.
3. HYDROCHLORIC ACID (50%) TANK - USED TO CLEAN STEEL PARTS.
4. SAME AS TANK 3
5. BRIGHT DIP TANK - MIXTURE OF NITRIC ACID AND PHOSPHORIC ACID, USED TO CLEAN COPPER OR BRASS PARTS.
6. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 5, 7 AND 8.
7. NICKEL STRIP TANK - PROPANE HEATED SOLUTION USED TO STRIP NICKEL.
8. NITRIC ACID TANK - USED TO CLEAN OR STRIP PARTS.
9. TIN/LEAD TANK - USED TO PLATE PARTS (TIN).
10. TIN PLATE TANK - USED TO PLATE PARTS (TIN).
11. TIN PLATE TANK - USED TO PLATE PARTS (TIN).
12. COPPER/CYANIDE TANK - USED TO PLATE PARTS (COPPER).
13. COPPER/CYANIDE DRAGOUT TANK - USED TO PRE-RINSE PARTS PRIOR TO FINAL RINSE.
14. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 12, 13, 15 AND 16.
15. SULFURIC ACID (50%) TANK - USED TO CLEAN PARTS.
16. SULFURIC ACID TANK - USED TO MAKE-UP AND HOLD RAW SULFURIC ACID SOLUTION.
17. HYDROCHLORIC (MURIATIC) ACID TANK - USED TO CLEAN STEEL PARTS.
18. HYDROCHLORIC (MURIATIC) ACID TANK - USED TO CLEAN COPPER AND BRASS PARTS.
19. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 17, 18 AND 20.
20. OAKITE 90 TANK - USED TO CLEAN PARTS.
21. CENTRIFUGE - USED TO SPIN DRY PARTS.
22. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 9, 10, 11 AND 23.
23. FLUOROBORIC TIN TANK - USED TO PLATE PARTS (TIN).
24. BRIGHT TIN TANK - USED TO PLATE PARTS (BRIGHT TIN).
25. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 24 AND 35.
26. DEIONIZED WATER TANK - USED TO PRE-RINSE PARTS PRIOR TO TANK 35.
27. DEIONIZED WATER TANK - USED TO PRE-RINSE PARTS PRIOR TO TANK 35.
28. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 26, 27 AND 29.
29. ACETIC ACID TANK - USED TO PRE-CLEAN PRIOR TO TANK 35.
30. NITRIC ACID TANK - USED TO CLEAN ALUMINUM.
31. ZINCATE TANK - USED TO PRE-CONDITION ALUMINUM.
32. IRIDITE TANK - USED TO PUT CHROMATE FINISH ON ALUMINUM.
33. IRIDITE DRAGOUT TANK - USED TO PRE-RINSE PARTS PRIOR TO FINAL RINSE.
34. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 32 AND 33.
35. SULFURIC ACID/TIN TANK - USED TO PLATE PARTS (TIN).
36. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 37 AND 38.
37. ELECTROLESS NICKEL DRAGOUT TANK - USED TO PRE-RINSE PARTS PRIOR TO FINAL RINSE.
38. ELECTROLESS NICKEL TANK - USED TO PLATE PARTS (NICKEL).
39. ELECTROLESS NICKEL HOLDING TANK.
40. ELECTROLESS NICKEL HOLDING TANK.
41. TETRACHLOROETHYLENE VAPOR DEGREASER - USED TO DEGREASE PARTS TO BE PLATED.
42. SAME AS TANK 21.

