ADEQ Arizona Department of Environmental Quality

TECHNICAL SUPPORT DOCUMENT

PROPOSED UNDERGROUND STORAGE TANK (UST) RELEASE CASE CLOSURE EVALUATION SUMMARY

LUST Case File #: 3254.01-.03
Facility ID # 0-000481
Maricopa County

former Chevron Service Station No. 9-3679
701 East Camelback Road
Phoenix, Arizona 85014

Background:
On behalf of Chevron Environmental Management Company (CEMC), Arcadis U.S., Inc. (Arcadis) has evaluated current groundwater and soil conditions at Former Chevron #9-3679. The Site is located on the southeastern corner of the intersection of North 7th Street and East Camelback Road in Phoenix, Arizona. The site encompasses an area of approximately 25,750 square feet, of which all is developed. The site is currently an active Chevron-branded service station and convenience store owned by Fuel Stop 101.

In 1981 a fuel release was identified and found to be associated with the southeast piping area. In June 1993 soil sampling confirmed this release during a stage II vapor recovery installation and the release was assigned Leaking UST (LUST) number 3254.01. In May 1996 four additional fuel releases were discovered when additional product piping and dispensers were replaced. Releases were found at the northeast piping run (LUST number 3254.02), the northwest dispenser area (LUST number 3254.03), the southwest piping run (LUST number 3254.04) and the north piping run (LUST number 3254.05). LUST numbers 3254.04 and 3254.05 were closed on June 7, 2010.

Subsequent investigations indicated soil and groundwater had been impacted by gasoline hydrocarbons (primarily Benzene, Toluene, Ethylbenzene and Xylenes [BTEX] and other volatile organic compounds [VOCs]). ADEQ approved the *Site Characterization Report* on November 23, 2010.

Removal or control of the source of contamination:
In November 2003, Keck product recovery skimmers were installed in monitoring wells MW-1, MW-4, and VW-2. By 2004, all measurable free product consisting of approximately 9.8-gallons of light non-aqueous phase liquids (LNAPL) were removed. A soil vapor extraction and air sparge system (SVE/AS) operated at the site from early 2013 to early 2015 removing 13,017 pounds of VOCs. The SVE/AS was comprised of three soil vapor extraction wells (VW-1, VW-2, and VEW-1) and seven air sparge wells (AS-1 through AS-7). VW-1 and VW-2 are located in close proximity to MW-11 and VEW-1 is located approximately 20 feet north of MW-12. The SVE/AS was effective at removing VOCs from soil at target areas (i.e., depths corresponding to the SVE well screens) and reducing dissolved VOC concentrations in groundwater. The SVE/AS system was shut down as laboratory analytical results suggested that the system had reached asymptotic conditions and the practical limit of mass recovery. At the time of shut down, the VOC extraction rate was less than 8 pounds per day.

VOC concentrations in groundwater declined in monitoring wells MW-11, MW-12, MW-13, and MW-14. Following the SVE/AS system shut down, a slight rebound in benzene concentrations was observed in monitoring well MW-11; however, concentrations remained below the pre-remediation concentrations. Since the SVE/AS was shut off, benzene concentrations have been below the AWQS, with the exception of MW-11 in June and December 2019, and methyl tert butyl ether (MTBE) concentrations in MW-14 have decreased but remain above the Tier 1 Corrective Action Standard.

Groundwater levels at the site have dropped approximately five feet since the SVE/AS began operation and four feet since the SVE/AS was turned off. Currently groundwater levels are at approximately 75 feet below ground surface (bgs). It is Arcadis' opinion that it is unlikely that declining groundwater levels have contaminated soil from 65 feet bgs to the current water table and VOC groundwater concentrations have remained low since the SVE/AS was started in early 2015.

Characterization of the groundwater plume:
Historically, BTEX constituents, MTBE, and 1,2-dichloroethane (1,2-DCA) were considered the site contaminants of concern (COCs) as they are typically associated with gasoline releases and were detected at concentrations in groundwater that exceeded their respective AWQS or Tier 1 Corrective Action Standard. However, the current COCs are considered to be those analytes detected at concentrations that exceeded their respective AWQS over a period of two years (i.e. the eight most recent quarterly groundwater monitoring events).

The horizontal extent of the benzene plume is well defined and centered on MW-11, which exceeds the Aquifer Water Quality Standard (AWQS) of 5 micrograms per liter (µg/L). The benzene concentration in December 2019 was 10 µg/L. Benzene has been non-detect at MW-12 (west of MW-11) since June 2014, MW-13 (north of MW-11) since October 2013, MW-14 (east of MW-11) since the well was installed in May 2016, and MW-2 (south of MW-11) since February 1997. However, MW-2 went dry in October 2008 and has not been sampled since May 2002. A replacement well was never installed at this location as it is cross-gradient of the release area.

The current MTBE plume encompasses MW-11 and MW-14. However, only MW-14 exceeds the Tier 1 Corrective Action Standard of 94 µg/L for MTBE for the most recent groundwater monitoring event in December 2019. MTBE has been non-detect at MW-12 (west of MW-11) since March 2012; MW-13 (north of MW-11) since July 2015, and MW-15 (east of MW-14) for two sampling events (December 2019 and March 2020). When MW-2 (south of MW-11) was last sampled in May 2002, MTBE concentrations were non-detect.

Since 1994, depth to groundwater has ranged from approximately 38.91 feet bgs (MW-3) in November 1997 to 76.49 feet bgs (MW-12) in June 2019. During the December 2019 groundwater monitoring event, groundwater flow was to the east at a hydraulic gradient of 0.005 feet/foot. Historically, groundwater flow has been to the north-northeast and east-northeast at a shallow hydraulic gradient, less than 0.003 feet/foot.

