

**REMEDIAL INVESTIGATION REPORT
BAHAMA AVENUE AND BIMINI LANE WQARF SITE
LAKE HAVASU, ARIZONA**

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With



and



EXECUTIVE SUMMARY

This Remedial Investigation (RI) Report for the Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund (WQARF) Site (the Site) was prepared by the Arizona Department of Environmental Quality (ADEQ), with Pinyon Environmental and CDM Smith (on behalf of ADEQ). The Site encompasses industrial, commercial, and residential areas located Lake Havasu City, Arizona. The Site is generally bound by Industrial Boulevard to the north, El Camino Drive to the south, the Orion Lane alignment to the east, and Lake Havasu to the west.

The purpose of the RI conducted at the Bahama Avenue and Bimini Lane WQARF Site was to determine the nature and extent of contamination. The RI also identified present and reasonably foreseeable uses of land and waters of the state that have been or are threatened to be impacted by the contamination. Based upon the data collected, the following represents the interpretations and conclusions reached as a result of the RI. This RI report presents the site investigation activities performed from 2001 through October 2025.

The former McCulloch facility manufactured small gasoline-powered equipment at the 648 North Lake Havasu Avenue property from the 1960s to 1989. As part of the manufacturing process, operations such as die-casting, machining, metal finishing, chrome plating, and product testing occurred. Vapor degreasers were likely used in the manufacturing process to clean metal parts. The southern portion of the property (now addressed as 530 Lake Havasu Avenue) was reportedly used as an “evaporation pond” for the wastes from the former McCulloch facility, although no photographs or diagrams of the exact pond location were found.

A structure reported to ADEQ as a “former waste oil clarifier” was also found during RI fieldwork. The former clarifier had previously been connected by piping to the 1790 Industrial Blvd. building, although this piping was found to now be abandoned. Residual fluids containing chlorinated volatile organic compounds (CVOCs) were found remaining in the former clarifier.

Investigations have indicated the presence of the tetrachloroethene (PCE) and trichloroethene (TCE) in samples of soil, soil gas and groundwater at the Site. Thallium has been found above Aquifer Water Quality Standards (AWQS) in limited samples in groundwater. In addition, arsenic was detected over Soil Remediation Levels (SRLs) in shallow soils in the area of the former evaporation pond. Based on the results of the RI, the Site contaminants of concern (COC) include PCE and TCE and arsenic. Thallium is a considered a contaminant of potential concern (COPC). These chemicals are all thought to have originated from the area of the former McCulloch facility. To date, ADEQ has not identified any other sources.

Drinking water in the vicinity of the Site is supplied by Lake Havasu City. Based on information supplied from the Arizona Department of Water Resources (ADWR), no production wells are present within the boundaries of the Site. The Lake Havasu City water production wells are located about 4,000 feet to the northwest of the Site, along Lake Havasu. One private well is located approximately 450 feet south of the source area; however, ADEQ has been unable to obtain access to sample this well. Land use in the general region of the Site consists of mixed-use, low-density residential use, with the usage of properties around the source area consisting of commercial and light industrial use. There are three surface water bodies within the Site boundaries, Lake Havasu, the Industrial Drain located north and the El Dorado Wash located south of the Site, both flowing into Lake Havasu.

Based on laboratory analyses of samples collected during the RI, TCE is the primary COC. The lateral extent of soil contamination in the vadose zone of chlorinated-hydrocarbons, specifically TCE, is confined to the source area. In the vicinity of the former waste clarifier, soils that contained elevated concentrations of PCE and TCE were excavated and removed. After removal of the clarifier and surrounding soils, PCE remained above SRLs in one sample location; however, this area could not be further excavated due to the proximity of a building foundation. PCE and TCE were not detected above SRLs in any other soil samples, but were present at low concentrations in multiple samples collected in source area soil borings.

The vertical extent of CVOCs in soil vapor at the source area is defined to depths of approximately 115 feet below ground surface (bgs), just above the water table. PCE in soil gas was also detected northeast or upgradient of the source area; however, groundwater is not impacted in this area. Soil gas samples collected between the Site and these two areas indicate the detections are likely unrelated to the Site.

As of October 2025, the Site groundwater monitoring and sampling network includes 45 groundwater monitoring wells. Groundwater levels detected near the source area range from 106 feet bgs to 146 feet bgs. Groundwater levels farthest downgradient near Lake Havasu range from approximately 5 feet bgs to 14 feet bgs.

TCE in groundwater was detected in the source area and extends towards Lake Havasu to the west. The extent of PCE detected at the Site is limited to one well in the source area. Thallium was also below AWQS in groundwater samples collected during the March 2025 sampling event.

Data collected at the Site has documented the migration of COCs from the source area downgradient, west, towards Lake Havasu. Based on laboratory analytical data, Lake Havasu has not been impacted by the COCs. The extent of COC contamination in groundwater extends from the source area approximately 4,100 feet west-southwest towards Lake Havasu.

The vadose zone and aquifer are composed mainly of interbedded sand, gravelly sand, silty sand, with minor layers of fine-grained materials. Groundwater elevations range from approximately 443 feet to 468 feet above mean sea level (amsl). Site groundwater flow was to the west-southwest until 2022, however, flow shifted to the northwest after 2022 due to the activation of the Lake Havasu City groundwater production wells located 4,000 feet to the northwest of the Site. The hydraulic gradient has remained consistent at approximately 0.004 feet/foot.

No current receptors were identified at the Site. Soil-gas receptors via vapor intrusion and private well receptors could not be confirmed due to lack of access for sample collection. Future possible receptors include construction workers in the source area, and users of Lake Havasu should the lake become impacted.

The following data gaps have been identified as part of this remedial investigation:

- The potential health impacts from use of the private well located near to the Site could not be evaluated due to the owner or tenant not allowing access.
- It is unknown if TCE has migrated into buildings near the source areas as no owner or tenant allowed access for indoor air sampling.
- Elevated concentrations of CVOCs have been detected at depth of 230 to 240 feet bgs in monitor wells BB-MW-10B and BB-MW-12B. Additional monitor wells are needed to define the extent of contamination in this deeper zone in the downgradient area.
- Site-specific hydrogeological parameters were not determined. Pumping and/or injection pilot tests will be necessary for evaluation of remedies for the Feasibility Study (FS).

The sources of TCE detected in shallow soil gas near to BB-MW-14 and BB-MW-16 are unknown. Shallow soil gas samples collected between the Site and these two areas indicate the detections are likely unrelated to the Site.

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List of Abbreviations

A.A.C.	Arizona Administrative Code
A.R.S.	Arizona Revised Statutes
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
amsl	Above mean sea level
AWQS	Aquifer Water Quality Standard
bgs	Below ground surface
blb	Below lake bottom
cells/mL	cells per milliliter
CIP	Community Involvement Plan
CLP	Contract Laboratory Program
COC	Contaminant of Concern
CVOC	Chlorinated Volatile Organic Compounds
COPC	Contaminant of Potential Concern
1,1-DCE	1,1-dichloroethene
1,2-DCE	1,2-dichloroethene
DEHP	Di-2-ethylhexyl phthalate/bis(2-ethylhexyl)phthalate)
DO	Dissolved oxygen
ERA	Early Response Action
°F	Degrees Fahrenheit
FS	Feasibility Study
GC	Gas chromatograph
HDPE	High Density Polyethylene
LCRIF	Lower Colorado River Industrial Foundation
lbs	Pounds
LWUS	Land and Water Use Study
µg/L	micrograms per liter
µg/m ³	micrograms per cubic meter
µs/cm	microsiemens per centimeter
mg/kg	milligrams per kilogram
PASI	Preliminary Assessment/Site Inspection
PCE	Tetrachloroethene
PI	Preliminary Investigation
PVC	Polyvinyl chloride
ORP	Oxidation-reduction potential
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROI	Radius of Influence
RSL	Regional Screening Level
Site	Bahama Avenue and Bimini Lane WQARF Site

List of Abbreviations Continued

SRL	Soil Remediation Level
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compounds
SVSL	Soil Vapor Screening Level
SWS	Surface Water Standard
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total organic carbon
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
VC	Vinyl chloride
WQARF	Water Quality Assurance Revolving Fund

1. INTRODUCTION

This Remedial Investigation (RI) Report for the Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund (WQARF) Site (the Site) was prepared by the Arizona Department of Environmental Quality (ADEQ), with Pinyon Environmental and CDM Smith (on behalf of the ADEQ). The Bahama Avenue and Bimini Lane WQARF area is located in Lake Havasu City and is generally bound by Industrial Boulevard to the north, El Camino Drive to the south, the Orion Lane alignment to the east, and Lake Havasu to the west. The Site is located approximately 0.5 miles to the south of the Lake Havasu Avenue and Holly Avenue WQARF site. The plumes from both WQARF sites are hydraulically cross-gradient and distinct by areal extent and contaminant makeup (**Figure 1**).

The Site is defined by the limits of groundwater plumes for contaminants of concern (COCs) over Aquifer Water Quality Standards (AWQS) and soil contamination above Soil Remediation Levels (SRLs). The COCs in groundwater are the chlorinated volatile organic compounds (CVOCs) tetrachloroethene (PCE) and trichloroethene (TCE). The COCs for soils are PCE, TCE and arsenic. Thallium, above regulatory standards, has been detected in groundwater in one location during the Preliminary Investigation (PI) and one location during the Remedial Investigation (RI), and is a contaminant of potential concern (COPC).

ADEQ initiated a Preliminary Investigation (PI) under WQARF in 2019. Based on the results of the PI, the Site was placed on the WQARF registry on September 2021, with an Eligibility and Evaluation score of 46 out of 120. This RI presents the results of previous investigations performed in 2001 and 2003 and RI activities performed from 2019 through 2025.

1.1. Purpose of RI Report

This RI was prepared in accordance with the requirements in Arizona Revised Statutes (A.R.S.) Title 49, Chapter 6, Article 5 and Arizona Administrative Code (A.A.C.) Title 18 Environmental

- Quality, Chapter 16 (R18-16-406). The objective of the RI is to:
- Establish the nature and extent of the contamination and the sources;
- Identify current and potential impacts to public health, welfare and the environment;
- Identify current and reasonably foreseeable uses of land and waters of the state, and
- Obtain and evaluate any other information necessary for identification and comparison of alternative remedial actions for the Feasibility Study (FS).

1.2. Site Contaminants of Concern

The results of site investigations completed to date indicate that soil, soil gas, and groundwater have been impacted at the Site. The COCs in groundwater are the CVOCs PCE and TCE which have been detected consistently above the AWQS. The COCs for soils are PCE, TCE, and arsenic. Arsenic was detected above regulatory standards in the southern portion of the site. Thallium, above regulatory standards, has been detected in groundwater in one location during the PI and one location during the RI and is a COPC. The associated groundwater contaminant plume extends to the west, approximately 4,100 feet through industrial and residential areas. The regulatory limits for the COCs are summarized in the table below:

Table 1. Regulatory Limits Utilized at Site

Contaminant of Concern	Aquifer Water Quality Standards (µg/L)	Residential Soil Remediation Level (mg/kg)	Non Residential Soil Remediation Level (mg/kg)
PCE	5	0.51	13
TCE	5	3.0	65
Arsenic	50	10	10
Thallium	2	5.2	6.7

NOTES:

µg/L = micrograms per Liter

mg/kg = milligrams per kilogram

The PCE, and TCE have been detected in soil, soil gas and groundwater samples collected from the Site. COCs have been detected in soil at concentrations exceeding applicable SRLs and in groundwater at the Site at concentrations exceeding applicable AWQSs.

2. Site Background

2.1. Site Description

The Site is located in Lake Havasu City, Arizona, in an urban setting that includes a mixture of commercial businesses, light industrial businesses, warehouses and residential neighborhoods (**Figure 1**). The Site is generally bounded to the north by Industrial Boulevard, El Camino Drive to the south, the Orion Lane to the east, and Lake Havasu to the west (**Figure 1**).

ADEQ has identified the area where the former McCulloch facility was located as a source area of the COCs. The former facility was located on what was originally the 648 North Lake Havasu Avenue property. Between 1998 to 2003, the 648 North Lake Havasu Avenue property was split into four parcels. When referencing the 648 North Lake Havasu property prior to the split, it will be called the *former* 648 North Lake Havasu Avenue property (**Figure 2**; ADEQ, 2001). The former 648 North Lake Havasu Avenue property was split into:

- 648 North Lake Havasu Avenue (parcel 106-16-001L)
- 622 North Lake Havasu Avenue (parcel 106-16-001K)
- 530 North Lake Havasu Avenue (parcel 106-16-001D)
- 1790 Industrial Boulevard (parcel 106-16-001J)

Further parcel splits occurred after the implementation of the RI, resulting in changes in 530 North Lake Havasu Avenue and 1790 Industrial Boulevard parcel designations. 530 North Lake Havasu Avenue split into two parcels, 106-16-001Q and 106-16-001R, with 106-16-001Q retaining the address 530 North Lake Havasu Avenue. 1790 Industrial Boulevard was split into three parcels, 106-16-001U, 106-16-001S, and 106-16-001T, with 106-16-001U retaining the address 1790 Industrial Boulevard. All references to property addresses refer to the properties as shown on **Figure 2**, as the RI work was conducted with this understanding of the parcels and addresses.

2.2. Former 648 North Lake Havasu Avenue (Former McCulloch Facility)

The former McCulloch facility started manufacturing chainsaws and other power equipment at former 648 North Lake Havasu Avenue in the 1960s (ADEQ, 2001). The exact date is unknown, as the property was reportedly undeveloped in 1965 (Steptoe & Johnson, 2000), but historical photographs of this facility indicate the original building on the property was constructed in 1964 (Lake Havasu Museum of History, 2021; Kuehl, 2013). Copies of these photographs are shown in **Appendix A**.

The manufacturing operations at the former McCulloch facility included vapor degreasing, die-casting, machining, metal finishing, chrome plating, and product testing.

The original facility contained three buildings and an evaporation pond. The first facility building was most likely constructed in 1964 (parcel 106-16-001K), with the east and north buildings added later (**Figure 2**). Mohave County records indicate parts of the north and east buildings were constructed in 1965 (Mohave, 2026). However, an aerial photo from December 1964 shows part of the north building was already constructed (**Appendix A**). Mohave County records show the north and east buildings had additions added in 1976, with an addition to the original building on parcel 106-16-001K occurring in 1982. There are no records of the use of any of the buildings.

A concrete tank that was reported to ADEQ as a “former waste oil clarifier” that received wastes from the east building was located on the north side of this building (**Figure 2**). On discovery, ADEQ confirmed that floor and shop drains that were previously connected to the waste oil clarifier were abandoned and no longer in use. For additional information, see **Section 5.1**.

To the south of the original building, evaporation ponds for the wastes produced on-site were reported as having existed on parcel 106-16-011D (ADEQ, 2001). The exact boundary of the former pond is not known. The possible extent of the pond/ponds shown on **Figure 2** are interpolated from the historical facility photo in **Appendix A** and the results of the shallow soil gas survey discussed in **Section 4.2.3**.

Initial use of the evaporation pond predated the Resource Conservation and Recovery Act (RCRA), however the facility continued to operate after RCRA was implemented in 1984. The former McCulloch facility on the former 648 North Lake Havasu Avenue property was not listed as a waste generator, however another McCulloch facility at 900 North Lake Havasu Avenue, approximately 0.5 miles north of the Site, was listed as a large quantity generator (RCRA ID #AZD041458555). The same RCRA ID may have been used for operations at the former 648 North Lake Havasu Avenue property (ADEQ, 2001).

The property containing the former McCulloch facility was sold to the Lower Colorado River Industrial Foundation (LCRIF) by Robert McCulloch in January 1967 (Steptoe & Johnson, 2000). The LCRIF was a non-profit corporation that provided grants and loans for public works projects, with the purpose of increasing industrial development and employment in the Lower Colorado River area. After the sale of the property, the McCulloch facility entered into a 30-year lease with the LCRIF for the continued use of the former 648 North Lake Havasu Avenue property (ADEQ, 2001).

In April 1988, the former McCulloch facility and LCRIF terminated the lease and McCulloch vacated the former 648 North Lake Havasu Avenue property. McCulloch continued operations at

the property located north of the Site at 900 North Lake Havasu Avenue until they filed for Chapter 11 bankruptcy re-organization in 1998 (ADEQ, 2001). The 900 North Lake Havasu Avenue location is the source area at the Lake Havasu Avenue and Holly Avenue WQARF site (**Figure 1**).

McCulloch conducted a Leaking UST (UST) investigation (facility ID: 0-003087) from 1989 to 1990 at what is now 622 North Lake Havasu Avenue (**Figure 2**). The investigation determined that petroleum hydrocarbon contamination was present to a depth of 65 feet below ground surface (bgs). During these investigations, the former UST and immediate surrounding soils were removed. In June 2000, the LCRIF conducted confirmation sampling at 10 feet bgs, and laboratory analyses detected no petroleum hydrocarbons above the method detection limits. This Leaking UST case was then closed. No petroleum hydrocarbons were detected over regulatory limits at or downgradient of the 622 North Lake Havasu Ave property during the RI.

2.3. 648 North Lake Havasu Avenue (Parcel 106-16-001L)

Following McCulloch's Chapter 11 bankruptcy, Del Rio Partners purchased Parcel 106-16-001L in 2000 (Mohave, 2026). Tenants at this address included Conquest Boats, Group 1 Marine, and Schuster Flexible Packaging. The current tenant is Conquest Boats (<https://conquestboats.com>, 2025). Group 1 Marine and Conquest Boats manufacture fiberglass boats. Chemicals reported as being used include: styrene monomer; methyl ethyl ketone; peroxide; acetone; resins to bond the layers of fiberglass; contact cement containing toluene, n-hexane, petroleum distillates and acetone; adhesives containing acetone, hexane, and isobutane/propane; and adhesive cleaners containing petroleum naphtha (ADEQ, 2001). None of these compounds were detected above regulatory standards during ADEQ's 2001 Preliminary Assessment/Site Inspection (PASI), and were not observed during the Preliminary Investigation (PI) or RI activities.

2.4. 622 North Lake Havasu Avenue (Parcel 106-16-001K)

Facilities using this property after the former McCulloch facility included Jamison Bedding and SCP Distributors. Jamison was a mattress sales warehouse and SCP Distributors sold pre-fabricated pools. Current tenants are SCP and National Pool Tile (Google, 2023). ADEQ has no records of chemical use or manufacturing on this property by these entities.

2.5. 1790 Industrial Boulevard (Parcel 106-16-001J)

Schuster Flexible Packaging and Domn8er (*sic*) Power Boats (Google, 2023) operated on the property after McCulloch ceased operations (ADEQ, 2001). Schuster Flexible Packaging manufactured flexible packaging for food products, using materials such as polyester, polyethylene, polypropylene, and solvent-based inks, which contained methyl ethyl ketone, acetone, toluene, and alcohols. Hazardous waste records indicated that the waste products from this facility were shipped off-property for proper disposal. According to ADEQ's PASI report from

2001, a thermal oxidizing unit was used for cleaning rags contaminated with solvents and inks, which were then sent to a commercial laundry service. A former hazardous waste and material storage area existed on the dock adjacent to the east side of the building. This area was bermed, coated with a solvent resistant epoxy, and equipped with two drains which were connected to a sealed truck loading bay on the north side of the dock and a concrete tank on the south side of the building. These areas were designed to catch firefighting wastewater in the event of a building fire. Schuster Flexible Packaging was listed as a large quantity hazardous waste generator with the RCRA ID number of AZR000003285 (ADEQ, 2001).

No information was found in ADEQ records regarding chemical use at Domn8er Power Boats. However, as they were a fiberglass boat manufacturer, it is likely they used similar products as Conquest Boats. None of the compounds associated with boat manufacturing were found in soils or groundwater at this property during the PI nor RI. There is no current tenant on this property at the time of this report.

2.6. 530 North Lake Havasu Avenue (Parcel 106-16-001D)

The property remained a vacant lot, with no formal use from 1988 until 2022. The 2001 PASI noted trespassers traversing the lot as potential receptors, indicating the lot was accessible to the public. The property sold in 2020 to Surf Thru LLC (Surf Thru). In 2022, Surf Thru constructed a car wash on the northern area of the property (now parcel 106-16-001Q). Prior to the sale of the property, Surf Thru conducted a Phase II Environmental Site Assessment and obtained a Prospective Purchasers Agreement with ADEQ.

2.7. History of Chemical Use

Historical operations at the former McCulloch facility were the manufacture of chainsaws and other power equipment. As part of the manufacturing process, it is known that vapor degreasers were used in the manufacturing process (ADEQ, 2001). There is no existing documentation of the chemicals or volumes used during manufacturing at this location; however, during the timeframe of operations at this property, PCE and TCE were commonly used as degreasers. No records of the waste handling exist for this facility. Wastewater was reported to have been discharged into an evaporation pond to the south of the facility (ADEQ, 2001). Also, during the RI, a former clarifier pit was discovered that likely was used for waste management by the facility during operations. Investigations have indicated the presence of the PCE and TCE in samples of soil, soil gas, and groundwater at the Site.

3. PREVIOUS INVESTIGATION

This section provides a summary of site investigations conducted at the former McCulloch facility and the Site. Investigations have included drilling exploratory borings, installation of groundwater monitoring wells, groundwater monitoring, and collection of soil, soil gas, and groundwater samples. Site investigations were performed by ADEQ in 2001, 2003 and 2021 and by Surf Thru in 2019.

3.1. ADEQ Preliminary Assessment/Site Inspection – 2001

In March 2000, Lake Havasu City reported a detection of chromium in municipal supply well LHC-3 that exceeded the chromium AWQS of 100 micrograms per liter ($\mu\text{g/L}$). In response, to investigate possible sources of the chromium contamination, ADEQ initiated a PASI in 2001. The PASI focused on the former McCulloch facility located at the 648 North Lake Havasu Avenue property due to United States Environmental Protection Agency (USEPA) reports of past chemical usage with no formal disposal documentation (ADEQ, 2001).

Fourteen soil borings (MCC-01 through MCC-14) were drilled and sampled across the Site (**Figure 3**). Eleven shallow samples (surface to 2 feet bgs) and 10 deeper (4 to 6 feet bgs) samples were collected and submitted for metals analysis using USEPA Method 6010. Laboratory analyses determined that arsenic was the only metal detected that exceeded the residential and non-residential SRL of 10 milligrams per kilogram (mg/kg). The maximum arsenic concentration detected was 24.3 mg/kg in the shallow sample collected from boring MCC-04 (**Table 2**). All of the other arsenic sample results ranged from 0.94 mg/kg to 8.8 mg/kg . The elevated arsenic concentration was confined to a former portion of the 648 North Lake Havasu Avenue parcel, now addressed as 530 North Lake Havasu Avenue. While arsenic is commonly a naturally occurring element in Arizona soils, the result at MCC-04 was seven times the average of all of the other arsenic results from this investigation.

Soil gas samples were also collected from borings MCC-01 through MCC-13 at depths ranging from 8 to 10.5 feet bgs. TCE was detected at concentrations ranging from 1,000 to 49,000 micrograms per cubic meter ($\mu\text{g/m}^3$) in all samples except the sample collected from boring MCC-01. The area with the highest concentrations of TCE in soil gas was on the parcel now addressed as 530 North Lake Havasu Avenue. PCE was detected at concentrations ranging from 2,000 to 18,000 $\mu\text{g/m}^3$ in three locations. All PCE detections were located in the northern part of the former facility, near the property now addressed as 1790 Industrial Boulevard. (**Table 3; Figure 4**).

3.2. ADEQ Expanded Site Inspection – 2003

The presence of contaminants in soil and soil gas, combined with an exceedance of chromium at municipal supply well LHC-3, led to the 2003 Expanded Site Inspection (ADEQ, 2004). The Expanded Site Inspection was conducted by ADEQ as an effort to gather groundwater data. Analytical data collected during the 2001 PASI indicated that CVOCs and metals had been released to subsurface soils and CVOCs were present in soil gas at the Site.

In September 2003, six borings (MCC-31 through MCC-36) were drilled and sampled to groundwater at the 530 North Lake Havasu Avenue address. Groundwater was encountered during drilling at depths ranging from 110 feet bgs in boring MCC-32 to 130 feet bgs in MCC-31 and MCC-34. Grab samples of groundwater were collected via bailer from the boreholes and submitted for volatile organic compounds (VOCs) using the EPA Contract Laboratory Program (CLP) for VOCs, semi-volatile organic compounds (SVOCs) using CLP SVOCs, and total (unfiltered) metals laboratory analyses using CLP total metals and cyanide (**Figure 5**; ADEQ, 2004).

Laboratory analytical results of the VOC analysis determined the presence of TCE, PCE, *cis*-1,2-dichloroethene (*cis*-1,2-DCE) and vinyl chloride (VC) in groundwater. TCE was detected above its AWQS of 5 µg/L in all samples, with concentrations ranging from 100 to 1,400 µg/L. PCE was detected below its AWQS of 5 µg/L in all samples, with a maximum concentration of 2.8 µg/L. *Cis*-1,2-DCE was detected below its AWQS of 70 µg/L in four samples, with a maximum concentration of 1.1 µg/L. VC was detected in one sample at an estimated concentration of 0.27 µg/L, below its AWQS of 2 µg/L (**Table 4**, **Figure 5**).

Laboratory analytical results of the SVOC analysis determined the presence of bis(2-ethylhexyl)phthalate (also called di-2-ethylhexyl phthalate (DHEP)) in five samples, with two detections above its AWQS of 6 µg/L at estimated concentrations of 9 and 18 µg/L in borings MCC-34 and MCC-35 (**Figure 5**). The DEHP concentrations were estimated due to high detection limits for the method used (**Table 4**). However, DHEP was not detected during the PI and is not considered a COC (**Section 3.4**).

Laboratory results of the metals analysis determined the presence of barium, beryllium, cadmium, chromium, lead, nickel, and thallium above their respective AWQSs. Arsenic was detected below its AWQS of 50 µg/L in all samples, with a maximum concentration of 21.3 µg/L. The CPOC thallium was detected in five samples, one of which exceeded its AWQS of 2 µg /L at an estimated concentration of 2.8 µg/L. Chromium was detected above its AWQS of 100 µg/L in all samples, with concentrations ranging from 112 to 858 µg/L. As the PASI samples were unfiltered, these results were likely due to sediment and were not representative of dissolved

constituents (**Table 4**). Groundwater samples collected for metals analysis during the PI (**Section 3.4**) were field filtered and only thallium was detected over AWQS.

3.3. Surf Thru Phase II Property Purchase Investigation - 2019

Prior to initiating the Phase II Environmental Site Investigation (Phase II), Surf Thru conducted an environmental records review for the 530 North Lake Havasu Avenue property. During the records review, Surf Thru made ADEQ aware of the 2001 PASI (ADEQ, 2001) and 2003 Expanded Site Investigation (ADEQ, 2004). ADEQ initiated PI activities under the WQARF program in response to this information.

In October 2019, Surf Thru conducted a limited Phase II as part of the pending sale of the 530 North Lake Havasu Avenue property (Western Technologies, 2019). As part of the Phase II, nine shallow soil borings were drilled and three test pits were excavated and sampled. Soil samples were collected from borings B-1 through B-6 and B-8 and B-9 at depths ranging from 3 to 20 feet bgs. Augur refusal occurred at B-7 so no soil samples were collected from this location. The three test pits (TP-1 through TP-3) were excavated in the center of the property to a depth of 10 to 12 feet bgs. Following excavation, one soil sample was collected from the sidewall of each pit (**Figure 3**). Samples were laboratory analyzed for VOCs using EPA Method 8260 and for arsenic, barium, cadmium, chromium, hexavalent chromium, lead, mercury, selenium, and silver by EPA Method 6010C/7471B. Laboratory analyses determined that no VOCs were detected over method reporting limits (Western Technologies, 2019). For metals, arsenic exceeded its SRL of 10 mg/kg in two locations: 17.2 mg/kg in B-5 at 20 feet bgs and 10.2 mg/kg in B-8 at 3 feet bgs (**Figure 3; Table 5**). No other metals were detected above their respective SRLs. The boring and test pit sample metals analytical results are shown in **Table 5**.

3.4. 2020-2021 WQARF Preliminary Investigation

In September 2020, groundwater monitoring wells BB-MW-01, BB-MW-02, and BB-MW-03 were installed in Lake Havasu City right-of-way to determine if concentrations of previously detected COCs at the Site remained above AWQS (**Table 6, Figure 6**). Monitor wells BB-MW-01 through BB-MW-03 were all installed within the southern parcel; wells BB-MW-01 and BB-MW-02 along the western property boundary and well BB-MW-03 installed along the eastern property boundary. Soil, soil gas, and groundwater samples were collected via push-ahead samplers during drilling. All samples were field screened for CVOCs using a portable gas chromatograph (GC). Boring logs for all monitoring wells are available in **Appendix B**.

For potential future site characterization, three permanent soil gas monitoring points were installed as nested wells during the installation of monitor wells BB-MW-02 (at 50 feet bgs) and BB-MW-03 (at 25 and 75 feet bgs). Wells were constructed using ¼-inch, High Density

Polyethylene (HDPE) tubing. The permanent monitoring points are referenced with the naming convention “BB-MW-[well number]-SG-[depth]” in **Table 6**.

3.4.1. Monitor Well Installation and Sampling

TCE was detected in soil samples collected during the drilling of all three monitoring wells, with a maximum concentration of 0.0344 mg/kg. PCE was detected in soil samples collected during the drilling of monitoring wells BB-MW-01 and BB-MW-03, with a maximum concentration of 0.0002 mg/kg. All detected concentrations of TCE and PCE were below SRLs. TCE was detected in every soil sample from the shallow soil to just above the water table at the BB-MW-03 location. Field screening results for soil samples collected during drilling are shown on **Table 7**.

TCE, PCE and *cis*- and *trans*-1,2-DCE were detected in soil gas samples collected during the drilling of BB-MW-02 (50 feet) and BB-MW-03 (25 and 75 feet). The maximum detected concentrations of TCE, PCE, and *cis*- and *trans*-1,2-DCE were 136,000 µg/m³; 247 µg/m³; 99.5 µg/m³; and 38.4 µg/m³, respectively. Multiple results for TCE exceeded the Soil Vapor Screening Level (SVSL) of 100 µg/m³ for non-residential properties, however the highest concentrations of TCE in soil gas were detected in BB-MW-02 at 50 feet bgs and in BB-MW-03 at 75 feet bgs. The SVSL was derived using the worker indoor air USEPA Regional Screening Levels (RSLs) divided by an attenuation factor of 0.03. Field screening results for soil gas samples collected during drilling are shown on **Table 8 and Figure 7**.

Groundwater samples were collected during drilling activities and field screened with a portable GC. Two samples from each well, the sample with the highest concentration and the sample that was the first likely under AWQS from the portable GC, were then sent to a fixed-based laboratory for analysis. Laboratory analyses indicated that TCE was detected in groundwater samples collected during the drilling of all three monitoring wells, with a maximum concentration of 2,650 µg/L in well BB-MW-01 at 120 feet bgs. Concentrations detected from samples collected at all three drilling locations exceeded the 5 µg/L AWQS for TCE. PCE was only detected above the AWQS of 5 µg/L in the groundwater sample collected from BB-MW-01 at a concentration of 5.82 µg/L at 120 feet bgs. VOC sample results collected during drilling are shown on **Table 9**.

In October 2020, a groundwater sampling event was conducted to evaluate concentrations of VOCs, SVOCs, and metals. A preexisting ADEQ monitoring well, MW-12B, was discovered during earlier PI field activities and included in this sampling event along with wells BB-MW-01, BB-MW-02, and BB-MW-03 (**Figure 6**). Groundwater samples from all four monitoring wells were collected via low-flow sampling for laboratory analysis of Chlorinated VOCs using EPA Method 8260B, dissolved metals barium, beryllium, cadmium, total chromium, hexavalent chromium,

lead, nickel, and thallium using EPA Method 6010D/7199, and SVOCs including di-2-ethylhexyl phthalate using EPA Method 8270C.

Laboratory analytical results indicated that TCE concentrations exceeded the AWQS in all groundwater samples, with a maximum concentration of 916 µg/L at 104 feet bgs in well BB-MW-02. TCE was detected at a concentration of 66.7 µg/L in the furthest downgradient well, MW-12B. PCE and TCE results are on **Table 10**. No other VOCs or SVOCs were detected at concentrations over their respective AWQS in the samples submitted for laboratory analysis. DEHP was not detected in any sample and was ruled out as a possible COC during the PI. Laboratory analytical results are available in **Appendix C**.

Laboratory results from the metals analysis detected thallium at an estimated concentration of 5.08 µg/L in BB-MW-02 at 155 feet bgs, which is above its AWQS of 2.0 µg/L (**Table 10**). No other metals were detected at concentrations over their respective AWQS. All laboratory analytical results are available in **Appendix C**.

