ADEQ Arizona Department of Environmental Quality

TECHNICAL SUPPORT DOCUMENT

PROPOSED LEAKING UST (LUST) CASE CLOSURE

The Arizona Department of Environmental Quality (ADEQ) is considering closure of the following leaking underground storage tank (LUST) cases:

LUST Case File #1323.01, .03, .04	**Bruce Church Inc.**
Facility ID # 0-000999	**6162 Cattle Ranch Loop**
Yuma County	**Yuma, Arizona 85365**

The Bruce Church Ranch facility (the Site) is located in the North Gila Valley southwest of the Laguna Mountains, approximately 0.3 miles east of the Colorado River and 1.8 miles northeast of the confluence of the Gila River with the Colorado River. It lies on the Colorado River floodplain downstream from the Laguna dam. Land use at and in the area of the Site is agricultural and consists predominantly of fields for large-scale commercial crop production. Scattered residential properties are present among the agricultural fields in the area. A refined product transmission pipeline runs east west approximately 1,000 feet north of the Site to a crossing at the Colorado River. The Site is part of an active farming operation, which includes fields, offices, and structures for the housing and maintenance of farming equipment. The source of the petroleum contamination at the Site was former USTs that stored gasoline and diesel fuel. The petroleum release was presumed to be from former UST #2, a 7,500-gallon gasoline UST. Site characterization and remediation activities have been ongoing at the Site since 1991. Shallow soil contamination in the vadose zone to the upper extent of the capillary fringe was present only in the area within 50 feet of the former USTs and the dispenser island. Impacts to soil in the capillary fringe initially extended up to 125 feet from the USTs. The *Site Characterization* Report was approved in November 2001. In December 2001, soil samples were collected from four locations within the area where the heaviest soil contamination had been encountered previously to evaluate remediation progress. None of the six soil samples, collected from depths of 10.5 to 16 feet below ground surface (bgs) had any detectable volatile organic compound (VOC) concentrations.

Active remediation of soil and groundwater began in December 2009. The first soil vapor extraction (SVE) system operated until February 2005. The system was shut down to evaluate potential rebound in hydrocarbon concentrations in the groundwater. While no large rebound spike was detected in any of the wells, the hydrocarbon concentrations were not being reduced enough in three of the wells for closure to be considered. The SVE treatment equipment was refurbished in late 2009 and 13 air sparge (AS) wells were added to the treatment system. The complete SVE/AS system was turned on in December 2009. In August 2011, eight more extraction wells and six more air sparge wells were added to the system in an attempt to speed up the removal of hydrocarbons from the groundwater. The system was shut down in August 2015.The only remaining VOCs at concentrations that exceed the Arizona Aquifer Water Quality Standards (AWQS) is benzene in four wells.

The UST owner/operator requested LUST case closure in August 2018. A *Tier 3 Risk Evaluation Report* was submitted in December 2018 to address deficiencies raised in ADEQ's September 27, 2018 interim determination. Based upon the results of remedial activities and site specific information, the above-referenced LUST site is eligible for alternative LUST closure under Arizona Revised Statutes (A.R.S.) §49-1005(E). Arizona Administrative Code (A.A.C.) R18-12-263.04 allows case closure of a LUST site

with groundwater contamination above the Arizona AWQS or Tier 1 Corrective Action Standards. ADEQ has considered the results of a site-specific assessment and the rule specific criteria below:

Threatened or impacted drinking water wells:
The Site lies within the Colorado River Upper Delta Region and is underlain by alluvial and deltaic sediments consisting of interbedded sands, silts, and clays typical of fluvial floodplain deposits. An upper, fine-grained zone comprised predominantly of fine- to medium-grained sand and silt typically extends to an average depth of 100 feet (ft.) bgs. The upper, fine-grained zone is underlain by a coarse gravel zone below a depth of about 100 feet bgs. Laterally extensive clays are also present, and a deep boring drilled at the Site encountered a clay layer at a depth of 92 feet bgs. Shallow groundwater at the Site typically occurs at a depth of 20 to 25 feet bgs in the upper, fine-grained zone. The lower coarse-grained zone below a depth of about 100 feet bgs serves as the source of water for all water supply wells in the area.

The Arizona Department of Water Resources (ADWR) well registry database identified 12 water supply wells located within one mile of the Site. Five of the wells are located on the west side of the Colorado River and would not be impacted by groundwater contamination from the Site since shallow groundwater discharges to the river. Five of the wells are located east and southeast of the Site and generally up gradient. The closest registered well is one of these up gradient wells located 1,400 feet (approximately ¼ mile) from the Site. The remaining two wells are located northeast of the Site and perpendicular to the general groundwater flow direction in the area. There are no registered wells identified down gradient of the Site, towards the river, other than monitoring wells. Based on their locations relative to the Site, none of the identified supply wells is considered a potential receptor.

The hydrocarbon groundwater contamination currently does not affect potable water sources because the hydrocarbon solute plume is restricted to the immediate area of the Site and there are no potable wells on the Site. The hydrocarbon groundwater contamination will not affect potable water sources in the future because the hydrocarbon solute plume is currently shrinking and is isolated to on site and located in the shallow aquifer. Water supply wells in the area are not screened in the shallow aquifer due to high salinity that make the shallow groundwater too brackish to be used as a potable water source.