Groundwater plume stability:
The current extent of the benzene and MTBE plumes was determined using data from the December 2019 groundwater monitoring event. The maximum extent of benzene and MTBE plumes were determined by identifying wells that have had benzene or MTBE detections in the past and contouring these wells to determine the overall extent. The benzene dissolved-phase plume has reduced in size over time and that the current plume is localized on-site. Benzene concentrations in groundwater greater than the AWQS of 5 µg/L are limited to a small footprint beneath monitoring well MW-11. The 2019 plume footprint is substantially smaller than the estimated maximum extent plume footprint and has been shrinking for about a decade. The approximate area of the benzene plume footprint reduced from a maximum extent of approximately 31,825 square feet (sq. ft.) to approximately 565 sq. ft. in December 2019 representing a 98 percent (%) reduction in size.

The MTBE dissolved-phase plume has reduced in size over time and that the current plume extent encompasses MW-11 and MW-14 only. MTBE concentrations in groundwater greater than the Tier 1 Corrective Action Standard of 94 µg/l are limited to a small area bound by MW-11 to the west and MW-15 to the east. The 2019 MTBE plume footprint is substantially smaller than the maximum extent and has been shrinking for about a decade. The approximate area of the MTBE plume footprint reduced from a maximum extent of approximately 206,275 sq. ft. to approximately 51,175 sq. ft. in December 2019 representing a 75% reduction in size.

Benzene and MTBE concentrations decreased substantially since 2012, indicating a receding (shrinking) plume. The maximum benzene concentration decreased from 14,000 µg/L in February 1997 at MW-1 to 10 µg/L in December 2019 at MW-11 (i.e., replacement well for MW-1). Dissolved-phase benzene concentrations have also decreased from above the AWQS to less than the AWQS (5 µg/L) in multiple wells including: MW-2, MW-7, MW-12, and MW-13. The maximum MTBE concentration decreased from 36,000 µg/L (MW-1) in April 1998 to 180 µg/L (MW-14) in December 2019. Dissolved phase MTBE concentrations have also decreased from above to below the Tier 1 Corrective Action Standard in multiple monitoring wells including: MW-8, MW-10, MW-13 and MW-14.

The statistical analysis of the concentration trends of benzene over time using Mann-Kendall was completed. The available historical data was evaluated. Results presented in the closure report show downward (significantly decreasing) trends for benzene at MW-11 and MBTE at MW-14.

Linear regression analyses using natural log-normalized concentrations of benzene was conducted to estimate trend direction, attenuation rates, and, approximate time to achieve the relevant AWQS. Results from the linear regression analysis indicate that benzene concentrations exhibit a statistically significant decreasing trend and support the occurrence of natural attenuation of benzene at the site. The majority of COCs in monitoring wells are currently below the relevant AWQS. Based on monitoring well MW-1 (the well with the historic highest benzene concentrations), the groundwater is expected to reach the AWQS by 2028 (i.e., in approximately 8 years).

Results of the linear regression analysis indicate the benzene concentrations in MW-11 exhibit a statistically significant decreasing trend and support the occurrence of natural attenuation of

benzene at the site. MTBE concentrations in MW-14 exhibit a statistically significant decreasing trend and support the occurrence of natural attenuation of MTBE at the site. The majority of COC concentrations in monitoring wells are currently below the relevant AWQS or Tier 1 Corrective Action Standards. Results for MW-14 (the well with the highest MTBE concentrations) show that MTBE concentrations in groundwater are expected to reach the Tier 1 Corrective Action Standard by May 2021. A projected year to reach the benzene AWQS could not be calculated for MW-11. Following SVE/AS shutdown, benzene concentrations were non-detect until 2019, after which there was slight rebound in concentrations.

Natural Attenuation:
Natural attenuation processes include diffusion, dispersion, sorption, volatilization, and biodegradation. A decreasing trend in VOC concentrations in groundwater has been established, which supports that natural attenuation is occurring. Hydrologic and geochemical data can be used to indirectly demonstrate the type(s) of natural attenuation processes.

In accordance with the ADEQ guidance and industry standards, multiple lines of evidence were used to evaluate natural attenuation at the site. The lines of evidence used were the continued stability and decline of dissolved constituents in the groundwater plume, the magnitude and distribution of geochemical parameters indicative of natural attenuation processes, and the assimilative capacity of the aquifer system as evaluated by geochemical parameters.

An assessment of biogeochemical conditions and indicator parameter results at the site is presented as a secondary line of evidence for the effectiveness of natural attenuation of the dissolved phase plume.

Degradation of petroleum hydrocarbons in groundwater can proceed via aerobic or anaerobic microbial processes. Bacteria present in soil and groundwater obtain energy for cell production and maintenance by facilitating thermodynamically advantageous oxidation-reduction reactions involving the transfer of electrons from electron donors to available electron acceptors. When sufficient dissolved oxygen (DO) is present in groundwater, biodegradation of hydrocarbons proceeds aerobically (with oxygen as the electron acceptor). As oxygen becomes less available, anaerobic microorganisms consume electron acceptors in the following order of preference: nitrate, manganese (IV), iron (III), sulfate, and carbon dioxide. Anaerobic biodegradation processes are thus associated with decreased concentrations of nitrate and sulfate, increased concentrations of dissolved manganese and ferrous iron, and production of methane within the plume (i.e., elevated when compared to background.

The following geochemical indicator parameters were collected as part of routine monitored natural attenuation (MNA) evaluations from February 2018 to December 2019: manganese, methane, sulfate, total nitrate, and total nitrite. In addition, DO, oxidation reduction potential (ORP), and ferrous iron field measurements were collected. If concentrations were non-detect the laboratory reporting limit was used to calculate the average values for the period.

Data indicate depleted levels of DO and nitrate and a negative redox value in the source area (MW-11) compared to background concentrations (MW-15) suggesting that anaerobic biochemical reactions that consume organic compounds are occurring.