In May 2021, two additional monitoring wells were installed to obtain more accurate groundwater flow direction data and to better define the CVOC plume. Monitoring wells BB-MW-04 and BB-MW-05 were installed to improve upgradient and side-gradient plume definition, respectively (**Figure 6**). Soil, soil gas, and groundwater samples were field screened for screening purposes only. Field screening results for soil, soil gas and groundwater samples are shown on **Tables 7, 8 and 9**, respectively. For potential future site characterization, one permanent soil gas monitoring point was installed as a nested well during the installation of monitor well BB-MW-04 (at 22 feet bgs). The well was constructed using ¼-inch, High Density Polyethylene (HDPE) tubing. The permanent monitoring points are referenced with the naming convention “BB-MW-[well number]-SG-[depth]” in **Table 6**.

In June 2021, following monitor well installation, groundwater samples were collected from the six monitoring wells (BB-MW-01 through -05 and MW-12B) using HydraSleeves™ and submitted for laboratory analysis of VOCs using EPA Method 8260B. TCE was detected at concentrations over its AWQS in samples collected from wells BB-MW-01, BB-MW-02, and BB-MW-03, with a maximum detected concentration of 1,290 µg/L at 105 feet bgs in well BB-MW-02. No other chlorinated VOCs were detected. COC results for groundwater samples collected from monitoring wells are shown on **Table 10**, and full laboratory analytical results are available in **Appendix C**.

3.4.2. Lake Havasu and Sediment Sampling - 2021

In May 2021, a total of ten samples, five surface water (LHS-01-SW through LHS-05-SW) and five lakebed porewater samples (LHS-01-SS through LHS-05-SS) were collected from the eastern

shoreline of Lake Havasu in areas suspected to be downgradient of the CVOC plume. Sampling locations were accessed from Lake Havasu using a pontoon boat. Upon arrival at each of the sampling locations, the boat was anchored or beached. Well points (36 inches long, 2 inches in diameter, 30-inch screen) were manually drove between 30 to 40 inches into the lake bottom until the screen was fully embedded or refusal was encountered. Additional piping was attached to the top of the well point so that lake water was not able to flow directly into the well point. The wells were then purged using a peristaltic pump attached to tubing placed at the bottom of the well point. The well points were purged until heavy sediments were removed and purge water was visually clear. Following purging, a subsurface sample was collected from each location.

Samples were submitted for laboratory analysis for a limited suite of CVOCs including TCE, PCE, and *cis*- and *trans*-1,2-DCE using EPA Method 8260B. Laboratory analyses indicated that TCE was detected in one sample (LHS-01-SS) at an estimated concentration of 0.248 µg/L. This concentration is below the fish consumption surface water quality standard of 29 µg/L and the drinking water standard of 5 µg/L. TCE and PCE were not detected over the method reporting limits in any other samples. Petroleum-related hydrocarbons (e.g. toluene at 0.337 µg/L, 1,2,3-trimethylbenzene at 0.18 µg/L) were also detected, but were below their respective AWQS. The petroleum-related hydrocarbons detected are unlikely to be related to the Site. No other CVOCs were detected. Laboratory analytical results for surface water and lakebed porewater samples are shown on **Figure 8**.

4. SITE CHARACTERIZATION ACTIVITIES

This section provides a summary of remedial actions performed following the listing of the Site on the WQARF Registry in September 2021. Investigations included additional lake sampling, soil gas investigations, installation of additional groundwater monitoring wells, a surface soil investigation, groundwater monitoring and the collection of soil, soil gas, groundwater samples.

4.1. Lake Havasu and Sediment Sampling – 2021 and 2023

In December 2021, five additional surface water (LHS-06-SW through LHS-10-SW) and five lakebed (LHS-06-SS through LHS-10-SS) samples were collected from the eastern shore of Lake Havasu, hydraulically downgradient of the source area. The co-located surface water samples were collected via placing new sample tubing above the lake bed adjacent to the temporary well point. Porewater samples were collected at depths ranging from 2.67 feet below lake bottom (blb) to 3.25 feet blb. Samples were submitted for laboratory analysis of VOCs using EPA Method 8260B. Laboratory analyses determined that PCE, TCE, *cis*-1,2-DCE and *trans*-1,2-DCE were not detected above the method reporting limits in any of the samples (**Figure 8**).

In March 2023, five additional surface water (LHS-11-SW through LHS-16-SW) and five lakebed (LHS-11-SS through LHS-16-SS) samples were collected from the eastern shore of Lake Havasu. Samples were submitted for laboratory analysis of VOCs using EPA Method 8260B. Laboratory analyses determined that PCE, TCE, *cis*-1,2-DCE and *trans*-1,2-DCE were not detected above the method reporting limits in any of the samples (**Figure 8**). Laboratory analytical results are available in **Appendix C**.

4.2. Soil Gas Investigation – 2022

From February to November 2022, shallow soil gas investigations were conducted to evaluate the former facility and surrounding area for shallow VOC soil contamination indicative of a contaminant release. An active soil gas investigation was performed within the rights-of-way of Industrial Boulevard to the north, Bahama Avenue and Bimini Lane to the southeast and Lake Havasu Avenue to the west. As part of a passive soil investigation, passive soil gas samplers were deployed to assess shallow soil gas around the southern portion of the Site where the former evaporation pond may have been located.

4.2.1. Active Soil Gas Sampling

In February 2022, 17 temporary soil gas sampling points (BB-SG-01 through BB-SG-17) were installed using a direct push drill rig (**Figure 9**). A single discrete soil gas sample was collected from each point at depths ranging from 5.5 to 15 feet bgs. If refusal was encountered less than 5

feet bgs, the boring was terminated and reattempted within 2 to 3 feet of the original location. BB-SG-10 was not sampled due to drilling equipment malfunction.

The temporary soil-gas points were installed by placing polyethylene tubing (with a vapor probe tip on the end) inside the borehole from ground surface to the sampling depth. The vapor probe tips were set in sand and sealed with hydrated bentonite. Following installation, the soil gas point was allowed to equilibrate for 20 minutes. Each soil gas point was then purged using a vacuum pump at an approximate rate of 200 milliliters per minute (mL/min). Purge time was calculated by dividing the “dead volume” (i.e., the internal volume of the tubing) by 200 mL/min. For QA/QC, 1,1-difluoroethane was used as a tracer gas during the sampling process (confirmation samples only) to evaluate if breakthrough had occurred. DFA was included in the target analytes. Samples were then collected using 1-liter vacuum canisters and submitted to AEL for laboratory analysis of PCE and TCE (February 2022) and full-list VOCs (June and October 2022) using EPA Method TO-15 (**Table 11**).

In June 2022, a total of 14 soil gas samples were collected from seven additional soil gas points (BB-SG-1-5 through BB-SG-7-15) from temporary soil gas sampling points near the former waste oil clarifier and a concrete lined pit at 1790 Industrial Boulevard (**Figure 10**). Two soil-gas samples were collected from each point at depths ranging from 5 to 15 feet bgs using the same methodology as above.

In October 2022, eight soil gas samples (BB-SG2-01 through BB-SG2-08) were collected from temporary soil gas points installed in step-out locations from the February 2022 sampling (**Figure 9**). These samples were collected to bound the TCE soil gas plume to concentrations less than the SVSLs of 16 $\mu\text{g}/\text{m}^3$ for residential properties or 100 $\mu\text{g}/\text{m}^3$ for non-residential properties.

Laboratory analyses determined that the highest PCE concentration in the shallow soil gas at the Site was 65,200 $\mu\text{g}/\text{m}^3$ in sample BB-SG-6-10 at 10 feet bgs, near the former waste clarifier (Figure 8). The highest concentration of TCE detected using the direct push method sampling was 30,700 $\mu\text{g}/\text{m}^3$ in sample BB-SG-03 at 15 feet bgs. The distribution of TCE in soil gas indicates that a preferential migration pathway may exist along utility corridors on Bimini Lane (**Figure 9**).

When shallow soil gas results collected from 15 feet bgs during monitoring well installation are included (**Section 4.3.2**), the highest TCE concentrations in the shallow soil gas was 130,000 $\mu\text{g}/\text{L}$ at the BB-MW-09 location. Laboratory results indicate that the shallow TCE soil gas plume is primarily bound by Industrial Drain to the north, El Dorado Wash to the south, to the Cibola Lane alignment to the east, and Highway 95 to the west. The PCE soil-gas plume is confined to the area near the former clarifier at 1790 Industrial Boulevard (**Table 11, Figures 9 and 10**).

4.2.2. Passive Soil Gas Sampling

In November 2022, 48 passive soil gas samplers (BB-PSG-1 through BB-PSG-48) were deployed to assess shallow soil gas around the southern portion of the Site where the former evaporation pond was located. The passive soil gas samplers were provided by Beacon Environmental (Beacon) and were deployed across the study area utilizing a grid configuration. were installed using a hand drill from one to three feet bgs. Following installation, the passive samplers were left in place for eight to nine days. Each sampler was then retrieved, sealed, and shipped back to Beacon for analysis of VOCs via USEPA Method 8260C. The Beacon passive soil-gas samplers have known uptake rates for CVOCs, therefore Beacon's analysis converted the mass of CVOCs into concentrations.

Laboratory analyses determined that the maximum detected concentrations of PCE, TCE and 1,1-DCE were 20.7 $\mu\text{g}/\text{m}^3$ (BB-PSG-46); 5,150 $\mu\text{g}/\text{m}^3$ (BB-PSG-48); and 5.93 $\mu\text{g}/\text{m}^3$ (BB-PSG-48), respectively. Analytical results indicated that the northwest portion of the study area had the highest relative concentration of TCE, PCE, and 1,1-DCE. The location of relatively high SVOC concentrations likely indicate the area where a former evaporation pond was located (**Figures 11A, B, and C**). Beacon's figures and tables describing the analytical results and sample locations of the soil gas survey are provided in **Appendix D**.

4.3. Monitor Well Installation – 2021 to 2023

From 2021 to 2023, 13 additional groundwater monitor wells (BB-MW-06 through BB-MW-18) were installed to define the extents of the groundwater contaminant plume (**Figure 6**). Total depth of the borings prior to installation of the monitor wells ranged from 85 to 340 feet bgs. The depth to groundwater encountered during drilling of wells upgradient of the source area from 148 and 158 feet bgs; at the source area ranged from 113 to 145 feet bgs; and down gradient near Lake Havasu was 5 and 30 feet bgs. Boreholes drilled beyond the screened interval were abandoned with hydrated bentonite chips from the bottom of the boring to approximately five feet below the bottom of the well screen. Single monitoring wells were constructed using schedule 80, 4-inch polyvinyl chloride (PVC) screen and casing. Dual-nested monitoring wells were installed using 2-inch, schedule 80 PVC screen and casing. All wells were constructed with washed silica sand filter packs, hydrated bentonite seals, and cement seals in accordance with ADWR requirements. The monitoring wells were completed at ground surface with 12-inch, flush-mounted, traffic-rated well covers. For potential future site characterization, eight permanent soil gas monitoring points were installed as nested wells during the installation of monitor wells BB-MW-13 (at 30 and 113.5 feet bgs), BB-MW-14 (at 48 feet bgs), BB-MW-15 (at 25 and 75 feet bgs) and BB-MW-16 (50, 100 and 125 feet bgs). Wells were constructed using ¼-

inch, High Density Polyethylene (HDPE) tubing. The permanent monitoring points are referenced with the naming convention “BB-MW-[well number]-SG-[depth]” in **Table 6**.

Well construction details are shown on **Table 6**; well locations are shown on **Figure 6**; and boring logs and well construction diagrams are included in **Appendix B**. Chronological installation details are as follows:

- From November 2021 to January 2022, wells BB-MW-06, BB-MW-07A/B, BB-MW-08A/B, and BB-MW-09A/B were installed. BB-MW-06 was installed as a single-screened monitoring well downgradient of the source area along Highway 95. BB-MW-07A/B, BB-MW-08A/B and BB-MW-09A/B were installed to help delineate the source area north of the big building. These wells were completed as dual-nested wells to monitor the depth of TCE and PCE contamination at the source area.
- From March to May 2022, wells BB-MW-10A/B, BB-MW-11A/B, BB-MW-12A/B and BB-MW-13A/B were installed. BB-MW-10A/B, BB-MW-11A/B and BB-MW-12A/B were installed as dual-nested wells to define the downgradient extent of the TCE plume, both laterally and vertically. BB-MW-13A/B was installed to investigate possible releases on a vacant parcel east of 1790 Industrial Boulevard.
- In October 2022, wells BB-MW-14A/B, BB-MW-15A/B, BB-MW-16A/B, and BB-MW-17A/B were installed. BB-MW-14A/B and BB-MW-17 A/B were installed as dual-nested wells to characterize the full downgradient and cross gradient extent of the TCE plume. BB-MW-15A/B and BB-MW-16A/B were installed to ensure no upgradient sources were contributing to the Site, due to increased TCE concentrations detected in BB-MW-04.
- In November 2023, wells BB-MW-10, BB-MW-12, and BB-MW-18A/B were installed to delineate the TCE plume in the shallow groundwater. BB-MW-10 and BB-MW-12 were installed as single screened wells, paired with BB-MW-10A/B and BB-MW-12/A/B, respectively. BB-MW-18A/B was completed as a dual nested well to delineate the downgradient extent of the TCE plume to the west.

Soil samples collected during drilling were screened in the field using a portable GC for PCE and TCE. Selected samples were also field screened for *cis*-1,2-DCE and *trans*-1,2-DCE and laboratory analyzed for arsenic and thallium using EPA Method 6010D (**Table 7**). No soil samples were collected from BB-MW-17 and BB-MW-18 as groundwater was encountered within the top ten feet of the boring.

Soil gas samples collected during drilling of wells BB-MW-06 through BB-MW-16 and BB-MW-18 were collected from push-ahead samplers or temporary soil vapor wells at depths shown on

Table 8. Samples were screened in the field using a portable GC for PCE, TCE, *cis*-1,2-DCE and *trans*-1,2-DCE (**Table 8**). No soil gas samples were collected from BB-MW-17 due to the presence of groundwater at 7 feet bgs.

Groundwater samples were collected at approximate 20-foot intervals using a push-ahead sampler during the drilling of each well. To provide vertical contaminant distribution data and assist in determining well screen depths, selected groundwater samples were screened for PCE, TCE, *cis*-1,2-DCE and *trans*-1,2-DCE using a portable GC or analyzed using a mobile laboratory.

4.3.1. Soil Sample Results

Highest field screening results of PCE and TCE were detected in the soil sample collected from BB-MW-08 at 147 feet bgs at concentrations of 0.039 mg/kg and 0.0151 mg/kg, respectively. All field screening results for PCE and TCE were below the SRL of 5 mg/kg. The selected samples that were field screened for *cis*-1,2-DCE and *trans*-1,2-DCE were all below their respective SRLs. Laboratory analyses determined that arsenic and thallium were not detected above SRLs in any of the soil samples analyzed (**Table 7**).

4.3.2. Soil Gas Sample Results

Highest field screening results of PCE and TCE were detected in soil gas samples collected from well BB-MW-09. Samples were collected during drilling of BB-MW-09 at 15, 25, 50, 75 and 115 feet bgs. The highest PCE results were detected in the sample collected from 25 feet bgs at a concentration of 101,000 $\mu\text{g}/\text{m}^3$. The highest TCE results were detected in the sample collected from 115 feet bgs at a concentration of 527,000 $\mu\text{g}/\text{m}^3$. Field screening of soil gas samples collected from wells BB-MW-15 and BB-MW-16, located offsite and northeast of the source area, detected elevated concentrations of both PCE and TCE. Soil gas samples collected from BB-MW-14, located offsite and northwest of the source area, also detected concentrations of PCE and TCE. It is unclear if these detections were related to the Site TCE soil gas plume (**Table 8, Figure 7**).

4.3.3. Groundwater Sample Results

Highest field screening groundwater results were detected in samples collected from well BB-MW-06. Samples were collected from well BB-MW-06 at 20-foot depth intervals from 110 to 340 feet bgs. Highest concentrations of PCE and TCE detected were in the sample collected at 150 feet bgs at concentrations of 56.1 $\mu\text{g}/\text{L}$ and 1,881 $\mu\text{g}/\text{L}$, respectively. Concentrations of PCE and TCE exceeded the AWQS of 5 $\mu\text{g}/\text{L}$ at all sample intervals except the sample collected from 330 feet bgs (3.86 $\mu\text{g}/\text{L}$ and 4.40 $\mu\text{g}/\text{L}$, respectively) (**Table 9**).

4.4. Groundwater Monitoring and Sampling – 2020 to 2025

Groundwater monitoring and sampling events of site monitor wells have taken place periodically from October 2020 to the most recent event in October 2025. Since groundwater monitoring began in 2020, the highest PCE and TCE concentrations detected have been in source area wells (BB-MW-01 through BB-MW-03, BB-MW-07A/B through BB-MW-09A/B and BB-MW-13A/B). The highest PCE detected was in well BB-MW-07A (279 µg/L) in August 2022. The highest TCE detected was in well BB-MW-01 (2,630 µg/L) in December 2022.

Laboratory analyses determined that TCE is the most extensively detected contaminant in groundwater across the Site. The highest concentrations of TCE have been consistently detected in wells BB-MW-01 (2,630 µg/L) and BB-MW-02 (2,050 µg/L). Since 2022, TCE concentrations in the source area wells have decreased. TCE concentrations detected in well BB-MW-01 have decreased from 2,630 µg/L in December 2022 to 250 µg/L in the most recent sampling event in October 2025.

Unlike TCE, elevated concentrations of PCE are limited to source area wells. Elevated concentrations of PCE have been consistently detected only in wells BB-MW-01 and BB-MW-07A, 08A and 09A. PCE has not been detected in any of the offsite monitoring wells or from wells with screens deeper than 155 feet bgs. Since 2022, PCE concentrations in the source area have also decreased. PCE concentrations detected in December 2022 from BB-MW-01 have decreased from 8.86 µg/L to <1.0 µg/L in October 2025. This decreasing trend is also apparent in wells BB-MW-07A, 08A and 09A where PCE concentrations detected in December 2022 were above AWQS and in March 2025 all samples are below AWQS (**Table 10**). PCE in BB-MW-07A rebounded to 7.3 µg/L in the October 2025 sampling, but all other wells remain below detection limits for PCE. Wells with decreasing PCE trends also had decreasing TCE concentrations, making it unlikely that the PCE decreases were due to dechlorination. The most recent figures displaying analytical results for TCE and PCE are included as **Figures 12A, 12B and 12C**. Figures displaying analytical results from monitoring events 2020 through December 2022 are included in **Appendix E**.

Groundwater samples were collected for thallium analysis from selected monitor wells in February 2022, June 2023 and March 2025 to determine if thallium should be considered a COPC at the Site. In February 2022, groundwater samples were collected from 13 monitor wells (BB-MW-01 through 06, 07A/B through 09A/B and MW-12B). Samples were submitted to the laboratory for analysis of thallium using EPA Method 6020B. Laboratory analytical results determined that thallium was detected above the laboratory method detection limit in the sample collected from well BB-MW-09A at a concentration of 0.132 µg/L, below the AWQS of 2 µg/L. All other samples were below the method detection limit of <0.121 µg/L. Thallium was not detected in well BB-MW-02 which had previously exceeded the AWQS during the PI.

In June 2023, groundwater samples from BB-MW-09A, 12A and 15A were collected for analysis of aquifer geochemistry data and thallium. Samples from these wells were chosen as they represented the upgradient, source area, and diffuse plume conditions for the geochemistry data. Samples were laboratory analyzed for dissolved gases, dissolved metals, organic carbon, anions, sulfide, and microbial parameters (**Table 12** and **Appendix F**). Laboratory analytical results determine that thallium was detected in BB-MW-09A at an estimated concentration of 6.7 µg/L. Wells BB-MW-12A and 15A did not contain thallium above the laboratory method detection limit. The aquifer parameters are discussed in **Section 6.6** and **Section 7**.

In March 2025, groundwater samples were also collected for thallium analysis from five monitor wells (BB-MW-01 through 03, 06 and 09A). Laboratory analytical results determined that thallium was not detected above the laboratory method detection limit of 0.79 µg/L in any of the samples collected (**Table 10**).

4.5. Soil Vapor Extraction Well Install – 2022

In November 2022, three shallow (60 feet bgs) and three deep (107 feet bgs) SVE wells (BB-SVE-1S/1D, 2S/2D and 3S/3D) were installed in the source area near monitor well BB-MW-09A/B, due to the high concentrations of TCE and PCE detected in the area (**Figure 13**). Soil-gas samples were collected while drilling using a push-ahead sampler and screened for PCE and TCE using a field GC. The highest concentrations of TCE were generally detected at 35 to 57 feet bgs (464 – 7,077 µg/m³) and 95 to 115 feet bgs (144 – 3,423 µg/m³) (**Table 13**).

The SVE wells were constructed using two-inch diameter schedule 80 PVC blank casing and screen (0.020-inch slots) in each of the six boreholes. Screens were set in BB-SVE-1S, 2S, and 3S from 45 to 60 feet bgs and were set in BB-SVE-1D and 2D from 90 to 105 feet bgs. The screen was set in BB-SVE-3D from 92 to 107 feet bgs. The depths were determined based on CVOC soil gas concentrations and observed stratigraphy (**Table 13; Appendix B**). The SVE wells were screened higher than the deepest soil-gas detections at 115 feet bgs to prevent drawing excess moisture into the SVE system, as groundwater in BB-MW-09A was recorded at approximately 120 feet bgs at the time.

In January 2023 an SVE pilot test was conducted. A mobile SVE unit was used for vacuum tests in each SVE well, two step tests, and a constant rate test. Based on the results of the pilot test, a radius of influence of approximately 70 to 100 feet horizontally and approximately 80 to 90 feet vertically was estimated. Results indicated that an interbedded silt layer between 20 and 130 feet bgs may limit vertical connection between the shallow and deep SVE wells. An estimated 2.77 pounds (lbs) of TCE mass was removed during pilot testing (**Appendix G**).

4.6. Confirmation Arsenic Sampling – 2023

During the 2001 PASI and 2019 Surf Thru sampling at the 530 North Lake Havasu Avenue property, soils with arsenic over the SRL of 10 mg/kg were detected at locations MCC-04, B-5, and B-8 (**Figure 3**). During subsequent construction of the car wash on the property, these areas were either capped by asphalt (MCC-04 and B-8) or removed (B-5). No confirmation samples were collected by the property owner during this time.

To confirm no exposed soil remained with arsenic concentrations exceeding SRLs, in 2023 ADEQ collected 21 shallow soil samples in the area of B-5 (BB-SS-1A-D through BB-SS-5A-D). Each sample was collected as a composite from ground surface to approximately 2 feet bgs, passed through a number 10 mesh sieve, homogenized, and submitted for laboratory analysis of arsenic using EPA Method 6010D. Laboratory analytical results determined that arsenic was detected at concentrations ranging from less than the method detection limit (sample BB-SS-1A) to 7.52 mg/kg (sample BB-SS-2B). All detected arsenic concentrations were below the residential and non-residential SRL of 10 mg/kg (**Figure 14** and **Table 14**).

In addition, ten shallow soil samples (BB-SS-6A-J) were collected in the nearby right-of-way of Bahama Avenue to determine background concentrations in the area (**Figure 14**). As with the Site samples, each sample was collected as a composite from ground surface to approximately 2 feet bgs, passed through a number 10 mesh sieve, homogenized, and submitted for laboratory analysis of arsenic using EPA Method 6010D. Laboratory analytical results determined that arsenic was detected at concentrations ranging from 1.29 mg/kg in sample BB-SS-6F to 6.95 mg/kg in sample BB-SS-6I. All detected arsenic concentrations were below the residential and non-residential SRL of 10 mg/kg (**Table 14**).

5. EARLY RESPONSE ACTIONS

An Early Response Action (ERA) under the WQARF Program includes investigations and remedial actions initiated under A.A.C. R-18-16-405 prior to selection of a remedy at a site under A.A.C. R-18-16-410. ERA activities at the Site were conducted to decrease sources of contaminants and address risk to public health and the environment. ERAs were performed at the facility in 2022 and 2024 and included the removal of the former waste oil clarifier, performance of a soil vapor extraction (SVE) pilot test and the installation and operation of an SVE system.

5.1. Former Waste Oil Clarifier Removal

In October 2021, a rectangular cover for an underground feature was observed during a Site walk of the 1790 Industrial Boulevard property (photos in **Appendix A**). The tenant of the property stated that the underground feature was a former “waste oil clarifier” used prior to the property’s connection to the Lake Havasu City sanitary sewer in 1995. The tenant also reported that the former waste clarifier was attached to floor drains throughout the building on the property, but that all of them were blocked off.

In June 2022, residual liquid present in the former clarifier was sampled using a HydraSleeve and submitted to the laboratory for analyses of VOCs using EPA Method 8260B. Due to the thickness of the sample, the matrix required analysis of the liquid from the clarifier be analyzed as a solid and reported as mg/kg. Laboratory results verified that the sludge contained PCE and TCE at concentrations of 0.0394 mg/kg and 0.0159 mg/kg, respectively. In addition, 4-methyl-2-pentanone was reported at 0.0617mg/kg

The floor drains which previously had piping leading from the 1790 Industrial building to the clarifier were scoped, and it was confirmed that the drains had been sealed off and were no longer in use (**Appendix H**).

In December 2022, ADEQ initiated removal actions for the former waste clarifier. Approximately 1,300 gallons of residual sludge was removed, and the concrete structure was excavated and demolished. Prior to disposal, the residual sludge was sampled and determined by the disposal subcontractor to not to be a hazardous waste. The residual sludge and demolition debris were transported to La Paz County Landfill for disposal.

Following clarifier removal, ten confirmation soil samples (BB-CP-CS01 through BB-CP-CS10) were collected from the side walls and floor of the excavation at depths ranging from 4.5 to 8.5 feet bgs. Samples were submitted to the laboratory for analysis of VOCs using EPA Method 8260B. Confirmation samples contained PCE at concentrations ranging from 0.0606 to 16.5 mg/kg (**Figure 15**). Five of the ten samples exceeded the residential SRL of 0.51 mg/kg. Laboratory

analyses detected TCE only within the sample collected within the inside of the pipe, sample BB-CP-CS04, at a concentration of 0.0359 mg/kg.

In February 2023, following receipt of laboratory analyses, additional soil was excavated from the clarifier pit to remove impacted soil from the north, south, western sidewalls and the floor of the excavation. An additional nine samples (BB-CP-CS14 through BB-CP-CS22) were collected from the following additional excavation to a depth of 9 feet. PCE was detected above its residential SRL at 2.6 mg/kg in sample BB-CP-CS22, which was collected from the southern sidewall at 9 feet bgs. However, additional soil excavation was not feasible in this location due to the proximity of the building foundation. All other sample results were below SRLs (**Figure 15; Appendix H**).

The excavated soil was sampled and submitted for laboratory analyzes for VOCs, SVOCs, and the RCRA 8 metals, using EPA Methods 8260B, 8270C and 6010C/7470A for the Toxicity Characteristic Leaching Procedure (TCLP). Laboratory results determined that the excavated soil contained detectable concentrations of 1,2-dichloroethane, 1,4-dichlorobenzene, chlorobenzene, arsenic, barium, cadmium, and silver. The results showed the excavated soils to be below the levels for a characteristically hazardous waste, and were transported to La Paz County Landfill for disposal.

The excavation was lined with geotextile fabric, backfilled with clean, imported material, compacted, and the area resurfaced with concrete to match pre-existing conditions. Overall, 50.68 tons of contaminated soil was removed and disposed at La Paz County Landfill as non-regulated waste.

5.2. SVE Pilot Test

In January 2023, an SVE pilot test was conducted to gather data for the design and installation of a full-scale SVE system. A mobile SVE unit was used for initial vacuum tests, step tests and a constant rate test (**Figure 13**).

The initial vacuum tests were conducted for 60 minutes each to evaluate the flow characteristics and radius of influence (ROI) of each SVE well. Step tests were then conducted for SVE wells BB-SVE-3S and BB-SVE-3D. These two wells were selected based on proximity to monitoring points and the vacuum measurements detected during initial testing. The step test on BB-SVE-3S was conducted for 150 minutes by operating the variable frequency drive at 60 MHz at varying dilutions. The step test on BB-SVE-3D was conducted for 240 minutes at 0% dilution with the variable frequency drive set to different rates. This change was made in methodologies between the wells because the deeper well caused automatic shutdowns of the mobile system when attempts were made to use the same methodology as the shallow well. A constant rate test was conducted on BB-SVE-3D and ran for approximately 8 hours, with the variable frequency drive held at one rate. Data collected during the pilot test are included in **Appendix G**.

From the results of these tests, the radius of influence of approximately 70 to 100 feet horizontally and approximately 80 to 90 feet vertically was estimated. Results indicated that an interbedded silt layer between 20 and 130 feet bgs may limit vertical connection between the shallow and deep SVE wells. An estimated 2.77 pounds lbs of TCE mass was removed during pilot testing (**Appendix G**). Based on the results of the SVE pilot test, it was determined that SVE was a viable remedial alternative for this area.

5.3. SVE ERA

In 2023 and 2024, an ERA SVE system was designed based on the pilot test results. The system was designed to be able to incorporate capacity for up to 12 SVE extraction wells to allow for expansion of the current SVE well network as needed. Additional information about the design and specifications of the SVE system is available in **Appendix G**.

The SVE system was installed in the southwest corner of the 1790 Industrial Boulevard property and connected to the six existing SVE wells (**Figure 13**). Geotechnical improvements were made during installation, including a concrete slab for the SVE system and stabilization of the ground to provide sufficient bearing capacity for forklift access to replace the GAC vessels.

After initial testing in 2024, the SVE system was started in February 2025. On startup, the influent concentrations of TCE were 149,000 $\mu\text{g}/\text{m}^3$. The SVE operated until June 2025, with an influent concentration of 54,000 $\mu\text{g}/\text{m}^3$. To date, an estimated 154.1 pounds of VOCs have been removed from the subsurface. Since the fall of 2025, the SVE system has been shut down due to multiple electrical issues. Additional information is available in **Appendix G**.

6. PHYSICAL SITE CHARACTERISTICS

6.1. Location and Physiography

The Site is located entirely within the boundaries of Lake Havasu City. Lake Havasu City is located along Lake Havasu, a reservoir formed by Parker Dam on the Colorado River. Most of the Lake Havasu area is sparsely vegetated by typical native desert plants. The elevation of the Site is approximately 600 feet above mean sea level (amsl) and the area generally slopes to the west-southwest with undulating hills and major and minor washes (USGS, 2022). Monitor wells drilled upgradient of the Site were installed at approximately 605 feet amsl while the most downgradient well, located near the bank of Lake Havasu was installed at 455 feet amsl. Major and minor drainages extend from the eastern mountains, and traverse across Lake Havasu City to the Colorado River to the west.

6.2. Climate

The Site is located in the northern and western limits of the Sonoran Desert. Average temperatures in the area reported from 2000 to 2024 are 97.4 degrees Fahrenheit (°F) during the hottest month (July) and 54.2°F during the coldest month (December). Average annual precipitation in the area is about 4.16 inches (NOAA, 2024). Generally, precipitation occurs during the monsoon season (July and August) and the winter months (November through March).

6.3. Geology

Surficial soil in the area consists primarily of Chuckawalla-Riverbend families complex. The Chuckawalla-Riverbend families complex is described as a very gravelly loam to a very gravelly sandy clay loam to a depth of 60 inches, typically with 2 to 15 percent slopes (USDA, 2018).

The Site is located in the Basin and Range physiographic province area of Arizona, in the Chemehuevi Valley within the Lake Havasu sub-basin. The area consists of a broad alluvial basin with northwest-southeast trending block-faulted Precambrian through Tertiary highlands. Sediments within the Lake Havasu sub-basin can extend up to hundreds of feet in thickness. These sediments are subdivided into two units: Recent Quaternary surface deposits and alluvial basin fill deposits (USGS, 1996).

The Chemehuevi Valley is bound on the east by the Mojave Mountains and on the west by the Colorado River and Lake Havasu. The Mojave Mountains are mostly composed of Middle Miocene to Oligocene volcanic and sedimentary rocks, Early Proterozoic metamorphic rocks, and Early Proterozoic granitic rocks (Arizona Geologic Survey, 2019). The valley is characterized by quaternary surficial deposits consisting of alluvial fans. Dry washes originating in the Mojave Mountains and trending southwest to the Colorado River cut across these quaternary deposits,

resulting in a series of river terraces cut into the alluvial deposits present on the valley slopes. The alluvial deposits consist of interbedded stream and basin-fill sediments comprised of sand, silt, gravel, and cobbles.

The stratigraphy encountered during the drilling activities conducted at the Site was predominantly sand and gravel with minor amounts of fine-grained sediment. Relatively thin discontinuous sandy or gravelly silt and clay horizons are present in some areas. Lithologic boring logs generated during Site drilling activities are included in **Appendix B**.