The primary water supply (approximately 85%) for the City of Yuma is the Colorado River. The remaining 15% is a seasonal blend of groundwater from three wells located at the Agua Viva Water Treatment Facility, which is located more than 10 miles from the Site.

Other exposure pathways:
The immediate area of the Site is part of a commercial farming operation, which includes fields, offices, and structures for residential housing and maintenance of farming equipment. The approximate limits of soil contamination at the Site were presented in a site assessment report and the 1995 *Site Characterization Report*, which was approved by ADEQ in 1996. Shallow soil contamination in the vadose zone to the upper extent of the capillary fringe was present only in the area within 50 feet of the former USTs and the dispenser island. Impacts to soil in the capillary fringe initially extended up to 125 feet from the USTs. In December 2001, soil samples were collected from four locations within the area where the heaviest soil contamination had been encountered previously to evaluate remediation progress. None of the six soil samples, collected from depths of 10.5 to 16 feet bgs had any detectable VOC concentrations. Exposure by direct dermal contact or ingestion of contaminated soils is not a complete exposure pathway since no contamination was present in the 2001 soil data.

Soil vapor probes VP-1 through VP-5 were installed on October 24, 2018 at a depth of 5 feet bgs. Soil vapor was analyzed by EPA Method TO-15, for VOCs. Field and laboratory quality assurance/quality

control (QA/QC) was acceptable. HGC used the on-line screening version of the Johnson & Ettinger model with site-specific data and model default parameters to evaluate potential human health risk under a residential land-use scenario. A cumulative cancer risk (ELCR) and a non-cancer hazard index (HI) value was calculated. The HI of 0.000915 is less than 1. The ELCR of 4.54×10-8 is less than the target value 1×10-6. Non-petroleum-related constituents in soil vapor included TCE. The calculated hazard quotient for TCE, based on the high estimate result of 0.00896 is less than the target value of 1, and the calculated cancer risk for TCE of 3.15×10-8 is less than the target value of 1×10-6. Even if combined with the petroleum-related constituents, the detected concentration of TCE does not yield a hazard index or cumulative cancer risk exceeding the target values.

In a ¼ mile land use/receptor survey, there are no schools, day care centers, hospitals or other sensitive populations. The Colorado River is approximately 900 feet northwest down-gradient of the source area. Benzene concentrations were reported in MW-7 (located near the river) at a concentration that exceeded the AWQS, in February 2002. No benzene was reported in MW-7 through 2005 after which the well was destroyed by road work. A replacement well (HMW-23) was later installed. Benzene was reported in HMW-23 in October 2015 at a concentration that exceeded the AWQS. However, all other monitoring events prior to and after October 2015 showed no benzene detections over laboratory reporting limits. The October 2015 data was determined to be anomalous by the consultant due to laboratory or field error. Two-dimensional modeling of the June 2018 maximum benzene concentration shows that the dissolved-phase plume does not reach the Colorado River.

Groundwater plume stability:
Shallow groundwater flow in the area of the Site generally is to the northwest toward the Colorado River. Typical hydraulic gradients are in the range of 0.002 to 0.01 ft. /ft. Some seasonal and localized spatial variation in water levels and groundwater flow direction occurs due to irrigation patterns, infrequent local storm events, and river stage fluctuations. Hydraulic gradients in the eastern portion of the Site have indicated groundwater flow to the northeast with gradients in the range of 0.007 to 0.027 ft. /ft. This pattern likely reflects the effects of mounding due to irrigation and the lack of accessible measuring points in recent monitoring rounds. The Colorado River acts as a drain in the area, and there are indications of an upward gradient. The gaining nature of the river in the area indicates that it receives discharging groundwater and the upward gradient would prevent downward groundwater movement to the lower coarse gravel zone. A major flooding event in 1993 caused increases in groundwater levels of up to 13 feet, but this was a transient event.. Recent groundwater hydrocarbon concentrations from monitoring wells near the release area (MW-9, HMW-11) in the milligram per liter (mg/L) range are consistent with the effective solubility of the constituents from LNAPL and, in the absence of free product, indicate the presence of residual LNAPL entrapped in pores below the water table. Dissolution of hydrocarbon constituents from the residual LNAPL into groundwater will act as an ongoing source of groundwater contamination that will deplete over time. Delineation of the groundwater solute plume in 2015 showed that the extent at that time was less than 100 feet down gradient from HMW-24. The down gradient extent of the groundwater solute plume subsequent to shut-down of the SVE/AS remediation system in 2015 has diminished, and in May 2018 was half of what it had been in 2015.

Groundwater travel time from the source area to the Colorado River based on the estimated average linear velocity of groundwater flow is expected to be on the order of one year or less, and the observed behavior of the solute plume over a period of three years further indicates that the solute plume is shrinking.

The major flooding event in 1993 caused increases in groundwater levels of up to 13 feet, but had no substantive effect on the groundwater solute plume. The recent observed behavior of the solute plume showing that the extent is receding toward the source area indicates that it will not impact the river.