MW-12 is located up gradient of the MW-11 source area, MW-11 is located in the source area, MW-14 has the highest MTBE concentrations and is located down gradient of the source area,

and MW-15 is located down gradient of MW-14 and is most representative of background conditions. As groundwater moves from monitoring well MW-12 through MW-11 and MW-14 DO is consumed. ORP in the source area well MW-11 decreases, indicating a reduced groundwater chemistry. DO and ORP then increase to background concentrations down gradient from the plume at MW-15 These signature changes are precisely those expected and demonstrated at many sites and are accepted as a secondary line of evidence for evaluating the effectiveness of natural attenuation.

The BIOSCREEN model was used to simulate remediation through natural attenuation of dissolved benzene at the site. Model inputs were chosen in accordance with the BIOSCREEN Natural Attenuation Decision Support System User's Manual version 1.3 and are presented in the closure report. Where appropriate site-specific data were used. The model was run assuming an infinite source. Assuming the source area to be the location of MW-1, the source area is approximately 60 feet from the property boundary in the direction of contaminant transport. The results for the instantaneous reaction model suggest that benzene concentrations will reach the point of compliance, i.e. the AWQS of 5 µg/L, 102 feet from the source area. However, site data indicate that 102 feet is an overestimation and that benzene concentrations are less than 5 µg/L at the property boundary and off-site. MW-4 is located on site and is up-gradient of MW-1. MW-3 is located approximately 5 feet off-site in a City right of way. Both these wells had benzene concentrations less than 5 µg/L in December 2019. Although the BIOSCREEN model overestimates the distance from the source at which benzene would be below the point of compliance (i.e., the AWQS), data suggests that benzene is naturally attenuating to concentrations that are below the AWQS before reaching sensitive receptors.

A benzene plume reduction of 99% was determined by comparing the current plume extent to the historical maximum plume extent. Based on these biogeochemical conditions, assimilative capacity, results of the linear regression statistical analysis, BIOSCREEN modelling results, and reduction of the benzene plume that has occurred to date, natural attenuation of the LUST-affected groundwater plume is occurring and is expected to continue.

Threatened or impacted drinking water wells:
Arcadis conducted a desktop well search using the Arizona Department of Water Resources (ADWR) well inventory database. There are no potable water supply wells or domestic water supply wells within ¼ mile of the LUST-affected groundwater; the wells identified during the search were environmental compliance wells. ADEQ expanded the well search to ½ mile of the LUST site. A total of 87 wells were identified, of which 83 are monitoring or other remedial wells. Two registered 'non-exempt" wells were identified. One well (#55-806199) is owned by the Salt River Project (SRP) and the well number was cancelled in 1991 with a notation of abandonment under water use. The other well (#55-628952) is located within 500 feet to the northwest (up-gradient/cross-gradient) on a residential property at 5001 N. 6th Street. Two registered "exempt" well were identified. One well (#55-607673) is owned by SRP and the well number was cancelled when the well was capped in October 1991. The other well (#55-640379) is located at 71 E. Pierson,about 0.37 miles southwest and hydraulically up-gradient/cross-gradient. According to the on-line City of Phoenix (COP) Water Services, https:// www.phoenix.gov/atyourservice, both properties have existing potable water service.

The COP Water Services Department supplies potable water to the area, and there are no City production wells within 1 mile of the LUST site. The COP operates a regulated public water system (AZ04-0725) that services the area around the LUST site. Currently the COP uses mainly surface water [Salt River Project (SRP) reservoirs and the Colorado River] as its main source of drinking water. Nearly 50% comes from the Colorado River, which may begin to have shortages as soon as 2020 according to the Bureau of Reclamation. Because of this, COP views all water within their service area boundary as a potential water supply source in the event that Colorado River allocations are curtailed during a drought declaration.

ADWR restricts the installation of any new non-municipal water supply wells in Active Management Areas (AMAs) with existing water supply distribution systems. The site is included in such a restricted area. According to ADWR, any new or replacement well located at or near this LUST site would need to meet the criteria of A.A.C. R12-15-1302 (B) (3).

Other exposure pathways:
Historic soil sample VOC results exceed the residential Soil Remediation Levels (rSRLs) and/or the minimum Groundwater Protection Levels (GPLs). However, these soil samples were collected between 1993 and 2010, prior to operation of the SVE/AS. These samples were collected in close proximity to the west dispenser island and the east dispenser island.

Soil samples collected following SVE/AS shut down are from ASB-01, ASB-02, and ASB-03. From which samples were collected from 8, 12, and 15 feet bgs. ASB-01, ASB-02, and ASB-03 are located in the vicinity of former releases associated with LUST #3254.01, LUST #3254.03, and LUST #3254.02, respectively. Samples were collected from two depths, 4.5 feet bgs and 9.5 feet bgs. The maximum soil gas BTEX concentrations were selected and converted to a corresponding soil result using the soil phase partitioning tab on ADEQ's GPL calculator. The value calculated for benzene was 0.00157 mg/kg, toluene was 0.00003 mg/kg, ethylbenzene was 0.00000542 mg/kg, and xylene was 0.0000137 mg/kg. These values are well below the rSRLs and GPLs. SVP-07a/b, SVP-08 a/b, and SVP- 09 a/b are located in the vicinity of former releases associated with LUST #3254.01, LUST #3254.02, and LUST #3254.03, respectively.

Although the soil confirmation boring showed no VOC contamination, the vapor intrusion pathway was evaluated using previously collected soil vapor data to assess all potential exposure pathways. At the request of the ADEQ, soil vapor data were reassessed using a residential scenario instead of a commercial scenario.