6.4. Hydrogeology

6.4.1. Groundwater Movement

The closest surface water body is Lake Havasu, located approximately 0.75 miles west of the Site. Lake Havasu is a man-made reservoir created by the Parker Dam obstructing the flow of the Colorado River. Two intermittent streams, the Industrial Drain and El Dorado Wash are located north and south of the Site, respectively (**Figure 1**) (USGS, 1997). Lake Havasu and the Colorado River are regional discharge areas for groundwater.

The Site is located within the Chemehuevi Valley within the Upper Colorado River Planning Area (ADWR, 2019). Regional drinking water is sourced from both the aquifer and Lake Havasu. Groundwater occurs in the interbedded gravel and sand basin-fill sediments underlying the Site. The aquifer is unconfined in the Site area. Most of the wells in the basin penetrate the upper 100 to 200 feet of the basin-fill, where groundwater is hydraulically connected to the Colorado River. According to the ADWR, the regional groundwater in the Lake Havasu Basin flows from north to south (ADWR, 2019).

Depth to water ranges from approximately 120 feet bgs near the source area to approximately five feet bgs near the distal end of the plume (**Table 15**). Groundwater elevations range from approximately 460 feet amsl to 440 feet amsl (**Figure 16**). Historically, the groundwater flow direction at the Site was southwesterly over the source area. Starting in 2022, the groundwater flow direction shifted west to west-northwest, with flow near Lake Havasu predominantly to the north. This is likely due to Lake Havasu City resuming pumping at their northern wellfield in 2022. Historical groundwater elevation figures are included in **Appendix I**.

Historically, groundwater elevations have increased approximately 30 feet from 2004 to 2014 (Geosyntec and ADEQ, 2020). This was likely due to extreme rain events that occurred in the area over that time period. Groundwater elevations have been decreasing gradually since that time.

The local groundwater horizontal hydraulic gradient is 0.004 feet/foot in the source area and decreases with proximity to Lake Havasu. Comparison of potentiometric head measurements in

well pairs at the Site, including wells BB-MW-10 A/B, BB-MW-11 A/B, MW-16A/B, and BB-MW-17A/B, show evidence of varying vertical gradients in the aquifer. Based on the groundwater elevation data collected from the well pairs, there is a current downward vertical gradient of approximately 0.003 to 0.004 for the wells located in the northern portion of the Site. Historical groundwater elevation data for these and other Site wells is presented in **Table 15**. The presence of a downward vertical gradient in the vicinity of the source area implies the likelihood of downward flow of groundwater which would increase downward transport of dissolved phase COCs.

6.4.2. Groundwater Field and Natural Attenuation Parameters

Field Parameters

The field parameters of temperature, conductivity, pH, dissolved oxygen (DO), and oxidation-reduction potential (ORP) were recorded during each groundwater sampling event for the Site. Most of the wells have similar field parameters. **Table 16** presents the most recent available (March 2025) field parameters recorded from the monitoring wells at the Site.

During the most recently available sampling event, temperatures generally ranged from 28.4 degrees Centigrade (°C) to 31.1 °C; conductivity ranged from 945 microsiemens per centimeter (µs/cm) to 3,295 ms/cm and, pH in the monitoring wells ranged from 7.27 to 7.60. Recorded values for DO in the monitoring wells ranged from 2.55 to 6.89 and ORP ranged from -123.6 to -258.4 mV.

Natural Attenuation Parameters

In June 2023, samples were collected from three groundwater monitoring wells and laboratory analyzed for various natural attenuation compounds. A detailed table presenting the detected natural attenuation compounds is presented in **Table 12** and a summary is presented below:

- Total organic carbon (TOC) ranged from 0.85 to 6.3 mg/L;
- Dissolved organic carbon was detected in all three wells ranging from 0.70 to 13 mg/L;
- Methane was detected in well BB-MW-12A at 420µg/L;
- Ethene and ethane was not detected in any of the three wells;
- Sulfate was detected in all three wells and ranged from 1.7 to 970 mg/L;
- Total sulfide was detected in two wells ranging from 0.08 to 8.6 mg/L;
- Chloride was detected in all three wells and ranged from 160 to 470 mg/L;
- Nitrate was detected in two wells ranging from 16 to 30 mg/L and
- Manganese (II) was detected in three wells ranging from 0.99 to 110 µg/L

7. NATURE AND EXTENT OF CONTAMINATION

This section describes the nature and extent of the COCs in soil, soil gas and groundwater beneath the Site, as well as the fate and transport characteristics of these COCs. The nature and extent of impacts to soil, soil gas, and groundwater was evaluated based on the analytical data collected during the PI and RI. The most prevalent COC identified at the Site is TCE; therefore, TCE was used to evaluate the nature and extent of impacts. While TCE breakdown products were detected in a limited number of samples, the detections were all within the footprint of the TCE impacts. Thallium remains periodically above AWQS in a limited number of samples, and is a COPC. Laboratory analytical results determined that arsenic is no longer present in shallow soils, and is no longer a COC.

7.1. Soil Contamination

Soil samples were collected at the source area properties during investigations conducted between 2001 and 2023. Based on the soil investigations, PCE and TCE were the dominant chemicals detected in soil. PCE and TCE were detected at depths ranging from 5 feet bgs to 147 feet bgs in the source area.

The highest concentration of PCE in soil was detected in a soil sample collected at 5 feet bgs near the former waste oil clarifier at 16.5 mg/kg, over its non-residential SRL of 13 mg/kg. After the removal action, PCE remained at 9 feet bgs between the former waste oil clarifier and the 1790 Industrial Blvd building at 2.6 mg/kg, over its residential SRL of 0.51 mg/kg.

The highest concentration of TCE in soil was detected in a soil sample collected from BB-MW-01 at 42 feet bgs (0.0344 mg/kg), below SRLs. Based on these results, no soil impacts of TCE have been identified at the Site. However, due to the difficulty of detecting VOCs in soil samples due to volatilization, the lateral extent of TCE in soil may be more appropriately delineated by collection of soil-gas samples. Soil gas is further discussed below in **Section 7.2**. All cis-1,2-DCE, and trans 1,2-DCE sample results were below all respective SRLs (**Appendix C**).

7.2. Soil-Gas Contamination

Soil gas impacts are present at the Site due to two processes, off-gassing from soil contamination and off-gassing from dissolved VOCs in the associated groundwater plume. Soil gas contamination is present at the Site in the areas beneath the locations of historical releases. These soil gas impacts are caused by the soil to soil-vapor phase partitioning between the soil contamination and the surrounding interstitial soil gas. At shallow depths, this form of contamination may be a better indicator of soil contamination than the direct measurements of VOCs in soil samples due to the complications from volatilization of those compounds during the

soil sample collection process itself. Soil gas contamination can also occur due to off-gassing of the dissolved phase of the compound as it is transported downgradient in groundwater. In this second form, impacts are likely to be present in highest concentrations in the soil immediately above the water table.

Soil-gas samples have been collected by active and passive surveys, in-situ samples collected during soil boring advancement and from soil vapor monitoring wells. ADEQ uses the Regional Screening Levels (RSLs) developed by EPA for evaluating risk associated with intrusion of chemical contaminants in soil and groundwater under occupied buildings. RSLs have been developed for both residential and commercial occupancies. EPA periodically updates the RSLs and lists most current values on its website at <http://www.epa.gov/region09/superfund/prg/>.

The RSLs represent the lower threshold for vapor concentrations in indoor air. ADEQ adjusts the RSLs to estimate vapor concentrations in soil gas by applying an attenuation factor of 0.03, to calculate the SVSLs. The attenuation factor is from a study conducted by EPA on attenuation of chlorinated hydrocarbons in residential buildings (2012, EPA). Use of attenuation factors allows for direct comparison between measured concentrations in soil gas and the soil vapor screening level. If measured concentrations exceed the SVSLs, additional investigation is warranted.

Table 17. SVSLs for PCE and TCE in $\mu\text{g}/\text{m}^3$

	Residential	Commercial
Compound	Cancer Risk (Target Risk = 10^{-6})	Cancer Risk (Target Risk = 10^{-6})
PCE	367	1,567
TCE	16	1,00

The SVSLs shown in the table above are based on the RSL values listed in EPA's website that were updated in May 2014.

Soil-gas sampling conducted indicated soil-gas impacts are present at the Site, predominantly in the source area (**Table 11; Figure 9**). The highest concentrations of TCE and PCE in shallow soil gas were 130,000 and 83,000 $\mu\text{g}/\text{m}^3$, respectively, at 15 feet bgs at BB-MW-09. The TCE and PCE concentrations generally decreased with distance away from the source area, apart from BB-SG-03. BB-SG-03 is located hydraulically cross-gradient and outside of original facility area, suggesting a preferential pathway may exist.

In deep soil gas, the highest concentrations were detected at BB-MW-09, with the highest TCE concentration of 527,000 $\mu\text{g}/\text{m}^3$ at a depth of approximately 115 feet bgs (**Figure 7**). No obvious vertical trend is present on the vertical distribution of TCE and PCE in soil gas.

Based on the data collected, shallow soil-gas contaminations in the vadose zone extends laterally approximately 500 feet from the source area properties. For deep soil gas, PCE and TCE concentrations have been detected upgradient of the source property in wells BB-MW-15 and 16, but no exceedances of AWQS exist in this area. Concentrations of COCs in soil gas have been detected vertically to depths of 115 feet bgs, just above the water table. Based on the soil-gas data collected from the Site, it appears that the COC contamination in soils has been adequately defined, as PCE and TCE soil-gas contamination is believed to be representative of soil contamination present.

In general, the detections of soil gas in wells in the diffuse plume area appears to be related to off-gassing from the groundwater plume. Based on the results of soil gas sampling, no evidence of other sources of COCs to groundwater have been identified. No obvious vertical trend is present on the vertical distribution of TCE and PCE in soil gas.

7.3. Groundwater Contamination

Depth specific groundwater sampling was conducted during installation of the groundwater monitoring wells (**Table 9**). Near the source area, the top of the TCE plume was near the water table at an elevation of approximately 455 feet amsl and was generally below the AWQS by approximately 350 feet amsl. The TCE concentrations moved downward with distance from the source area, with AWQS exceedances occurring at an elevation of 258 feet amsl (232 feet bgs) approximately 2,000 feet downgradient of the source area (BB-MW-10B). TCE was below detection limits at the water table in this location (**Table 10**: BB-MW-10). The total estimated TCE plume length was measured to be approximately 4,100 feet, with a width of approximately 1,900 feet. The farthest downgradient extent of chlorinated hydrocarbons observed in groundwater monitoring data for the Site has been detected in samples collected from well BB-MW-17A, located approximately 3,600 feet west-southwest of the source area.

The estimated TCE plume thickness is approximately 75 to 100 feet; however, this measurement is variable across the Site due to the interbedded alluvial fan geology creating channels with varying amounts of contamination with depth. Results from samples collected while drilling showed the TCE plume near the source area extending vertically from the water table at approximately 455 feet amsl to an elevation of 350 feet amsl. In the area around well BB-MW-10, TCE is not detected at the water table, but occurs generally from 360 feet amsl to 260 feet amsl. Nearer to Lake Havasu, TCE is detected only in the upper 20 feet of the aquifer (**Table 10**; **Figures 17A, B, and C**).

Groundwater sampling was conducted at the Site to define the extent of impacts in groundwater from the source. TCE concentrations increased by approximately two to six times in the source

area (BB-MW-01 through BB-MW-03 and BB-MW-07 through BB-MW-09) from October 2020 to December 2022, to a maximum of 2,250 µg/L in BB-MW-01. Since 2022, TCE concentrations in the source area decreased to similar or lower levels than in 2020. The TCE concentrations in samples from two downgradient wells, BB-MW-06 and BB-MW-10A have increased by approximately three times since 2022, to a maximum of 380 µg/L in BB-MW-06 (**Table 10; Appendix C**).

Historically, PCE has only been detected above AWQS in monitoring wells BB-MW-01, -07A, -08A and -09A. In 2020, PCE concentrations were below AWQS in the three source area monitoring wells installed at that time (BB-MW-01 through BB-MW-03). PCE concentrations in monitoring wells BB-MW-07A, -08A and -09A at the time of first sampling in February 2022 were all above AWQS. In the most recent sampling, PCE was detected over AWQS in one monitoring well, BB-MW-07A, at a concentration of 7.3 µg/L (**Table 10; Appendix C**). The distribution of PCE and TCE indicates that TCE is present as distinct releases, and not as a result of PCE degradation.

The most recent groundwater data from October 2025 has been used to evaluate the current extent of impacts because it is the most representative of current conditions and has the most coverage in the downgradient direction. During the October 2025 groundwater sampling event, the highest concentration of TCE (720 µg/l) was detected in BB-MW-02, which is the groundwater monitoring well closest to the potential location of the former evaporation pond. Concentrations of TCE exceeding the AWQS are laterally defined upgradient to the east by BB-MW-15, north by BB-MW-14, south by BB-MW-05, BB-MW-11 and MW-12, and west by BB-MW-17. The 2022, 2023 and 2025 distribution of PCE and TCE in groundwater is shown on **Figures 12A, 12B, and 12C**.

Although *cis*-1,2-DCE, *trans*-1,2-DCE, and 1,1-DCE have also been detected at the Site, none of these constituents have been detected above AWQS and have no widespread distributions. *Cis*-1,2-DCE, *trans*-1,2-DCE, and 1,1-DCE are likely present as degradation products of TCE.

8. FATE AND TRANSPORT

Contaminants at the Bahama Avenue and Bimini Lane WQARF Site include volatile constituents. Transport pathways for the volatile compounds have been determined to include both saturated and unsaturated (soil gas) routes. The VOCs at the Site principally include PCE and TCE. VOCs historically were released into the subsurface from the waste oil clarifier and the evaporation pond. Once in the subsurface soils, vadose-zone transport was controlled by the chemical nature of the compound, physical properties of subsurface soils, diffusion within the vadose-zone, and vertical movement of infiltrating water due to precipitation. Saturated-zone transport was a product of the chemical sorption characteristics of the compound, the subsurface medium through which the compound moved, and direction and gradient of groundwater flow.

8.1. Chemical Properties

TCE is a colorless liquid with a chloroform-like odor. It is a chlorinated hydrocarbon compound that has been widely used as a commercial and industrial solvent and degreaser (CDC, 2024). TCE can also be a PCE degradation product. TCE is carcinogenic to humans by all routes of exposure, with the potential to cause kidney cancer, liver cancer, and non-Hodgkin lymphoma in humans (USEPA, 2011). TCE is a potential human health hazard for noncancer toxicity to the nervous system, kidneys, liver, immune system, male reproductive system, and the developing embryo/fetus.

PCE is a colorless liquid with a mild, chloroform-like odor. It is a chlorinated hydrocarbon compound that has been widely used as a commercial and industrial solvent, frequently used in dry cleaning (CDC, 2024). It is characterized as “likely to be carcinogenic to humans” by all routes of exposure. Suggestive evidence of carcinogenicity has been observed through epidemiological studies and conclusive evidence of increases in tumor incidence has been observed in experimental animal studies, resulting in bladder cancer, non-Hodgkin lymphoma, and multiple myeloma (USEPA, 2012). Noncancer health effects of PCE exposure in humans target the central nervous system, kidneys, liver, immune and hematologic systems, and development and reproduction. Studies indicate that noncarcinogenic effects occur at lower exposures than carcinogenic effects.

Evaluation of the nature of transport of *cis*-1,2-DCE, *trans*-1,2-DCE, and 1,1-DCE were not conducted due to the generally low concentrations and inconsistent distribution at the Site.

8.2. Chemical/Biological Transformation Processes

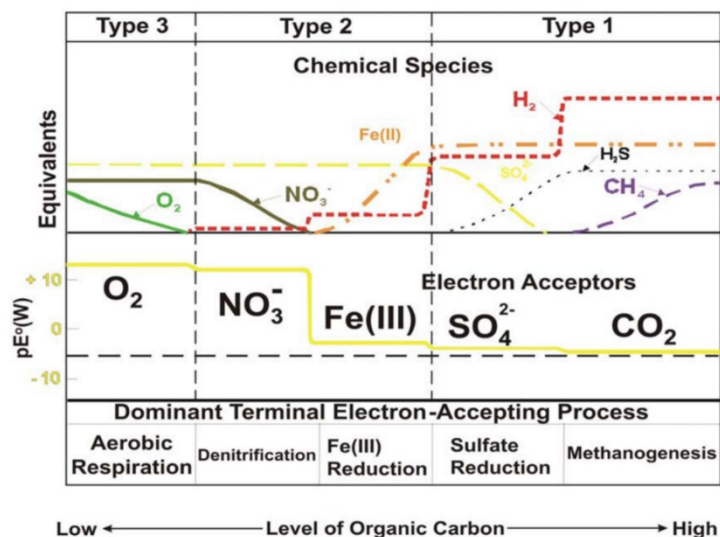
Once released into the environment, PCE and TCE can undergo degradation processes, such as dechlorination. A minimal amount of dechlorination can occur abiotically, catalyzed by metals in

the aquifer materials. Microbial reductive dechlorination occurs generally at a higher rate than abiotic processes when microbes such as *Dehalococcoides spp.* are available. The reduction of PCE and TCE to the non-toxic end product of ethene gas occurs mostly through cometabolic processes. The lack of significant concentrations of breakdown products (e.g. *cis*-1,2-DCE) at the Site indicate that dechlorination of TCE is not occurring at high rates by any process.

Samples collected at the Site indicate a very limited *Dehalococcoides spp.* population. *Dehalococcoides spp.* was detected at 4.00E-01 cells per millimeter (cells/mL) in groundwater samples collected at well BB-MW-12A. This is below the 1.00E01 cells/mL threshold required for the reduction of PCE and TCE. In addition, there were no detections of the functional genes which are known to facilitate rapid reductive dechlorination (**Appendix F**). Next generation sequencing analysis of these samples indicated that populations of other dechlorinating microorganisms such as *dehalobacter* and *dehalogenimonas* are also low (0.001 – 0.003%) (**Appendix F**).

Guidance on enhanced bioremediation of chlorinated solvents have classified aquifers in terms of their dominant terminal electron acceptor and reduction-oxidation conditions (FRTR, 2004). Type 3 aquifers are oxidative and have dissolved oxygen as their terminal electron acceptor. Type 2 aquifers are mildly oxidative to mildly reductive, have lower to no dissolved oxygen, and nitrate and iron (III) are the terminal electron acceptors. Type 1 aquifers are anoxic, reductive, and sulfate and ultimately carbon dioxide act as the terminal electron acceptors:

From FRTR, 2004



While it has been found to be generally possible to modify an aquifer classification by adding remedial amendments, it is unlikely that a Type 3 aquifer could become a Type 1.

The aquifer parameters shown in **Table 12** are suggestive of an aquifer between a Type 3 and Type 2. It may be possible, therefore, to amend the Site to achieve a Type 2/Type 1 aquifer, where reductive dechlorination might occur at rates high enough to be beneficial to the Site. However, given the low microbial counts at the Site, bioaugmentation may also be needed if native microbial populations do not demonstrate the ability during bench-scale studies and/or pilot tests to complete the breakdown of the CVOCs to non-toxic substances.

8.3. Soil

VOCs historically were released into the subsurface through the use of an evaporation pond and clarifier. The downward movement of VOCs can be expedited through infiltration of stormwater or waste discharges. Once in the subsurface soils, vadose-zone transport was controlled by the chemical nature of the compound, physical properties of subsurface soils, diffusion within the vadose-zone, and vertical movement of infiltrating water due to precipitation. Saturated-zone transport was a product of the chemical sorption characteristics of the compound, the subsurface medium through which the compound moved, and direction and gradient of groundwater flow.

Lithologies observed during drilling activities at the Site were composed primarily of sand and gravel with minor amounts of fine-grained sediment. Relatively thin discontinuous sandy or gravelly silt and clay horizons are present in some areas. The water table in the source area has historically been observed at elevations ranging from approximately 99 to 106 feet bgs (approximately 461 to 454 feet amsl in well BB-MW-02). These soils are expected to represent a minimal barrier to downward movement of introduced contaminants. Although soil moisture and organic carbon content of soils typically act to retard movement of VOCs through the vadose zone, either due to the moisture occupying available pore spaces or due to the affinity of the VOCs for soil carbon via sorption processes.

Volatilization of VOCs, particularly those with low vapor pressures such as PCE and TCE, leads to phase transfer from liquid to soil gas. The highest concentrations of these compounds were found just above the water table, suggesting that the VOCs may be volatilizing into soil gas from dissolved phase in groundwater.

8.4. Soil Gas

VOCs in the soil gas often move via diffusion, a molecular process that causes transport from areas of high concentrations to low concentrations. The highest concentration of TCE detected in soil-gas was 527,000 $\mu\text{g}/\text{m}^3$ at a depth of approximately 115 feet bgs in BB-MW-09. Soil-gas sample analytical results indicate that soil-gas concentrations of TCE decrease laterally and vertically in all directions from this general area. This indicates that diffusive transport of contaminated soil gas is a likely transport mechanism at the Site. The higher concentration of TCE

detected in the shallow soil gas at point BB-SG-03 indicates some preferential flow path along utility conduits may exist along Bahama Avenue (**Figure 9**).

In the desert southwest, VOC contamination in the soil gas can also spread vertically through the dry soils and dissolve into groundwater (Walter et al., 2003). The resulting concentration of a compound in the groundwater can be estimated using the three-phase partitioning equation. Using this equation and the TCE soil gas concentration of 527,000 $\mu\text{g}/\text{m}^3$, the resulting estimated groundwater concentration is 1,250 $\mu\text{g}/\text{L}$. This concentration is within the range of groundwater concentrations in the source area, indicating that transport of contaminated soil gas to groundwater is a likely mechanism at this Site. Volatilization of VOCs, particularly those with low vapor pressures such as PCE and TCE, leads to phase transfer from liquid to soil gas. The highest concentrations of these compounds were found just above the water table, suggesting that the VOCs may be volatilizing into soil gas from dissolved phase in groundwater.

8.5. Groundwater

PCE and TCE, the primary COCs at the Site, are presumed to enter the groundwater immediately beneath the source area. As dissolved phase hydrocarbons, transport within groundwater is controlled by a combination of groundwater properties and aquifer characteristics properties, in addition to chemical properties of the contaminants.

Advection and dispersion are typically considered the principal mechanisms of contaminant transport. In coarse-grained sediments, transport parallel with groundwater flow, or advection, is considered to dominate. With advection, as the groundwater flows through the subsurface, the contaminants are transported in the same direction. The transport of the contaminants typically occurs at a slower rate than the groundwater flow rate. The speed at which the transport occurs is dependent on the aquifer properties such as porosity, hydraulic gradient, and hydraulic conductivity, and the chemical properties of both the contaminant and the aquifer. COC plumes at sites dominated by advective processes tend to be narrow and elongated in the direction of groundwater flow, whereas those at sites dominated by dispersion will commonly be nearly as wide as they are long. Advection is a transport mechanism occurring at the Site, as the TCE plume extends from the east to the west following the historical groundwater flow direction. It is likely that advection will cause the plume to migrate northwest to follow the new groundwater flow direction over time.

In very fine-grained sediments with high clay content, the tendency of individual water molecules to follow irregular and non-linear paths that are not necessarily parallel with groundwater flow leads to the spreading of dissolved phase contaminants. Spreading, in combination with diffusion

that occurs as the result of chemical gradients is known as dispersion, may dominate transport in fine-grained materials in which advective flow is minimal.

Dispersion comprises diffusion and mechanical dispersion. Diffusion occurs in all directions and is a result of the chemical gradient causing contaminants to move from areas of high concentration to areas of low concentration. Mechanical dispersion is the spreading of contaminants based on large and small-scale heterogeneity in the aquifer materials, causing different travel times and paths. Dispersion is occurring at the Site, as evidenced by the spreading of the TCE plume as it moves down gradient.

The vertical migration of contaminants in the groundwater can be influenced by geologic conditions and vertical gradients. Geologic conditions can be highly transmissive layers that dip in the direction of the plume movement, creating diving preferential flow paths. Vertical groundwater gradients can be caused by regional pumping, groundwater mounding from infiltration, and/or proximity to surface water. At the Site, the data show that the plume moves deeper within the aquifer as it moves downgradient, then towards the surface again towards the lake. This is a typical pattern of groundwater entering a gaining surface water body (Earle, 2015).

Plume migration may be further affected by two processes which constrain spreading, adsorption and degradation. As chlorinated hydrocarbons such as PCE or TCE move through subsurface soils, their non-polar charged structure comes in contact with clay minerals and organic matter in the aquifer. Charge-based affinity between the hydrocarbons and clay minerals, as well as the porous and partially hydrophobic nature of organic matter causes the hydrocarbons to adsorb or “stick” temporarily to the organic matter, which in turn causes the downgradient transport to be delayed or retarded.

Degradation may also lead to an apparent slowing of the COC transport as the hydrocarbons break down chemically or biologically into other components. PCE degrades via biotic reductive dechlorination into daughter compounds TCE and, following further dechlorination, *cis*-1,2-DCE. To a lesser extent, *trans*-1,2-DCE may also be formed during this second dechlorination step. These compounds in turn degrade into vinyl chloride. Assuming that bacteria necessary to promote these degradation processes are present in subsurface soils, concentrations of source-based PCE may be expected to decline over time as degradation processes convert it to daughter products.

8.5.1. Groundwater Movement

Groundwater elevations across the Site ranged from approximately 468 to 440 feet amsl during the March 2025 groundwater monitoring event. In general, groundwater elevations have fallen across the Site, with an average decrease of 6.7 feet between October 2020 and March 2025.

Groundwater elevations fell in all wells between December 2022 and March 2025, except BB-MW-17A. During this time, the groundwater elevation in BB-MW-17A increased 0.10 feet. Well BB-MW-17A is located next to Lake Havasu and may be subject to influences from surface water.

At the start of monitoring, groundwater in the source area primarily flowed from east to west; however, as discussed in **Section 6.4.1**, since 2022 groundwater flow has shifted to the northwest. This change in groundwater flow direction is most likely due to drawdown from two new Lake Havasu City water supply wells located northwest for the Site (**Figure 6** and **Figure 16**).

Data from the Lake Havasu Avenue and Holly Avenue WQARF site, which is located approximately 0.5 miles to the north, show that groundwater elevations historically were lower in the early 2000s than current elevations. Then between 2004 and 2014, groundwater elevations increased by almost 30 feet (Geosyntec and ADEQ, 2020). Water elevations since 2014 have been slowly declining, with a more marked decline after Lake Havasu City turned on their northern wellfield in 2022.

While the water levels at the Site have fallen, the gradient has remained consistent throughout the monitoring period. Across the source area, the gradient is approximately 0.004 feet/foot. Across the Site as a whole, the gradient is approximately 0.007 feet/foot. There was no observable correlation between groundwater concentrations and groundwater elevations. COC concentrations have fluctuated independently of the falling groundwater elevations (**Appendix J**). Historical depth-to-water measurements and groundwater elevations is presented in **Table 15**.

9. LAND AND WATER USE EVALUATION

This Land and Water Use section for the Site has been prepared as part of this RI report to meet the requirements established under A.A.C. R18-16-406 (D). The purpose of this section is to present information regarding current and foreseeable uses of land or waters that have been or are threatened to be impacted by releases of COCs, and to project time frames for future changes in those uses. Information gathered from property owners, water providers, municipalities, and well owners are included in the section.

The current and potential future land and water users were identified by sending questionnaires to the land and water users in the site vicinity. This land and water use section evaluates the future uses and the “reasonably foreseeable” uses of the land and water based on the information from the completed questionnaires. Reasonable foreseeable uses of land are those uses of land likely to occur at the site. Reasonable foreseeable uses of water are those likely to occur within 100 years unless a longer time period is shown to be reasonable based on site-specific circumstances. The surveys did not indicate any substantial changes in the future use of the land and water uses in the area of the Site and therefore, reasonable foreseeable uses are the current land and water uses in the area of the Site. The completed questionnaires are included in **Appendix K**.

In 2021, the ADEQ defined a Community Involvement Area (CIA) which encompasses the Site as well as residential, commercial, and industrial communities that surround the Site. The CIA is presented on **Figure 18**. Within the CIA, no sensitive receptors have been identified other than Lake Havasu.

Based on a preliminary evaluation of properties located in proximity of the source area, properties judged likely to be potentially impacted by future soil and/or groundwater remediation efforts were identified. Land and Water Use Surveys were sent to the Lake Havasu City, the private well owner of well 55-591209 and four property owners in the area of the source. The identified properties were asked to provide information regarding current and future land and water uses. Of these, the Lake Havasu City was the only survey returned. The Land and Water Use Study (LWUS) was prepared pursuant to A.A.C. R18-16-406(D). Full details can be found in the LWUS Report (**Appendix K**; Pinyon and ADEQ, 2022). The sections below summarize the information provided to ADEQ by Lake Havasu City. The complete responses are contained in **Appendix K**.

9.1. Current Land Use

Arizona State law requires each city to have a General Plan that establishes policy for the city's physical development. According to the 2016 Lake Havasu City General Plan, the Site is located within the urban core and tourism-based areas (Lake Havasu City, 2016). Current regional zoning in the Site area consists of commercial mixed use (21.2%), resort related uses (37.6%), recreational open space use (20.9%), and residential (20.3%). The western area of the Site is mainly resort and recreational uses, with the eastern being having mixed commercial and residential uses.

9.2. Future Land Uses

According to the Future Land Use Map included in the 2016 Lake Havasu City General Plan, development constraints exist resulting from the proximity of Federal and state-owned lands to the Lake Havasu City borders. Based on information in the General Plan, the City does not have plans to significantly alter current zoning or develop new areas within the Study Area (LHC, 2022). Minor expansion of resort related zoning is anticipated on the western extent of the Site near Lake Havasu. No special projects are planned for the Site. Lake Havasu City Council, in conjunction with the Planning and Zoning Commission and Lake Havasu City Community Services Department, is responsible for the definition of boundaries for potential future developments.

9.3. Current Groundwater Uses

According to the Arizona Department of Water Resources (ADWR), the Site is located within the Lake Havasu groundwater subbasin of the Upper Colorado River Aquifer (ADWR, 2022). The Site is outside of an Active Management Area (AMA), where there are no restrictions on groundwater withdrawal, provided the water is put to reasonable and beneficial use (ADWR, 2016). The only exception to groundwater withdrawal occurs within areas designated as Irrigation Non-Expansion Areas (INAs), where irrigation of new agricultural land is restricted to prevent decline in groundwater levels. The Site is not located within an INA.

Wells penetrating the Colorado River Aquifer are hydraulically connected to the Colorado River and Lake Havasu (LHC, 2019). Regional groundwater in the Lake Havasu subbasin flows from the north to the south (ADWR, 2022).

Lake Havasu City owns and operates 13 municipal water production wells, treatment plants, booster stations, transmission and distribution lines and storage facilities. The City's northern wellfield is located along Lake Havasu to the north of the Site (**Figure 6**). Until 2022, approximately 98% of Lake Havasu City's supply demand was met using the Horizontal Collector Well (LHC, 2022a). The production wells that were previously reserved for backup use are currently being used for the City's main water supply.

According to ADWR records, there are seven non-exempt and two exempt wells located within one mile of the Site and used for industrial, commercial, domestic and municipal water production. Per ADWR records, wells 55-516380 (LHC-3) , 55-606031 and 55-606044 (Lakeview Trailer Park Well) are abandoned or inactive. Two private wells (ADWR 55-807341 and 55-511667) are registered for landscape irrigation purposes at the Memorial Gardens Cemetery, located approximately 1.25 miles north of the Site and the Queens Bay Resort golf course, located 1.48 miles south of the Site. One exempt well (55-591209) is located south of the source area (**Figure 6**). Previous attempts to obtain access to sample this well were refused. The Water Use Questionnaire for this well was not returned. These private wells along with the City's municipal wells were constructed within the Colorado River Aquifer and are hydrologically connected to the Colorado River and Lake Havasu.

9.4. Future Groundwater Uses

Groundwater uses are not expected to change in the future. Per Lake Havasu City's 2020 Water Conservation Plan, the City anticipates enough groundwater capacity to meet the projected increases in per capita water demands under standard water supply conditions.

9.5. Current Surface Water Uses

Surface water bodies near the Site include Lake Havasu and the Colorado River, located on the western boundary of the Site. Lake Havasu and the Colorado River are the primary water supply source for Lake Havasu City with treated wastewater, groundwater from the Colorado River Aquifer and reserved water supplies serving as supplemental sources.

Lake Havasu was formed in the 1930s by the construction of the Parker Dam, located downriver approximately 19 river-miles from the Site and was filled in the early 1940s to its capacity. Lake Havasu, located on the western extent of the Site, is used for drinking water, irrigation, fishing, and recreation. Lake Havasu City, the Central Arizona Project canal, and the Colorado River Aqueduct collect water from the lake for drinking water and irrigation purposes. The Central Arizona Project serves an area that includes 80% of Arizona's population. The Colorado River Aqueduct distributes water from the California and Arizona border where it is processed and treated prior to delivery as drinking water to urban populations of southern California.

9.6. Future Surface Water Uses

According to the 2016 Lake Havasu City General Plan, surface water uses are not expected to change in the future.