Benzene is the only dissolved-phase contaminant of concern (CoC) reported exceeding the AWQS. The benzene plume has been monitored at the site for 30 years without significant migration. The benzene plume is confined to on-site in the vicinity of the former USTs and has decreased in extent and concentration between 1992 and 2018. Concentration time series for individual monitoring wells were evaluated using the nonparametric Mann-Kendall test for trend. The analysis was performed only for concentrations of benzene in monitoring wells because data for other hydrocarbons (toluene, ethylbenzene, xylenes) indicated behavior and patterns similar to benzene. The concentration time series for the evaluated wells all indicate either decreasing trends or no statistically significant trend. This provides a strong indication of decreasing concentrations over time. Additionally, from the standpoint of solute plume behavior, the lack of a defined trend in a Mann-Kendall analysis can be indicative of stability depending on the amount of variation because no trend is consistent with a steady-state condition. This provides a strong indication that the solute plume is stable or shrinking in extent.

Hydrocarbon concentrations in several monitoring wells rebounded subsequent to shut-down of the SVE/AS remediation system in 2015, but the concentration time series appear to reflect reversion back to an anaerobic condition while residual oxygen from the remediation system was depleted.

Characterization of the groundwater plume:
Gasoline was released from the UST system as a light non-aqueous phase liquid (LNAPL) that moved downward to the water table where it spread laterally. Mobile LNAPL originally extended approximately 250 to 300 feet northwest, down gradient from the source area, forming a thin free product lens approximately 80 to 100 feet wide ranging up to approximately 0.5 feet in thickness. No mobile LNAPL has been identified at the Site since 2001.

Groundwater monitoring has been occurring at the Site since October 1990, shortly after the first three monitoring wells were installed. Subsequent to shutting down the second SVE/AS system, 15 of the monitoring wells located in and around the core of the hydrocarbon solute plume have been continuously gauged and sampled, with the most recent event occurring in May 2018. For all five of the monitoring events since the remediation system shutdown, groundwater samples have been analyzed for VOCs by EPA Method 8260B, PAHs by EPA Method 8270C-SIM and tetraethyl lead by 8270-SIM. For the two monitoring events in 2017 and 2018, natural attenuation parameters (dissolved oxygen, nitrate, sulfate, methane, ferrous iron, manganese, redox potential and temperature) have also been analyzed. Once the SVE/AS system was shutdown, water levels fell 1-4 feet as equilibrium was reestablished. Concentrations of all hydrocarbon constituents decreased during this period, leaving four wells (three at the source area, and one down gradient near the source area) with benzene concentrations exceeding the AWQS of 5 µg/L. ADEQ had a contractor collect groundwater data in August 2019 and August 2020 at selected wells near the source area.

Benzene is the primary CoC with concentrations exceeding the AWQS of 5 micrograms per liter (µg/L) in MW-6 (11.5 µg/L as reported in August 2020), MW-9 (30.8 µg/L as reported in August 2020), HMW-11 (987 µg/L as reported in August 2020), and HMW-13 (9.11 µg/L as reported in May 2018). HMW-13 could not be sampled in August 2019, due to the well was filled with dirt.

Natural Attenuation:
Natural attenuation of petroleum hydrocarbons is driven by naturally occurring biodegradation. When the rate of biodegradation in groundwater down gradient from the source equals or exceeds the rate of contaminant dissolution and transport away from the source, the solute plume will stabilize or recede. The solute plume is essentially an in situ treatment zone that maintains itself. The natural biodegradation of

hydrocarbons by indigenous microbes is universal and occurs to varying extents in all subsurface environments. It is essentially an oxidation-reduction (redox) process where the petroleum hydrocarbon constituents serve as electron donors and the microbes catalyze the transfer of electrons to naturally occurring electron acceptors, deriving energy from the reaction. The general pattern of depleted concentrations of electron acceptors (dissolved oxygen, nitrate, and sulfate) and elevated concentrations of metabolic products (dissolved manganese, ferrous iron, and methane) relative to background conditions in the aquifer associated with petroleum hydrocarbon biodegradation is well established. The pattern of depleted concentrations of electron acceptors and elevated concentrations of metabolic products within the hydrocarbon solute plume is evident. Additionally, the fact that biodegradation of hydrocarbons is an exothermic process coupled with the temperature anomaly coincident with the area of elevated hydrocarbon concentrations indicates that active biodegradation of the hydrocarbons is occurring.

Removal or control of the source of contamination:
The former UST system was permanently closed in 1990. Free product removals commenced in September 1990. Free product removals were initially conducted by hand bailing of the wells. Subsequently, one or more skimmer pumps were installed in the wells to aid in removal efficiency. Approximately 4,900 gallons of undifferentiated product and water were removed from the wells and hauled to an offsite recycler between January 1991 and November 1992. Additional free product removals by bailer, conducted from late 1995 through 1997, resulted in removal of less than 2 gallons of free product. All free product was considered to be removed from the Site as of March 22, 2001. SVE has been utilized twice at this Site to remove residual hydrocarbons from the soil and groundwater. The first SVE system, consisting of 15 extraction wells connected to a thermal oxidizer unit, operated from October 1999 through February 2005. During that time, approximately 18,800 gallons of gasoline-equivalent were removed from the vadose zone and remaining free product layer. The system was shut down to evaluate potential rebound in hydrocarbon concentrations in the groundwater. While no large rebound spike was detected in any of the wells, the hydrocarbon concentrations were not being reduced enough in three of the wells for closure to be considered. The SVE treatment equipment was refurbished in late 2009, and 13 air sparge wells were added to the treatment system. The complete SVE/AS system was turned on in December 2009. In August 2011, eight more extraction wells and six more air sparge wells were added to the system in an attempt to speed up the removal of hydrocarbons from the groundwater. As of August 2015, when the entire treatment system was shut down, an additional 1,780 gallons of gasoline-equivalent had been removed from the subsurface.