As an initial screening step, available soil gas (2017) and groundwater concentrations collected over the past two years at locations near inhabited buildings were compared to the USEPA Vapor Intrusion Screening Levels (VISLs) to determine whether further evaluation (i.e., vapor intrusion modeling) was required.

Arcadis evaluated the soil vapor data using the Johnson & Ettinger model, using typical residential parameters. The estimated total cancer risk and non-cancer hazard index for potential exposure to vapors in indoor air by future residential property receptors from subsurface impacts is 4 x 10-6 and 0.99, respectively. The modeling demonstrates the inhalation exposure route shows an acceptable cancer and non-cancer risk for petroleum related CoCs. The estimated total

cancer risk and non-cancer hazard index for potential exposure to vapors in indoor air by current and future commercial workers at the site property from subsurface impacts are 1 x 10-6 and 0.09, respectively.

The maximum benzene and ethylbenzene concentrations (440 µg/L and 240 µg/L, respectively at MW-01) exceeded the target commercial groundwater VISLs (6.93 µg/L and 15.2 µg/L, respectively). Therefore, vapor intrusion modeling was completed for the residential and commercial scenarios for onsite groundwater. To be conservative, all detected onsite groundwater constituents were modeled.

The site is zoned as commercial (C2) and is bordered by a church to the east, and commercial property to the south. Across Camelback Road to the north is commercial property, and to the west across 7th Street is commercial property.

The maximum concentrations in all offsite groundwater did not exceed the respective target commercial or residential groundwater VISLs; therefore, vapor intrusion modeling was not completed for offsite groundwater.

Requirements of A.R.S. §49-1005(D) and (E):
The results of the corrective action completed at the site assure protection of public health, welfare and the environment, to the extent practicable, the clean-up activities competed at this site allow for the maximum beneficial use of the site, while being reasonable, necessary and cost effective.

Other information that is pertinent to the LUST case closure approval:
The facility and LUST files were reviewed for information regarding prior cleanup activities, prior site uses and operational history of the UST system prior to removal.

Groundwater tables:

Well ID#	ADWR Registration #	Date Installed	Well location/address	Consultant	Purpose	Well Depth (feet bgs)	Diameter (inches)	Screen Interval (feet)
MW-1	55-541738	8/22/1994	701 E. Camelback Rd., Phoenix, AZ 85014	Flour Danial GTI	GWM	78.5	4"	38.5-78.5
MW-2	55-544739	8/23/1994	701 E. Camelback Rd., Phoenix, AZ 85014	Flour Danial GTI	GWM	70	4"	40-70
MW-3	55-544740	8/25/1994	701 E. Camelback Rd., Phoenix, AZ 85014	Flour Danial GTI	GWM	70	4"	40-70
MW-4	55-544741	8/29/1994	701 E. Camelback Rd., Phoenix, AZ 85014	Flour Danial GTI	GWM	69.75	4"	39.75-69.75
MW-5	55-574154	7/6/1999	801 E. Camelback Rd., Phoenix, AZ 85014	ATC	GWM	60	4"	30-60
MW-6	55-574152	10/18/1999	701 E. Camelback Rd., Phoenix, AZ 85014	ATC	GWM	60	4"	30-60
MW-7	55-574153	10/18/1999	701 E. Camelback Rd., Phoenix, AZ 85014	ATC	GWM	60	4"	30-60
MW-8	55-598849	3/26/2004	710 E. Camelback Rd., Phoenix, AZ 85014	HFA	GWM	70	4"	30-70
MW-9	55-598848	7/1/2004	710 E. Camelback Rd., Phoenix, AZ 85014	HFA	GWM	70	4"	30-70
MW-10*	55-908129	7/3/2008	5050 N. 8th Place, Phoenix, AZ 85014	HFA	GWM	90	4"	60-90
MW-11	55-909777	9/23/2008	701 E. Camelback Rd., Phoenix, AZ 85014	HFA	GWM	90	4"	60-90
MW-12	55-909778	9/25/2008	701 E. Camelback Rd., Phoenix, AZ 85014	HFA	GWM	90	4"	60-90
MW-13	55-910459	3/4/2009	701 E. Camelback Rd., Phoenix, AZ 85014	HFA	GWM	90	4"	60-90
MW-14	55-910450	5/1/2016	801 E. Camelback Rd., Phoenix, AZ 85014	Stantec	GWM	90	4"	60-90
MW-15	55-923411	12/8/2019	8th Place South of Camelback Rd., Phoenix, AZ	Arcadis	GWM	97.7	4"	57.7

Primary COC Analytical Results - Fourth Quarter 2019 and Two-Year Average

Well ID	Benzene (µg/L)	Benzene 2-year Average (µg/L)	MTBE (µg/L)	MTBE 2-year Average (µg/L)
AWQS	*5*	*5*	*94*	*94*
MW-11	**10**	2.6	18	53.6
MW-12	< 2.0	ND	< 1.0	ND
MW-13	< 2.0	ND	< 1.0	ND
MW-14	< 2.0	ND	**180**	**860**
MW-15	< 2.0	ND	< 1.0	ND

Notes:
*Tier 1 Risk Based Standard for MTBE is 94 µg/L
Bolded values indicate the COC concentration exceeded the AWQS or the Tier 1 Risk Based Standard
µg/L = micrograms per liter

MW- 12 (up- gradient of MW-11)

Date	Benzene AWQS is 5.0 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to Water (feet)
August 2013	<2.0	<1.0	69.80
November 2014	<0.12	<0.22	70.81
November 2015	0.31	<0.22	72.06
December 2016	0.21	<0.50	72.75
May 2017	<0.50	<0.50	73.53
November 2017	<0.50	<0.50	73.94
May 2018	<0.50	<0.50	74.87
November 2018	<0.50	<0.50	74.31
March 2019	<2.0	<0.50	74.65
June 2019	<2.0	<1.0	76.49
September 2019	<2.0	<1.0	75.72
December 2019	<2.0	<1.0	75.50