10. HUMAN HEALTH AND ECOLOGICAL RISK EVALUATION

A Site-specific risk evaluation was conducted to evaluate the current risk to public health and the environment. The risk evaluation includes identifying the potential migration pathways and receptors within the Study Area. The potential risk is based on the concentration of the hazard present and the potential completion of the pathway. This risk evaluation is focused on the potential risk from TCE and PCE in groundwater and soils (**Figure 9** and **Figure 12C**). Thallium was not included as it not a COC but a COPC.

10.1. Potential Exposure Health Risk

Potential health risks from TCE and PCE are an increased risk of cancer through exposure to impacted water, contact with impacted soil, and through inhalation of impacted soil vapor.

Table 18. Health Risk Evaluation Regulatory Standards and Screening Levels

	AWQS	Minimum SWS	Soil Remediation Level	SVSL
	µg/L	µg/L	mg/kg	µg/m ³
PCE	5	261	Residential (10 ⁻⁶ Risk): 0.51 Non-Residential: 13	Residential: 367 Non-Residential: 1,567
TCE	5	29	Residential (10 ⁻⁶ Risk): 3.0 Non-Residential: 65	Residential: 16 Non-Residential: 100
Arsenic	NA	NA	Residential (all): 10 Non-Residential: 10	NA

Notes:

Minimum SWS = the lowest Surface Water Standard (excluding drinking water)

SVSLs are derived from the USEPA Regional Screening Levels for indoor air, divided by a 0.03 attenuation factor

NA = not applicable

10.2. Exposure Pathway

An exposure pathway is the route which the potential hazard (identified COCs) migrates from the source (soil vapor, soil, surface water, or groundwater) to a receptor. Pathways can include (**Figure 19**):

- Inhalation of impacted vapors
- Dermal contact with impacted soil, groundwater, or surface water
- Ingestion of impacted soil, groundwater, or surface water.

10.2.1. Soil Pathways

The soil pathway would be complete if receptors were exposed through direct skin contact or ingestion of contaminated soils. No soil samples had concentrations of TCE above the residential SRL. PCE exceeded the residential SRL in a soil sample collected at 9 feet bgs on a non-residential property; therefore, the current soil pathway for VOC exposure is incomplete.

Arsenic was previously detected above the SRL in soils three locations in the southern portion of the source area (**Figure 3**). Two location was paved during the construction activities on the property. Soil was removed by the property owner in the third location, with confirmation sample results collected by ADEQ showing arsenic concentrations were subsequently below the residential SRL (**Figure 14**). Therefore, the soil pathway for arsenic exposure is incomplete.

10.2.2. Vapor Pathways

The vapor pathway would be complete if receptors were exposed to vapor through volatilization of the COCs from soils or groundwater. The vapor could reach receptors through vapor intrusion into residential or commercial buildings.

To evaluate the potential risk of vapor intrusion from the soils, soil gas samples were collected near the source area, adjacent to buildings where vapor intrusion could occur. The soil gas samples were compared to SVSLs adapted from the applicable EPA RSLs for indoor air. Soil gas samples near buildings were above the residential and non-residential SVSLs, but no indoor air samples were permitted to be collected by any business or resident in the area. Therefore, the vapor pathway from soils is considered to be potentially complete.

The risk of vapor exposure from off-gassing of the groundwater plume further downgradient from the source area is unlikely due to the low concentrations of contaminants observed in the soil gas downgradient. Soil gas samples collected while drilling the wells in the diffuse plume were collected at 15 feet bgs; none of these samples exceeded the SVSLs. Therefore, the pathway of distal plume volatilization is considered incomplete.

10.2.3. Groundwater Pathways

The groundwater pathway would be complete if contaminated groundwater reached receptors through groundwater supply wells, where exposure could then occur through ingestion, inhalation, and direct skin contact. Lake Havasu City does not have any active drinking water wells within the area of the plume. There is one private well in the area of the Site with reported domestic use. No access was granted to collect a sample from this well. Therefore, the groundwater pathway is considered potentially complete, due to the private well.

10.2.4. Surface Water Pathways

The surface water pathway would be complete if contaminated surface water reached receptors, where they could come into contact with the contaminants through ingestion and direct skin contact. Surface water in the area is used for fishing and recreation. Based on samples collected from Lake Havasu, there are no impacts above the either AWQS or surface water standards at the Site. Therefore, this pathway is currently incomplete.

10.3. Potential Receptors

10.3.1. Soil and Soil Gas Receptors

The current potential receptors to the shallow soils are construction/utility workers digging in the subsurface near the former clarifier pit area, where soils are impacted by PCE over SRLs. Workers or residents in buildings near areas where TCE and PCE were detected in soil gas over SVSLs are also potential receptors. No residents or businesses granted access for indoor air sampling, therefore there are no known current receptors.

A prospective purchaser's agreement for the 530 North Lake Havasu Avenue property states that vapor barriers would be installed in buildings on this property where workers were expected to spend eight hours or more (ADEQ and Surf Thru, 2020); therefore, users of these buildings would not be included as potential receptors.

10.3.2. Groundwater Receptors

According to Lake Havasu City, two registered wells LHC-3 (ADWR # 55-516380) and LHC-Sea Prince (ADWR # 55-606044) previously located near the Site have been abandoned (**Figure 6**). Therefore, recipients of Lake Havasu City water are not currently considered receptors.

ADWR records indicate one private well (ADWR # 55-591209) within the area, is located south of the junction of Bahama Avenue and Bimini Lane (**Figure 6**). In late 2019, the property owner informed ADEQ that this well was in use for domestic and irrigation purposes. The property owner stated they had no connection to the Lake Havasu City water supply. The property owner has since not responded to multiple attempts to contact them. No other private wells are registered with ADWR in the area of the Site.

10.3.3. Surface Water Receptors

Lake Havasu is directly adjacent to the Site. Lake Havasu supplies water for Lake Havasu City, which has the authority to use its Horizontal Collector Well for its main water supply. The Horizontal Collector Well is located approximately 1.75 miles south of the Site. Lake Havasu City's current main drinking water supply comes from nine groundwater wells along the lakeside that

penetrate the Colorado River Aquifer (**Figure 6**) (Geosyntec and ADEQ, 2020). Lake Havasu City then processes and treats the water prior to distribution to the public as drinking water.

Lake Havasu also supplies water to southern Arizona and southern California. The intakes for these water supplies (the Central Arizona Project and the Colorado River Aqueducts) are at the Parker Dam, which is located approximately 18 miles down-river from the Site. The water supplied to southern Arizona and southern California is processed and treated prior to distribution to the public; therefore, these users are not considered current receptors.

10.4. Ecological Risk Evaluation

A.A.C. R18-7-201 defines an ecological receptor as “a specific ecological community, population, or individual organism, protected by federal or state laws and regulations, or a local population that provides an important natural or economic resource, function, and value”. As the Site does not contain much habitat suitable for any federally listed species, impacts to soil, soil gas, or groundwater would have no effect on these species. However, these species may be present along the shore of Lake Havasu where it is more likely that suitable habitat is present. Potential impacts on terrestrial or aquatic biota that are present would be similar in nature and extent to those affecting humans that reside in or use the area. Based on the sample results from Lake Havasu, there is currently no impact to surface water. Therefore, a complete surface water pathway for ecological exposure is not currently present.

11. CONCLUSIONS AND DATA GAPS

The purpose of the RI conducted at the Bahama Avenue and Bimini Lane WQARF Site was to determine the nature and extent of contamination at the Site. The RI also identified present and reasonably foreseeable uses of land and waters of the state that have been or are threatened to be impacted by the contamination. In addition, data was collected at the Site to better evaluate remedial actions in the FS. Based upon the data collected, the following represents the interpretations and conclusions.

Based on the results of the RI, the Site COCs include PCE and TCE and arsenic. Thallium has been detected above regulatory standards and is considered a COPC. These chemicals are all thought to have originated from chemicals that originated from the area of the former McCulloch facility, and have all been detected in soil at concentrations exceeding SRLs and/or groundwater at concentrations exceeding AWQS. To date, ADEQ has not identified any other sources.

During investigative activities, TCE was detected as the most prevalent COC. The extent of the PCE in soil over SRLs is limited to a location approximately 9 feet bgs in samples collected near a former waste oil clarifier pit. TCE was not detected in soil over the SRLs. Arsenic was detected above regulatory standards in shallow soils only at three locations on the Surf Thru property. Following construction activities at the Surf Thru facility, the soils were either removed or capped. Confirmation sampling conducted by ADEQ indicate that arsenic was not detected above SRLs in exposed soils. Arsenic above SRLs likely remain under the capped areas of the Surf Thru facility, but there is no current exposure pathway for arsenic.

The extent of elevated concentrations of TCE in soil gas extend from north of the former waste oil clarifier to south of the former evaporation pond and from the vacant lot on Industrial Boulevard to approximately Highway 95. Soil gas with elevated TCE was detected extending from 15 feet bgs to groundwater in several locations. Concentrations indicate that contaminated soil gas could be acting as a source to groundwater at the Site. PCE in soil gas was elevated only in the area around the former clarifier.

The extent of TCE in groundwater extends from the vacant lot on Industrial Boulevard to Lake Havasu, with a length of approximately 1,900 feet. The current extent of impacts appears consistent with the pre-2022 groundwater flow to the west. The vertical extent of the TCE plume is generally 100 feet thick under the water table. PCE impacts previously extended from the former waste clarifier location to Lake Havasu Avenue. The most recent groundwater data from October 2025 indicates that PCE was only present in one monitoring well (BB-MW-7A) over AWQS.

The current soil pathway for PCE and arsenic exposure is incomplete. There is a future risk to construction workers or others excavating areas above SRLs. Soil-gas impacted by VOCs could present a risk to receptors through inhalation via vapor intrusion into buildings. However, the exposure route could not be evaluated as no indoor air samples could be collected as access to collect samples was not granted.

There is no current known exposure to impacted groundwater at the Site. There are no municipal supply wells within the Site. Residents in the area that are connected to Lake Havasu City water are supplied with processed and treated water. Drinking water provided by Lake Havasu City meet all drinking water standards. One private well with domestic water use is located near to the plume, but impacts to it are unknown as access to collect a sample was not granted. Therefore, the ingestion of and direct contact with groundwater impacted with TCE from the Site is a potential risk to human health for the private well.

TCE was not detected in Lake Havasu above any regulatory standard; however, the lake is potentially threatened by contamination from the Site due to the plume proximity to the lake.

11.1. Data Gaps

The following data gaps have been identified during this remedial investigation:

- The potential health impacts from use of the private well located near to the Site could not be evaluated due to the owner or tenant not allowing access.
- It is unknown if TCE has migrated into buildings near the source areas as no owner or tenant allowed access for indoor air sampling.
- Elevated concentrations of VOCs have been detected at depth of 230 to 240 feet bgs in monitor wells BB-MW-10B and BB-MW-12B. Additional monitor wells are needed to define the extent of contamination in this deeper zone in the downgradient area.
- Site-specific hydrogeological parameters were not determined. Pumping and/or injection pilot tests will be necessary for evaluation of remedies for the FS.
- The sources of TCE detected in shallow soil gas near to BB-MW-14 and BB-MW-16 are unknown. Shallow soil gas samples collected between the Site and these two areas indicate the detections are likely unrelated to the Site.

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TABLES

Table 2 - Soil Analytical Results - 2001 Preliminary Assessment/Site Inspection
Bahama Avenue and Bimini Lane WQARF Site
Lake Havasu City, Arizona

	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Residential SRL	76,000	31	10	15,000	150	39	NA	900	3,100	400	3,300	23	1,600	390	390	5.2	78	23,000
Non-Residential SRL	920,000	410	10	170,000	1,900	510	NA	13,000	41,000	800	32,000	310	20,000	5,100	5,100	67	1,000	310,000
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample ID	2001 Preliminary Assessment/Site Inspection - Shallow samples (0-2 feet below ground surface)*																	
MCC-03	2,590	3.4	3	26.5	<0.21	<0.21	8.4	2.7	5.8	4.9	112	<0.050	4.9	<0.62	<0.62	<1.0	14.9	17.7
MCC-04	5,010	6.9	24.3	24	0.3	<0.20	10.4	5.2	9.1	8.4	131	<0.050	14.2	<0.61	<0.61	<1.0	23.3	31.7
MCC-04 Dup (MCC-16)	3,520	6.6	21.7	38.7	0.29	<0.20	8	3.7	8	8.2	102	<0.040	6.1	<0.60	<0.60	1	16.4	26.5
MCC-05	6,860	13	3.6	158	0.51	0.27	39	6.2	15.2	11.3	267	<0.050	12.6	<0.59	<0.59	<0.98	24.8	43.4
MCC-06	4,810	9.1	7.5	59.5	0.41	<0.26	11.6	5	12.2	8.5	213	<0.060	10.3	<0.79	<0.79	<1.3	20.2	31.5
MCC-07	4,990	6.8	3.5	227	0.25	<0.20	7.3	3.4	5.7	4.5	205	<0.050	5.6	<0.61	<0.61	<1.0	16.3	24.5
MCC-08	3,830	6.7	4.1	139	0.21	<0.20	9.1	3.2	6	5.4	132	<0.040	5.2	<0.61	<0.61	<1.0	14.6	19.9
MCC-09	3,710	5.8	2.4	134	0.22	<0.20	9.1	3.6	8.3	6.7	120	<0.040	7.6	<0.61	<0.61	<1.0	13.3	22.7
MCC-10	6,310	6.2	2.8	126	0.46	<0.20	18.8	6.9	13.4	13.3	216	<0.050	13.2	<0.59	1.6	0.99	23.3	44.5
MCC-13	4,460	4.8	2.2	146	0.32	0.21	10.3	4	10.5	8.2	236	<0.050	8.3	<0.62	<0.62	<1.0	15.4	31.3
MCC-14 ¹	2,340	1.9	3.2	81	<0.19	<0.19	7.1	3.1	5.4	2.8	108	<0.050	5.6	<0.58	<0.58	<0.97	12.8	16.5
Sample ID	2001 Preliminary Assessment/Site Inspection - Deep samples (4-6 feet below ground surface)*																	
MCC-01	2,720	2.1	1.6	257	0.21	<0.21	14.5	2.1	4.2	3.8	63.7	0.08	4.1	<0.62	<0.62	<1.0	7.5	15.2
MCC-02	2,980	2.5	1	258	0.21	<0.21	6.4	2.5	4	4.4	55.2	<0.05	4.2	<0.62	<0.62	<1.0	8.3	13.9
MCC-02 Dup (MCC-15)	2,810	1.9	0.94	215	<0.2	<0.2	6.7	2.1	3.2	3.2	67.6	<0.05	3.9	<0.59	<0.59	<0.99	7.6	12.4
MCC-03	3,720	3.1	2	685	<0.20	<0.20	19.1	2.9	5	4	95.4	<0.040	9.1	<0.59	<0.59	<0.98	12.3	19.8
MCC-04	5,090	10	2.1	92.5	0.34	0.23	23.6	4.8	11.3	10.2	139	<0.050	11.4	<0.60	<0.60	<1.0	19.6	33.2
MCC-04 Dup (MCC-16)	4,910	9.4	2.4	46.1	0.31	0.48	13.4	4.7	9.1	14	416	<0.050	9	<0.59	<0.59	<0.98	15.3	30.8
MCC-05	5,270	17.1	2	40.4	0.34	1.2	18.8	4.7	11.1	13.6	139	<0.050	9.4	<0.58	<0.58	<0.96	15.8	71.4
MCC-06	3,190	6.6	3.5	54.5	0.23	<0.20	8.8	3.7	8	5.2	130	<0.040	5.8	<0.60	<0.60	<1.0	10.6	22.5
MCC-07	4,860	6.1	5	179	0.21	3.8	98.6	20.5	14.2	6	198	0.06	18	<0.58	<0.58	<0.97	18.6	247
MCC-08	4,420	7.5	5.1	152	0.24	<0.19	11	3.9	6.3	6	149	<0.040	6.4	<0.58	<0.58	<0.97	20	22.2
MCC-09	4,740	7.9	2.9	139	0.31	<0.20	14.6	4.4	11.1	7.8	146	0.06	9.7	<0.61	<0.61	<1.0	16.9	27.6
MCC-10	6,530	5.8	3.1	91.2	0.52	1.4	23.4	5.7	14.3	9.8	178	<0.040	12.7	<0.58	<0.58	<0.97	27.8	50.2
MCC-11	4,290	4.3	5	152	0.27	<0.19	16	3.5	7.5	3.9	316	<0.05	6.1	<0.58	<0.58	<0.97	13.6	16.5
MCC-12	6,660	7.6	8.8	233	0.52	0.23	12	5.9	15.1	10.6	350	0.06	12.1	<0.68	<0.68	1.1	27.5	49.9
MCC-13	5,720	5.7	2.8	266	0.43	<0.21	9.3	4.2	9.2	6.8	397	<0.050	10.1	<0.62	<0.62	1.2	16.8	36.3
MCC-14 ¹	5,710	6.3	4.7	220	0.45	<0.21	10.8	4.8	10.3	9.3	375	<0.050	9.4	<0.62	<0.62	1.2	18.8	38.5

Notes:	FT - feet	NA - Not applicable	* Soil Results from 2001 Sampling Event, Bahama Avenue and Bimini Lane Preliminary Site Assessment/Site Inspection Report (ADEQ 2001)
Dup - duplicate sample	(1) - Background sample; exact location unknown.	SRL - Soil Remediation Level BOLD - Exceeds SRLs	< - analyte not detected above the laboratory minimum detection limit

Table 3 - Soil Gas Analytical Results - 2001 Preliminary Assessment/Site Inspection
Bahama Avenue and Bimini Lane WQARF Site
Lake Havasu City, Arizona

	PCE	TCE	1,1,1-TCA	1,2-DCA	Benzene	Toluene	Ethylbenzene	Xylene, p- m-	Xylene, o-
Units	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
Sample ID	2001 Preliminary Assessment/Site Inspection - Deep Samples (8.5 - 10 feet below ground surface)								
MCC-01	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-02	3,000	2,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-02-Dup (MCC-15)	3,000	2,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-03	<1,000	49,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-04	<1,000	31,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-04 Dup (MCC-16)	<1,000	29,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-05	<1,000	16,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-06	<1,000	4,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-07	<1,000	49,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-08	<1,000	20,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-09	<1,000	1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-10	<1,000	23,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-11	<1,000	20,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-12	18,000	9,000	<1,000	2000	<1,000	<1,000	<1,000	<1,000	<1,000
MCC-13	2,000	27,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000

Notes:

µg/m³ - microgram per miter cubed

Dup - duplicate sample

PCE - Tetrachloroethene

TCE - Trichloroethene

1,1,1-TCA - 1,1,1-Trichloroethane

1,2-DCA - 1,2-Dichloroethane

Bold exceeds applicable Vapor Intrusion Screening Level

* Soil Gas Results from 2001 Sampling Event, Bahama Avenue and Bimini Lane Preliminary Site Assessment/Site Inspection Report (ADEQ 2001)

Table 4 - Groundwater Analytical Results – 2003 Expanded Site Inspection Report
Bahama Avenue and Bimini Lane WQARF Site
Lake Havasu City, Arizona

Analyte	PCE	TCE	cis 1,2-DCE	Vinyl Chloride	B(2-E)P (DEHP)
AWQS	5	5	70	2	6
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Sample ID	2003 Expanded Site Inspection Report				
MCC-31	0.24 J	110	<0.50	<0.50	3.3 J
MCC-32	0.24 J	100	<0.50	<0.50	1.4 J
MCC-33	2.6	1,200	0.76 J	<0.50	<5.0
MCC-33 Dup MCC-37	2.8	1,400	0.88	0.27 J	NA
MCC-34	2.5	1,400	0.74	<0.50	9 J
MCC-35	1.2	1,300	1.1	<0.50	18 J
MCC-36	0.84	380	1.1	<0.50	2.6 J

Notes:

µg/L - micrograms per liter

AWQS - Aquifer Water Quality Standard

Dup - duplicate sample

B(2-E)P - Bis(2-Ethylhexyl)Phthalate

DEHP - di-2-ethylhexyl phthalate

cis 1,2-DCE - cis 1,2-Dichloroethene

TCE - Trichloroethene

PCE - Tetrachloroethene

J - Result is less than the minimum reporting limit but greater than or equal to the minimum detection limit

Bold - exceeds AWQS

*Groundwater Results from 2003 Expanded Site Inspection Report (ADEQ, 2004)

**Table 5 - Soil Analytical Results -
2019 Surf-Thru Phase II Site Investigation
Bahama Avenue and Bimini Land WQARF Site
Lake Havasu City, Arizona**

Residential SRL Non-Residential SRL Units		Arsenic	Barium	Cadmium	Chromium	Chromium VI	Lead	Mercury	Selenium	Silver
		10	15,000	39	NA	30	400	23	390	390
		10	170,000	510	NA	65	800	310	5,100	5,100
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sample ID (depth)	Sample Date	2019 Surf-Thru Phase II Site Investigation								
B-1 (11.5 FT)	10/28/2019	7.67	124	<0.500	7.18	NA	4.72	0.0401	<2.00	<1.00
B-1 (17 FT)	10/28/2019	3.82	93.1	<0.500	6.36	NA	3.84	<0.0300	<2.00	<1.00
B-2 (11.5 FT)	10/28/2019	<2.00	154	<0.500	33.4	<2.00	4.61	<0.0300	<2.00	<1.00
B-2 (22 FT)	10/28/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA
B-3 (10 FT)	10/28/2019	2.72	392	<0.500	9.73	NA	6.12	<0.0300	<2.00	<1.00
B-4 (10 FT)	10/28/2019	<2.00	234	<0.500	9.83	NA	3.74	<0.0300	<2.00	<1.00
B-4 (20 FT)	10/28/2019	<2.00	232	<0.500	10.1	NA	3.85	<0.0300	<2.00	<1.00
B-5 (10 FT)	10/28/2019	7.32	276	<0.500	14.8	NA	6.92	<0.0300	<2.00	<1.00
B-5 (20 FT)	10/28/2019	17.2	257	<0.500	37	<2.00	3.33	<0.0300	<2.00	<1.00
B-6 (10 FT)	10/29/2019	5.04	287	<0.500	8.74	NA	3.73	<0.0300	<2.00	<1.00
B-6 (20 FT)	10/29/2019	7.04	394	<0.500	32	<2.00	3.5	<0.0300	<2.00	<1.00
B-8 (3 FT)	10/29/2019	10.2	173	<0.500	11.4	NA	3.52	<0.0300	<2.00	<1.00
B-9 (10 FT)	10/29/2019	<2.00	325	<0.500	4.96	NA	3.02	<0.0300	<2.00	<1.00
TP-1 (10 FT)	10/30/2019	4.75	217	<0.500	12.3	NA	5.22	<0.0300	<2.00	<1.00
TP-2 (12 FT)	10/30/2019	5.14	105	40.2	242	<2.00	7.43	<0.0300	<2.00	1.23
TP-3 (10 FT)	10/30/2019	8.31	196	<0.500	9.17	NA	4.52	<0.0300	<2.00	<1.00

Notes:

mg/kg = milligrams per kilogram

SRL - Soil Remediation Level

FT - feet

NA - Not Analyzed

BOLD - Exceeds SRL

Table 6 - Well Construction Information

Remedial Investigation Report

Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site

Lake Havasu City, Arizona

Location	Installation Date	ADWR No.	Borehole Depth (ft bgs)	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Casing Diameter (inches)	Top-of-Casing Elevation (ft amsl)	Well Material	Latitude	Longitude
BB-MW-01	9/17/2020	55-924815	220	160	110-160	4	574.17	Schedule 80 PVC	34.4914182926083°N	114.347802871678°W
BB-MW-02	9/22/2020	55-924816	275	165	105-165	4	560.12	Schedule 80 PVC	34.4907597945972°N	114.3477968777°W
BB-MW-02-SG-50	9/22/2020	55-924816	275	165	50	1/4	NA	HDPE	34.4907597945972°N	114.3477968777°W
BB-MW-03	10/5/2020	55-924817	210	160	100-160	4	562.86	Schedule 80 PVC	34.491078660525°N	114.346928772919°W
BB-MW-03-SG-25	10/5/2020	55-924817	210	160	25	1/4	NA	HDPE	34.491078660525°N	114.346928772919°W
BB-MW-03-SG-75	10/5/2020	55-924817	210	160	75	1/4	NA	HDPE	34.491078660525°N	114.346928772919°W
BB-MW-04	5/10/2021	55-926170	250	190	140-190	4	599.73	Schedule 80 PVC	34.4937945258667°N	114.346275202575°W
BB-MW-04-SG-22	5/10/2021	55-926170	250	190	22	1/4	NA	HDPE	34.4937945258667°N	114.346275202575°W
BB-MW-05	5/21/2021	55-926173	250	165	105-165	4	558.62	Schedule 80 PVC	34.4887986031944°N	114.346138711119°W
BB-MW-06	11/22/2021	55-927263	340	160	110-160	4	558.36	Schedule 80 PVC	34.4916875496833°N	114.349616327472°W
BB-MW-07A	12/6/2021	55-927362	250	135	115-135	2	582.44	Schedule 80 PVC	34.4923136235472°N	114.347759170683°W
BB-MW-07B	12/6/2021	55-927362	250	233	223-233	2	582.41	Schedule 80 PVC	34.4923137268°N	114.347758159342°W
BB-MW-08A	12/17/2021	55-927405	250	150	120-150	2	583.36	Schedule 80 PVC	34.4927510388389°N	114.347060328892°W
BB-MW-08B	12/17/2021	55-927405	250	240	230-240	2	583.30	Schedule 80 PVC	34.4927508315833°N	114.347058893353°W
BB-MW-09A	1/11/2021	55-927479	305	140	120-140	2	582.63	Schedule 80 PVC	34.4921451779306°N	114.347148378744°W
BB-MW-09B	1/11/2021	55-927479	305	240	220-240	2	582.62	Schedule 80 PVC	34.4921450709361°N	114.347147397197°W
BB-MW-10	11/11/2023	55-930446	85	82	62-82	2	488.26	Schedule 80 PVC	34.4888010937°N	114.354472776225°W
BB-MW-10A	3/8/2022	55-236390	260	145	125-145	2	488.00	Schedule 80 PVC	34.4888032840139°N	114.354502429919°W
BB-MW-10B	3/8/2022	55-236390	260	240	230-240	2	488.00	Schedule 80 PVC	34.4888034092222°N	114.354503154183°W
BB-MW-11A	3/18/2022	55-927776	260	65	45-65	2	484.76	Schedule 80 PVC	34.4859477035667°N	114.352968158417°W
BB-MW-11B	3/18/2022	55-927776	260	190	170-190	2	484.77	Schedule 80 PVC	34.4859475871944°N	114.352967296994°W
BB-MW-12	11/11/2023	55-930445	110	108	88-110	2	520.09	Schedule 80 PVC	34.4917004277167°N	114.353824351283°W
BB-MW-12A	4/4/2022	55-927818	260	145	180-190	2	519.65	Schedule 80 PVC	34.4917009782056°N	114.353860667736°W
BB-MW-12B	4/4/2022	55-927818	260	240	230-240	2	519.66	Schedule 80 PVC	34.4917001286306°N	114.353860715364°W
BB-MW-13A	5/12/2022	55-928063	270	150	130-150	2	593.05	Schedule 80 PVC	34.4928670544278°N	114.346174904019°W
BB-MW-13B	5/12/2022	55-928063	270	255	235-255	2	593.07	Schedule 80 PVC	34.4928675481583°N	114.346175324844°W
BB-MW-13-SG-30	5/12/2022	55-928063	270	255	30	1/4	NA	HDPE	34.4928675481583°N	114.346175324844°W
BB-MW-13-SG-113.5	5/12/2022	55-928063	270	255	113.5	1/4	NA	HDPE	34.4928675481583°N	114.346175324844°W
BB-MW-14A	10/4/2022	55-237763	250	105	90-105	2	514.26	Schedule 80 PVC	34.4942928464528°N	114.355372236464°W
BB-MW-14B	10/4/2022	55-237763	250	230	210-230	2	514.27	Schedule 80 PVC	34.4942922491861°N	114.355372329672°W
BB-MW-14-SG-48	10/4/2022	55-237763	250	230	48	1/4	NA	HDPE	34.4942922491861°N	114.355372329672°W
BB-MW-15A	10/9/2022	55-237765	250	165	145-165	2	605.09	Schedule 80 PVC	34.4931277945083°N	114.344403927575°W
BB-MW-15B	10/9/2022	55-237765	250	215	205-215	2	605.13	Schedule 80 PVC	34.4931283886667°N	114.344404705019°W
BB-MW-15-SG-25	10/9/2022	55-237765	250	215	25	1/4	NA	HDPE	34.4931283886667°N	114.344404705019°W
BB-MW-15-SG-75	10/9/2022	55-237765	250	215	75	1/4	NA	HDPE	34.4931283886667°N	114.344404705019°W
BB-MW-16A	10/23/2022	55-237764	250	195	175-195	2	636.74	Schedule 80 PVC	34.4945084561083°N	114.342385158753°W
BB-MW-16B	10/23/2022	55-237764	250	245	235-245	2	636.79	Schedule 80 PVC	34.494508148875°N	114.342384636642°W
BB-MW-16-SG-50	10/23/2022	55-237764	250	245	50	1/4	NA	HDPE	34.494508148875°N	114.342384636642°W
BB-MW-16-SG-100	10/23/2022	55-237764	250	245	100	1/4	NA	HDPE	34.494508148875°N	114.342384636642°W
BB-MW-16-SG-125	10/23/2022	55-237764	250	245	125	1/4	NA	HDPE	34.494508148875°N	114.342384636642°W
BB-MW-17A	10/29/2022	55-237854	227	19	9-19	2	455.33	Schedule 80 PVC	34.4878014757°N	114.357892809503°W
BB-MW-17B	10/29/2022	55-237854	227	95	75-95	2	455.33	Schedule 80 PVC	34.4878010798167°N	114.357893740133°W
BB-MW-18A	11/11/2023	55-930447	210	27	12-27	2	463.61	Schedule 80 PVC	34.4912818540694°N	114.360335532428°W
BB-MW-18B	11/11/2023	55-930447	210	73	53-73	2	463.61	Schedule 80 PVC	34.4912811985333°N	114.360336199642°W
MW-12B	6/5/1995	55-548600	95	95	93-95	2	NA	Schedule 80 PVC	34.4880010870222°N	114.349487599933°W

Notes:
ADWR - Arizona Department of Water Resources
ft amsl - feet above mean sea level
ft bgs - feet below ground surface
No. - Number
NA - Not assigned or not available

Latitude and longitude are formatted as Decimal Degrees in the NAD83 datum.
Elevation data are presented in the NAVD88 datum.
HDPE - High-density polyethylene
PVC - polyvinylchloride

Table 7 - Soil Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ^I (µg/L)				VOCs by EPA Method 8260B (mg/kg)		Metals by 6010D (mg/kg)	
				PCE	TCE	cDCE	tDCE	PCE	TCE	Arsenic	Thallium
BB-MW-01	BB-MW-01-15-S	9/14/2020	15	ND	ND	ND	ND	~	~	~	~
	BB-MW-01-25-S		25	ND	ND	ND	ND	~	~	~	~
	BB-MW-01-42-S		42	0.2	34.4	ND	ND	~	~	~	~
	BB-MW-01-50-S		50	ND	8.2	ND	ND	~	~	~	~
	BB-MW-01-75-S	9/15/2020	75	ND	3.0	ND	ND	~	~	~	~
	BB-MW-01-100-S		100	0.1	3.4	ND	ND	~	~	~	~
	BB-MW-01-111-S		111	ND	0.6	ND	ND	~	~	~	~
BB-MW-02	BB-MW-02-15-S	9/19/2020	15	ND	ND	ND	ND	~	~	~	~
	BB-MW-02-25-S		25	ND	ND	ND	ND	~	~	~	~
	DUP-S-01			ND	ND	ND	ND	~	~	~	~
	BB-MW-02-50-S		50	ND	3.2	ND	ND	~	~	~	~
	BB-MW-02-75-S	9/20/2020	75	ND	0.40	ND	ND	~	~	~	~
	DUP-S-02			ND	0.30	ND	ND	~	~	~	~
	BB-MW-02-100-S		100	ND	0.3	ND	ND	~	~	~	~
BB-MW-03	BB-MW-03-15-S	9/30/2020	15	ND	1.6	ND	ND	~	~	~	~
	BB-MW-03-25-S		25	0.1	2.4	ND	ND	~	~	~	~
	BB-MW-03-50-S	10/1/2020	50	ND	0.5	ND	ND	~	~	~	~
	BB-MW-03-75-S		75	ND	0.5	ND	ND	~	~	~	~
	BB-MW-03-86-S		86	ND	0.4	ND	ND	~	~	~	~
	BB-MW-03-94-S		94	ND	0.2	ND	ND	~	~	~	~
	BB-MW-03-100-S		100	ND	0.2	ND	ND	~	~	~	~
	DUP-S-03			ND	0.2	ND	ND	~	~	~	~
	BB-MW-03-104-S	10/10/2020	104	ND	0.1	ND	ND	~	~	~	~