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 data for HMW-11 (source area)

Date	Benzene AWQS is 5 µg/L	Depth to water (ft.)
July 1995	**14,000**	15.26
June 1997	**14,000**	18.34
August 2001	**13,000**	20.51
August 2002	**18,000**	21.07
August 2003	**16,000**	21.49
August 2004	**7800**	20.91
August 2005	**5600**	19.42
August 2006	**3900**	22.50
August 2007	**13,000**	22.31
September 2008	**2700**	21.47
September 2009	**1600**	22.12
September 2010	**400**	21.89
September 2011	**380**	22.15
July 2012	**41**	18.32
January 2013	**70**	17.40
July 2013	**36**	18.40
January 2014	**48**	18.52
August 2014	**34**	18.55
April 2015	**27**	22.40
October 2015	**83.5**	19.57
May 2016	**87.5**	19.60
March 2017	**2460**	23.17
September 2017	**3610**	22.80
May 2018	**518/438**	23.15
August 2019	**311**	22.52
August 2020	**987**	22.41

Groundwater data for MW-6 (source area)

Date	Benzene AWQS is 5 µg/L	Depth to water (ft.)
May 1995	Trace free product	16.03
August 1995	--	16.76
August 2006	**2200**	22.00
August 2007	**100**	21.26
September 2008	**1700**	21.00
September 2009	**810**	21.73
September 2010	**610**	21.36
September 2011	**6.5**	--
July 2012	**4200**	20.84
January 2013	**580**	19.92
July 2013	**940**	20.92
January 2014	**1400**	21.04
August 2014	**490**	21.06

April 2015	**--**	--
October 2015	**1140**	21.67
May 2016	**--**	--
March 2017	**82.9**	23.08
September 2017	**11.5**	22.72
May 2018	**11.2**	23.09
July 2019	**Not sampled**	22.45
August 2020	**11.5**	22.36

Groundwater data for MW-9 (source area)

Date	**Benzene AWQS is 5 µg/L**	**Ethylbenzene AWQS 700 µg/L**	**Depth to water (ft.)**
August 2004	**9700**	**2400**	22.25
August 2005	**9900**	**940**	22.53
August 2006	**7300**	**1200**	23.79
August 2007	**5300**	580	23.65
September 2008	**7100**	**1400**	23.54
March 2009	**5200**	**1300**	24.00
September 2010	**5100**	**1100**	23.70
September 2011	**5200**	**2900**	24.28
July 2012	**3800**	**1100**	23.61
January 2013	**1500**	160	22.67
July 2013	**530**	150	24.68
January 2014	**580**	42	24.80
August 2014	**490**	25	24.84
April 2015	<0.500	<2.00	28.69
October 2015	**23.6**	112	24.86
May 2016	**5530**	**1510**	24.88
March 2017	**3100**	**1340**	25.21
September 2017	**3880**	**1400**	24.95
June 2018 (depth specific)	**3500**	**1190**	25.11
June 2018 (depth specific)	**2330**	656	34.50
August 2019	**421**	159	24.60
August 2020	**308**	66.3	24.54

Groundwater data for HMW-13 (down gradient)

Date	**Benzene AWQS is 5 µg/L**	**Depth to water (ft.)**
December 1995	**22000**	19.89
March 1996	--	20.32
June 2000	**16100**	23.15
August 2002	**7500**	23.38
August 2003	**9400**	23.50
August 2004	**5200**	22.93
August 2005	**2300**	23.14

August 2006	**5000**	24.47
August 2007	**3500**	24.23
September 2008	**2000**	23.34
September 2009	**9300**	24.13
September 2010	**--**	--
September 2011	**--**	--
July 2012	<0.5	21.00
January 2013	<0.5	20.90
July 2013	<0.5	21.90
January 2014	<0.5	22.00
August 2014	<0.5	22.04
April 2015	<0.500	25.89
October 2015	**20.8**	--
May 2016	**--**	--
March 2017	**42.1**	23.30
November 2017	**35.5**	23.05
May 2018 (depth specific)	**9.11**	22.95
May 2018 (depth specific)	3.39	27.50
July 2019 (filled with dirt)	---	---

Groundwater data for HMW-24 (down gradient of HMW-13)