MW-13 (cross gradient of MW-11 on-site)

Date	Benzene AWQS is 5.0 µg/L	MTBE Tier 1 Corrective Action Standard is 94 µg/L	Depth to Water (feet)
August 2013	4.8	**100**	69.52
November 2014	<0.12	4.1	70.63
November 2015	<0.12	0.33	71.86
December 2016	<0.50	<0.50	72.58

May 2017	<0.50	<0.50	73.30
November 2017	<0.50	<0.50	73.64
May 2018	<0.50	<0.50	74.58
November 2018	<0.50	<0.50	74.11
March 2019	<2.0	<0.50	74.72
June 2019	<2.0	<1.0	75.32
September 2019	<2.0	<1.0	75.53
December 2019	<2.0	<1.0	75.16

MW-8 (cross-gradient off site to north)

Date	**Benzene AWQS is 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**Depth to Water (feet)**
April 2004	<1.0	**240**	62.16
May 2004-September 2008	Not sampled	Not sampled	Not measured
October 2008 –August 2011			Dry
August 2011	<1.0	<5.0	68.85
September 2011-December 2019			Dry

MW-9 (cross-gradient off site to north-northeast of MW-8)

Date	**Benzene AWQS is 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**Depth to Water (feet)**
July 2004	<1.0	93	64.15
August 2004-September 2008	Not sampled	Not sampled	Not measured
October 2008 –April 2011			Dry
May 2011	<1.0	<5.0	69.14
August 2011	<1.0	<5.0	69.21
September 2011-February 2019			Dry
March 2019	Not sampled	Not sampled	70.49

Groundwater data for MW-11 (near source)

Date	**Benzene AWQS is 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**Depth to Water (feet)**
October 2008	**69**	**1,300**	68.60
May 2010	**48**	**18,000**	68.40

September 2010	**83**	**<5.0**	67.91
November 2010	**40**	**28,000**	67.53
March 2011	**88**	**19,000**	67.13
May 2011	**74**	**10,000**	67.50
August 2011	**<50**	**19,000**	67.49
August 2012	**210**	**8,000**	69.69
August 2013	**58**	**9,300**	70.04
SVE/AS start 2013			
November 2014	<0.12	**1,000**	71.10
SVE/AS end 2015			
November 2015	<0.12	**260**	72.40
December 2016	<0.50	**140**	73.08
May 2017	<0.50	**130**	73.80
November 2017	<0.50	**160**	74.17
May 2018	<0.50	**160**	74.12
November 2018	<0.50	36	74.61
March 2019	0.75	23	74.91
June 2019	**6.1**	19	75.83
September 2019	2.1	23	76.08
December 2019	**10**	18	75.57

Groundwater data for MW-5 (down gradient off site)

Date	**Benzene AWQS is 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**Depth to Water (feet)**
May 2002	<1.0	<5.0	54.08
September 2003	Not sampled	Not sampled	57.02
February 2004	Not sampled	Not sampled	58.08
October 2008-December 2019			Dry

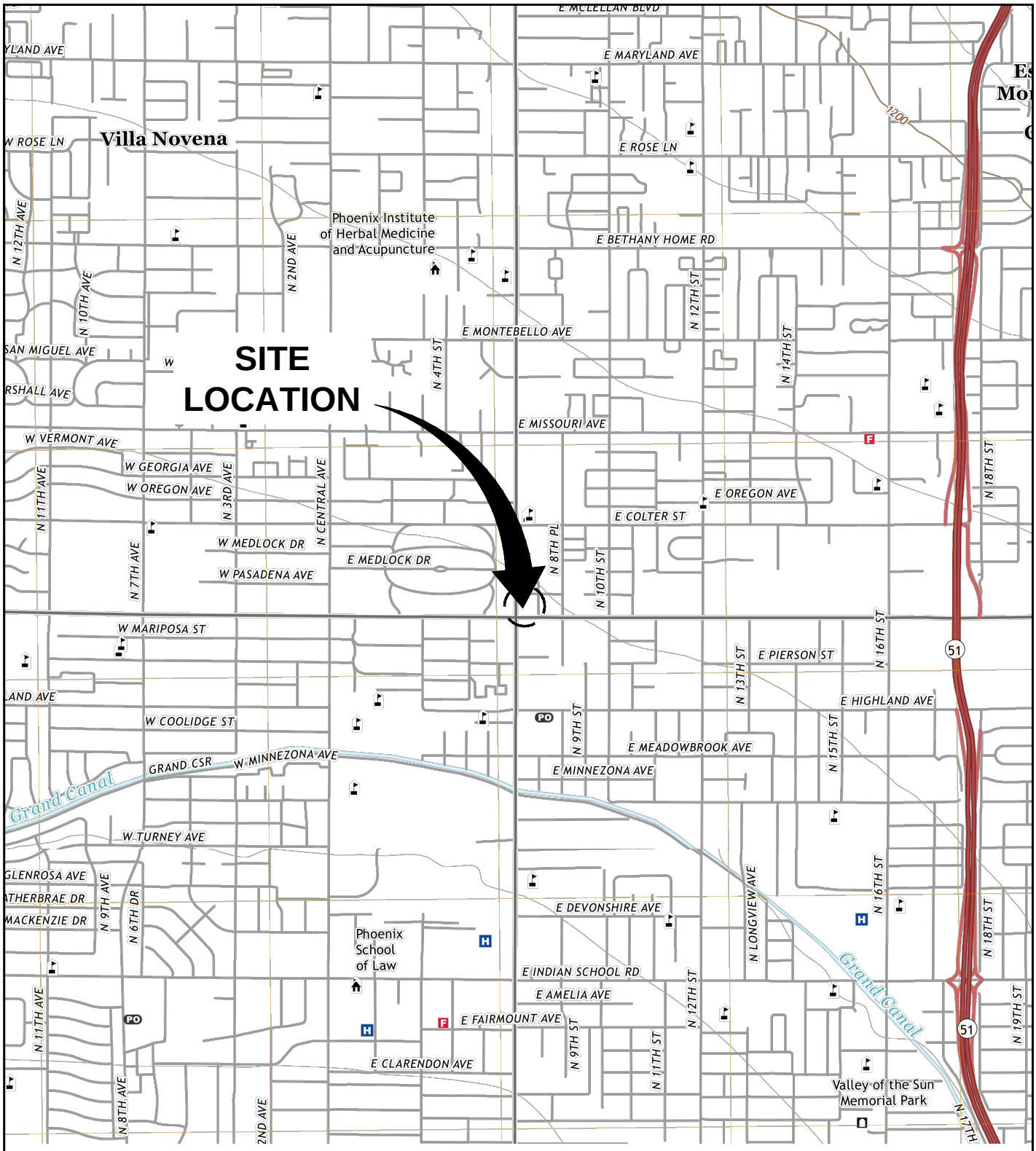
Groundwater data for MW-14 (down gradient to east off- site)