REFERENCE
APPLIED METALLICS, INC. "TANK LOCATION DIAGRAM, FIGURE 2" WESTERN TECHNOLOGIES, INC., 1989

N

LEGEND
- DRYWELL
- VAPOR EXTRACTION WELL
- GROUNDWATER MONITORING WELL

JOB NO.	14-2012-2020.06.24
DESIGN:	JC
DRAWN:	GWH
DATE:	4/2012
SCALE:	NTS

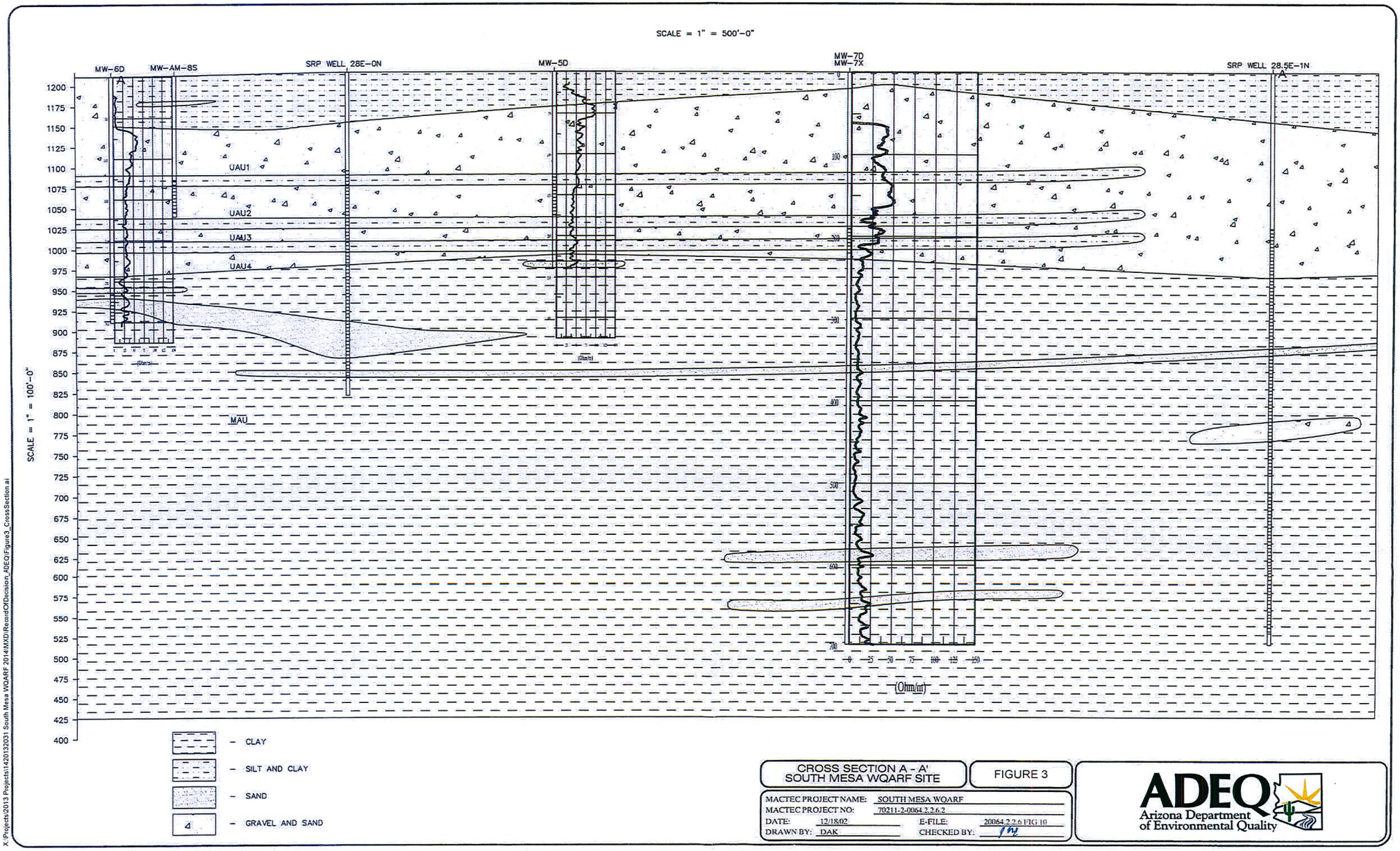
Record of Decision
South Mesa WQARF Registry Site
Mesa and Gilbert, Arizona

Former Applied Metallics
Site Plan and Location Map

FIGURE 2

ADEQ Arizona Department of Environmental Quality

X:\Projects\2012 Projects\49721\2050 South Mesa WQARF\CAD\92050.3.19 FIG 2.dwg X:\Projects\2013 Projects\1420132031 South Mesa WQARF 2014\WXD\Record Of Decision_ADEQ\Figure2_SitePlan.ai



CROSS SECTION A - A'
SOUTH MESA WQARF SITE

FIGURE 3

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MACTEC PROJECT NO: 70211-2-0064.2.2.6.2
DATE: 12/18/02
E-FILE: 20064.2.2.6 FIG 10
DRAWN BY: DAK
CHECKED BY:

ADEQ Arizona Department of Environmental Quality

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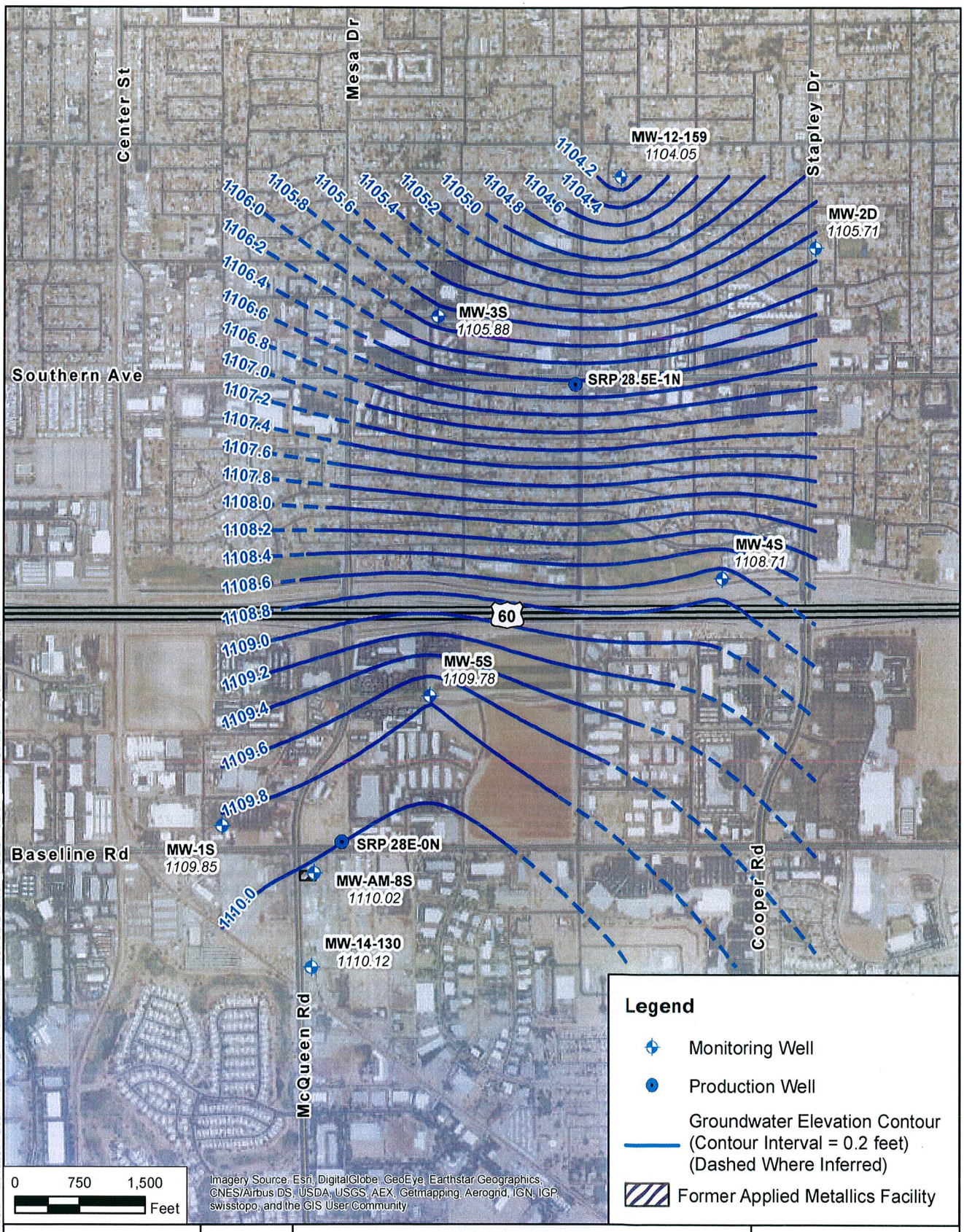


Job No.	1420132031
PM:	JNC
Date:	4/25/2016
Scale:	1" = 1500'