Table 7 - Soil Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ^I (µg/L)				VOCs by EPA Method 8260B (mg/kg)		Metals by 6010D (mg/kg)	
				PCE	TCE	cDCE	tDCE	PCE	TCE	Arsenic	Thallium
BB-MW-04	BB-MW-04-15-S	5/4/2021	15	0.3 J	0.4 J	ND	ND	~	~	~	~
	BB-MW-04-39-S	5/5/2021	39	ND	0.1 J	ND	ND	~	~	~	~
	BB-MW-04-57-S		57	ND	0.7 J	ND	ND	~	~	~	~
	BB-MW-04-134-S	5/6/2021	134	ND	ND	ND	ND	~	~	~	~
	DUP-S-01		134	ND	ND	ND	ND	~	~	~	~
BB-MW-05	BB-MW-05-15-S	5/11/2021	15	ND	0.2 J	ND	ND	~	~	~	~
	DUP-S-02		15	ND	ND	ND	ND	~	~	~	~
	BB-MW-05-95-S	5/12/2021	95	ND	0.2 J	ND	ND	~	~	~	~
	DUP-S-03		95	ND	ND	ND	ND	~	~	~	~
BB-MW-06	BB-MW-06-S-10	11/16/2021	10	8.2	4.9	8.0	1.7	~	~	~	~
	BB-MW-06-S-15		15	9.1	5.1	7.5	1.5	~	~	~	~
	BB-MW-06-S-22		22	8.3	4.7	8.2	1.2	~	~	~	~
	BB-MW-06-S-27		27	5.5	3.6	6.3	1.4	~	~	~	~
	BB-MW-06-S-39		39	6.6	3.0	5.6	1.0	~	~	~	~
	BB-MW-06-S-50		50	4.7	2.6	4.5	1.0	~	~	~	~
	BB-MW-06-S-75		75	5.8	3.0	5.2	1.2	~	~	~	~
	BB-MW-06-S-92	11/17/2021	92	4.6	2.6	4.5	1.1	~	~	~	~
	BB-MW-06-S-100		100	5.4	3.2	6.0	1.2	~	~	~	~
BB-MW-07	BB-MW-07-S-05	12/1/2021	5	NA	NA	NA	NA	<0.0224	<0.0146	1.97	<0.394
	BB-MW-07-S-15		15	3.9	2.4	3.2	1	NA	NA	NA	NA
	BB-MW-07-S-25		25	5.0	2.6	3.5	1.1	<0.0224	<0.0146	<0.518	<0.394
	BB-MW-07-S-45		45	16.5	8.7	9.0	2.7	NA	NA	NA	NA
	BB-MW-07-S-50		50	3.0	1.7	2.0	0.7	<0.0224	<0.0146	<0.518	<0.394

Table 7 - Soil Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ^I (µg/L)				VOCs by EPA Method 8260B (mg/kg)		Metals by 6010D (mg/kg)	
				PCE	TCE	cDCE	tDCE	PCE	TCE	Arsenic	Thallium
BB-MW-07 cont.	BB-MW-07-S-65	12/2/2021	65	8.7	4.5	5.1	1.6	NA	NA	NA	NA
	DUP-S-01		65	3.6	2.1	3.2	0.9	<0.0226	<0.0147	0.977	<0.394
	BB-MW-07-S-68		68	3.2	2.0	2.6	0.6	NA	NA	NA	NA
	BB-MW-07-S-75		75	4.2	2.5	3.5	0.9	<0.026	<0.0169	1.07	<0.394
	BB-MW-07-S-87		87	3.2	1.8	3.5	0.9	NA	NA	NA	NA
	BB-MW-07-S-93		93	3.6	1.9	3.0	0.8	NA	NA	NA	NA
	BB-MW-07-S-108		108	20.7	12.6	8.5	2.5	NA	NA	NA	NA
	BB-MW-07-S-110		110	9.5	7.3	5.6	1.7	NA	NA	NA	NA
	BB-MW-07-S-115		115	2.9	2.7	2.3	ND	<0.0249	<0.0162	<0.518	<0.394
BB-MW-08	BB-MW-08-S-05	12/7/2021	5	NA	NA	NA	NA	<0.0224	<0.0146	2.44	<0.394
	BB-MW-08-S-13		13	9.1	8.6	7.8	1.9	NA	NA	NA	NA
	BB-MW-08-S-25		25	2.7	3.2	2.7	ND	<0.0224	<0.0146	1.84	<0.394
	DUP-S-02		25	2.8	4.3	2.7	0.8	NA	NA	NA	NA
	BB-MW-08-S-33		33	2.4	1.6	1.9	0.7	NA	NA	NA	NA
	BB-MW-08-S-39		39	2.2	2.0	ND	ND	NA	NA	NA	NA
	BB-MW-08-S-42		42	1.9	1.7	1.5	0.7	NA	NA	NA	NA
	BB-MW-08-S-45		45	1.9	1.4	1.9	0.6	NA	NA	NA	NA
	BB-MW-08-S-50		50	1.7	1.2	ND	ND	<0.0224	<0.0146	0.906	<0.394
	BB-MW-08-S-56		56	3.0	2.3	2.0	0.8	NA	NA	NA	NA
	BB-MW-08-S-62		62	1.2	1.1	ND	ND	NA	NA	NA	NA
	BB-MW-08-S-68		68	1.2	0.7	ND	ND	NA	NA	NA	NA
	BB-MW-08-S-75	12/8/2021	75	4.3	4.1	3.0	1.7	<0.0224	<0.0146	<0.518	0.788
	BB-MW-08-S-87		87	2.4	2.5	3.2	1.0	~	~	~	~

Table 7 - Soil Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				VOCs by EPA Method 8260B (mg/kg)		Metals by 6010D (mg/kg)	
				PCE	TCE	cDCE	tDCE	PCE	TCE	Arsenic	Thallium
BB-MW-08 cont.	DUP-S-03	12/8/2021	87	1.5	1.2	1.6	0.7	~	~	~	~
	BB-MW-08-S-115	12/14/2021	115	NA	NA	NA	NA	<0.0249	<0.0162	1.23	<0.394
	BB-MW-08-S-147		147	39.0	15.1	ND	ND	~	~	~	~
BB-MW-09	BB-MW-09-S-15	1/4/2022	15	16.1	9.9	7.3	2.8	<0.0228	<0.0149	2.82	<0.394
	BB-MW-09-S-25		25	17.6	10.4	6.6	2.7	<0.0224	<0.0146	1.1	<0.394
	BB-MW-09-S-46		46	11.2	6.7	5.6	2.1	~	~	~	~
	BB-MW-09-S-50		50	12.2	7.2	5.0	1.8	<0.0307	<0.020	1.53	<0.394
	DUP-S-04		50	9.6	4.7	3.5	1.7	~	~	~	~
	BB-MW-09-S-75	1/5/2022	75	<22.2	<14.6	NA	NA	<0.0224	<0.0146	1.91	<0.394
	BB-MW-09-S-115		115	<24.2	<15.8	NA	NA	<0.0242	<0.0158	1.42	<0.394
BB-MW-10	BB-MW-10-S-15	3/1/2022	15	ND	ND	NA	NA	<0.0224*	<0.0146*	2.3	<0.394
	BB-MW-10-S-25		25	ND	ND	NA	NA	<0.0224*	<0.0146*	0.533	<0.394
	BB-MW-10-S-32		32	ND	ND	NA	NA	<0.0224*	<0.0146*	0.677	<0.394
	DUP-S-01		32	ND	ND	NA	NA	~	~	~	~
BB-MW-11	BB-MW-11-S-15	3/15/2022	15	ND	ND	NA	NA	~	~	<0.518	0.408
	BB-MW-11-S-25		25	ND	ND	NA	NA	~	~	<0.518	<0.394
	BB-MW-11-S-30		30	ND	ND	NA	NA	~	~	<0.518	<0.394
	DUP-S-02		30	ND	ND	NA	NA	~	~	~	~
BB-MW-12	BB-MW-12-S-15	3/29/2022	15	ND	ND	NA	NA	~	~	1.85	~
	BB-MW-12-S-25		25	ND	ND	NA	NA	~	~	0.83	~
	BB-MW-12-S-35		35	ND	ND	NA	NA	~	~	<0.518	~
	BB-MW-12-S-45		45	ND	ND	NA	NA	~	~	<0.518	~
	BB-MW-12-S-55		55	ND	ND	~	~	~	~	<0.518	~

Table 7 - Soil Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ^I (µg/L)				VOCs by EPA Method 8260B (mg/kg)		Metals by 6010D (mg/kg)	
				PCE	TCE	cDCE	tDCE	PCE	TCE	Arsenic	Thallium
BB-MW-12 cont.	BB-MW-12-S-65	3/30/2022	65	ND	ND	~	~	~	~	<0.518	~
	DUP-S-03		65	ND	ND	~	~	~	~	~	~
BB-MW-13	BB-MW-13-S-15	5/5/2022	15	ND	ND	~	~	~	~	~	~
	BB-MW-13-S-25		25	ND	ND	~	~	~	~	~	~
	BB-MW-13-S-50		50	ND	ND	~	~	~	~	1.36	<394
	DUP-S-04		50	ND	ND	~	~	~	~	~	~
	BB-MW-13-S-73	5/6/2022	73	ND	ND	~	~	~	~	~	~
	BB-MW-13-S-113		113	NA	NA	~	~	~	~	<0.518	<394
BB-MW-14	BB-MW-14-S-15	9/28/2022	15	ND	ND	~	~	~	~	~	~
	DUP-01		15	ND	ND	~	~	~	~	~	~
	BB-MW-14-S-50	9/29/2022	50	ND	ND	~	~	~	~	~	~
	BB-MW-14-S-61		60	ND	ND	~	~	~	~	~	~
	DUP-02		60	ND	ND	~	~	~	~	~	~
BB-MW-15	BB-MW-15-S-15	10/4/2022	15	ND	ND	~	~	~	~	~	~
	DUP-03		15	ND	ND	~	~	~	~	~	~
	BB-MW-15-S-50	10/5/2022	50	ND	ND	~	~	~	~	~	~
	DUP-04		50	ND	ND	~	~	~	~	~	~
	BB-MW-15-S-75		75	ND	ND	~	~	~	~	~	~
	BB-MW-15-S-90		90	ND	ND	~	~	~	~	~	~
	BB-MW-15-S-115	10/6/2022	115	ND	ND	~	~	~	~	~	~
	DUP-S-05		115	ND	ND	~	~	~	~	~	~

Table 7 - Soil Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				VOCs by EPA Method 8260B (mg/kg)		Metals by 6010D (mg/kg)	
				PCE	TCE	cDCE	tDCE	PCE	TCE	Arsenic	Thallium
BB-MW-16	BB-MW-16-S-20	10/18/2022	20	ND	ND	~	~	~	~	~	~
	DUP-06		20	ND	ND	~	~	~	~	~	~
	BB-MW-16-S-50	10/19/2022	50	ND	ND	~	~	~	~	~	~
	DUP-07		50	ND	ND	~	~	~	~	~	~
	BB-MW-16-S-83	10/20/2022	83	ND	ND	~	~	~	~	~	~
	DUP-08		83	ND	ND	~	~	~	~	~	~
	BB-MW-16-S-100		100	ND	ND	~	~	~	~	~	~

Notes:
Reporting limits for field portable GC/MS results are not available for individual samples
(1) - Values listed are representative of corrected results.
PCE - Tetrachloroethene
cDCE - cis-1,2-Dichloroethene
tDCE - trans-1,2-Dichloroethene
ft bgs - feet below ground surface
µg/kg - micrograms per killogram

mg/kg - milligrams per kilogram
< - Analyte not detected above laboratory reporting limit
Bold - Analyte detected above laboratory reporting limit
~ - Sample not analyzed for analyte
ND - Non-detect
GC - Gas Chromatograph
* - Analyzed using EPA Method 8260B Full List

Table 8 - Soil-Gas Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Elevation (ft amsl)	Purge PID (ppm)	Analyte			
						Volatile Organic Compounds by Portable GC ¹ (µg/m ³)			
						PCE	TCE	cDCE	tDCE
BB-MW-01	BB-MW-01-15-SG	9/14/2020	15	560	4.3	ND	ND	ND	ND
	BB-MW-01-25-SG		25	550	13.5	ND	ND	ND	ND
	BB-MW-01-50-SG		50	525	97	ND	ND	ND	ND
	DUP-SG-01				97	ND	ND	ND	ND
	BB-MW-01-75-SG	9/15/2020	75	500	10.8	ND	ND	ND	ND
	BB-MW-01-100-SG		100	475	39	ND	ND	ND	ND
BB-MW-02	BB-MW-02-15-SG	9/19/2020	15	545	5.6	ND	ND	ND	ND
	BB-MW-02-25-SG		25	535	8.9	ND	ND	ND	ND
	DUP-SG-02				8.9	ND	ND	ND	ND
	BB-MW-02-50-SG		50	510	28.5	247	136,000	99.5	13.6
	BB-MW-02-75-SG	9/20/2020	75	485	6.6	ND	ND	ND	ND
	DUP-SG-03				6.6	ND	ND	ND	ND
BB-MW-03	BB-MW-03-15-SG	9/30/2020	15	549	8.2	143	57,900	6.97	6.81
	BB-MW-03-25-SG		25	539	6.1	235	109,000	39.2	38.4
	BB-MW-03-50-SG	10/1/2020	50	514	4.7	13.9	5,570	2.95	ND
	BB-MW-03-75-SG		75	489	7.2	243	114,000	79.3	7.75
	BB-MW-03-100-SG		100	464	9.4	ND	ND	ND	ND
	DUP-SG-04				9.4	ND	ND	ND	ND
BB-MW-04	BB-MW-04-15-SG	5/4/2021	15	585	0.0	379	6,860	1.00	ND
	BB-MW-04-134-SG	5/6/2021	134	466	75.0	ND	22,800	ND	ND
	DUP-SG-01		134	466	75.0	331	7,190	4.77	ND
	DUP-SG-02		134	466	75.0	355	7,700	3.94	ND

Table 8 - Soil-Gas Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Elevation (ft amsl)	Purge PID (ppm)	Analyte			
						Volatile Organic Compounds by Portable GC ¹ (µg/m ³)			
						PCE	TCE	cDCE	tDCE
BB-MW-05	BB-MW-05-15-SG	5/11/2021	15	544	7.5	1.10	1.26	ND	2.52
	DUP-SG-03		15	544	7.5	1.10	ND	ND	ND
	BB-MW-05-95-SG	5/12/2021	95	464	8.6	ND	3.05	ND	1.83
	DUP-SG-04		95	464	8.6	3.68	0.78	11.6	11.4
	DUP-SG-05		95	464	8.6	3.73	1.89	10.6	10.3
BB-MW-06	BB-MW-06-SG-15	11/16/2021	15	544	3.5	1.03	16.0	ND	4.66
	DUP-SG-01		15	544	3.5	1.70	13.2	ND	ND
	BB-MW-06-SG-50		50	509	3.5	132	7,280	6.63	ND
	BB-MW-06-SG-75		75	484	2.8	144	10,500	7.58	ND
	BB-MW-06-SG-97	11/17/2021	97	462	5.0	ND	25.2	5.81	ND
	DUP-SG-02		97	462	5.0	ND	26.5	ND	ND
BB-MW-07	BB-MW-07-SG-15	12/1/2021	15	568	0.3	268	6,530	ND	ND
	DUP-SG-03		15	568	0.3	279	7,180	ND	ND
	BB-MW-07-SG-25		25	558	0.7	1,220	33,300	16.0	15.6
	BB-MW-07-SG-50		50	533	1.0	5,320	77,400	17.2	ND
	BB-MW-07-SG-75	12/2/2021	75	508	13.6	894	26,400	ND	15.5
	DUP-SG-04		75	508	13.6	900	27,300	13.2	ND
	BB-MW-07-SG-115		115	468	1.3	16,006	118,000	35.0	ND
BB-MW-08	BB-MW-08-SG-15	12/7/2021	15	569	0.3	130	520	ND	10.5
	DUP-SG-05		15	569	0.3	126	544	ND	ND
	BB-MW-08-SG-25		25	559	7.2	2,390	8,717	ND	ND
	BB-MW-08-SG-50		50	534	0.5	46,500	124,000	42.8	327
	BB-MW-08-SG-75	12/8/2021	75	509	0.6	544	7,110	7.55	ND
	DUP-SG-06		75	509	0.6	548	7,300	ND	ND
	BB-MW-08-SG-115	12/14/2021	115	469	NR	13.0	280	ND	ND

Table 8 - Soil-Gas Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Elevation (ft amsl)	Purge PID (ppm)	Analyte			
						Volatile Organic Compounds by Portable GC ¹ (µg/m ³)			
						PCE	TCE	cDCE	tDCE
BB-MW-09	BB-MW-09-SG-15	1/4/2022	15	568	0.9	83,300	130,000	337	45.3
	BB-MW-09-SG-25		25	558	2.5	101,000	262,000	239	69.0
	BB-MW-09-SG-50		50	533	4.1	40,700	372,000	214	ND
	DUP-SG-07		50	533	4.1	38,800	355,000	219	ND
	BB-MW-09-SG-75	1/5/2022	75	508	3.0	1,100	40,000	ND	ND
	BB-MW-09-SG-115		115	468	19.2	11,000	527,000	ND	ND
BB-MW-10	BB-MW-10-SG-13.5	3/1/2022	13.5	475	0.2	ND	ND	NA	NA
	BB-MW-10-SG-23		23	465	0.1	ND	ND	NA	NA
	DUP-SG-01		23	465	0.1	ND	ND	NA	NA
	BB-MW-10-SG-32		32	456	0.2	ND	ND	NA	NA
BB-MW-11	BB-MW-11-SG-15	3/15/2022	15	470	7.2	ND	ND	NA	NA
	BB-MW-11-SG-25		25	460	36.2	ND	ND	NA	NA
	BB-MW-11-SG-30		30	455	20.8	ND	ND	NA	NA
	DUP-SG-02		30	455	20.8	ND	ND	NA	NA
BB-MW-12	BB-MW-12-SG-15	3/29/2022	15	505	0.4	ND	ND	NA	NA
	BB-MW-12-SG-25		25	495	0.5	ND	ND	NA	NA
	BB-MW-12-SG-35		35	485	4.1	ND	ND	NA	NA
	BB-MW-12-SG-45		45	475	2.4	ND	ND	NA	NA
	BB-MW-12-SG-55		55	465	5.4	ND	ND	NA	NA
	BB-MW-12-SG-65	3/30/2022	65	455	3.1	ND	ND	NA	NA
	DUP-SG-03		65	455	3.1	ND	ND	NA	NA

Table 8 - Soil-Gas Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Elevation (ft amsl)	Purge PID (ppm)	Analyte			
						Volatile Organic Compounds by Portable GC ¹ (µg/m ³)			
						PCE	TCE	cDCE	tDCE
BB-MW-13	BB-MW-13-SG-15	5/5/2022	15	578	0.4	ND	54.7	NA	NA
	BB-MW-13-SG-25		25	568	0.3	16.0	2,280	NA	NA
	DUP-SG-04		25	568	0.3	39.1	4,870	NA	NA
	BB-MW-13-SG-50		50	543	5.3	154	136,000	NA	NA
	BB-MW-13-SG-73*	5/6/2022	73	520	0.1	ND	ND	NA	NA
	DUP-SG-05*		73	520	0.1	ND	2.08	NA	NA
	BB-MW-13-SG-87*		87	506	10.3	ND	10,600	NA	NA
	DUP-SG-06		87	506	10.3	55,300	2,780	NA	NA
	BB-MW-13-SG-113		113	480	56.3	259	327,000	NA	NA
	DUP-SG-07		113	480	56.3	114	223,000	NA	NA
BB-MW-14	BB-MW-14-SG-15	9/27/2022	15	500	0.8	37.5	362	NA	NA
	DUP-01	9/28/2022	15	500	0.8	ND	536	NA	NA
	BB-MW-14-SG-50		50	465	2.1	12,300	ND	NA	NA
	DUP-02		50	465	2.1	11,300	ND	NA	NA
	BB-MW-14-SG-61		61	454	0.2	31.9	ND	NA	NA
	DUP-03		61	454	0.2	34.5	ND	NA	NA
BB-MW-15	BB-MW-15-SG-15	10/5/2022	15	591	8.1	53.4	31.6	NA	NA
	DUP-04		15	591	8.1	46.0	97.5	NA	NA
	BB-MW-15-SG-50		50	556	0.0	ND	ND	NA	NA
	BB-MW-15-SG-75		75	531	0.6	579	695	NA	NA
	DUP-05		75	531	0.6	827	828	NA	NA
	BB-MW-15-SG-90		90	516	1.9	1.52	207	NA	NA
	BB-MW-15-SG-115	10/6/2022	115	491	2.0	ND	ND	NA	NA
	DUP-06		115	491	2.0	ND	ND	NA	NA

Table 8 - Soil-Gas Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Sample Elevation (ft amsl)	Purge PID (ppm)	Analyte			
						Volatile Organic Compounds by Portable GC ¹ (µg/m ³)			
						PCE	TCE	cDCE	tDCE
BB-MW-16	BB-MW-16-SG-20	10/18/2022	20	617	1.2	51.6	170	NA	NA
	DUP-07		20	617	1.2	61.2	138	NA	NA
	BB-MW-16-SG-50	10/19/2022	50	587	3.5	7253	212	NA	NA
	DUP-08		50	587	3.5	11,000	325	NA	NA
	BB-MW-16-SG-75		75	562	2.5	236	85.3	NA	NA
	BB-MW-16-SG-100	10/20/2022	100	537	1.5	14,600	767	NA	NA
	DUP-09		100	537	1.5	15,000	765	NA	NA
	BB-MW-16-SG-125		125	512	0.3	37.8	34.5	NA	NA
	BB-MW-16-SG-150		150	487	0.2	ND	ND	NA	NA
BB-MW-18	BB-MW-18-SG-5	11/17/2023	5	459	0.2	ND	ND	NA	NA

Notes:

PCE - Tetrachloroethene

TCE - Trichloroethene

cDCE - cis-1,2-Dichloroethene

tDCE - trans-1,2-Dichloroethene

(1) Reporting limits for field portable GC/MS results are not available for individual samples

ft bgs - feet below ground surface

µg/m³ - micrograms per cubic meter

Bold - Analyte detected above laboratory reporting limit

ND - Non-detect

NA- Not Available

GC - Gas Chromatograph

ppm - parts per million air

PID - Photoionization Detector

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-01	BB-MW-01-120-GW	9/15/2020	120	3.61	1,836	1.40	1.52	5.82	2,650	1.53	<0.001
	BB-MW-01-140-GW		140	2.57	725	ND	ND	NA	NA	NA	NA
				1.96	549	ND	0.14				
				1.44	472	ND	0.12				
	BB-MW-01-160-GW	9/16/2020	160	0.79	203	ND	ND	NS	NS	NS	NS
	BB-MW-01-180-GW		180	0.00	5.22	ND	ND	<0.001	1.78	<0.001	<0.001
	DUP-GW-01			0.00	3.88	ND	ND				
	BB-MW-01-200-GW	9/17/2020	200	0.00	0.64	ND	ND	NS	NS	NS	NS
	DUP-GW-02			0.05	2.91	ND	ND	NS	NS	NS	NS
	DUP-GW-03			0.00	2.55	ND	ND	NS	NS	NS	NS
BB-MW-01-220-GW	220			0.00	1.06	ND	ND	NA	NA	NA	NA
BB-MW-02	BB-MW-02-115-GW	9/21/2020	115	0.29	281	0.46	0.24	NS	NS	NS	NS
	BB-MW-02-135-GW		135	0.00	17.2	ND	ND	NS	NS	NS	NS
	DUP-GW-04			0.00	13.0	ND	ND	NS	NS	NS	NS
	BB-MW-02-155-GW	9/22/2020	155	0.39	672	ND	ND	2.46	1,280	0.214 ^{E4}	<0.001
	DUP-GW-05			0.38	539	ND	ND				
	BB-MW-02-175-GW		175	0.00	29.9	ND	ND	NS	NS	NS	NS
	BB-MW-02-195-GW		195	0.00	7.10	ND	ND	NS	NS	NS	NS
	BB-MW-02-215-GW	9/23/2020	215	0.00	0.84	ND	ND	NS	NS	NS	NS
	DUP-GW-06			0.00	0.87	ND	ND	NS	NS	NS	NS
	BB-MW-02-235-GW		235	0.03	24.5	ND	ND	NS	NS	NS	NS
	BB-MW-02-255-GW		255	0.00	0.94	ND	ND	NS	NS	NS	NS
	BB-MW-02-275-GW		275	0.00	1.02	ND	ND	<0.001	0.616 ^{E4}	<0.001	<0.001

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-03	BB-MW-03-110-GW	10/1/2020	110	0.00	22.2	ND	ND	NS	NS	NS	NS
	BB-MW-03-130-GW	10/2/2020	130	0.00	1.99	ND	ND	NS	NS	NS	NS
	BB-MW-03-150-GW		150	0.20	146	ND	ND	0.914 ^{E4}	416 ^{LI}	<0.001	<0.001
	DUP-GW-07			0.20	147	ND	ND				
	BB-MW-03-170-GW		170	0.00	0.31	ND	ND	<0.001	0.310 ^{E4 LI}	<0.001	<0.001
	BB-MW-03-170-GW	0.00		0.30	ND	ND					
	BB-MW-03-190-GW	10/3/2020	190	0.00	0.22	ND	ND	NS	NS	NS	NS
	BB-MW-03-190-GW			0.00	0.35	ND	ND	NS	NS	NS	NS
	BB-MW-03-210-GW		210	0.00	0.46	ND	ND	NS	NS	NS	NS
	DUP-GW-08			0.00	0.48	ND	ND	NS	NS	NS	NS
BB-MW-04	BB-MW-04-146-GW	5/6/2021	146	0.00	0.288	ND	ND	NS	NS	NS	NS
	BB-MW-04-171-GW		171	0.00	0.172	ND	ND	NS	NS	NS	NS
	BB-MW-04-186-GW		186	0.00	0.484	ND	ND	NS	NS	NS	NS
	DUP-GW-01		186	0.024	0.412	ND	ND	NS	NS	NS	NS
	BB-MW-04-206-GW		206	0.00	0.00	ND	ND	NS	NS	NS	NS
	BB-MW-04-206-GW		206	0.00	0.034	ND	ND	NS	NS	NS	NS
	BB-MW-04-226-GW	5/7/2021	226	0.044	0.196	ND	ND	NS	NS	NS	NS
	BB-MW-04-250-GW		250	0.00	0.228	ND	ND	NS	NS	NS	NS
BB-MW-05	BB-MW-05-100-GW	5/17/2021	100	0.00	0.108	ND	ND	NS	NS	NS	NS
	DUP-GW-02		100	0.00	0.128	ND	ND	NS	NS	NS	NS
	BB-MW-05-125-GW		125	0.00	0.036	ND	ND	NS	NS	NS	NS
	BB-MW-05-145-GW		145	0.00	0.108	ND	ND	NS	NS	NS	NS
	BB-MW-05-165-GW		165	0.00	0.084	ND	ND	NS	NS	NS	NS
	BB-MW-05-185-GW	5/18/2021	185	0.088	0.00	ND	ND	NS	NS	NS	NS

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-05 cont.	BB-MW-05-205-GW	5/18/2021	205	0.00	0.064	ND	ND	NS	NS	NS	NS
	BB-MW-05-225-GW		225	0.00	0.108	ND	ND	NS	NS	NS	NS
	DUP-GW-03		225	0.00	0.124	ND	ND	NS	NS	NS	NS
	BB-MW-05-250-GW	5/19/2021	250	0.00	0.064	ND	ND	NS	NS	NS	NS
	DUP-GW-04		250	0.00	0.00	ND	ND	NS	NS	NS	NS
BB-MW-06	BB-MW-06-GW-110	11/17/2021	110	4.32	11.7	4.13	0.69	NS	NS	NS	NS
	BB-MW-06-GW-130		130	8.06	637	4.32	0.94	NS	NS	NS	NS
	BB-MW-06-GW-150	11/18/2021	150	27.2	1,881	7.32	ND	NS	NS	NS	NS
	DUP-GW-01			56.1	1,630	28.6	5.19	NS	NS	NS	NS
	BB-MW-06-GW-170		170	6.22	290	4.22	0.81	NS	NS	NS	NS
	BB-MW-06-GW-190		190	11.7	58.8	6.22	1.65	NS	NS	NS	NS
	BB-MW-06-GW-210	11/19/2021	210	16.5	14.3	10.8	1.66	NS	NS	NS	NS
	DUP-GW-02			17.2	14.2	9.93	1.42	NS	NS	NS	NS
	BB-MW-06-GW-230		230	29.6	19.3	16.0	2.13	NS	NS	NS	NS
	BB-MW-06-GW-250		250	11.8	113	8.03	1.61	NS	NS	NS	NS
	BB-MW-06-GW-270	11/20/2021	270	21.2	16.21	9.34	2.70	NS	NS	NS	NS
	DUP-GW-03			28.5	21.9	11.9	2.99	NS	NS	NS	NS
	BB-MW-06-GW-290		290	19.1	18.9	9.13	2.42	NS	NS	NS	NS
	BB-MW-06-GW-310	11/22/2021	310	33.0	79.2	10.9	3.90	NS	NS	NS	NS
	DUP-GW-04			17.3	90.2	8.35	2.33	NS	NS	NS	NS
	BB-MW-06-GW-330		330	3.86	4.40	ND	ND	NS	NS	NS	NS
	DUP-GW-05			3.33	2.90	ND	ND	NS	NS	NS	NS
	BB-MW-06-GW-340		340	5.28	3.69	3.04	0.95	NS	NS	NS	NS
	DUP-GW-06			0.74	0.93	ND	ND	NS	NS	NS	NS

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-07	BB-MW-07-GW-125	12/3/2021	125	47.3	1,848	4.86	1.72	NS	NS	NS	NS
	BB-MW-07-GW-145		145	8.46	87.3	6.67	1.97	NS	NS	NS	NS
	DUP-GW-07			14.2	82.1	9.02	1.95	NS	NS	NS	NS
	BB-MW-07-GW-165		165	16.2	464	7.01	2.31	NS	NS	NS	NS
	BB-MW-07-GW-190	12/4/2021	190	2.08	1.83	1.62	1.15	NS	NS	NS	NS
	DUP-GW-08			2.04	1.67	1.83	1.33	NS	NS	NS	NS
	BB-MW-07-GW-210		210	1.48	1.86	1.45	0.40	NS	NS	NS	NS
	BB-MW-07-GW-230		230	3.70	5.95	3.32	0.91	NS	NS	NS	NS
	DUP-GW-09			4.79	7.06	3.74	0.95	NS	NS	NS	NS
	BB-MW-07-GW-250		250	0.90	1.92	1.29	0.28	NS	NS	NS	NS
	DUP-GW-10			0.23	0.70	ND	ND	NS	NS	NS	NS
BB-MW-08	BB-MW-08-GW-130	12/14/2021	130	2.10	141	ND	ND	2.10	141	<0.001	<0.001
	BB-MW-08-GW-150		150	ND	6.70	ND	ND	<0.001	6.70	<0.001	<0.001
	BB-MW-08-GW-170		170	ND	ND	ND	ND	<0.001	<0.001	<0.001	<0.001
	BB-MW-08-GW-190	12/15/2021	190	ND	ND	ND	ND	<0.001	<0.001	<0.001	<0.001
	BB-MW-08-GW-210		210	ND	ND	ND	ND	<0.001	<0.001	<0.001	<0.001
	BB-MW-08-GW-230		230	ND	ND	ND	ND	<0.001	<0.001	<0.001	<0.001
	BB-MW-08-GW-250		250	ND	ND	ND	ND	<0.001	<0.001	<0.001	<0.001
BB-MW-09	BB-MW-09-GW-125	1/6/2022	125	NS	NS	NS	NS	11.0	928	<0.001	<0.001
	BB-MW-09-GW-145		145	NS	NS	NS	NS	<0.001	41.0	<0.001	<0.001
	BB-MW-09-GW-165		165	NS	NS	NS	NS	<0.001	9.40	<0.001	<0.001
	BB-MW-09-GW-185	1/7/2022	185	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001
	BB-MW-09-GW-205		205	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001
	BB-MW-09-GW-225		225	NS	NS	NS	NS	<0.001	20.0	<0.001	<0.001