Date	**Benzene AWQS is 5 µg/L**	**Depth to water (ft.)**
September 2011	3.8	--
July 2012	**3700**	21.32
January 2013	**630**	20.42
July 2013	**470**	21.42
January 2014	**580**	21.54
July 2014	**200**	21.57
April 2015	**487**	25.42
November 2015	**126**	21.59
June 2016	**210**	21.62
March 2017	<0.500	22.80
November 2017	<0.500	26.47
May 2018	<0.500	26.44
July 2019 (destroyed)	---	---

Groundwater data for MW-7 (former sentinel well for River)

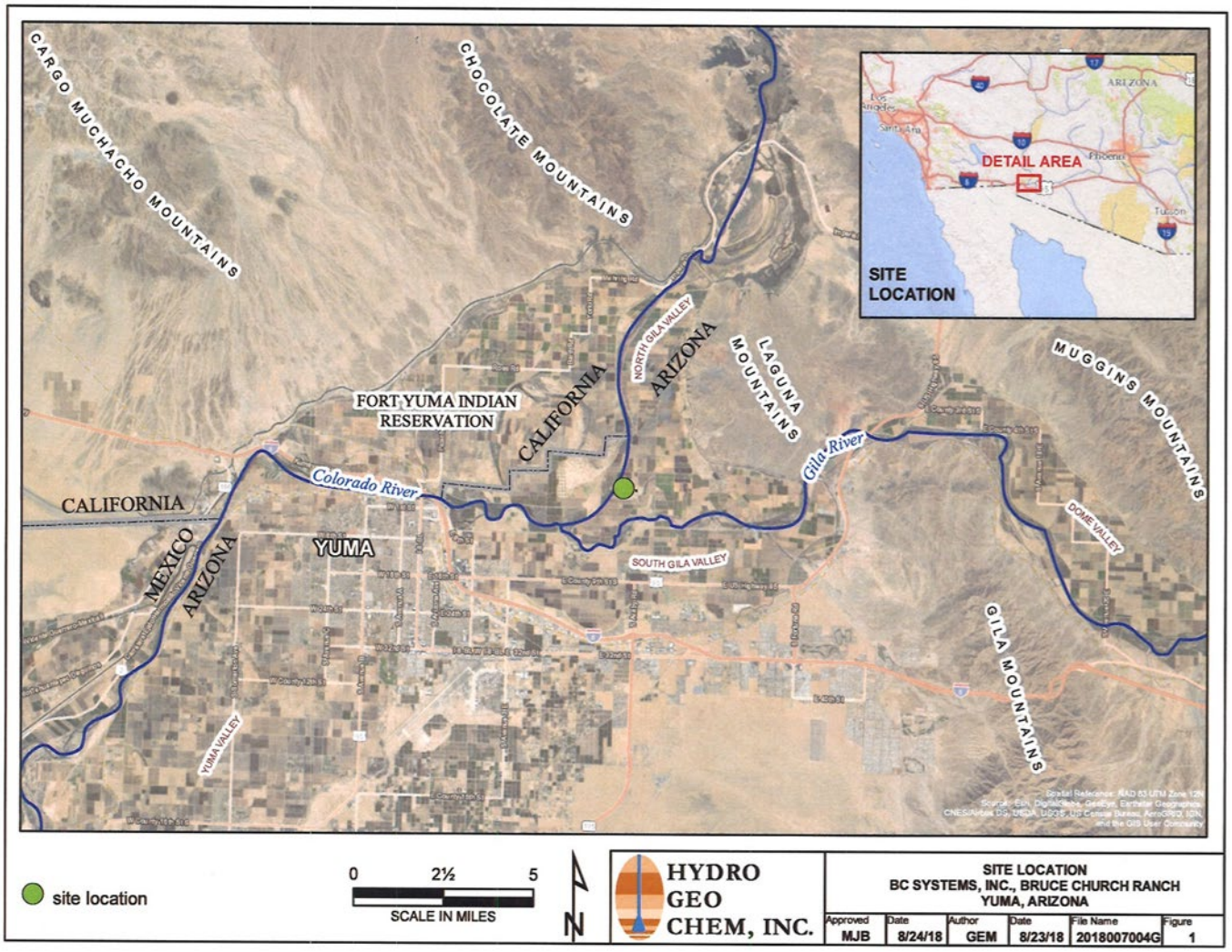
Date	**Benzene AWQS is 5 µg/L**	**Depth to water (ft.)**
May 1995	<1.0	15.59
September 1996	<1.0	18.73
October 1997	<1.0	18.16
July 1998	<0.50	21.04

July 1999	1.1	21.88
June 2000	<0.10	21.61
August 2001	<0.50	20.96
February 2002	**14.0**	22.01
August 2002	<0.50	22.01
August 2003	<0.50	21.73
August 2004	<0.50	21.24
August 2005	<0.50	19.98

Groundwater data for HMW-23 (sentinel well for River)

Date	**Benzene AWQS is 5 µg/L**	**Depth to water (ft.)**
September 2011	<0.5	20.70
March 2012	<0.5	21.02
July 2012	<0.5	19.98
January 2013	<0.5	19.06
July 2013	<0.5	20.06
January 2014	<0.5	20.18
August 2014	<0.5	20.21
April 2015	<0.500	24.07
October 2015 (anomalous data)	**21.2***	20.23
May 2016	--	--
March 2017	<0.500	22.05
September 2017	<0.500	20.33
July 2019	Not sampled	20.26

