

**PROPOSED LEAKING UNDERGROUND STORAGE TANK (LUST)
RELEASE CASE CLOSURE EVALUATION SUMMARY**

LUST Case File #: 5388.01
Facility ID # 0-004557
Pima County

Circle K Store No. 08850
4965 West Ajo Way
Tucson, Arizona 85746

Background:

Circle K Store No. 08850 (the site) is located on the southeast corner of the intersection of West Ajo Way and South Kinney Road in Tucson, Arizona. Circle K Stores, Inc. (Circle K) operates as a convenience store with retail gasoline sales at the site. According to Phillips 66 (then ConocoPhillips Company [ConocoPhillips]) files associated with Circle K Store No. 08850, the UST system was installed at the property in July 1987. The UST system consisted of three single-walled, fiberglass-reinforced plastic 10,000-gallon USTs containing regular unleaded, unleaded plus and premium unleaded gasoline; three product dispensers and associated lateral product piping. Suspect releases associated with the UST system were identified in June 1997, January 1999 and March 1999. All of the suspect releases were identified through statistical inventory reconciliation recordkeeping procedures, were subsequently investigated, and closed using UST tightness testing. None of the suspect releases resulted in a LUST assignment from ADEQ.

On April 2, 2004, a due diligence drilling and soil sampling investigation was conducted by Blaes Environmental Management, Inc. (Blaes) as part of the ConocoPhillips transfer in ownership of Circle K to Alimentation Couche-Tard Inc. This investigation included four hollow-stem auger drilled borings advanced adjacent to the UST basin, three angled hand auger borings drilled adjacent to the dispensers, and one vertical hand auger boring advanced near the lateral product piping. As a result of the due diligence investigation, specifically the laboratory results reported for the soil sample collected at 30 feet below ground surface (bgs), ADEQ assigned LUST File No. 5388.01 to the gasoline USTs.

Subsequent to conducting site characterization activities in October 2004 (installation of groundwater monitor wells MW-1 through MW-4), ATC Group Services (ATC) submitted a Site Characterization Report dated March 28, 2005. In response, ADEQ notified ConocoPhillips on May 18, 2005 that the Site Characterization Report did not adequately characterize dissolved phase contaminants of concern (COC). In response, ATC installed groundwater monitor wells MW-5 through MW-8 on the site in May 2006. After receiving access from Pima County, groundwater monitor wells MW-9 and MW-10 were installed off-site to the southwest and south, respectively, in December 2006. Following groundwater monitoring and sampling events in January 2007 and February 2007, ATC submitted a Site Characterization Report Addendum dated April 25, 2007. ADEQ notified ConocoPhillips on May 23, 2007 of its approval of the Site Characterization Report Addendum.

ATC submitted a Corrective Action Completion Report (LUST Case Closure Request) dated November 16, 2017. ADEQ issued a LUST Case Closure Notice of Decision on December 12, 2017. In the LUST Case Closure Notice of Decision, ADEQ noted that the dissolved phase methyl tert butyl ether (MTBE) plume had not been adequately defined and MTBE plume stability had not been demonstrated.

ATC submitted a second Corrective Action Completion Report (LUST Case Closure Request) dated May 30, 2019. ADEQ issued a LUST Case Closure Notice of Decision on September 20, 2019. In the LUST Case Closure Notice of Decision, ADEQ noted that the dissolved phase MTBE plume still was not defined and MTBE plume stability had not been demonstrated. ConocoPhillips submitted an Informal Appeal of the LUST Case Closure Notice of Decision on October 18, 2019. An Informal Appeal Meeting was held at ADEQ on December 16, 2019. During the meeting, the October 2019 submittal was discussed.

Removal or control of the source of contamination:

ATC utilized air sparge (AS), ozone sparge (OS) and vapor extraction (VE) systems to remediate groundwater impacted with petroleum hydrocarbons. The VE system operated from February 29, 2008 to February 9, 2009. Operation of the VE system for 6,453 hours resulted in the recovery of approximately 328 pounds (equivalent to approximately 47 gallons) of volatile fuel hydrocarbons (VFH). The VE system was shut down due to low (less than one pound per day) VFH recovery rates. ATC began operation of the AS system on April 22, 2008. The system was shut down on November 17, 2009 for a groundwater rebound evaluation. The AS system was restarted on August 31, 2011. The system was shut down on November 1, 2012 after running for 12,944 cumulative hours between April 22, 2008 and November 1, 2012. ATC removed the AS and VE systems and plumbed a 2.7 pounds/day OS system to 15 remediation wells onsite. The OS system was started on February 2, 2015. The system operated for approximately 15,252 hours and injected an estimated 1,779.8 pounds of ozone. The OS system was shut down on March 30, 2017 for scheduled maintenance and was not restarted.