Date	**Benzene AWQS is 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**Depth to Water (feet)**
June 2016	0.12	**2,500**	72.89
July 2016	0.14	**2,600**	73.09
September 2016	<2.0	**3,600**	73.04
December 2016	<0.50	**4,200**	72.84
March 2017	<0.50	**3,300**	72.97
May 2017	<0.50	**3,500**	72.97
August 2017	<0.50	**2,500**	73.73

November 2017	<0.50	**1,900**	73.65
February 2018	<0.50	**2,000**	74.01
May 2018	<0.50	**1,800**	74.70
August 2018	<0.50	**1,200**	74.44
November 2018	<2.0	**420**	74.06
March 2019	<2.0/<2.0	**430/420**	74.50
June 2019	<2.0/<2.0	**450/420**	75.41
September 2019	<2.0/<2.0	**400/400**	75.88
December 2019	<2.0/<2.0	**180/180**	74.90

MW-15 (down gradient of MW-14 to the east off-site)

Date	**Benzene AWQS is 5.0 µg/L**	**MTBE Tier 1 Corrective Action Standard is 94 µg/L**	**Depth to Water (feet)**
September 2019	<2.0	<1.0	76.43
March 2020	<2.0	<1.0	75.57



SOURCE: USGS 7.5 SUNNYSLOPE QUADRANGLE: MARICOPA COUNTY ARIZONA.

N

0 2000' 4000'

APPROXIMATE GRAPHIC SCALE

AREA LOCATION

ARIZONA

FORMER CHEVRON SERVICE STATION NO.93679
701 EAST CAMELBACK ROAD
PHOENIX, ARIZONA

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

N

WELLS FARGO BANK

OFFICE BUILDING

MW-10

EAST PASADENA AVENUE

ELECTRICAL BOX

PARKING

VACANT LOT

WALGREENS

MW-9 (DRY)

COVERED PARKING

NORTH 7TH STREET

NORTH 8TH STREET

SIDEWALK

PARKING

PARKING

RETAIL

LOLAS TAPAS RESTAURANT

PARKING

MW-8 (DRY)

PARKING

SIDEWALK

EAST CAMELBACK ROAD

NORTH 8TH PI STREET

1059.00

1058.50

1058.00

MW-6 (DRY)

SIDEWALK

MW-7 (DRY)

MW-13 (1059.00)

AS-7

ASPHALT

SIGN

0.005 FT/FT

AS/VEW-1

AS-5

AS-6

CANOPY

LAWN

ASPHALT

MW-14 (1057.74)

MW-4 (DRY)

MW-5 (DRY)

MW-12 (1059.05)*

AS-4

DISPENSER ISLAND

BUILDING

DISPENSER ISLAND

AS-2

VW-2

MW-1 (DRY)

VW-1

AS-3

MW-11 (1059.06)

FAITH LUTHERAN CHURCH AND SCHOOL

MW-15 (1061.31)*

SIDEWALK

UST AREA

PARKING

PARKING

ASPHALT

CONCRETE

MW-2 (DRY)

MW-3 (DRY)

REMEDIATION SYSTEM ENCLOSURE

TRASH ENCLOSURE

THRIFTY TRANSMISSION AND AUTO REPAIR

LEGEND

- PROPERTY BOUNDARY
- FENCE
- PRODUCT PIPING
- GROUNDWATER MONITORING WELL LOCATION
- DRY GROUNDWATER MONITORING WELL LOCATION
- VAPOR EXTRACTION WELL LOCATION
- AIR SPARGE WELL LOCATION
- AIR SPARGE/VAPOR EXTRACTION WELL LOCATION
- ABANDONED WELL
- (1059.00) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- 1059.00 GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL) DASHED WHERE INFERRED
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- 0.005 FT/FT APPROXIMATE HYDRAULIC GRADIENT (FEET/FOOT)

(DRY) WELL IS DRY

* WELL NOT USED FOR CONTOURING

0 70' 140'

Approximate Scale: 1 in. = 70 ft.