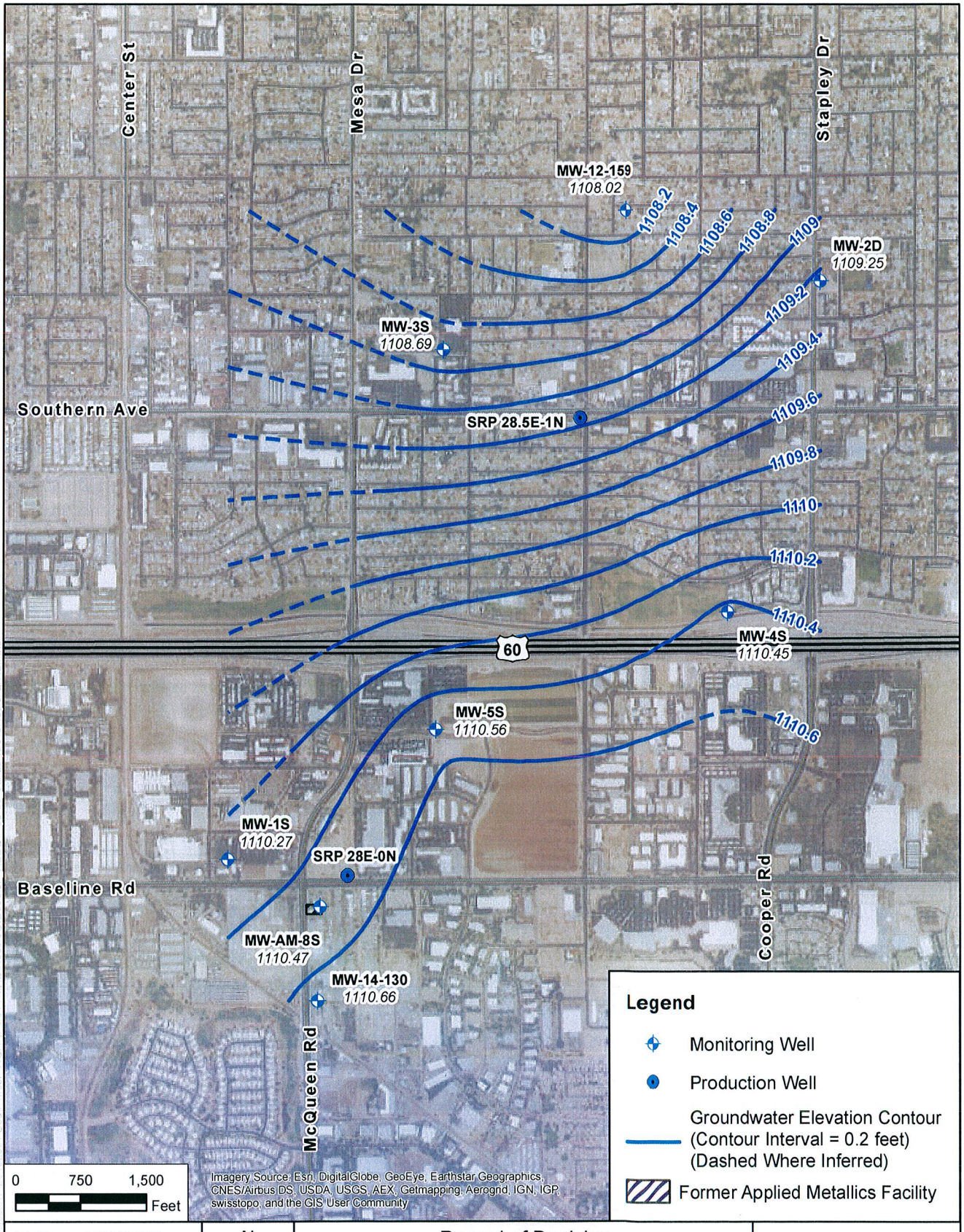
N

Record of Decision
South Mesa WQARF Registry Site
Mesa and Gilbert, Arizona

November 14, 2014
Regional Groundwater Elevations

FIGURE
4

ADEQ Arizona Department of Environmental Quality



Job No.	1420132031
PM:	JNC
Date:	4/25/2016
Scale:	1" = 1500'