Circle K had not begun store razing and rebuilding activities when ATC submitted Corrective Action Completion Report/Closure Request (LUST Case Closure Request) on May 30, 2019. At the time of the Informal Appeal, Circle K completed razing activities and began UST system replacement activities. On behalf of Circle K, EnCore Consulting, LLC (EnCore) oversaw the permanent closure of the former UST system on August 5, 2019. Soil sample laboratory analytical results indicate that no volatile organic compounds (including MTBE) or polynuclear aromatic hydrocarbons were detected at concentrations exceeding their respective ADEQ established Release Confirmation Levels. This indicates that no additional petroleum releases associated with the UST system have occurred since LUST File No. 5388.01 was identified.

Characterization of the groundwater plume:

There are eight groundwater monitor wells (MW-1 through MW-8) located within the approximate site property boundary. Groundwater monitor well MW-10 is located approximately 380 feet south-southeast of the release location. Groundwater monitor well MW-9 was located approximately 280 feet southwest of the release location, east of South Kinney Road. Arizona Department of Transportation notified ATC in August 2012 that MW-9 would be impacted by reconstruction along South Kinney Road and that the well would need to be moved or

abandoned. ATC received clearance from ADEQ via email to discontinue groundwater monitoring and sampling activities at MW-9 and abandon the well on July 31, 2013. MW-9 was abandoned on October 8, 2013. On September 4 and September 5, 2018, ATC oversaw the installation of groundwater monitor well MW-9R. The well was installed approximately 10 feet north of abandoned monitor well MW-9.

Forty-two groundwater monitoring and sampling events were conducted at the site between October 5, 2004 and February 27, 2019, including 13 compliance (post-purge) groundwater sampling events between June 4, 2015 and February 27, 2019.

Historically, groundwater samples collected at groundwater monitor wells MW-1 through MW-9 have contained dissolved phase benzene, ethylbenzene, MTBE; toluene and/or total xylenes at concentrations exceeding their respective ADEQ established Aquifer Water Quality Standard (AWQS) or Tier 1 Cleanup Standard. Since compliance groundwater monitoring and sampling activities began on June 4, 2015, benzene, ethylbenzene, toluene and total xylenes have not been detected at the locations of MW-1 through MW-8, MW-9R and MW-10 at concentrations above their respective ADEQ AWQS. During the most recent groundwater monitoring and sampling event in February 2019, MTBE concentrations were greater than its Tier 1 Cleanup Standard in samples collected at the locations of monitor wells MW-1, MW-6 and MW-7.

Groundwater plume stability:

In order to evaluate the dissolved phase MTBE plume stability at groundwater monitor wells MW-1 through MW-8, MW-9R and MW-10, ATC analyzed the data collected during compliance groundwater monitoring and sampling events conducted following the shutdown of the OS remediation system on March 30, 2017 using the Mann-Kendall statistical test. ATC conducted five compliance groundwater monitoring and sampling events between April 2017 and February 2019. The Mann-Kendall statistical test was not used to evaluate dissolved phase MTBE concentrations at MW-9R during this time period because only three groundwater monitoring and sampling events have been conducted since the installation of monitor well MW-9R. The Mann-Kendall analysis is valid using at least four data points. ATC used the Mann-Kendall statistical test to examine the 10 most recent laboratory analytical results of samples collected at MW-9 and MW-9R. The spreadsheet uses up to ten dissolved phase COC concentration inputs to generate an output trend and classifies it as “increasing”, “decreasing”, or “no-trend”. A “no-trend” output is determined if neither an “increasing” nor “decreasing” trend can be determined at the 80 percent confidence interval. Additionally, a “no-trend” output is designated as “non-stable” if the variation in COC concentration is relatively high and “stable” if COC concentration variation is relatively low. ATC used a concentration of 0.01 micrograms per liter ($\mu\text{g/L}$) for non-detect values reported by the laboratory in this analysis. The Mann-Kendall analyses indicate that the dissolved phase concentration of MTBE at groundwater monitor wells MW-3, MW-4, MW-9/MW-9R and MW-10 are decreasing between April 2017 and February 2019 at the 80 or 90 percent confidence level. Dissolved phase concentrations of MTBE demonstrate “No-Trend” at MW-1, MW-2, MW-5, MW-6 and MW-8 and are increasing at MW-7 during the same period.