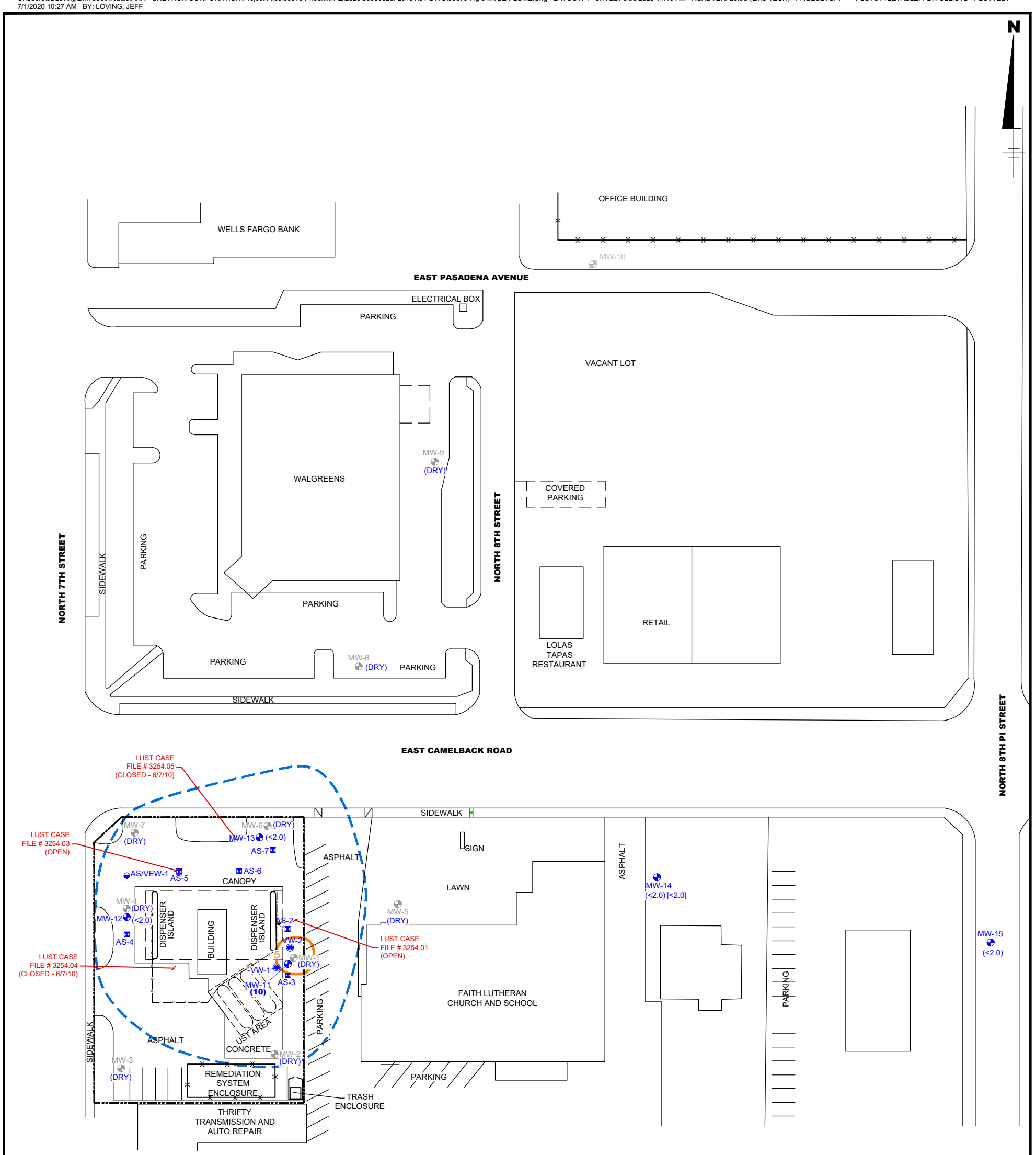
FORMER CHEVRON SERVICE STATION NO.93679
701 EAST CAMELBACK ROAD
PHOENIX, ARIZONA

GROUNDWATER ELEVATION CONTOUR MAP DECEMBER 12, 2019

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\JDLoving\BIM 360\Arcadis\ANA - CHEVRON CORPORATION\Project Files\93679 Phoenix, AZ\2020\30009620. L9401\01-DWG\93679 Fig 5 MTBE PLUME.dwg LAYOUT: 4 SAVED: 6/30/2020 11:10 AM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 7/1/2020 10:27 AM BY: LOVING, JEFF



LEGEND

- PROPERTY BOUNDARY
- FENCE
- PRODUCT PIPING
- GROUNDWATER MONITORING WELL LOCATION
- DRY GROUNDWATER MONITORING WELL LOCATION
- VAPOR EXTRACTION WELL LOCATION
- AIR SPARGE WELL LOCATION
- AIR SPARGE/VAPOR EXTRACTION WELL LOCATION
- ABANDONED WELL
- LUST — LEAKING UNDERGROUND STORAGE TANK
- ESTIMATED MAXIMUM EXTENT OF BENZENE PLUME
- 5 — BENZENE ISOCONCENTRATION CONTOUR

(DRY)	WELL IS DRY
BOLD	CONCENTRATION EXCEEDS THE ADEQ AQUIFER WATER QUALITY STARNDARD (AWQS)
ADEQ	ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
(<2.0)	NOT DETECTED AT OR ABOVE REPORTING LIMIT
(<2.0) [<2.0]	DUPLICATE SAMPLE RESULT

NOTE:

THE ADEQ AWQS FOR BENZENE is 5 µg/L

DISSOLVED MTBE ANALYTICAL RESULTS ARE PRESENTED IN MICROGRAMS PER LITER (µg/L)

0 70' 140'

APPROXIMATE SCALE: 1 in. = 70 ft.