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-09 cont.	BB-MW-09-GW-250	1/7/2022	250	NS	NS	NS	NS	<0.001	13.0	<0.001	<0.001
	BB-MW-09-GW-270	1/8/2022	270	NS	NS	NS	NS	<0.001	<0.001	<0.001	<0.001
	BB-MW-09-GW-290		290	NS	NS	NS	NS	<0.001	1.40	<0.001	<0.001
BB-MW-10	BB-MW-10-GW-50-NF	3/1/2022	50	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-50-F			ND	ND	NS	NS				
	BB-MW-10-GW-70-NF	3/2/2022	70	ND	ND	NS	NS	<0.300	<0.190	<0.126	<0.149
	BB-MW-10-GW-70-F			ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-90-NF		90	ND	2.95	NS	NS	<0.001	1.73	<0.001	<0.001
	DUP-GW-01			2.24	2.72	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-90-F			2.19	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-110-NF		110	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-110-F			ND	ND	NS	NS				
	BB-MW-10-GW-130-NF	3/3/2022	130	ND	51.3	NS	NS	<0.001	38.2	<0.001	<0.001
	DUP-GW-02			ND	58.5	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-130-F			ND	22.8	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-150-NF	3/4/2022	150	9.08	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-150-F	ND		ND	NS	NS					
	BB-MW-10-GW-155-F	3/4/2022	155	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-155-NF			ND	ND	NS	NS				
	BB-MW-10-GW-175-NF		175	ND	8.46	NS	NS	<0.001	6.42	<0.001	<0.001
	BB-MW-10-175-F			ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-195-NF		195	ND	6.65	NS	NS	NS	NS	NS	NS
	BB-MW-10-195-F			ND	3.36	NS	NS				
	BB-MW-10-GW-215-NF		215	ND	3.57	NS	NS	NS	NS	NS	NS

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-10 cont.	BB-MW-10-GW-215-F	3/4/2022	215	ND	2.92	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-235-NF		235	ND	26.6	NS	NS	<0.001	<0.001	<0.001	<0.001
	DUP-GW-03			ND	32.5	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-235-F			ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-250-NF	3/5/2022	250	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-250-F			ND	ND	NS	NS				
	BB-MW-10-GW-260-NF		260	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001
	DUP-GW-04			ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-10-GW-260-F			ND	ND	NS	NS	NS	NS	NS	NS
BB-MW-11	BB-MW-11-GW-40	3/15/2022	40	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-GW-05			1.85	ND	NS	NS				
	BB-MW-11-GW-40-F			ND	ND	NS	NS				
	BB-MW-11-GW-60		60	ND	7.25	NS	NS	<0.001	<0.001	<0.001	<0.001
	BB-MW-11-GW-60-F			ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-11-GW-80	3/16/2022	80	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-11-GW-80-F			ND	ND	NS	NS				
	BB-MW-11-GW-100		100	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001
	BB-MW-11-GW-100-F			ND	2.55	NS	NS	NS	NS	NS	NS
	DUP-GW-06			ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-11-GW-120		120	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-11-GW-120-F			ND	ND	NS	NS				
	BB-MW-11-GW-145	3/17/2022	145	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-11-GW-145-F			ND	ND	NS	NS				
	BB-MW-11-GW-160		160	ND	ND	NS	NS	NS	NS	NS	NS

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
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Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte								
				Volatile Organic Compounds by Portable GC ¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)				
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE	
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L	
BB-MW-11 cont.	BB-MW-11-GW-160-F	3/17/2022	160	ND	ND	NS	NS	NS	NS	NS	NS	
	BB-MW-11-GW-180		180	ND	2.32	NS	NS	<0.001	<0.001	<0.001	<0.001	
	BB-MW-11-GW-180-F			ND	ND	NS	NS	NS	NS	NS	NS	
	BB-MW-11-GW-200		200	ND	ND	NS	NS	NS	NS	NS	NS	
	BB-MW-11-GW-200-F			ND	ND	NS	NS					
	BB-MW-11-GW-220		220	ND	ND	NS	NS	NS	NS	NS	NS	
	DUP-GW-07			ND	ND	NS	NS					
	BB-MW-11-GW-220-F			ND	ND	NS	NS					
	BB-MW-11-GW-240	3/18/2022	240	ND	ND	NS	NS	NS	NS	NS	NS	
	DUP-GW-08			ND	ND	NS	NS					
	BB-MW-11-GW-240-F			ND	ND	NS	NS					
	BB-MW-11-GW-260		260	ND	ND	NS	NS	NS	NS	NS	NS	
	BB-MW-11-GW-260-F			ND	ND	NS	NS					
	BB-MW-12	BB-MW-12-GW-66	3/30/2022	66	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001
		BB-MW-12-GW-85		85	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001
BB-MW-12-GW-105		105		ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001	
DUP-GW-09				ND	1.41	NS	NS	<0.001	NS	NS	NS	
BB-MW-12-GW-125		125		ND	0.97	NS	NS	<0.001	<0.001	<0.001	<0.001	
BB-MW-12-GW-145		145		ND	2.00	NS	NS	<0.001	<0.001	<0.001	<0.001	
BB-MW-12-GW-165		3/31/2022	165	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001	
BB-MW-12-GW-185*			185	51	1.51	NS	NS	<0.001	0.574	<0.001	<0.001	
DUP-GW-10*				33	1.53	NS	NS	<0.001	NS	NS	NS	
BB-MW-12-GW-205*			205	3.07	1.74	NS	NS	<0.001	2.41	<0.001	<0.001	
BB-MW-12-GW-225*			225	ND	9.65	NS	NS	<0.001	8.29	<0.001	<0.001	

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-12 cont.	BB-MW-12-GW-235*	4/1/2022	235	ND	0.79	NS	NS	<0.001	1.07	<0.001	<0.001
	DUP-GW-11*			ND	0.65	NS	NS	<0.001	NS	NS	NS
	DECON WATER		NA	ND	ND	NS	NS	<0.001	NS	NS	NS
	BB-MW-12-GW-250		250	0.96	2.56	NS	NS	<0.001	2.28	<0.001	<0.001
	BB-MW-12-GW-270		270	ND	1.42	NS	NS	<0.001	0.901	<0.001	<0.001
	BB-MW-12-GW-290		290	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001
BB-MW-13	BB-MW-13-GW-135	5/7/2022	135	ND	34.1	NS	NS	0.496	28.2	NS	NS
	DUP-GW-12			ND	25.1	NS	NS	NS	NS	NS	NS
	BB-MW-13-GW-155		155	ND	9.45	NS	NS	NS	NS	NS	NS
	BB-MW-13-GW-175	5/8/2022	175	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-GW-13			ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-13-GW-195		195	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-13-GW-215		215	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-13-GW-235		235	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-13-GW-255		255	ND	ND	NS	NS	ND	ND	NS	NS
	BB-MW-13-GW-270	5/9/2022	270	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-GW-14		270	ND	ND	NS	NS	NS	NS	NS	NS
BB-MW-14	BB-MW-14-GW-80	9/28/2022	80	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-100		100	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-01		100	ND	0.15	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-120		120	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-140	9/29/2022	140	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-160		160	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-02		160	ND	ND	NS	NS	NS	NS	NS	NS

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-14 cont.	BB-MW-14-GW-180	9/29/2022	180	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-202	9/30/2022	202	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-220		220	ND	ND	NS	NS	NS	NS	NS	
	DUP-03		220	ND	0.08	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-240		240	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-14-GW-250		250	ND	ND	NS	NS	NS	NS	NS	NS
BB-MW-15	BB-MW-15-GW-150	10/7/2022	150	ND	1.37	NS	NS	NS	NS	NS	NS
	DUP-04		150	ND	0.66	NS	NS	NS	NS	NS	NS
	BB-MW-15-GW-170		170	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-15-GW-190		190	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-15-GW-210	10/8/2022	210	ND	0.34	NS	NS	NS	NS	NS	NS
	DUP-05		210	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-15-GW-230		230	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-15-GW-250		250	ND	ND	NS	NS	NS	NS	NS	NS
BB-MW-16	BB-MW-16-GW-177	10/22/2022	177	ND	0.31	NS	NS	NS	NS	NS	NS
	BB-MW-16-GW-197		197	ND	0.23	NS	NS	NS	NS	NS	NS
	Dup-06		197	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-16-GW-217		217	ND	0.31	NS	NS	NS	NS	NS	NS
	BB-MW-16-GW-237		237	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-GW-250	10/23/2022	250	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-07		250	ND	ND	NS	NS	NS	NS	NS	NS
BB-MW-17	BB-MW-17-GW-17	10/25/2022	17	12.3	ND	NS	NS	NS	NS	NS	NS
	DUP-08		17	12.4	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-37		37	0.32	ND	NS	NS	NS	NS	NS	NS

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
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Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-17 cont.	BB-MW-17-GW-57	10/25/2022	57	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-77		77	0.28	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-97	10/26/2022	97	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-117		117	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-137		137	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-09		137	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-157		157	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-177	10/27/2022	177	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-197		197	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-10		197	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-207		207	0.12	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-217	10/28/2022	217	0.28	ND	NS	NS	NS	NS	NS	NS
	DUP-11		217	0.29	ND	NS	NS	NS	NS	NS	NS
	BB-MW-17-GW-227		227	0.71	ND	NS	NS	NS	NS	NS	NS
BB-MW-18	BB-MW-18-35	11/17/2023	35	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001
	BB-MW-18-55		55	ND	ND	NS	NS	<0.001	<0.001	<0.001	<0.001
	BB-MW-18-85		85	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-01		85	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-18-105	11/18/2023	105	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-18-125		125	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-02		125	ND	ND	NS	NS	NS	NS	NS	NS

Table 9 - VOC Groundwater Sample Analytical Results During Drilling
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Well ID	Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte							
				Volatile Organic Compounds by Portable GC¹ (µg/L)				Volatile Organic Compounds by EPA Method 8260B (ug/L)			
				PCE	TCE	cDCE	tDCE	PCE	TCE	cDCE	tDCE
Aquifer Water Quality Standard				5 µg/L	5 µg/L	70 µg/L	100 µg/L	5 µg/L	5 µg/L	70 µg/L	100 µg/L
BB-MW-18 cont.	BB-MW-18-150	11/18/2023	150	ND	ND	NS	NS	NS	NS	NS	NS
	DUP-03	11/19/2023	170	ND	ND	NS	NS	NS	NS	NS	NS
	BB-MW-170		170	ND	ND	NS	NS	NS	NS	NS	
	BB-MW-18-190		190	ND	ND	NS	NS	NS	NS	NS	

Notes: Reporting limits for field portable GC/MS results are not available for individual samples.

¹ - Values listed are representative of corrected results.

² - Reporting limits for field spectrophotometer results are not available for individual samples.

VOC - Volatile Organic Compound

PCE - Tetrachloroethene

TCE - Trichloroethene

cDCE - cis-1,2-Dichloroethene

tDCE - trans-1,2-Dichloroethene

ft bgs - feet below ground surface

mg/L - milligrams per liter

< - analyte not detected above the laboratory detection limit

Bold - Analyte detected above laboratory detection limit

E4 - Concentration estimated. Analyte was detected below laboratory minimum reportling level (MRL) but above method detection limit (MDL)

L1 - The associated blank spike recovery was above laboratory acceptance limits.

NS - Sample not analyzed for analyte

ND - Non-detect

µg/L - micrograms per liter

GC - Gas Chromatograph

Table 10 - Monitoring Well Groundwater Analytical Results
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-01	10/28/2025	124	<1.0	180	NS
		135	<1.0	250	NS
		155	<1.0	230	NS
	3/25/2025	124	0.620	195	NS
		135	0.640	210	<0.79
		155	0.650	189	NS
	1/24/2024	121	3.08 ^{E4}	769	NS
		135	4.82 ^{E4}	797	NS
		155	3.90 ^{E4}	690	NS
	12/10/2022	118	8.86	2,120	NS
		135	7.59 ^{E4}	2,630	NS
		155	6.58 ^{E4}	1,770	NS
	8/9/2022	118	6.81	1,430	NS
		135	10.6	1,020	NS
		155	9.64	1,140	NS
	6/10/2022	118	3.8	2,250	NS
		135	<2.5	1,360	NS
		155	6.0	1,310	NS
	2/9/2022	118	7.58	1,190	<0.121
		135	8.08	1,030	<0.121
		155	7.74	1,200	<0.121
	6/27/2021	118	<0.5	555	NS
		135	<0.5	533	NS
		155	<0.5	358	NS
	10/27/2020	118	1.83	357	<10
		135	2.67	567	<10
		155	2.02	409	<10
BB-MW-02	10/28/2025	110	<1.0	720	NS
		130	<1.0	500	NS
		155	<1.0	350	NS
	3/25/2025	110	3.4	548	NS
		130	<1.5 ^{VI}	409	NS
		155	<1.5 ^{E8,VI}	338	<0.79
	1/24/2024	105	<3.00	1560	NS
		130	<3.00	1300	NS
		155	1.62 ^{E4}	1210	NS
	12/10/2022	105	<3.00	1380	NS
		130	<0.300	1260	NS
		155	<0.300	915	NS
	8/9/2022	105	2.7	1270	NS
		130	1.68	701	NS
		155	1.13	549	NS
6/10/2022	105	<2.5	1820	NS	
	130	<2.5	822	NS	
	155	<2.5	652	NS	

Table 10 - Monitoring Well Groundwater Analytical Results
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Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-02 - cont.	2/9/2022	105	2.73	2050	<0.121
		130	0.812	542	<0.121
		155	0.929	490	<0.121
	6/27/2021	105	<0.5	1290	NS
		130	<0.5	235	NS
		155	<0.5	275	NS
	10/27/2020	104	1.18	787	<10
		104 - Duplicate	1.30	916	<10
		130	0.862 ^{E4}	605	5.08 E4
		155	0.381 ^{E4}	320	<10
BB-MW-03	10/28/2025	109	Dry	Dry	NS
		135	<1.0	18	NS
		157	<1.0	18	NS
	3/25/2025	109	Dry	Dry	NS
		135	<0.30	13.3	<0.79
		157	<0.30	12.4	NS
	1/24/2024	109	<0.300	34.1	NS
		135	<0.300	41.4	NS
		157	<0.300	42.0	NS
	12/9/2022	106	<0.300	63.8	NS
		135	<0.300	62.5	NS
		157	<0.300	76.7	NS
	8/9/2022	106	<0.300	61	NS
		135	<0.300	34.7 ^{LI}	NS
		157	<0.300	36.0 ^{LI}	NS
		157 - Duplicate	<0.300	31.7	NS
	6/9/2022	106	<0.5	95	NS
		135	<0.5	24	NS
		160	<0.5	24	NS
		160 - Duplicate	<0.5	7.7	NS
	2/9/2022	106	<0.300	54.6	<0.121
		135	<0.300	66.5	<0.121
		160	<0.300	123	<0.121
	6/6/2021	106	<0.5	38	NS
		135	<0.5	28	NS
		160	<0.5	16	NS
	10/27/2020	106	<0.300	18.6	<10
		135	<0.300	13.3	<10
		160	<0.300	6.62	<10
BB-MW-04	10/28/2025	150	<1.0	64.0	NS
		170	<1.0	55.0	NS
		187.5	<1.0	51.0	NS
	3/26/2025	150	0.37	31.7	NS
		170	<0.30	25.0	NS
		187.5	<0.30	22.2	NS

Table 10 - Monitoring Well Groundwater Analytical Results
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Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-04 - cont.	1/24/2024	145	<0.300	24.2	NS
		170	0.451 ^{E4}	29.7	NS
		190	0.412 ^{E4}	29.7	NS
	12/8/2022	145	0.646 ^{E4}	44.1	NS
		170	<0.300	25.7	NS
		187	<0.300	25.3	NS
	8/9/2022	145	<0.300	15.6	NS
		170	<0.300	14.8	NS
		187	<0.300	14.3	NS
	6/8/2022	145	N/A	N/A	N/A
		170	<0.5	7.7	NS
		190	<0.5	7.5	NS
	2/9/2022	145	<0.300	1.76	<0.121
		170	<0.300	1.62	<0.121
		190	<0.300	2.29	<0.121
	6/8/2021	145	<0.5	<0.5	NS
		170	<0.5	<0.5	NS
		190	<0.5	<0.5	NS
BB-MW-05	10/28/2025	110	<1.0	<1.0	NS
		135	<1.0	<1.0	NS
		160	<1.0	<1.0	NS
	3/25/2025	110	<0.30	<0.31	NS
		135	<0.30	<0.31	NS
		160	<0.30	<0.31	NS
	1/24/2024	110	<0.300	<0.190	NS
		135	<0.300	<0.190	NS
		160	<0.300	<0.190	NS
		160 - Duplicate	<0.300	<0.190	NS
	12/8/2022	110	<0.300	<0.190	NS
		135	<0.300	<0.190	NS
		160	<0.300	<0.190	NS
	8/8/2022	110	<0.300	<0.190	NS
		135	<0.300	<0.190	NS
		135 - Duplicate	<0.300	0.236 ^{E4}	NS
		160	<0.300	<0.190	NS
	6/8/2022	110	<0.5	<0.5	NS
135		<0.5	<0.5	NS	
160		<0.5	<0.5	NS	
2/9/2022	110	<0.300	<0.190	<0.121	
	135	<0.300	<0.190	<0.121	
	160	<0.300	<0.190	NS	

Table 10 - Monitoring Well Groundwater Analytical Results
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Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-05 - cont.	6/9/2021	110	<0.5	<0.5	NS
		135	<0.5	<0.5	NS
		135 - Duplicate	<0.5	<0.5	NS
		160	<0.5	<0.5	NS
BB-MW-06	10/28/2025	120	NS	NS	NS
		135	<1.0	380	NS
		157.5	NS	NS	NS
	3/25/2025	120	0.31	84.7	<0.79
		135	1.6	275	NS
		157.5	3.2	514	NS
	1/24/2024	120	0.458 ^{E4}	110	NS
		120 - Duplicate	0.345 ^{E4}	90.7	NS
		135	3.08	362	NS
		150	3.93	438	NS
	12/8/2022	120	0.311 ^{E4}	101	NS
		135	0.456 ^{E4}	139	NS
		150	0.780 ^{E4}	161	NS
	8/9/2022	120	0.433 ^{E4}	114 ^{LI}	NS
		135	0.668 ^{E4}	132 ^{LI}	NS
		150	1.3	185 ^{LI}	NS
	6/8/2022	155	1.2	163	NS
	2/9/2022	150	2.33	287	<0.121
BB-MW-07A	10/28/2025	132	7.30	530	NS
	3/26/2025	132	4.30	416	NS
	1/24/2024	132	8.66	497	NS
	12/9/2022	125	4.48 ^{E4}	297	NS
		132	4.68 ^{E4}	368	NS
	8/10/2022	125	8.45	263	NS
		125 - Duplicate	6.37 ^{E4}	351	NS
		132	279	8.52	NS
	6/9/2022	125	5.8	330	NS
2/10/2022	125	11.6	434	<0.121	
BB-MW-07B	10/28/2025	230	<1.0	<1.0	NS
	3/26/2025	230	<0.30	0.36	NS
	1/24/2024	230	<0.300	<0.190	NS
	12/9/2022	230	0.739 ^{E4}	<0.190	NS
	8/10/2022	230	<0.300	0.539 ^{E4}	NS
	6/9/2022	230	<0.5	<0.5	NS
	2/10/2022	230	<0.300	0.749	<0.121
BB-MW-08A	10/28/2025	131	<1.0	57.0	NS
		147	<1.0	68.0	NS
	3/26/2025	131	<0.30	20.9	NS
		147	<0.30	12.7	NS
	1/24/2024	130	1.62 ^{E4}	135	NS

Table 10 - Monitoring Well Groundwater Analytical Results
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Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-08A - cont.	1/24/2024	147	1.92 ^{E4}	151	NS
	12/9/2022	130	10.3	455	NS
		147	6.98	345	NS
	8/10/2022	130	15.8	543	NS
		147	12.5	473	NS
	6/9/2022	130	9.3	414	NS
	2/10/2022	130	1.08	45.8	<0.121
BB-MW-08B	10/28/2025	235	<1.0	<1.0	<1.0
	3/26/2025	235	<0.30	<0.31	NS
	1/24/2024	235	<0.300	<0.190	NS
	12/9/2022	235	<0.300	<0.190	NS
	8/10/2022	235	<0.300	<0.190	NS
	6/9/2022	235	<0.5	<0.5	NS
	2/10/2022	235	<0.300	0.498	<0.121
BB-MW-09A	10/28/2025	135	<1.0	160	NS
	3/25/2025	135	1.4	158	<0.79
	1/24/2024	135	7.79	683	NS
	6/8/2023	125	NS	NS	6.7 ^{E4}
	12/9/2022	125	12	811	NS
		135	11.1	812	NS
	8/10/2022	125	26	862	NS
		135	21.6	1000	NS
	6/9/2022	125	15	1200	NS
2/10/2022	125	14.6	892	0.132 ^{E4}	
BB-MW-09B	10/28/2025	225	<1.0	<1.0	NS
	3/25/2025	225	<0.30	0.44	NS
	1/24/2024	225	<0.300	0.832 ^{E4}	NS
	12/9/2022	225	<0.300.50	<0.190	NS
	8/10/2022	225	<0.300	<0.190	NS
	6/9/2022	225	<0.5	<0.5	NS
	2/10/2022	225	<0.300	0.260	<0.121
BB-MW-10	10/28/2025	72	<1.0	<1.0	NS
	3/25/2025	72	<0.30	<0.30	NS
	1/1/2024	72	<0.300	<0.190	<0.126
BB-MW-10A	10/28/2025	130	<1.0	180	NS
		140	<1.0	200	NS
	3/25/2025	130	0.43	118	NS
		140	0.38	107	NS
	1/24/2024	130	1.09	337	NS
		140	0.940 ^{E4}	316	NS
		140 - Duplicate	0.979 ^{E4}	357	NS
	12/9/2022	130	<0.300	33.7	NS
		130 - Duplicate	<0.300	37.3	NS
		140	<0.300	22.5	NS
8/10/2022	130	<0.300	16.2 ^{LI}	NS	

Table 10 - Monitoring Well Groundwater Analytical Results
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Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-10A - cont.	8/10/2022	140	<0.300	1.70 ^{LI}	NS
	6/9/2022	135	<0.300	4.3	NS
BB-MW-10B	10/28/2025	235	<1.0	7.4	NS
	3/25/2025	235	<0.30	7.6	NS
	1/24/2024	235	<0.300	13.5	NS
	12/9/2022	235	<0.300	0.569 ^{E4}	NS
	8/10/2022	235	<0.300	<0.190	NS
	6/1/2022	235	<0.5	<0.5	NS
BB-MW-11A	10/28/2025	47	<1.0	<1.0	NS
		60	<1.0	<1.0	NS
	3/25/2025	47	<0.30	<0.31	NS
		60	<0.30	<0.31	NS
	1/24/2024	45	<0.300	<0.190	NS
		45 - Duplicate	<0.300	<0.190	NS
		60	<0.300	<0.190	NS
	12/9/2022	45	<0.300	<0.190	NS
		45 - Duplicate	<0.300	<0.190	NS
		60	<0.300	<0.190	NS
	8/10/2022	45	<0.300	<0.190	NS
		60	<0.300	<0.190	NS
	6/1/2022	55	<0.5	<0.5	NS
BB-MW-11B	10/28/2025	NS	NS	NS	NS
	3/7/2025	NS	NS	NS	NS
	1/24/2024	180	<0.300	<0.190	NS
	12/9/2022	180	<0.300	<0.190	NS
	8/10/2022	180	<0.300	<0.190.90	NS
	6/1/2022	180	<5.0	<0.1900	NS
BB-MW-12	10/28/2025	98	<1.0	<1.0	NS
	3/25/2025	98	<0.30	<0.31	NS
	1/1/2024	98	<0.300	<0.190	NS
BB-MW-12A	10/28/2025	185	<1.0	29.0	NS
	3/25/2025	185	<0.30	25.1	NS
	1/1/2024	185	<0.300	63.3	NS
	6/8/2023	185	NS	NS	<2.3
	12/9/2022	185	<0.300	7.54	NS
		185 - Duplicate	<0.300	6.60	NS
	8/10/2022	185	<0.300	31.6	NS
	6/1/2022	185	<0.5	10	NS
BB-MW-12B	10/28/2025	232.5	<1.0	38	NS
	3/25/2025	232.5	<0.30	35.1	NS
	1/1/2024	230	<0.300	15.9	NS
	12/9/2022	230	0.348 ^{E4}	41.1	NS
	8/10/2022	230	<0.300	35.2	NS
	6/1/2022	226	<0.5	7.0	NS

Table 10 - Monitoring Well Groundwater Analytical Results
Remedial Investigation Report
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Lake Havasu City, Arizona

Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-13A	10/28/2025	139	<1.0	42	NS
		147	<1.0	27	NS
	3/26/2025	139	<0.30	22.6	NS
		147	<0.30	20	NS
	1/24/2024	138	0.313 ^{E4}	39.7	NS
		147	<0.300	22.2	NS
BB-MW-13A - cont.	1/24/2024	147 - Duplicate	<0.300	17.9	NS
	12/8/2022	135	2.04	161	NS
		147	0.688 ^{E4}	61.3	NS
	8/1/2022	135	2.97	199	NS
		147	1.39	110	NS
	6/8/2022	140	0.7	67	NS
		140 - Duplcate	<0.5	7.7	NS
BB-MW-13B	10/28/2025	245	<1.0	<1.0	NS
	3/25/2025	245	<0.30	<0.31	NS
	1/24/2024	245	<0.300	<0.190	NS
	12/10/2022	245	<0.300	<0.190	NS
	8/1/2022	245	<0.300	0.448 ^{E4}	NS
	6/10/2022	245	<0.5	<0.190.0	NS
BB-MW-14A	10/28/2025	100	<1.0	<1.0	NS
	3/25/2025	100	<0.30	<0.31	NS
	1/24/2024	100	<0.300	<0.190	NS
	12/10/2022	100	<0.300	<0.190	NS
BB-MW-14B	10/28/2025	220	<1.0	<1.0	NS
	3/25/2025	220	<0.30	<0.31	NS
	1/24/2024	220	<0.300	<0.190	NS
	12/10/2022	220	<0.300	<0.190	NS
BB-MW-15A	10/28/2025	150	<1.0	<1.0	NS
	3/25/2025	150	<0.30	1.5	NS
	1/24/2024	150	<0.300	3.66	NS
	6/6/2023	150	NS	NS	<2.3
	12/10/2022	150	<0.300	1.48	NS
BB-MW-15B	10/28/2025	210	<1.0	<1.0	NS
	3/25/2025	210	<0.30	<0.31	NS
	1/24/2024	210	<0.300	<0.190	NS
	12/10/2022	210	<0.300	<0.190	NS
BB-MW-16A	10/28/2025	180	<1.0	<1.0	NS
	3/26/2025	180	<0.30	<0.31	NS
	1/24/2024	180	<0.300	<0.190	<0.126
	12/10/2022	180	<0.300	<0.190	<0.126
BB-MW-16B	10/28/2025	240	<1.0		
	3/26/2025	240	<0.30	<0.31	NS
	1/24/2024	240	<0.300	<0.190	NS
		240 - Duplicate	<0.300	<0.190	NS
	12/10/2022	240	<0.300	<0.190	NS

Table 10 - Monitoring Well Groundwater Analytical Results

Remedial Investigation Report

Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site

Lake Havasu City, Arizona

Sample ID	Sample Date	Sample Depth (ft btc)	Analyte		
			PCE	TCE	Thallium
Units			µg/L		
BB-MW-17A	10/28/2025	14	<1.0	2.5	NS
	3/26/2025	14	<0.30	4.4	NS
	1/24/2024	14	<0.300	17.2	NS
	12/10/2022	14	<0.300	4.87	NS
	1/24/2023	14	<2.0	7.60	NS
BB-MW-17B	10/28/2025	80	<1.0	<1.0	NS
	3/26/2025	80	<0.30	<0.31	NS
	1/24/2024	80	<0.300	<0.190	NS
	12/10/2022	80	<0.300	<0.190	NS
	1/24/2023	80	<2.0	<2.0	NS
BB-MW-18A	10/28/2025	21	<1.0	<1.0	NS
	3/26/2025	21	<0.30	<0.31	NS
	1/24/2024	21	<0.300	<0.190	NS
BB-MW-18B	10/28/2025	63	<1.0	<1.0	NS
	3/26/2025	63	<0.30	<0.31	NS
	1/24/2024	63	<0.300	<0.190	NS
MW-12B	10/28/2025	93.8	<1.0	<1.0	NS
	3/26/2025	93.8	<0.30	<0.31	NS
	1/1/2024	95	<0.300	<0.190	NS
	12/8/2022	95	<0.300	<0.190	NS
	8/10/2022	92	<0.300	<0.190	NS
	6/8/2022	94	<0.5	<0.5	NS
	2/10/2022	94	<0.300	<0.190	<0.121
	6/10/2021	88	<0.300	<0.190	NS
	10/10/2020	92	<0.300	66.7	<10
Arizona Water Quality Standard			5	5	2

Notes:

PCE - Tetrachloroethene

TCE - Trichloroethene

cDCE - cis-1,2-dichloroethene

ft btc - Feet below top of casing

ft amsl- feet above mean sea level

µg/l - Micrograms per liter

< - Analyte not detected above laboratory reporting limit

Bold - Analyte detected above laboratory reporting limit EPA - Environmental Protection Agency

Highlighted - Above Aquifer Water Quality Standard

E4 - Concentration estimated. Analyte was detected below the laboratory Minimum Reporting Level but above the Method Detection Limit

M1 - Matrix spike recovery was high, the method control sample recovery was acceptable

L1 - The associated blank spike recovery was above laboratory acceptance limits

VI - Continuing Calibration Verification recovery was above method acceptance limits. This target analyte was not detected in the sample.

Table 11 - Shallow Soil-Gas Sampling Results
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Sample ID	Sample Date	Sample Depth (ft bgs)	Purge PID (ppm)	Analyte	
				Volatile Organics in Air TO-15 (µg/m ³)	
				PCE	TCE
BB-SG-01	2/1/2022	12	0.0	66.3	1,300
BB-SG-02		14	0.0	< 13.6	2,730
BB-SG-03		15	1.2	< 13.6	30,700
BB-SG-04		14	0.0	< 13.6	127
BB-SG-05		15	0.0	< 13.6	88.1
BB-SG-06	2/2/2022	10	0.0	< 13.6	12.0
BB-SG-07	2/1/2022	15	0.0	< 13.6	7,360
BB-SG-08		12	0.0	< 13.6	1,610
BB-SG-09	2/2/2022	9	2.3	36.6	8,810
BB-SG-10	NS	NS	NS	NS	NS
BB-SG-11	2/2/2022	15	0.4	< 13.6	339
BB-SG-12		6	0.0	< 13.6	5,110
BB-SG-13		6	0.0	< 13.6	1,760
BB-SG-14		14	0.0	28.7	249
BB-SG-15		10	0.0	< 13.6	403
BB-SG-16		6.5	0.0	< 13.6	1,500
BB-SG-17		5.5	0.0	< 13.6	< 5.37
DUP-01	2/2/2022	14	0.0	25.2	163
BB-SG-1-5	6/1/2022	5	2.80	<136	2,200
BB-SG-1-15		15	236.0	<136	3,460
BB-SG-2-5		5	2.2	<67.8	1,480
BB-SG-2-15		15	6.2	<271	8,110
BB-SG-3-10		10	6.9	<136	2,980
BB-SG-3-15		15	12.4	<33.9	141
BB-SG-4-5	6/2/2022	5	4.4	1,950	453
BB-SG-4-10		10	10.2	24,800	5,210
BB-SG-5-10		10	4.8	27,100	3,230
BB-SG-5-14		14	27.0	48,500	5,800
BB-SG-6-5		5	3.30	1,600	266
BB-SG-6-10		10	37.2	65,200	5,800
BB-SG-7-5		5	20.0	47,300	4,080
BB-SG-7-10		10	24.6	21,000	2,410
BB-SG2-01	10/11/2022	10	0.4	< 13.6	< 5.37
BB-SG2-02	10/12/2022	14	0.4	38.5	< 5.37
BB-SG2-03		9	NR	< 13.6	< 5.37
BB-SG2-04	10/11/2022	13	0.3	< 13.6	< 5.37
BB-SG2-05		9	0.2	< 13.6	51.0
BB-SG2-06		9	0.9	< 13.6	385
BB-SG2-07		13	0.4	< 13.6	1512
BB-SG2-08		8	0.3	< 13.6	< 5.37
DUP-01		9	0.9	< 13.6	408

Notes:
ft bgs - feet below ground surface
µg/m³ - micrograms per cubic meter
Bold - Analyte detected above laboratory method detection limit (MDL)
< - Analyte not detected above laboratory MDL
NR- Not Recorded
NS- Not Sampled

Table 12 - Aquifer Geochemistry
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Analytes	Units	Well ID		
		BB-MW-09A	BB-MW-12A	BB-MW-15A
	Date	6/8/2023	6/7/2023	6/6/2023
Ethane	µg/L	<0.57	<0.57	<0.57
Ethene	µg/L	<0.40	<0.40	<0.40
Methane	µg/L	<0.63	420	<0.63
Chloride	mg/L	390 D2	160	470 D2
Nitrate	mg/L	16	<0.014	30 D2 H3
Sulfate	mg/L	970 D2	1.7 E4	310 D2
Antimony	mg/L	<0.0040	<0.0040	0.0040 E4
Arsenic	mg/L	0.014 E4	0.0049 E4	0.0053 E4
Beryllium	mg/L	0.00034 E4	0.00013 E4	0.00019 E4
Cadmium	mg/L	<0.00066	<0.00066	<0.00066
Chromium	mg/L	0.085	<0.00085	0.017
Copper	mg/L	0.0051 E4	0.0042 E4	0.0031 E4
Lead	mg/L	<0.0027	<0.0027	<0.0027
Nickel	mg/L	0.011	<0.0052	<0.0052
Selenium	mg/L	0.0065 E4	<0.0025	<0.0025
Silver	mg/L	<0.00041	<0.00041	<0.00041
Thallium	mg/L	0.0067 E4	<0.0023	<0.0023
Zinc	mg/L	0.010 E4	0.011 E4	0.011 E4
Manganese (II)	µg/L	3.2	110	0.99
Mercury	mg/L	0.00090	<0.000070	<0.000070
TOC	mg/L	6.3	15	0.85
Total Sulfide	mg/L	0.08	8.6 D2	<0.017
DOC	mg/L	6	13	0.70

Notes:

µg/L - microgram per liter

DOC - Dissolved Organic Carbon

< - Analyte not detected above laboratory MDL

mg/L - milligram per liter

Bold - Analyte detected above laboratory method detection limit (MDL)

TOC - Total Organic Carbon

D2 - Sample required dilution due to high concentration of analyte.