Dissolved phase MTBE is not present at concentrations exceeding its ADEQ established Tier 1 Cleanup Standard ($94 \mu\text{g/L}$) in groundwater samples collected at monitor well MW-10.

Dissolved phase MTBE has not been detected at concentrations exceeding its minimum laboratory MRL in samples collected at groundwater monitor well MW-9R since sampling began at that location on September 17, 2018. This demonstrates that natural attenuation of MTBE is actively occurring between groundwater monitor wells located near the southern site boundary (MW-6 and MW-7) and downgradient off-site groundwater monitor wells MW-9R and MW-10.

The Informal Appeal submittal included an analysis of dissolved phase MTBE concentrations (October 2004 to February 2019) using the Ground Water Spatiotemporal Data Analysis Tool (GWSDAT) which indicates that the MTBE plume is stable and decreasing.

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.

Dissolved phase MTBE has not been detected at concentrations exceeding its minimum laboratory MRL in samples collected at groundwater monitor well MW-9R since sampling began at that location on September 17, 2018. This demonstrates that natural attenuation of MTBE is actively occurring between groundwater monitor wells located near the southern site boundary (MW-6 and MW-7) and downgradient off-site groundwater monitor wells MW-9R and MW-10.

ATC analyzed the biodegradation and transport of dissolved phase MTBE using BIOSCREEN Version 1.4. The software is programmed into a Microsoft Excel workbook and was developed for the Air Force Center for Environmental Excellence. The BIOSCREEN software uses a combination of site-specific data and assumed values to simulate contaminant transport mechanisms such as advection and dispersion and attenuation through biodegradation. The software allows the user to analyze a groundwater plume under one of three models: No Decay, First-Order Decay or Instantaneous Decay. According to the EPA BIOSCREEN Natural Attenuation Decision Support System User's Manual, the First-Order Decay Model is most appropriate for petroleum hydrocarbon contamination. ATC utilized the BIOSCREEN Model to determine the maximum lateral distance downgradient of the source area at which the concentration of dissolved phase MTBE is expected to exceed its ADEQ established Tier 1 Cleanup Standard. ATC assumed the source area to be the existing UST basin and that the source concentration is equal to the highest dissolved phase MTBE concentration reported during the February 2019 groundwater monitoring and sampling event. Using the first-order decay rate assumption, the model predicts that dissolved phase MTBE at concentrations exceeding its ADEQ established Tier 1 Cleanup Standard will be detected at a distance of less than 300 feet downgradient of the source area in 36 years.

Threatened or impacted drinking water wells:

On March 18, 2019, ATC conducted a search of the Arizona Department of Water Resources (ADWR) electronic database for all registered groundwater wells within a one-half mile radius of the subject site. The results of the search indicate that there are 26 ADWR-registered groundwater monitor or remediation wells within a one-half mile radius of the onsite plume. All 26 ADWR-registered wells are associated with the subject site LUST facility. Tucson Water, a department of the City of Tucson, provides water to the area. Sources of potable water utilized

by Tucson Water include groundwater pumped from local aquifers and surface water collected from the Central Arizona Project. No wells owned by Tucson Water or other local water providers were identified in this search.

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:

ATC conducted a desktop review of properties located within a 0.50-mile radius of the site using information available on Google Maps and the Pima County Assessor’s Office database. No surface water bodies, schools, day care facilities, hospitals or nursing homes were identified during this review.

Soil samples collected at investigative borings advanced near the UST basin in April and October 2004 were analyzed for VOCs using EPA Method 8260B. No COC were detected above their respective rSRLs.

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 completed 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 data tables representing source area and down gradient conditions:

MW-1 (center of source)
Total Depth: 45 feet. Screened 30-45 feet.

Date	MTBE Tier 1 Corrective Action Standard 94 ug/L	Depth to Water (feet)
October 2004	38,000	34.74
December 2004	51,000	34.65
November 2005	48,000	31.92
November 2006	38,000	31.34
November 2007	28,000	32.29
November 2008	8,700	28.27
July 2009	590	29.80
July 2010	1,700	30.63
June 2011	9,560	31.56
July 2012	107	28.85
August 2013	1,530	28.35

October 2014	3,890	29.15
November 2015	166	29.36
October 2016	6.4	30.81
January 2017	220	30.43
April 2017	1,200	30.40
July 2017	13	31.71
September 2018	412	30.20
December 2018	471	28.23
February 2019	815	26.21

MW-6
Total Depth: 46 feet. Screened 20-46 feet.