* Discussed in Other Receptors section


CARGO MUCHACHO MOUNTAINS
CHOCOLATE MOUNTAINS
SITE LOCATION
DETAIL AREA
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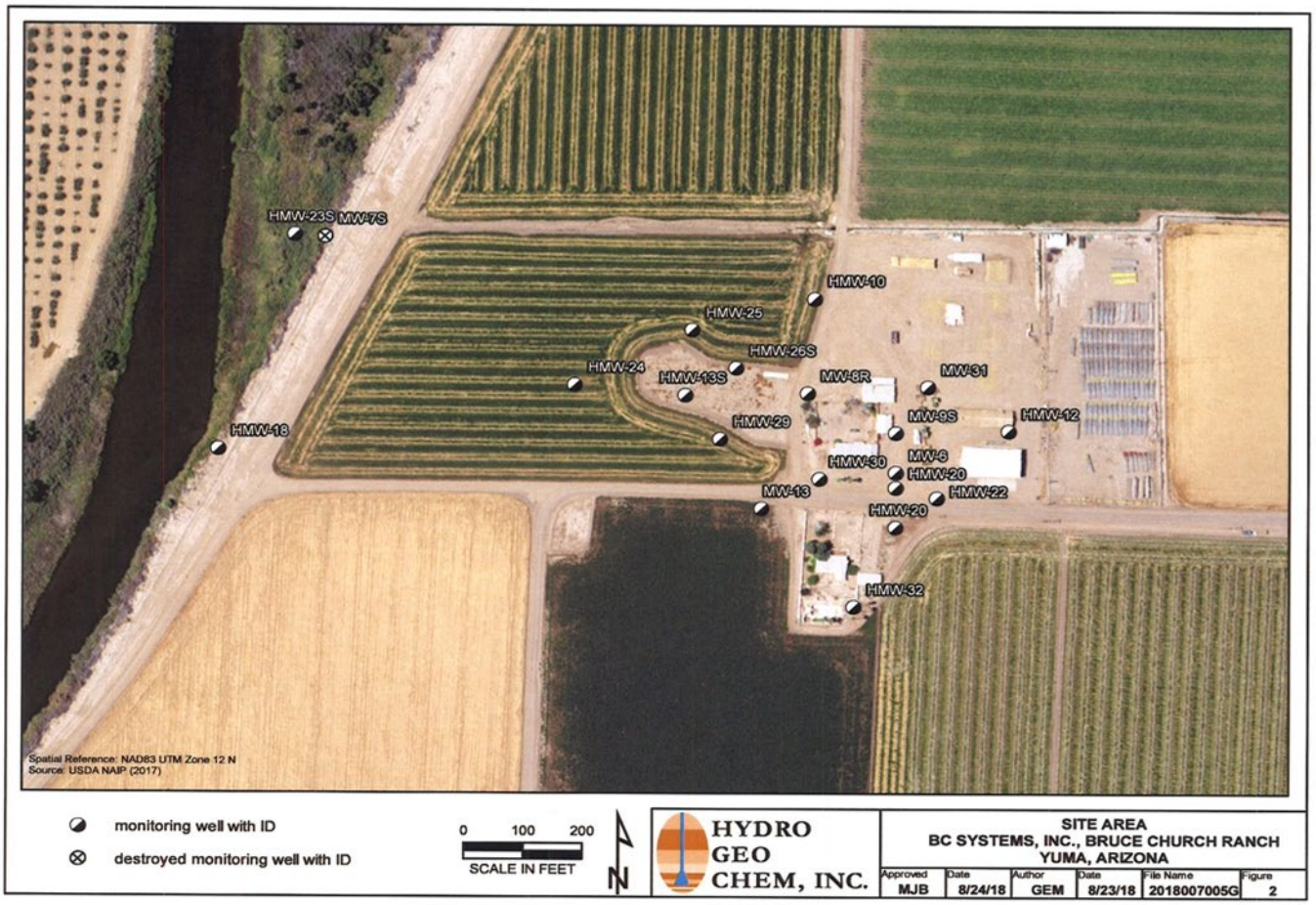
FORT YUMA INDIAN RESERVATION
CALIFORNIA
NORTH GILA VALLEY
ARIZONA
LAGUNA MOUNTAINS
MUGGINS MOUNTAINS
Colorado River
Gila River
CALIFORNIA
MEXICO
ARIZONA
YUMA
SOUTH GILA VALLEY
DOME VALLEY
GILA MOUNTAINS
YUMA VALLEY
site location
0 2½ 5
SCALE IN MILES
N
HYDRO GEO CHEM, INC.
SITE LOCATION
BC SYSTEMS, INC., BRUCE CHURCH RANCH
YUMA, ARIZONA
Approved MJB
Date 8/24/18
Author GEM