E4 - Concentration estimated. Analyte was detected below laboratory minimum reporting level (MRL) but above MDL.

H3 - Sample was received and/ or analysis requested past holding time.

Low Flow Parameters	Well ID			
	BB-MW-09A	BB-MW-12A	BB-MW-15A	
Date	6/8/2023	6/7/2023	6/6/2023	6/7/2023
Sample Depth	132.3	135	155	155
Water Temp (°C)	28.4	30.2	30.6	31.1
pH (SU)	7.60	7.45	7.26	7.27
ORP (mV)	-201.1	-258.4	-123.6	-146.5
Sp Cond (µs/cm)	3,295	945	2,263	2,427
DO (mg/L)	6.89	2.55	6.39	6.10
Turbidity (NTU)	29	6.8	6.9	2.9

Notes:

°C - degree Celcius

mg/L - milligram per liter

mV - millivolt

NTU - Nephelometric Turbidity Unit

SU - Standard Unit

µs/cm - microSiemen per centimeter

Table 13 - SVE Wells - Soil-Gas Results During Drilling

Remedial Investigation Report

Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site

Lake Havasu City, Arizona

Sample ID	Sample Date	Sample Depth (ft bgs)	Analyte (VOCs by Portable GC)	
			Tetrachloroethene	Trichloroethene
Units			µg/m ³	µg/m ³
BB-SVE-1D	11/13/2022	15	1,568	2,002
	11/13/2022	37	232	1,148
	11/13/2022	37 - DUP-05	269	1,117
	11/13/2022	57	400	1,845
	11/13/2022	77	7,981	ND
	11/13/2022	77	ND	ND
	11/14/2022	107	14.10	159
	11/14/2022	107 - DUP-06	12.12	144
	11/14/2022	117	ND	2,302
BB-SVE-2D	11/8/2022	15	1,298	3,378
	11/8/2022	15 - DUP-01	1,300	3,222
	11/8/2022	37	58.88	7,077
	11/9/2022	57	ND	464
	11/9/2022	77	ND	130
	11/9/2022	97	370	3,071
	11/9/2022	97 - DUP-02	385	3,145
	11/10/2022	117	ND	378
BB-SVE-3D	11/11/2022	15	1,931	933
	11/11/2022	35	305	1,455
	11/11/2022	55	179	2,389
	11/11/2022	75	21.00	1,618
	11/11/2022	75 - DUP-03	27.04	1,831
	11/12/2022	95	124	3,423
	11/12/2022	115	457	2,101
	11/12/2022	115 - DUP-04	519	2,150

Notes:

VOCs - Volatile Organic Compounds ft bgs - feet below ground surface

ND - Concentration is below detection limit for the FROG-5000 portable gas chromatograph

Table 14 - Arsenic in Shallow Soils
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Sample ID	Sample Date	Arsenic by Method 6010D (mg/kg)
BB-SS-1A	11/14/2023	<0.518 ^I
BB-SS-1B	11/15/2023	0.913 ^{E4 I}
BB-SS-1C	11/15/2023	4.70 ^I
BB-SS-1D	11/15/2023	1.75 ^{E4 I}
BB-SS-2A	11/16/2023	0.904 ^{E4 I}
BB-SS-2B	11/16/2023	7.52 ^I
BB-SS-2C	11/16/2023	1.93 ^{E4 I}
BB-SS-2D	11/16/2023	3.05 ^I
BB-SS-3A	11/20/2023	1.46 ^{E4}
BB-SS-3B	11/20/2023	3.83
BB-SS-3C	11/20/2023	1.70 ^{E4}
BB-SS-3D	11/20/2023	1.32 ^{E4}
BB-SS-3X	11/20/2023	2.02
BB-SS-4A	11/16/2023	3.66 ^I
BB-SS-4B	11/16/2023	2.38 ^I
BB-SS-4C	11/16/2023	3.12 ^I
BB-SS-4D	11/16/2023	2.56 ^{BI I}
BB-SS-5A	11/20/2023	1.92 ^{E4}
BB-SS-5B	11/20/2023	2.86
BB-SS-5C	11/20/2023	1.82 ^{E4}
BB-SS-5D	11/20/2023	2.98
BB-SS-6A	11/20/2023	2.27
BB-SS-6B	11/20/2023	2.23
BB-SS-6C	11/20/2023	1.85 ^{E4}
BB-SS-6D	11/20/2023	2.52
BB-SS-6E	11/20/2023	2.72
BB-SS-6F	11/20/2023	1.29 ^{E4}
BB-SS-6G	11/20/2023	2.16
BB-SS-6H	11/20/2023	3.67
BB-SS-6I	11/20/2023	6.95
BB-SS-6J	11/21/2023	5.19

Notes:

ft bgs - feet below ground surface

Samples were collected from 2 feet below ground surface

(I) - Concentration converted from micrograms per kilogram (µg/kg) to milligrams/kilogram (mg/kg)

< - Analyte not detected above method detection limit

BI - target analyte detected in method blank at or above the method detection limit

Bold - Analyte detected above laboratory method detection limit (MDL)

E4 - concentration estimated. Analyte was detected below laboratory minimum reporting limit (MRL) but above the laboratory MDL.

ICP - Inductively Coupled Plasma

Shaded = Background Sample Location

Table 15 - Groundwater Depths and Elevations Remedial Investigation Report Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site Lake Havasu City, Arizona				
Location	Measurement Date	TOC Elevation (ft btoc)	Depth to Groundwater (ft btoc)	Water Elevation (ft amsl)
BB-MW-01				
	3/25/2025	574.17	121.00	453.17
	1/17/2024	574.17	118.65	455.52
	2/10/2023	574.17	115.53	458.64
	12/22/2022	574.17	114.85	459.32
	8/9/2022	574.17	113.52	460.65
	6/10/2022	574.17	113.10	461.07
	2/9/2022	574.17	117.44	456.73
	6/15/2021	574.17	112.42	461.75
	10/27/2020	574.17	112.45	461.72
BB-MW-02	3/25/2025	560.12	106.35	453.77
	1/17/2024	560.12	104.26	455.86
	2/10/2023	560.12	101.49	458.63
	12/22/2022	560.12	100.82	459.30
	8/9/2022	560.12	99.68	460.44
	6/10/2022	560.12	99.40	460.72
	2/9/2022	560.12	98.55	461.57
	6/15/2021	560.12	98.7	461.42
	10/27/2020	560.12	98.72	461.40
BB-MW-03	3/25/2025	562.86	108.45	454.41
	1/16/2024	562.86	106.20	456.66
	2/10/2023	562.86	103.26	459.60
	12/22/2022	562.86	102.61	460.25
	8/9/2022	562.86	101.45	461.41
	6/9/2022	562.86	102.20	460.66
	2/9/2022	562.86	100.36	462.50
	6/15/2021	562.86	100.43	462.43
	10/27/2020	562.86	100.53	462.33
BB-MW-04	3/26/2025	599.73	146.20	453.53
	1/16/2024	599.73	143.02	456.71
	2/10/2023	599.73	138.71	461.02
	12/22/2022	599.73	137.94	461.79
	8/9/2022	599.73	136.21	463.52
	6/8/2022	599.73	134.80	464.93
	2/9/2022	599.73	134.84	464.89
	6/15/2021	599.73	134.59	465.14
BB-MW-05	3/25/2025	558.62	101.34	457.28
	1/15/2024	558.62	99.69	458.93
	2/10/2023	558.62	97.9	460.72
	12/22/2022	558.62	97.5	461.12
	8/9/2022	558.62	96.95	461.67
	6/8/2022	558.62	96.70	461.92
	2/9/2022	558.62	96.45	462.17
	6/15/2021	558.62	92.25	466.37
BB-MW-06	3/25/2025	558.36	107.93	450.43
	1/17/2024	558.36	105.52	452.84
	2/10/2023	558.36	102.29	456.07
	12/22/2022	558.36	101.65	456.71
	8/10/2022	558.36	100.11	458.25
	6/8/2022	558.36	99.50	458.86
	2/9/2022	558.36	98.69	459.67

Table 15 - Groundwater Depths and Elevations Remedial Investigation Report Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site Lake Havasu City, Arizona				
Location	Measurement Date	TOC Elevation (ft btoc)	Depth to Groundwater (ft btoc)	Water Elevation (ft amsl)
BB-MW-07A	3/26/2025	582.44	130.10	452.34
	1/16/2024	582.44	127.49	454.95
	2/10/2023	582.44	123.79	458.65
	12/22/2022	582.44	123.19	459.25
	8/10/2022	582.44	121.66	460.78
	6/9/2022	582.44	121.20	461.24
	2/10/2022	582.44	120.48	461.96
BB-MW-07B	3/26/2025	582.41	130.10	452.31
	1/16/2024	582.41	127.54	454.87
	2/10/2023	582.41	123.98	458.43
	12/22/2022	582.41	123.17	459.24
	8/10/2022	582.41	121.80	460.61
	6/9/2022	582.41	121.20	461.21
	2/10/2022	582.41	120.42	461.99
BB-MW-08A	3/26/2025	583.36	130.50	452.86
	1/17/2024	583.36	127.58	455.78
	2/10/2023	583.36	123.79	459.57
	12/22/2022	583.36	123.29	460.07
	8/10/2022	583.36	121.71	461.65
	6/9/2022	583.36	121.00	462.36
	2/10/2022	583.36	120.54	462.82
BB-MW-08B	3/26/2025	583.30	130.30	453.00
	1/17/2024	583.30	127.51	455.79
	2/10/2023	583.30	123.81	459.49
	12/22/2022	583.30	124.01	459.29
	8/10/2022	583.30	121.66	461.64
	6/9/2022	583.30	121.00	462.30
	2/10/2022	583.30	120.18	463.12
BB-MW-09A	3/25/2025	582.63	129.32	453.31
	1/17/2024	582.63	126.75	455.88
	2/10/2023	582.63	123.12	459.51
	12/22/2022	582.63	122.48	460.15
	8/10/2022	582.63	121.20	461.43
	6/9/2022	582.63	120.60	462.03
	2/10/2022	582.63	120.17	462.46
BB-MW-09B	3/25/2025	582.62	129.25	453.37
	1/17/2024	582.62	126.68	455.94
	2/10/2023	582.62	123.21	459.41
	12/22/2022	582.62	122.42	460.20
	8/10/2022	582.62	121.18	461.44
	6/9/2022	582.62	120.60	462.02
	2/10/2022	582.62	119.87	462.75
BB-MW-10	3/25/2025	488.26	38.70	449.56
	1/17/2024	488.26	38.29	449.97
BB-MW-10A	3/25/2025	488.00	38.30	449.70
	1/17/2024	488.00	37.48	450.52
	2/10/2023	488.00	36.68	451.32
	12/22/2022	488.00	36.60	451.40
	8/10/2022	488.00	35.30	452.70
	6/9/2022	488.00	31.20	456.80

Table 15 - Groundwater Depths and Elevations Remedial Investigation Report Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site Lake Havasu City, Arizona				
Location	Measurement Date	TOC Elevation (ft btoc)	Depth to Groundwater (ft btoc)	Water Elevation (ft amsl)
BB-MW-10B	3/25/2025	488.00	38.55	449.45
	1/17/2024	488.00	38.07	449.93
	2/10/2023	488.00	36.46	451.54
	12/22/2022	488.00	36.26	451.74
	8/10/2022	488.00	35.11	452.89
	6/9/2022	488.00	31.20	456.80
BB-MW-11A	3/25/2025	484.76	34.46	450.30
	1/15/2024	484.76	33.22	451.54
	2/10/2023	484.76	32.77	451.99
	12/22/2022	484.76	33.14	451.62
	8/10/2022	484.76	32.01	452.75
	6/9/2022	484.76	32.20	452.56
BB-MW-11B	3/7/2025	484.77	35.10	449.67
	1/15/2024	484.77	33.04	451.73
	2/10/2023	484.77	32.35	452.42
	12/22/2022	484.77	32.66	452.11
	8/10/2022	484.77	31.92	452.85
	6/9/2022	484.77	32.20	452.57
BB-MW-12	3/25/2025	520.09	73.30	446.79
	1/17/2024	520.09	71.56	448.53
BB-MW-12A	3/25/2025	519.65	72.95	446.70
	1/17/2024	519.65	71.32	448.33
	2/10/2023	519.65	68.47	451.18
	12/22/2022	519.65	67.92	451.73
	8/9/2022	519.65	66.28	453.37
	6/9/2022	519.65	65.60	454.05
BB-MW-12B	3/25/2025	519.66	73.20	446.46
	1/17/2024	519.66	71.61	448.05
	2/10/2023	519.66	68.64	451.02
	12/22/2022	519.66	68.07	451.59
	8/9/2022	519.66	66.51	453.15
	6/9/2022	519.66	65.60	454.06
BB-MW-13A	3/26/2025	593.05	138.70	454.35
	1/17/2024	593.05	135.86	457.19
	2/10/2023	593.05	131.80	461.25
	12/22/2022	593.05	131.19	461.86
	8/10/2022	593.05	129.75	463.30
	6/10/2022	593.05	129.30	463.75
BB-MW-13B	3/25/2025	593.07	138.75	454.32
	1/16/2024	593.07	136.14	456.93
	2/10/2023	593.07	132.14	460.91
	12/22/2022	593.07	131.30	461.77
	8/8/2022	593.07	129.97	463.10
	6/10/2022	593.07	129.30	463.77
BB-MW-14A	3/25/2025	514.26	73.15	441.11
	1/16/2024	514.26	70.82	443.44
	2/10/2023	514.26	66.67	447.59
	12/22/2022	514.26	65.81	448.45

Table 15 - Groundwater Depths and Elevations
Remedial Investigation Report
Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Location	Measurement Date	TOC Elevation (ft btoc)	Depth to Groundwater (ft btoc)	Water Elevation (ft amsl)
BB-MW-14B	3/25/2025	514.27	73.45	440.82
	1/16/2024	514.27	71.30	442.97
	2/10/2023	514.27	66.43	447.84
	12/22/2022	514.27	65.87	448.40
BB-MW-15A	3/25/2025	605.09	148.00	457.09
	1/16/2024	605.09	145.13	459.96
	2/10/2023	605.09	141.20	463.89
	12/22/2022	605.09	140.18	464.91
BB-MW-15B	3/25/2025	605.13	148.12	457.01
	1/16/2024	605.13	145.39	459.74
	2/10/2023	605.13	141.62	463.51
	12/22/2022	605.13	140.47	464.66
BB-MW-16A	3/26/2025	636.74	176.02	460.72
	1/16/2024	636.74	173.90	462.84
	2/10/2023	636.74	169.71	467.03
	12/22/2022	636.74	168.56	468.18
BB-MW-16B	3/26/2025	636.79	177.00	459.79
	1/16/2024	636.79	174.23	462.56
	2/10/2023	636.79	170.11	466.68
	12/22/2022	636.79	168.58	468.21
BB-MW-17A	3/26/2025	455.33	5.63	449.70
	1/17/2024	455.33	6.09	449.24
	2/10/2023	455.33	5.09	450.24
	12/22/2022	455.33	5.73	449.60
BB-MW-17B	3/26/2025	455.33	5.80	449.53
	1/17/2024	455.33	6.20	449.13
	2/10/2023	455.33	5.08	450.25
	12/22/2022	455.33	5.72	449.61
BB-MW-18A	3/26/2025	463.61	14.25	449.36
	1/17/2024	463.61	14.62	448.99
BB-MW-18B	3/26/2025	463.61	14.25	449.36
	1/17/2024	463.61	14.68	448.93
MW-12B	3/26/2025	535.79	82.20	453.60
	1/16/2024	535.79	81.24	454.55
	2/10/2023	535.79	79.72	456.07
	12/22/2022	535.79	79.42	456.37
	8/9/2022	535.79	78.77	457.02
	6/8/2022	535.79	78.70	457.09
	2/10/2022	535.79	78.52	457.27
	6/15/2021	535.79	78.09	457.70
	10/27/2020	535.79	78.09	457.70

Notes:

TOC - Top of Casing

ft btoc - feet below top of casing

ft amsl - feet above mean sea level

Table 16 - Groundwater Field Parameters - March 2025

Remedial Investigation Report

Bahama Avenue and Bimini Lane Water Quality Assurance Revolving Fund Site

Lake Havasu City, Arizona

Well ID	Date	Sample Depth* (ft btoc)	DO (mg/L)	ORP (mV)	pH (su)	Temperature °C	Specific Conductance (µs/cm)	Turbidity (NTUs)	PID (ppm)
BB-MW-01	3/25/2025	124	9.2	85	7.73	28.45	924	2.1	0
BB-MW-02	3/25/2025	110	9.49	74.3	7.5	27.95	771	27	0
BB-MW-03	3/25/2025	135	9.02	130	7.31	28.62	1344	145	
BB-MW-04	3/26/2025	150	7.63	151	7.75	25.4	1348	-	0.1
BB-MW-05	3/25/2025	110	6.28	42.3	7.67	27.23	902	15	0
BB-MW-06	3/25/2025	120	6.63	28.5	7.55	26.93	864	150	0.9
BB-MW-07A	3/26/2025	132	8.36	74	7.57	24.29	6	-	0
BB-MW-07B	3/26/2025	230	8.38	47.4	7.84	25.15	697	-	0
BB-MW-08A	3/26/2025	147	8.46	81.7	8.09	22.8	500	-	
BB-MW-08B	3/26/2025	235	7.5	72	7.85	23.92	16	-	0.1
BB-MW-09B	3/25/2025	225	11.01	128	7.65	29.5	837	-	0.2
BB-MW-10	3/25/2025	72	7.27	54.7	7.07	23.07	4	95	15.2
BB-MW-10A	3/25/2025	130	6.22	18.4	8.11	23.51	300	110	1.8
BB-MW-10B	3/25/2025	235	6.32	29.1	7.69	24.16	210	13	2
BB-MW-11A	3/25/2025	47	7.82	60.4	6.3	23.07	23	290	0.1
BB-MW-12	3/25/2025	98	7.75	36.6	8.17	26.81	846	33	17.2
BB-MW-12A	3/25/2025	185	6.12	31	7.77	24.75	443	19	28.6
BB-MW-12B	3/25/2025	232.5	7.78	44.8	7.77	25.87	758	15	2.2
BB-MW-13A	3/26/2025	147	10.08	33.4	7.67	27.63	5	-	
BB-MW-13B	3/25/2025	245	7.97	50.3	7.54	28.07	754	50	0.2
BB-MW-14A	3/25/2025	100	8.04	44.1	7.53	25.11	697	50	2.8
BB-MW-14B	3/25/2025	220	7.28	22.1	7.68	25.16	262	130	3.7
BB-MW-15A	3/25/2025	150	6.83	24.8	7.37	27.2	616	16	0.1
BB-MW-15B	3/25/2025	210	8.18	53.5	7.49	27.5	1390	45	0.2
BB-MW-16A	3/26/2025	180	100.55	234	7.45	21.48	709	-	0.1
BB-MW-16B	3/26/2025	240	10.55	203	7.44	24.22	68	-	9.1
BB-MW-17A	3/26/2025	14	12.14	-36.5	7.49	23.5	234	-	0
BB-MW-18A	3/26/2025	21	9.53	6.3	7.11	25.64	1189	-	0
BB-MW-18B	3/26/2025	63	9.74	-18.7	7.17	26.31	1644	-	3.7
MW-12B	3/26/2025	93.8	9.89	-37.6	7.43	26.15	454	-	0

Notes:

btoc - below top of casing

°C - degrees Celsius

DO - dissolved oxygen

ft - feet

*Sample Depth represents the center of the sample interval

mg/L - milligrams per liter

mV - millivolt

µs/cm - microSiemens per centimeter

NTU - nephelometric turbidity unit

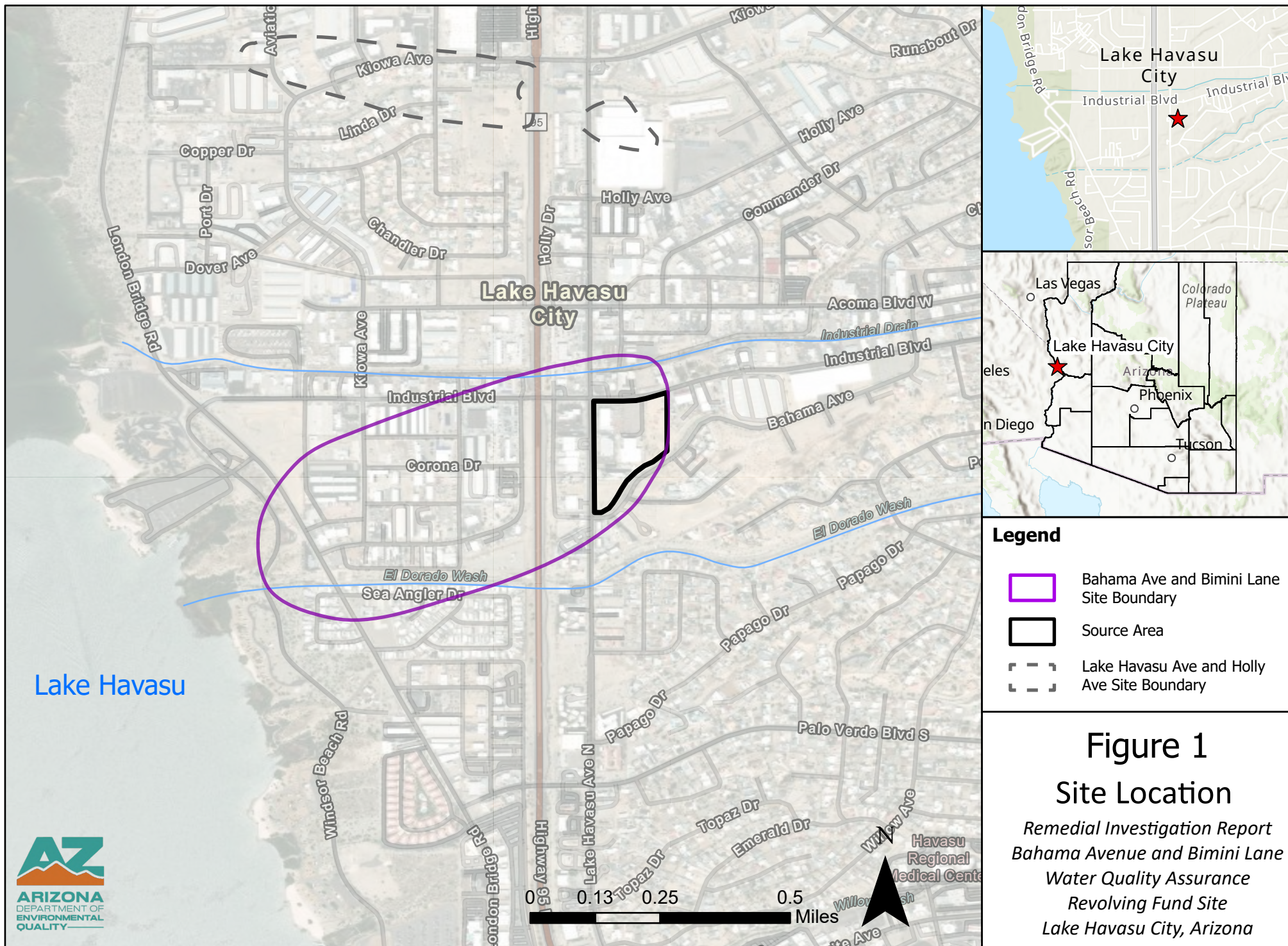
PID - photoionization detector

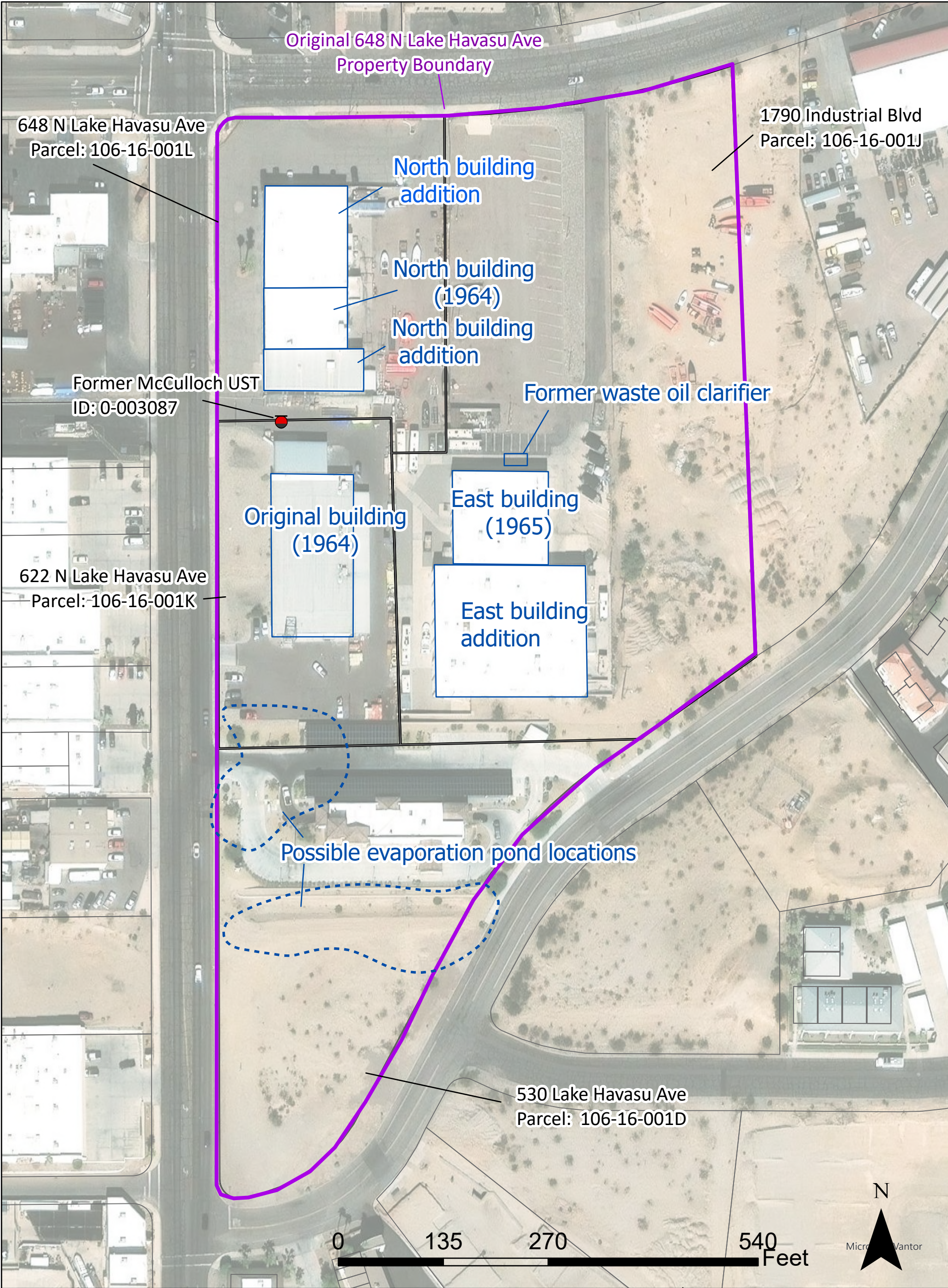
ppm - part per million

ORP - oxidation reduction potential

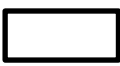
su - standard unit

FIGURES





Legend

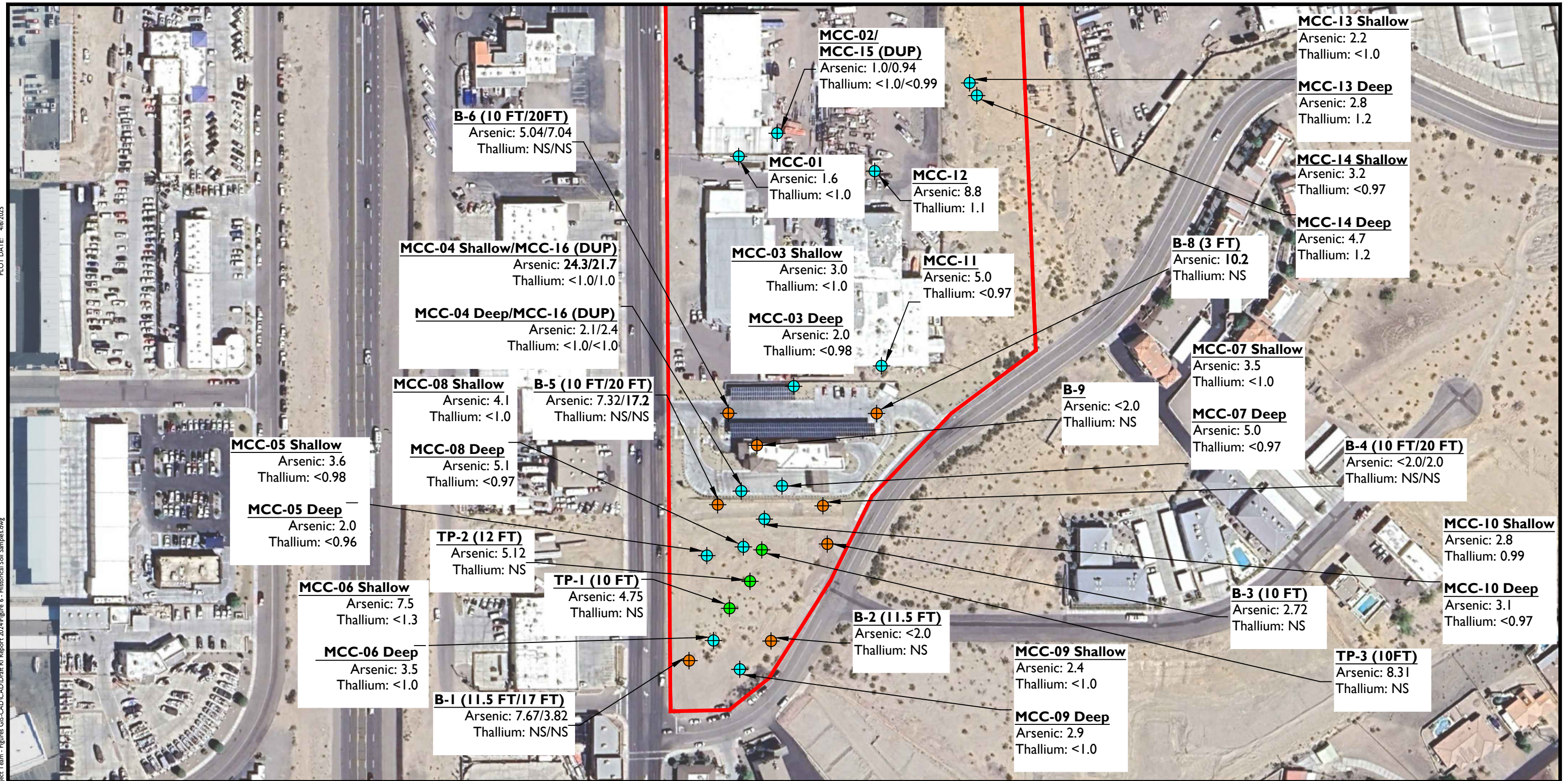
-  Former Facility Area
-  Facility Features
-  Property Boundaries
-  Former Underground Storage Tank (UST)



HAC

05/06/26

Figure 2
Former Facility Layout
*Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance
Revolving Fund Site
Lake Havasu City, Arizona*



N

LEGEND

Potential Source Area

Approximate Historical Soil Boring Locations (2019)

Approximate Historical Test Pit Soil Boring Locations (2019)

Approximate Preliminary Assessment / Site Inspection Sample Locations (2001)

Notes:

All values are given in milligrams per kilogram (mg/kg)

DUP - Duplicate sample

NS - Not Sampled

FT - feet

Bold = Over Soil Remediation Level

0

150'

300'

SCALE: 1" = 150'

Pinyon

Environmental, Inc.