Date	MTBE Tier 1 Corrective Action Standard 94 ug/L	Depth to Water (feet)
June 2006	28,000	32.65
November 2006	20,000	30.95
November 2007	12,000	30.99
November 2008	9,600	27.85
July 2009	2,200	29.32
July 2010	5,600	30.28
June 2011	4,160	30.97
July 2012	171	28.32
August 2013	4,910	27.98
October 2014	4,580	28.50
November 2015	2.6	28.80
October 2016	0.70	30.20
January 2017	200	29.90
April 2017	310/95	29.82
July 2017	920/620	31.10
September 2018	1,250	29.65
December 2018	864	27.69
February 2019	219	25.66

MW-7
Total Depth: 52 feet. Screened 20-52 feet.

Date	MTBE Tier 1 Corrective Action Standard 94 ug/L	Depth to Water (feet)
June 2006	3,100	33.24
November 2006	7,200	31.51
November 2007	5,700	31.49
November 2008	1,500	28.48

July 2009	1,500	29.82
July 2010	750	30.85
June 2011	1,690	31.68
July 2012	1.1	29.06
August 2013	1,700	28.77
October 2014	684	29.30
November 2015	48.7/55.9	29.45
October 2016	1,320	31.04
January 2017	<5.0/<5.0	30.65
April 2017	25	30.51
July 2017	1,100	31.95
September 2018	1,410	30.49
December 2018	1,120	28.51
February 2019	1,860	26.50

MW-9

Abandoned July 2013 due to road construction
Total Depth: 47 feet. Screened 21-47 feet.

Date	MTBE Tier 1 Corrective Action Standard 94 ug/L	Depth to Water (feet)
January 2007	470	29.14
November 2007	410	29.09
November 2008	100	26.23
July 2009	150	27.48
July 2010	21	28.46
June 2011	248	29.06
July 2012	16.3	26.93
May 2013	321	25.49

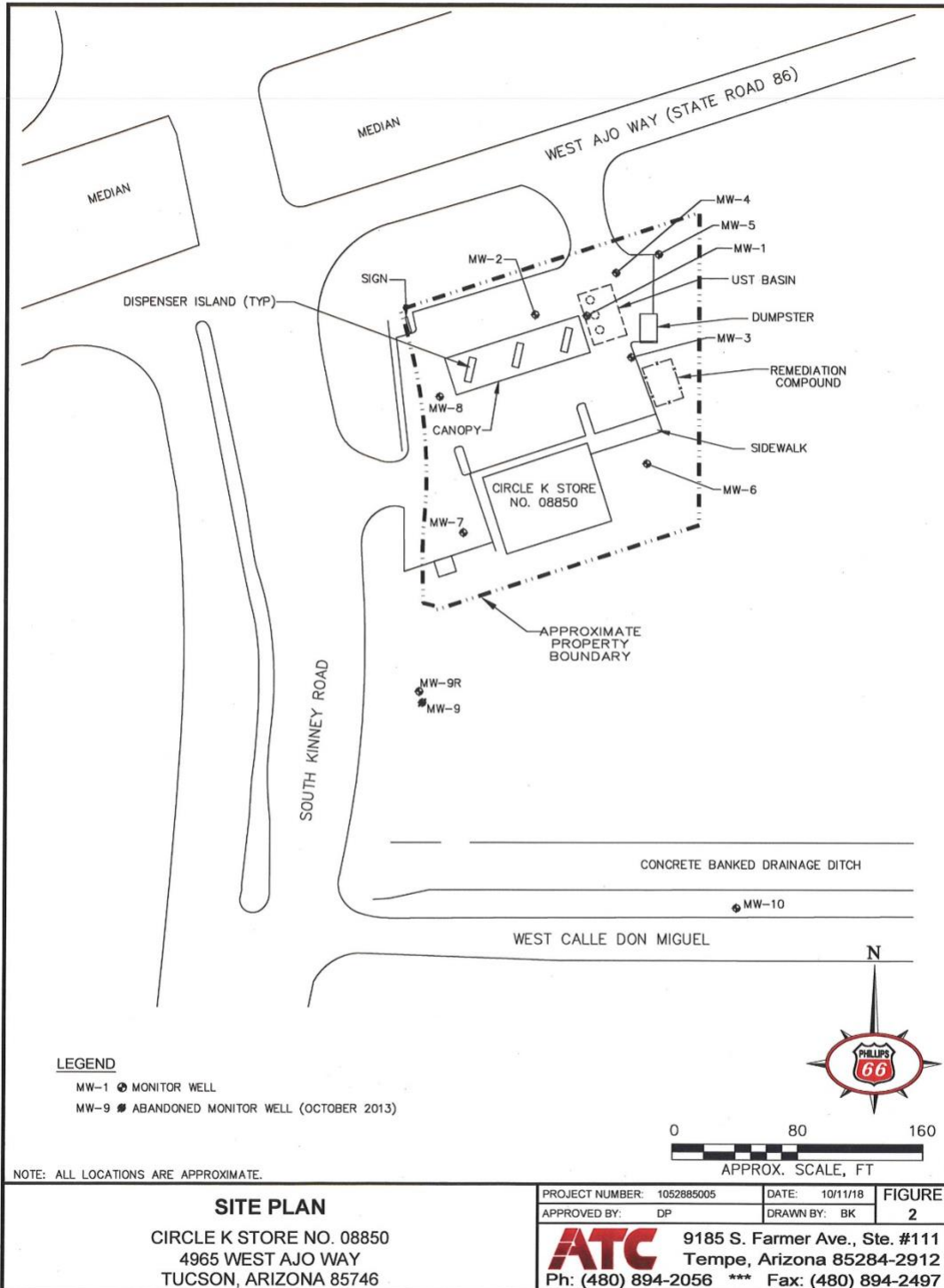
MW-9R (off-site cross to down gradient)