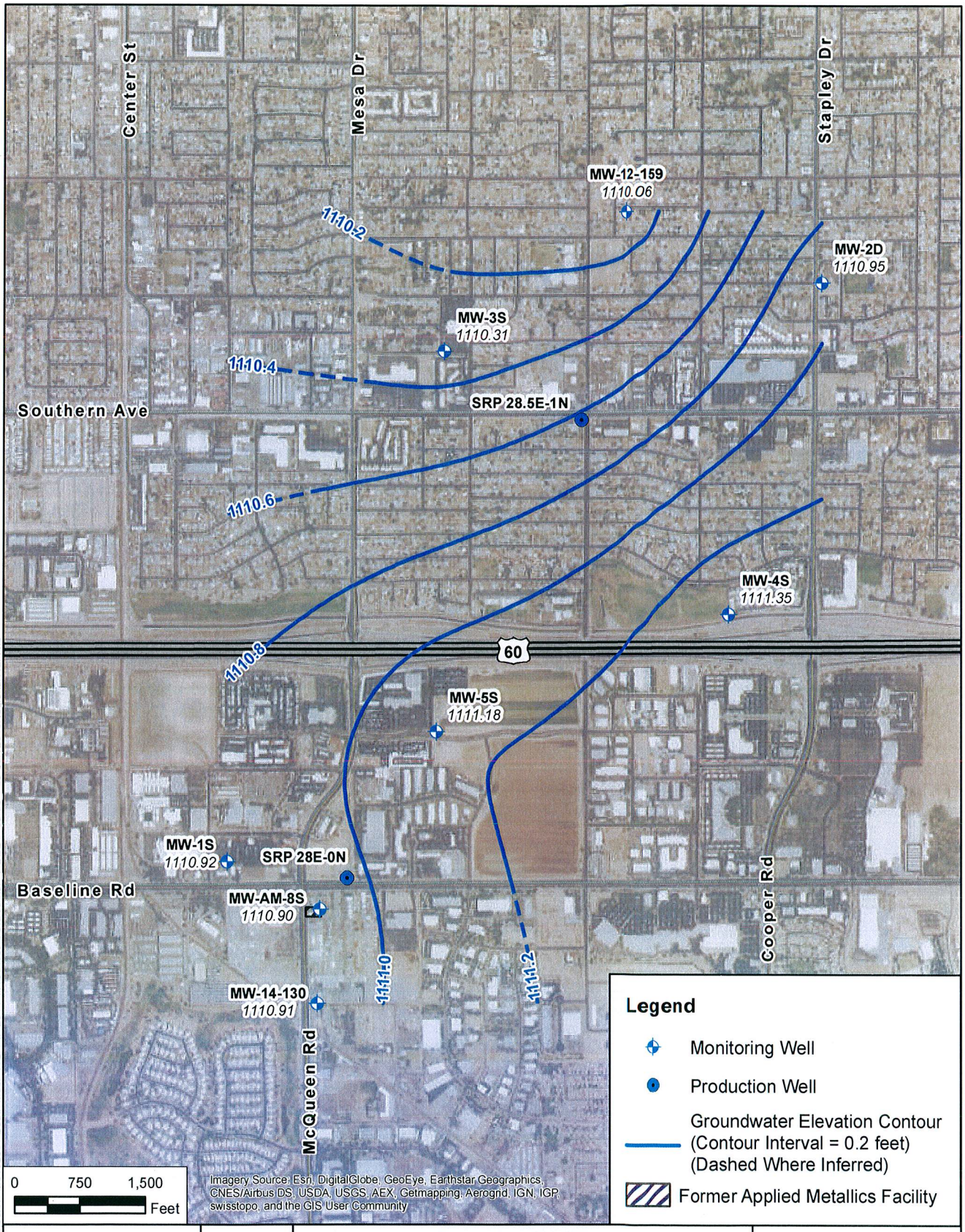
N

Record of Decision
South Mesa WQARF Registry Site
Mesa and Gilbert, Arizona

ADEQ Arizona Department of Environmental Quality

January 12, 2015
Regional Groundwater Elevations

FIGURE
5



Job No.	1420132031
PM:	JNC
Date:	4/26/2016
Scale:	1" = 1500'