Date 8/23/18
File Name 2018007004G
Figure 1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HMW-20
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MW-13
HMW-20
HMW-32
Spatial Reference: NAD83 UTM Zone 12 N
Source: USDA NAIP (2017)
monitoring well with ID
destroyed monitoring well with ID
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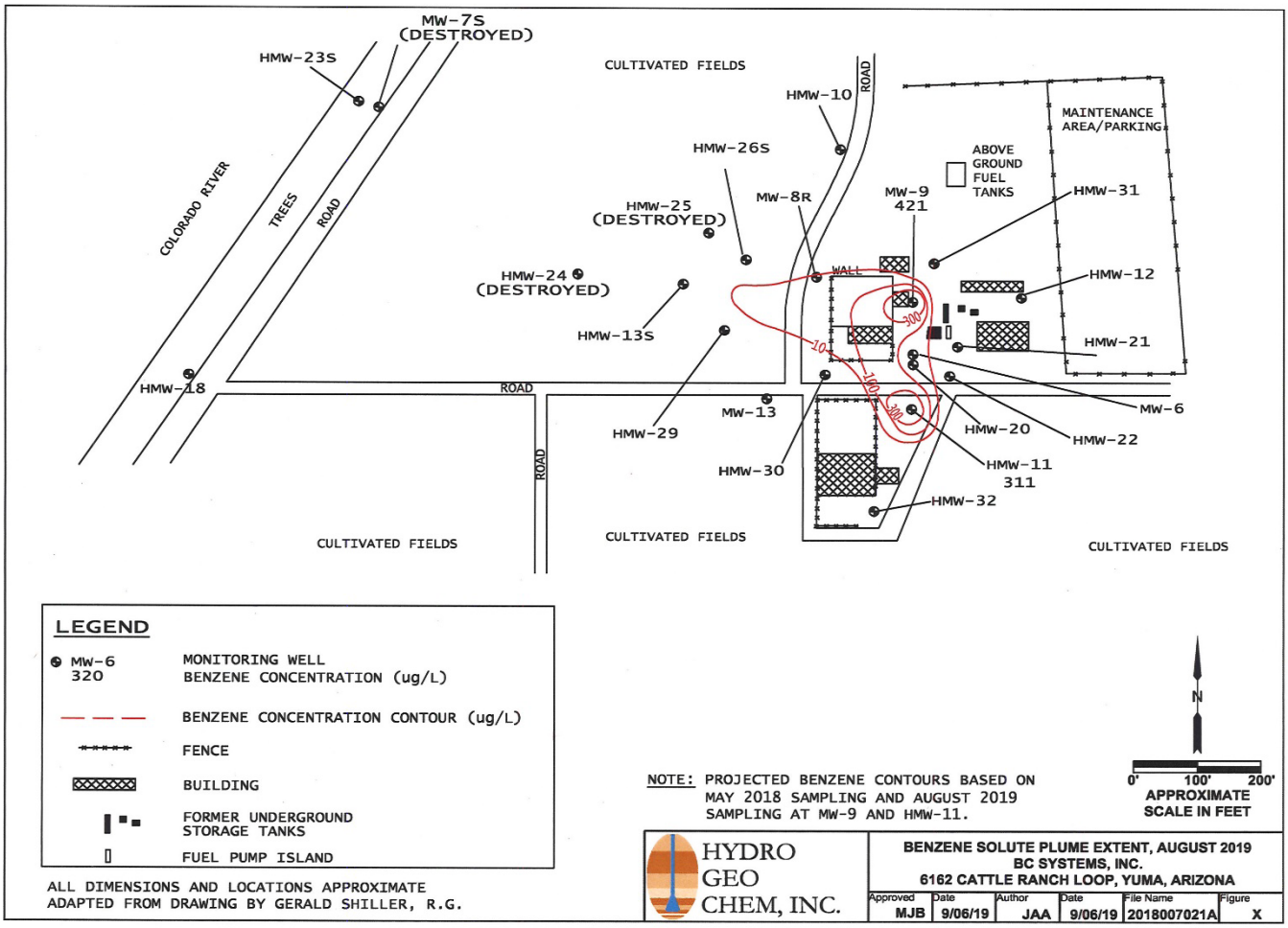
SCALE IN FEET
N
HYDRO GEO CHEM, INC.
SITE AREA
BC SYSTEMS, INC., BRUCE CHURCH RANCH
YUMA, ARIZONA
Approved MJB
Date 8/24/18
Author GEM
Date 8/23/18
File Name 2018007005G
Figure 2