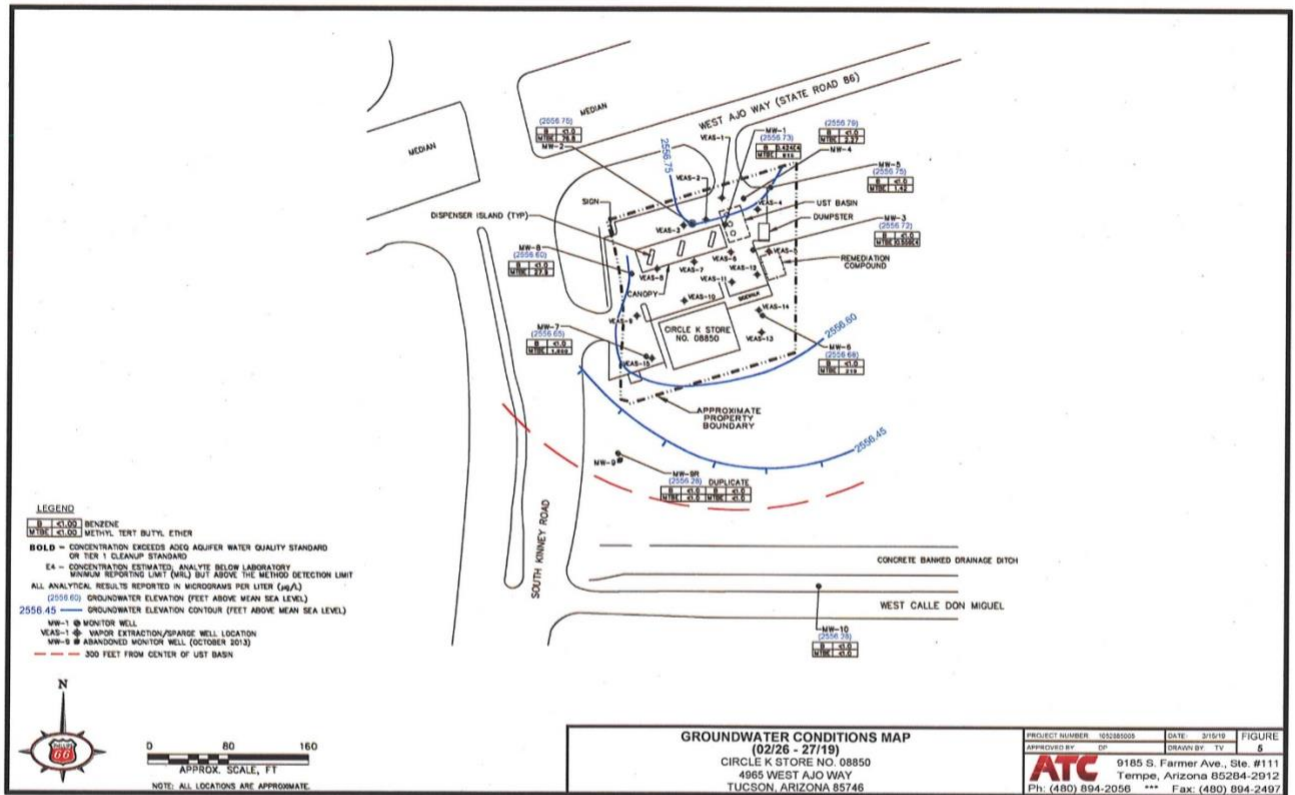
Located 10 feet north of MW-9
Total Depth: 45 feet. Screened 25-45 feet.