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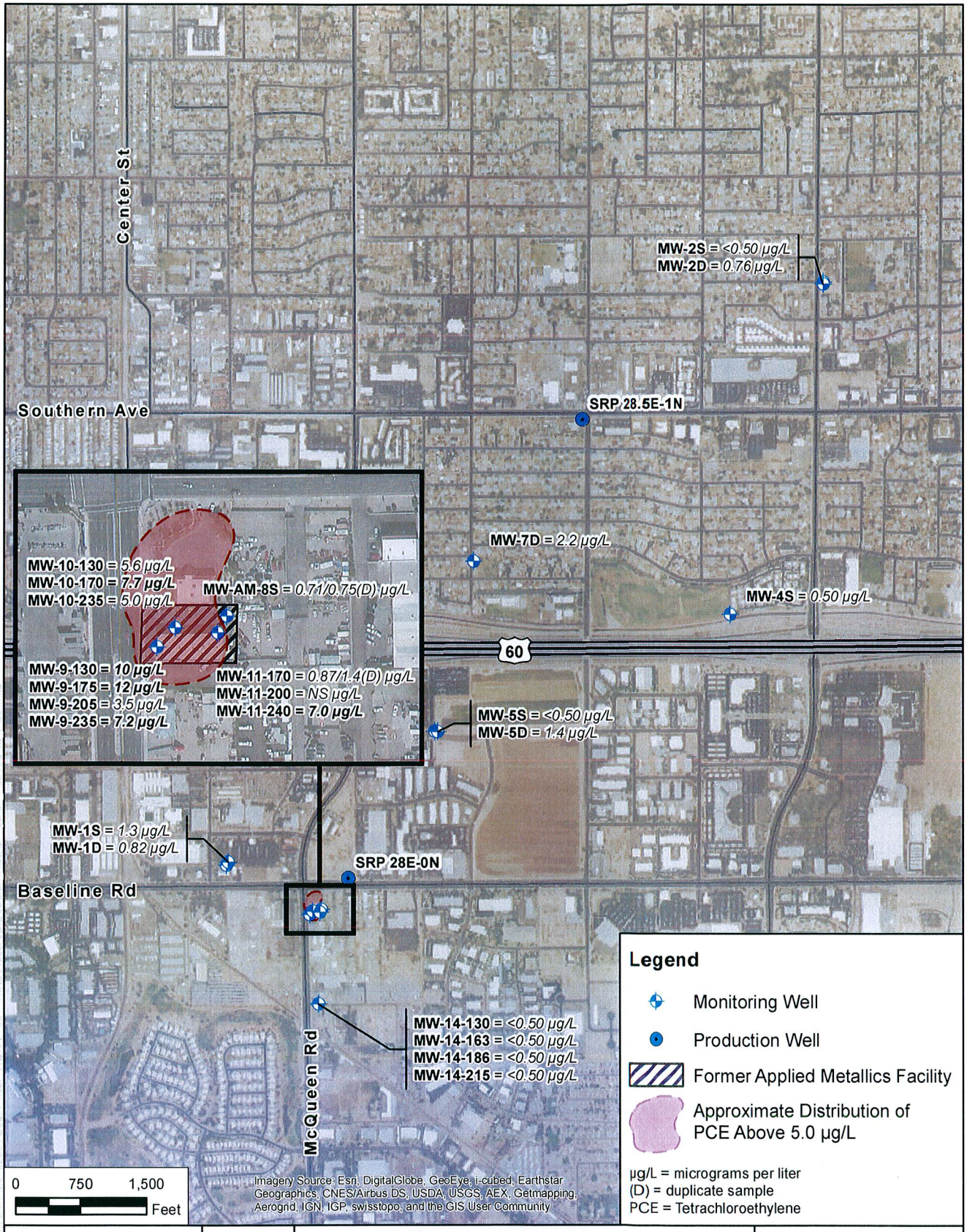
Record of Decision
South Mesa WQARF Registry Site
Mesa and Gilbert, Arizona

ADEQ Arizona Department of Environmental Quality

February 18, 2016
Regional Groundwater Elevations

FIGURE
6



Job No.	1420132031
PM:	JNC
Date:	4/25/2016
Scale:	1" = 1500'

N

Record of Decision
South Mesa WQARF Registry Site
Mesa and Gilbert, Arizona

February 2016
Upper Alluvial Unit PCE Distribution

FIGURE
7

ADEQ Arizona Department of Environmental Quality