MW-7S
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HMW-23S
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ROAD
MAINTENANCE
AREA/PARKING
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ABOVE
GROUND
FUEL
TANKS
COLORADO RIVER
TREES
ROAD
MW-8R
MW-9
421
HMW-31
HMW-25
(DESTROYED)
WALL
HMW-12
HMW-24
(DESTROYED)
HMW-13S
HMW-21
HMW-18
ROAD
MW-13
MW-6
HMW-29
HMW-20
HMW-22
HMW-11
311
HMW-30
HMW-32
CULTIVATED FIELDS
CULTIVATED FIELDS
CULTIVATED FIELDS
LEGEND
MW-6
320
MONITORING WELL
BENZENE CONCENTRATION (ug/L)
BENZENE CONCENTRATION CONTOUR (ug/L)
FENCE
BUILDING
FORMER UNDERGROUND
STORAGE TANKS
FUEL PUMP ISLAND
ALL DIMENSIONS AND LOCATIONS APPROXIMATE
ADAPTED FROM DRAWING BY GERALD SHILLER, R.G.
NOTE: PROJECTED BENZENE CONTOURS BASED ON
MAY 2018 SAMPLING AND AUGUST 2019
SAMPLING AT MW-9 AND HMW-11.
N
0'
100'
200'
APPROXIMATE
SCALE IN FEET
HYDRO
GEO
CHEM, INC.
BENZENE SOLUTE PLUME EXTENT, AUGUST 2019
BC SYSTEMS, INC.
6162 CATTLE RANCH LOOP, YUMA, ARIZONA
Approved
MJB
Date
9/06/19
Author
JAA
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9/06/19
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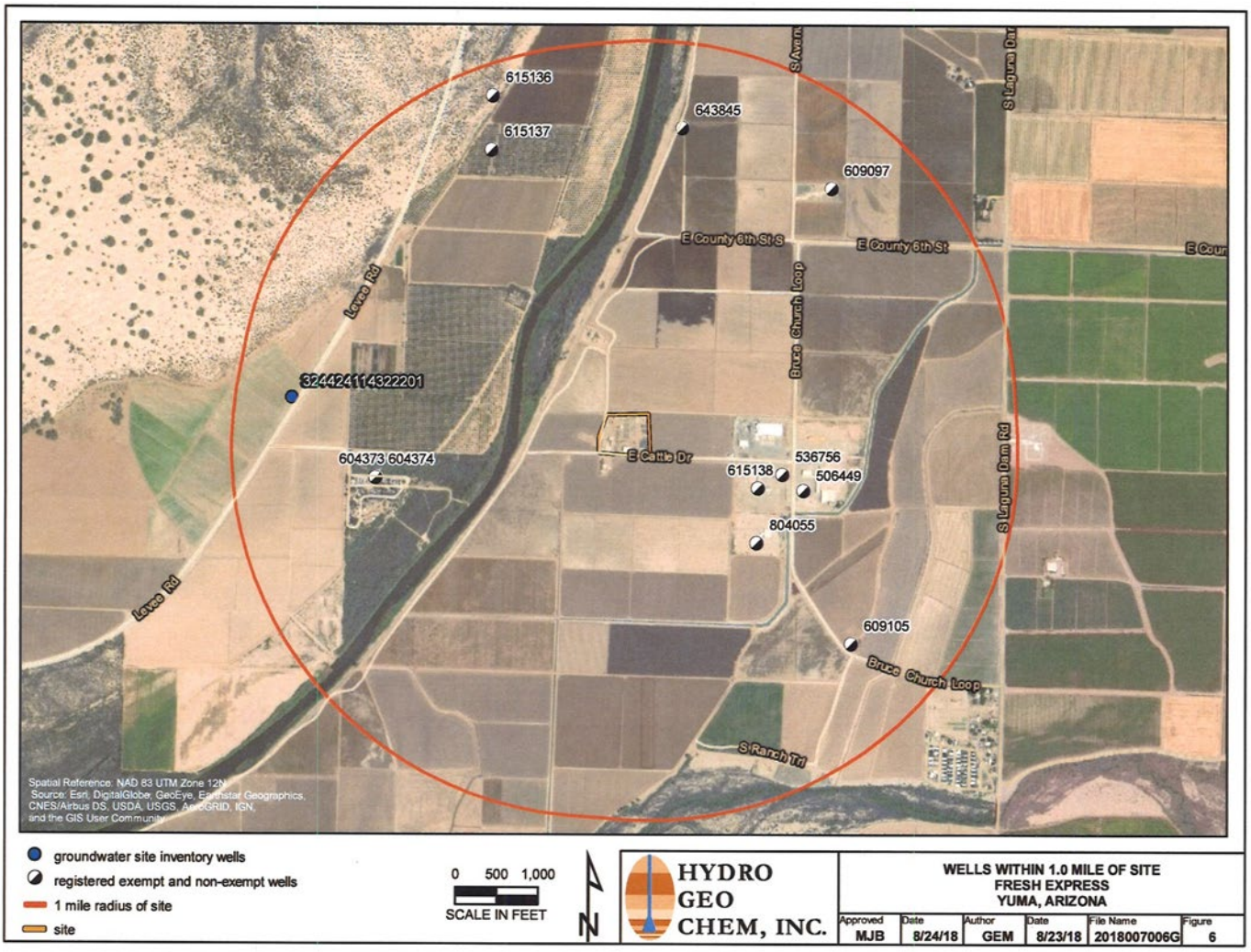
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Bruce Church Loop
S Ranch Trl
Spatial Reference: NAD 83 UTM Zone 12N
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
groundwater site inventory wells
registered exempt and non-exempt wells
1 mile radius of site
site
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SCALE IN FEET
N
HYDRO GEO CHEM, INC.
WELLS WITHIN 1.0 MILE OF SITE
FRESH EXPRESS
YUMA, ARIZONA
Approved MJB
Date 8/24/18
Author GEM
Date 8/23/18
File Name 2018007006G
Figure 6

Wells Currently Registered as Domestic Use near Bruce Church LUST site Yuma County

Legend

● Wells Currently Registered as Domestic Use
—— Roads