Date	MTBE Tier 1 Corrective Action Standard 94 ug/L	Depth to Water (feet)
September 2018	<1.0/<1.0	29.06
December 2018	<1.0/<1.0	27.09
February 2019	<1.0/<1.0	25.27

MW-10 (off-site down gradient)
Total Depth: 46 feet. Screened 21-46 feet.

Date	MTBE Tier 1 Corrective Action Standard 94 ug/L	Depth to Water (feet)
January 2007	<5	30.47
November 2007	<5	30.41
November 2008	<5	27.53
July 2009	<5	28.79
July 2010	<1	29.77
June 2011	1.2	30.51
July 2012	<1.0	28.43
August 2013	3.2	27.67
October 2014	6.5	28.07
November 2015	2.7	28.40
October 2016	0.57	29.85
January 2017	<5.0	29.40
April 2017	8.0	29.40
July 2017	11	30.67
September 2018	<1.0	29.00
December 2018	<1.0	27.24
February 2019	<1.0	25.40





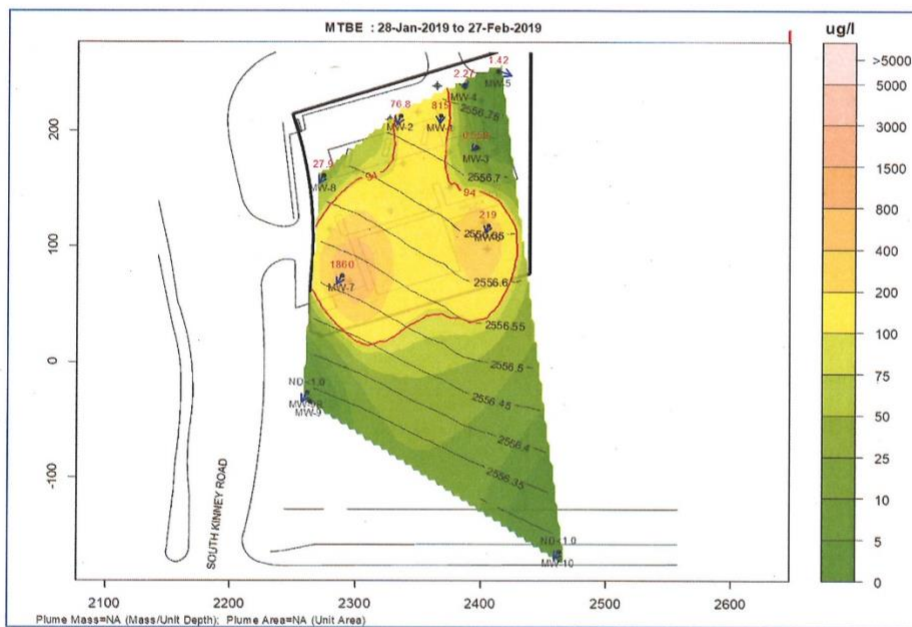


TABLE 4
SUMMARY OF MANN-KENDALL STATISTICAL TEST OUTPUTS
 Circle K Store No. 08850
 4965 West Ajo Way, Tucson, Arizona 85746

Groundwater Monitor Well	Mann-Kendall Trend Output
MW-1	No Trend : Stable
MW-2	No Trend : Non-stable
MW-3	Decreasing
MW-4	Decreasing
MW-5	No Trend: Non-stable
MW-6	No Trend: Stable
MW-7	Increasing
MW-8	No Trend: Non-stable
MW-9/MW-9R	Decreasing
MW-10	Decreasing