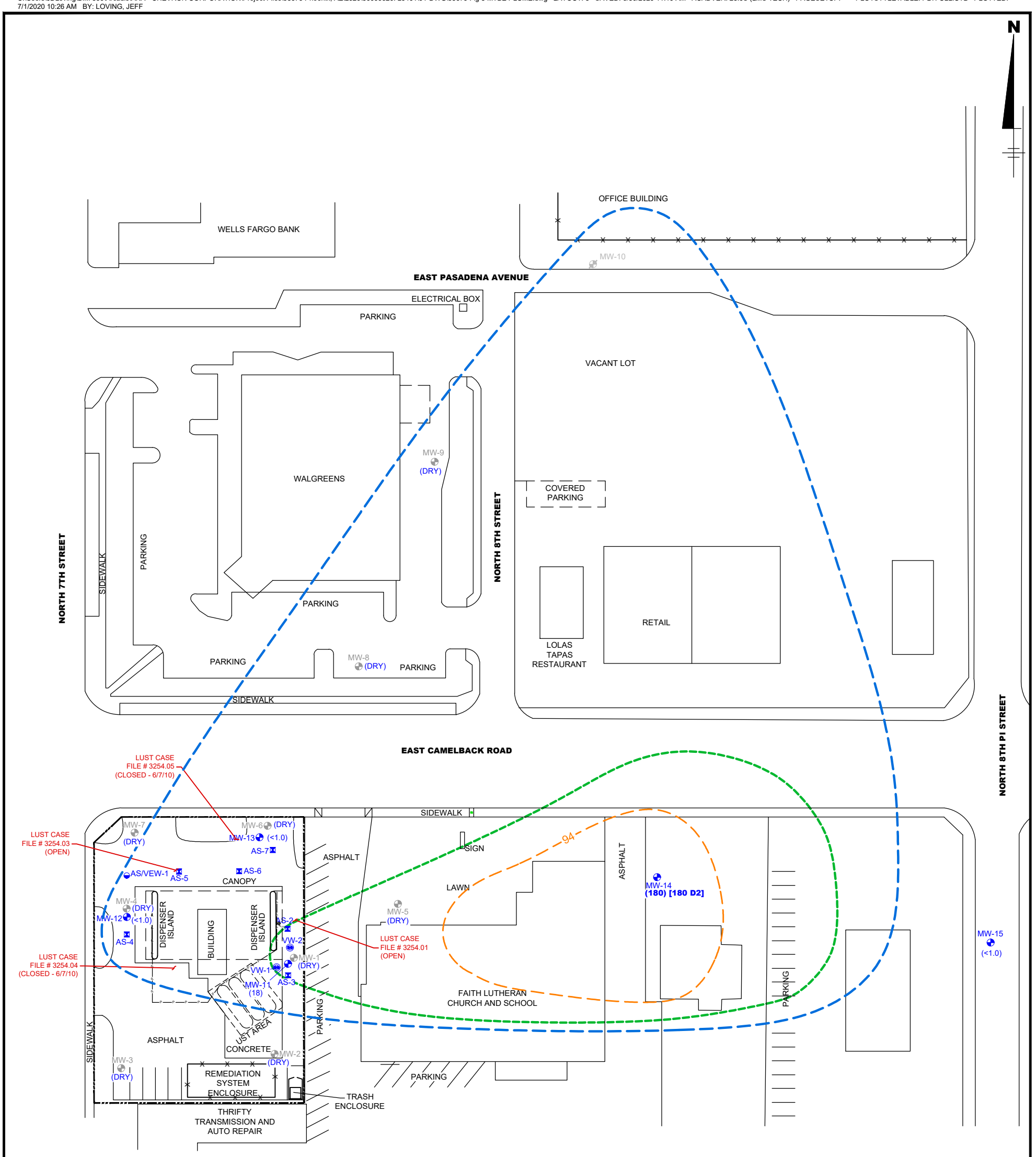
FORMER CHEVRON SERVICE STATION NO.93679
701 EAST CAMELBACK ROAD
PHOENIX, ARIZONA

MAXIMUM AND CURRENT EXTENT OF BENZENE PLUME

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\JDLoving\BIM 360\Arcadis\ANA - CHEVRON CORPORATION\Project Files\93679 Phoenix, AZ\2020\30009620. L9401\01-DWG\93679 Fig 5 MTBE PLUME.dwg LAYOUT: 5 SAVED: 6/30/2020 11:10 AM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 7/1/2020 10:26 AM BY: LOVING, JEFF



LEGEND

- PROPERTY BOUNDARY
- FENCE
- PRODUCT PIPING
- GROUNDWATER MONITORING WELL LOCATION
- DRY GROUNDWATER MONITORING WELL LOCATION
- VAPOR EXTRACTION WELL LOCATION
- AIR SPARGE WELL LOCATION
- AIR SPARGE/VAPOR EXTRACTION WELL LOCATION
- ABANDONED WELL
- MTBE — METHYL TERT-BUTYL ETHER
- LUST — LEAKING UNDERGROUND STORAGE TANK
- ESTIMATED MAXIMUM EXTENT OF MTBE PLUME
- ESTIMATED CURRENT EXTENT OF MTBE PLUME
- 94 — MTBE ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)

(DRY)	WELL IS DRY
BOLD	CONCENTRATION EXCEEDS THE ADEQ TEIR 1 RISK BASED LEVEL
ADEQ	ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
<1.0	NOT DETECTED AT OR ABOVE REPORTING LIMIT
<180 [180 D2]	DUPLICATE SAMPLE RESULT
D2	SAMPLE REQUIRED DILUTION DUE TO HIGH CONCENTRATION OF ANALYTE

NOTE:

THE ADEQ TIER 1 RISK-BASED STANDARD FOR MTBE IS 94 µg/L

DISSOLVED MTBE ANALYTICAL RESULTS ARE PRESENTED IN MICROGRAMS PER LITER (µg/L)

0 70' 140'

APPROXIMATE SCALE: 1 in. = 70 ft.

FORMER CHEVRON SERVICE STATION NO.93679
701 EAST CAMELBACK ROAD
PHOENIX, ARIZONA

MAXIMUM AND CURRENT EXTENT OF MTBE PLUME

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

Fuel Stop #101