HISTORICAL SOIL SAMPLES - METALS

Remedial Investigation Report

Bahama Avenue and Bimini Lane

Water Quality Assurance Revolving Fund Site

Lake Havasu City, Arizona

Drawn By: SJA

Reviewed By: ABP

Figure: 3

Date: 4/8/2025

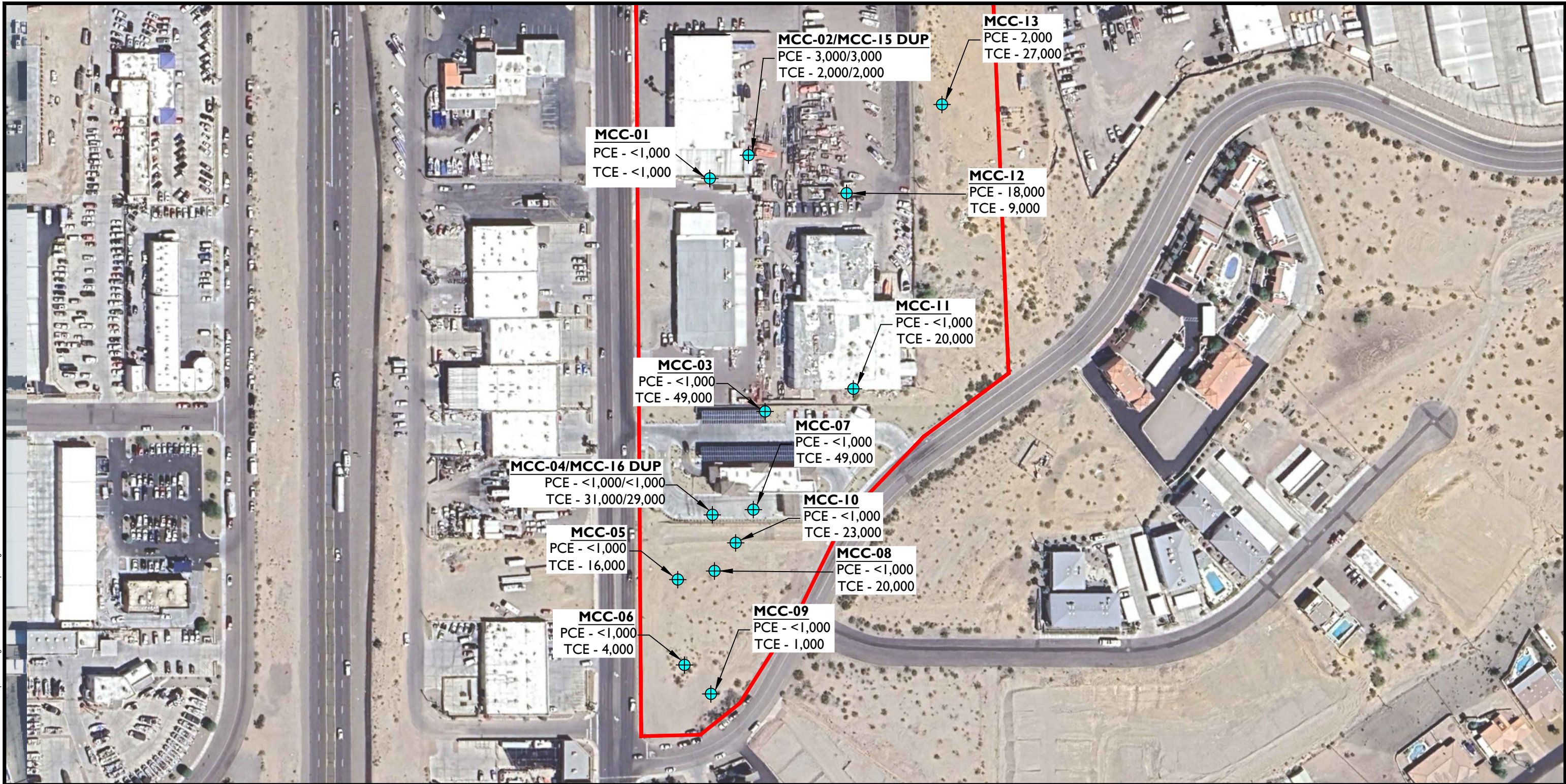
Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-100-602.012.REM001.34

Coordinate System: NAD83 ARIZONA STATE PLANES, WEST ZONE, US FOOT - AZ83-WF

PLOT DATE: 3/27/2025

C:\Users\yanjinh\OneDrive - CDM Smith\Desktop\project\2025\3_march\Bahama and Bimini\Draft RI Report 2024\Figure 6 - Historical Soil Samples.dwg



LEGEND



Potential Source Area



Approximate Assessment / Site Inspection Sample Locations (2001)

Notes:

All values are given in microgram per cubic meter ($\mu\text{g}/\text{m}^3$)

DUP - Duplicate sample

PCE - Tetrachloroethene

TCE- Trichloroethene

COCs - Contaminants of Concern

VOCs - Volatile Organic Compounds



SCALE: 1" = 150'



**HISTORICAL SOIL GAS
SAMPLES - VOCs**

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

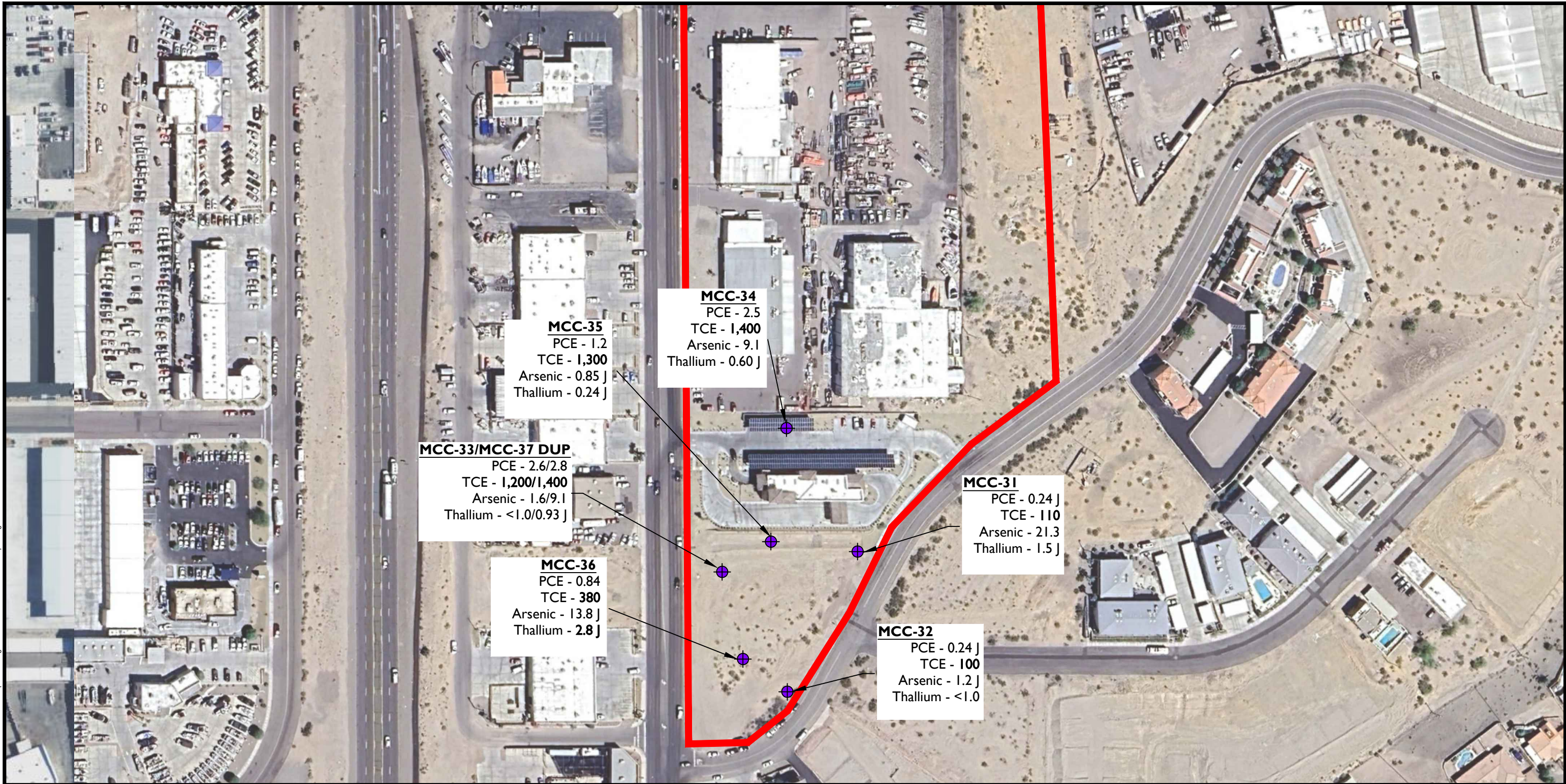
Pinyon Project Number: 7/19-100-602.012.REM001.34

Drawn By: SJA

Figure: 4

Reviewed By: ABP

Date: 3/27/2025

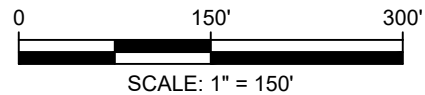


LEGEND

-  Potential Source Area
-  Approximate Environmental Site Inspection Sample Locations (2003)

Notes:

J - Analyte was positively identified, but the associated numerical value is approximate.
All locations are approximate, data not collected by Pinyon.
All values are in micrograms per liter (µg/L).
Bold = Over Aquifer Water Quality Standards
PCE - Tetrachloroethene
TCE - Trichloroethene
VOC - Volatile Organic Compounds
Metals samples not filtered



**HISTORICAL GROUNDWATER SAMPLES -
VOCS AND METALS**
Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-100-602.012.REM001.34

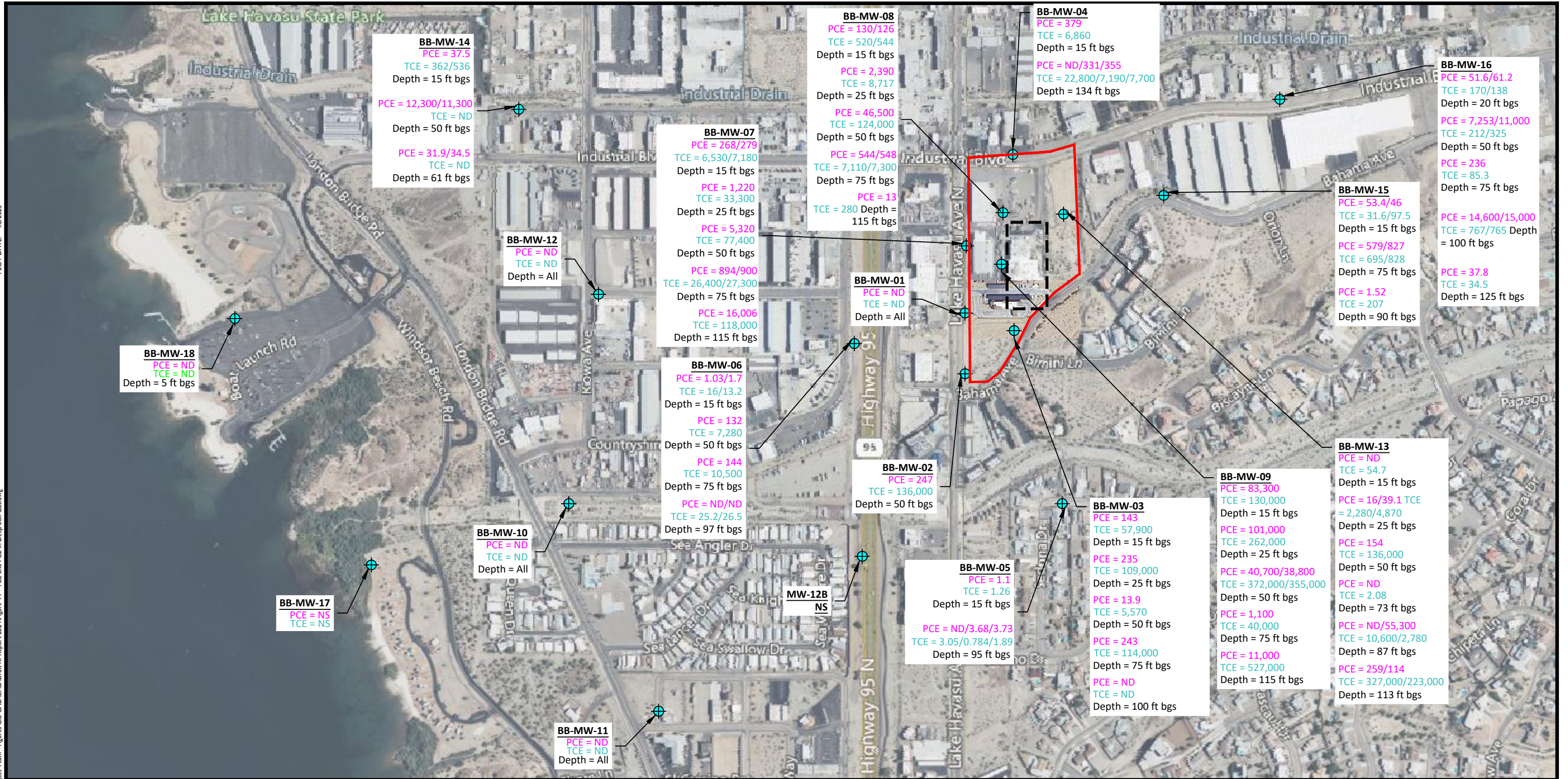
Drawn By: SJA

Figure: 5

Reviewed By: ABP

Date: 3/27/2025



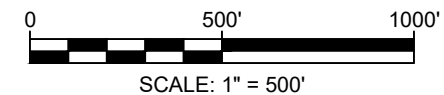


LEGEND

- Source Area
- Groundwater Monitoring Well Location

Notes:

PCE - Tetrachloroethene
TCE - Trichloroethene
ND - Non-Detect
NS - Not Sampled
"/" Symbol denotes duplicate concentrations. The parent sample is listed first, followed by its duplicates.
Units for are reported in $\mu\text{g}/\text{m}^3$ - micrograms per cubic meter
Reporting limits for field portable GC/MS results are not available for individual samples
Soil-gas results from the time of each individual well drilling



TCE AND PCE IN DEEP SOIL GAS
Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-100-602.012

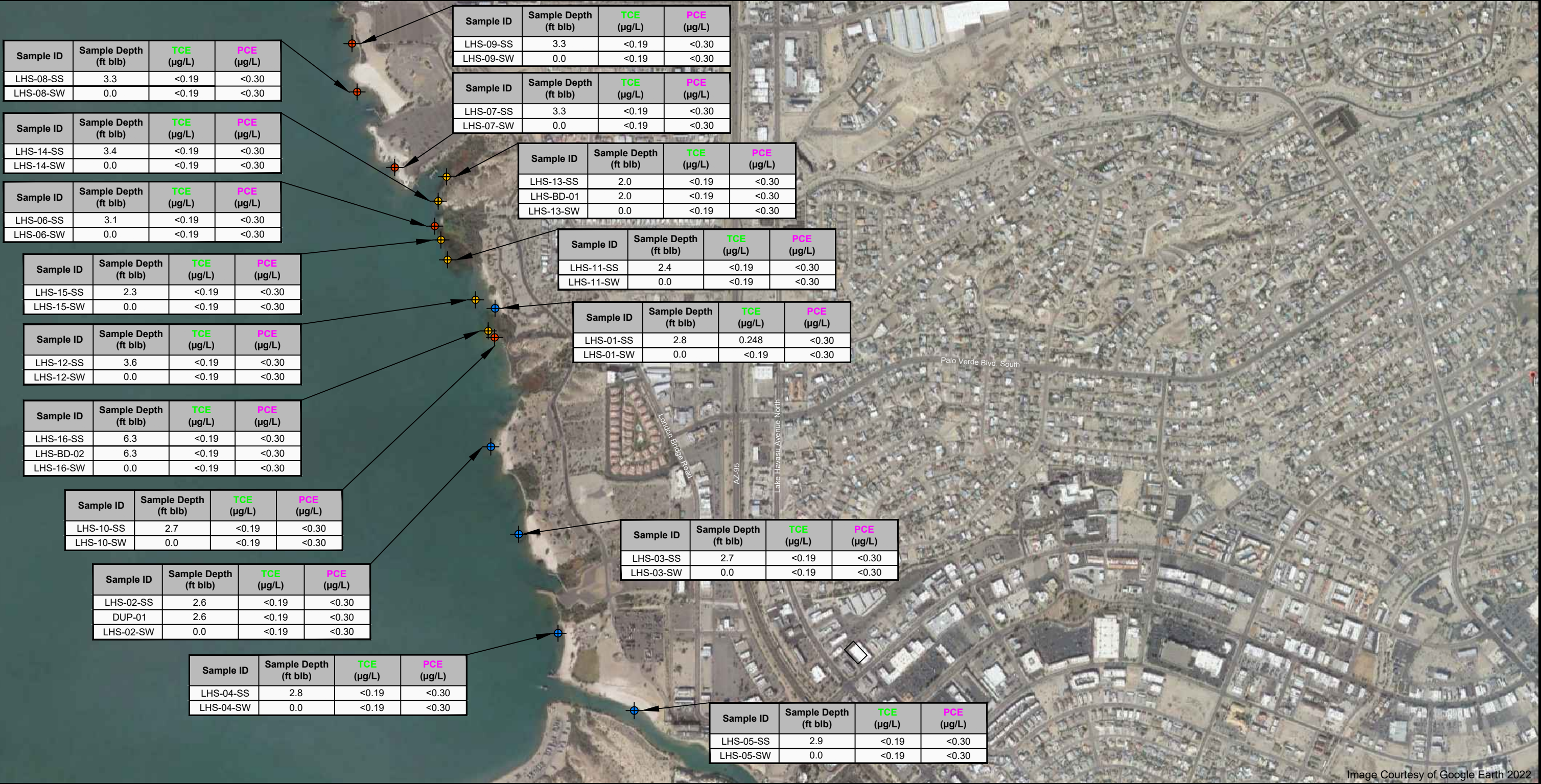
Drawn By: AEN

Figure: 7

Reviewed By: ABP

Date: 4/8/2025

C:\Users\yanjitho\OneDrive - CDM Smith\304583-Bahama&Bimini-Project Team - Figures GIS-CAD\CAD\Draft RI Report 2024\Figure 8 - In-Lake Sample Locations and Results.dwg
PLOT DATE: 4/14/2025



LEGEND



Surface and Subsurface Water Sample Location Collected 5/25/2021

Surface and Subsurface Water Sample Location Collected 12/9 - 12/10/2021

Surface and Subsurface Water Sample Location Collected 3/6/2023

Notes:

Samples taken on 05/2021 - 03/2023

PCE - Tetrachloroethene

TCE - Trichloroethene

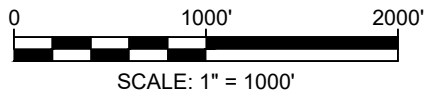
Units for PCE and TCE reported in µg/L (micrograms per liter)

ft blb - Feet below lake bottom

For lake samples, two samples were collected from each location. Therefore, LHS-01-SS AND LHS-01-SW were collected from the location LHS-01

SS = Subsurface

SW = Surface Water



IN-LAKE SAMPLE LOCATIONS AND RESULTS

Remedial Investigation Report

Bahama Avenue and Bimini Lane

Water Quality Assurance Revolving Fund Site

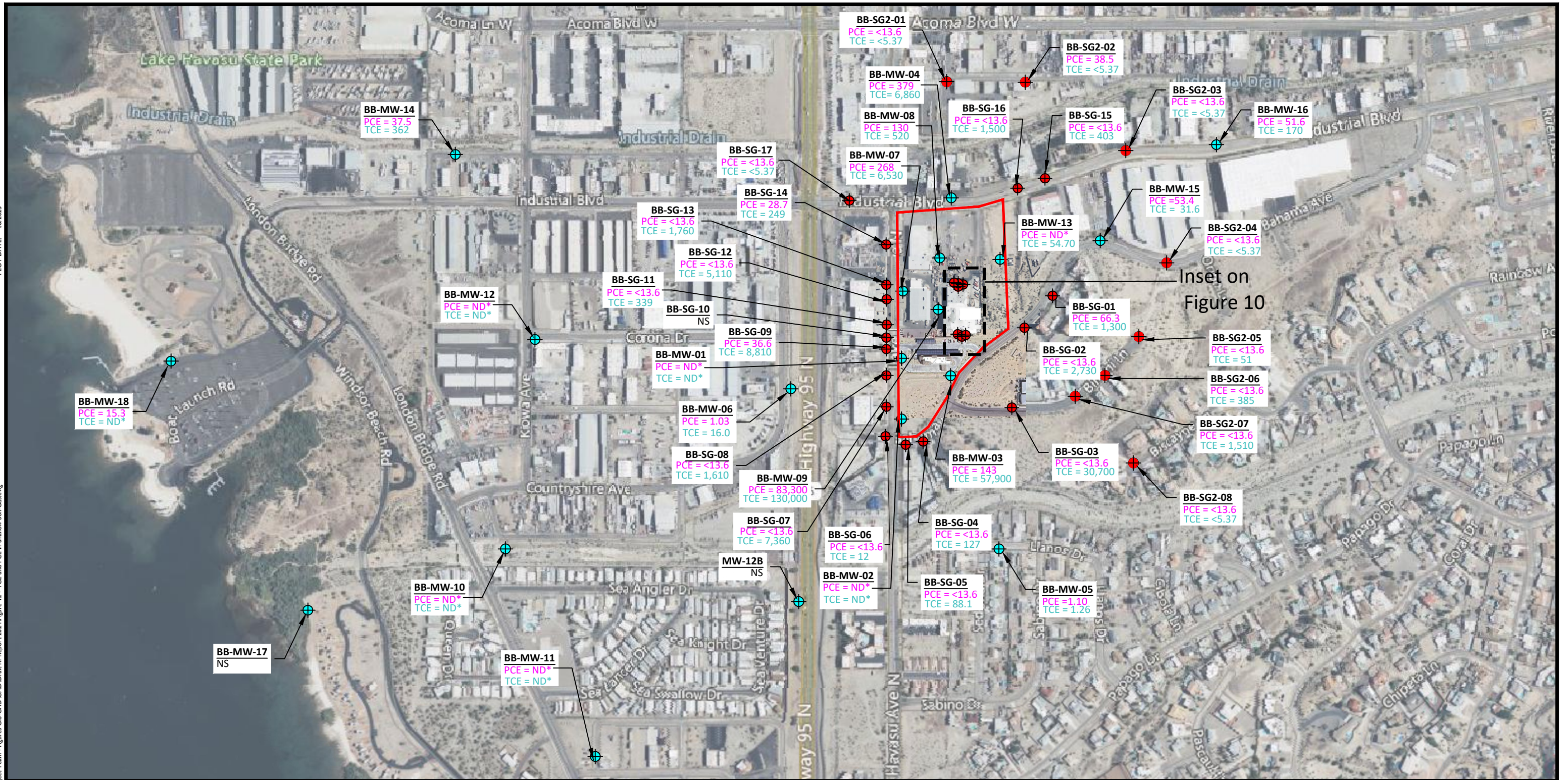
Lake Havasu City, Arizona

Drawn By: SJA

Figure: 8

Reviewed By: ABP

Date: 4/14/2025



LEGEND

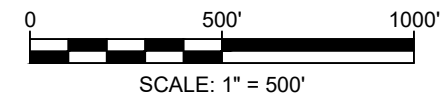
↑
N

□ Potential Source Area

⊕ Groundwater Monitoring Well Location

● Soil Gas Well Locations

Notes:
"SG" samples collected 2/2022 and 6/2022. "SG2" samples collected 10/2022
PCE - Tetrachloroethene
TCE - Trichloroethene
ND - Non-Detect
NS - Not Sampled
Units for are reported in $\mu\text{g}/\text{m}^3$ - micrograms per cubic meter
SVSLs calculated using an attenuation factor of 0.03
*Reporting limits for field portable GC/MS results are not available for individual samples



Pinyon
Environmental, Inc.

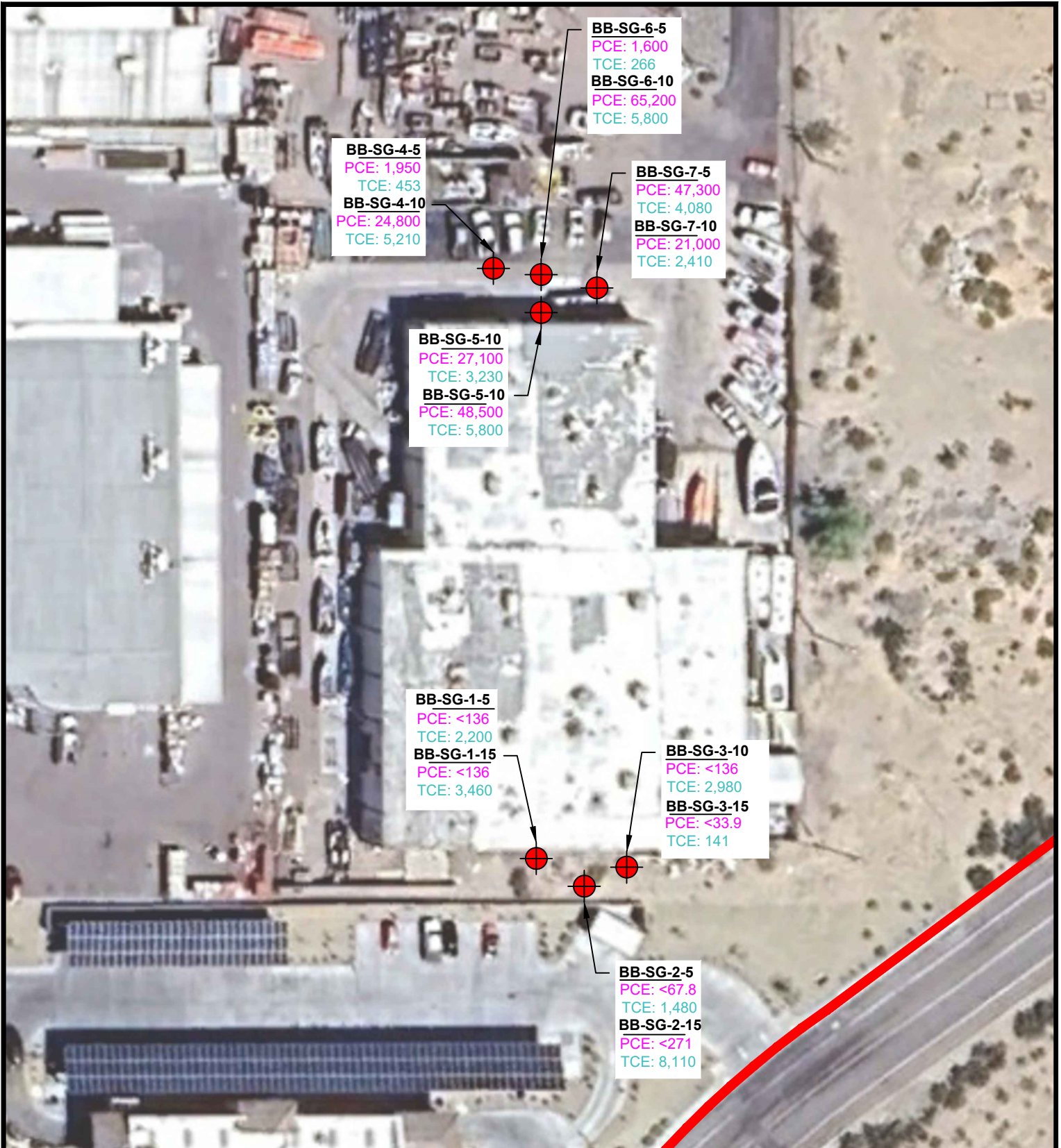
TCE AND PCE IN SHALLOW SOIL GAS

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

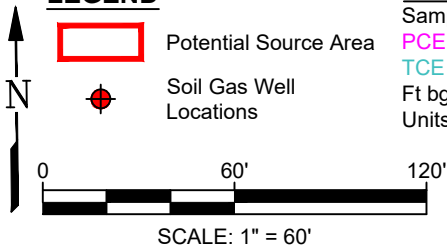
Drawn By: SJA	Figure: 9
Reviewed By: ABP	Date: 4/8/2025

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-100-602.012.REM001.34



LEGEND



Notes:

Samples collected 06/2022
PCE - Tetrachloroethene
TCE - Trichloroethene
Ft bgs - Feet below ground surface
Units for are reported in µg/m³ - micrograms per cubic meter



TCE AND PCE IN SOIL GAS NEAR FORMER FACILITY FEATURES

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3 and 4, T 13N, R 20W, Gila and Salt River Meridian

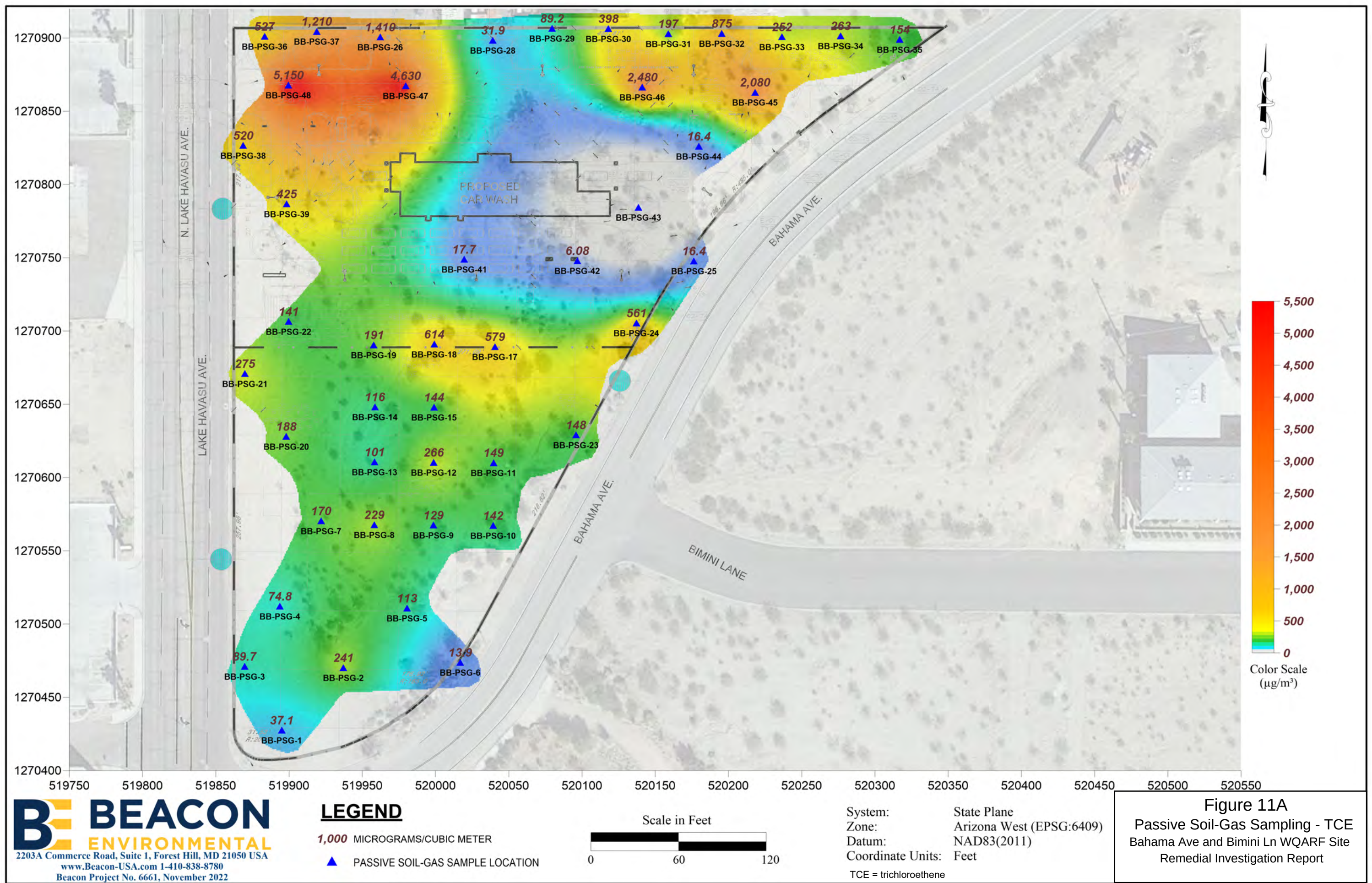
Pinyon Project Number: 7/19-100-602.012.REM001.34

Drawn By: SJA

Figure: 10

Reviewed By: ABP

Date: 3/27/2025



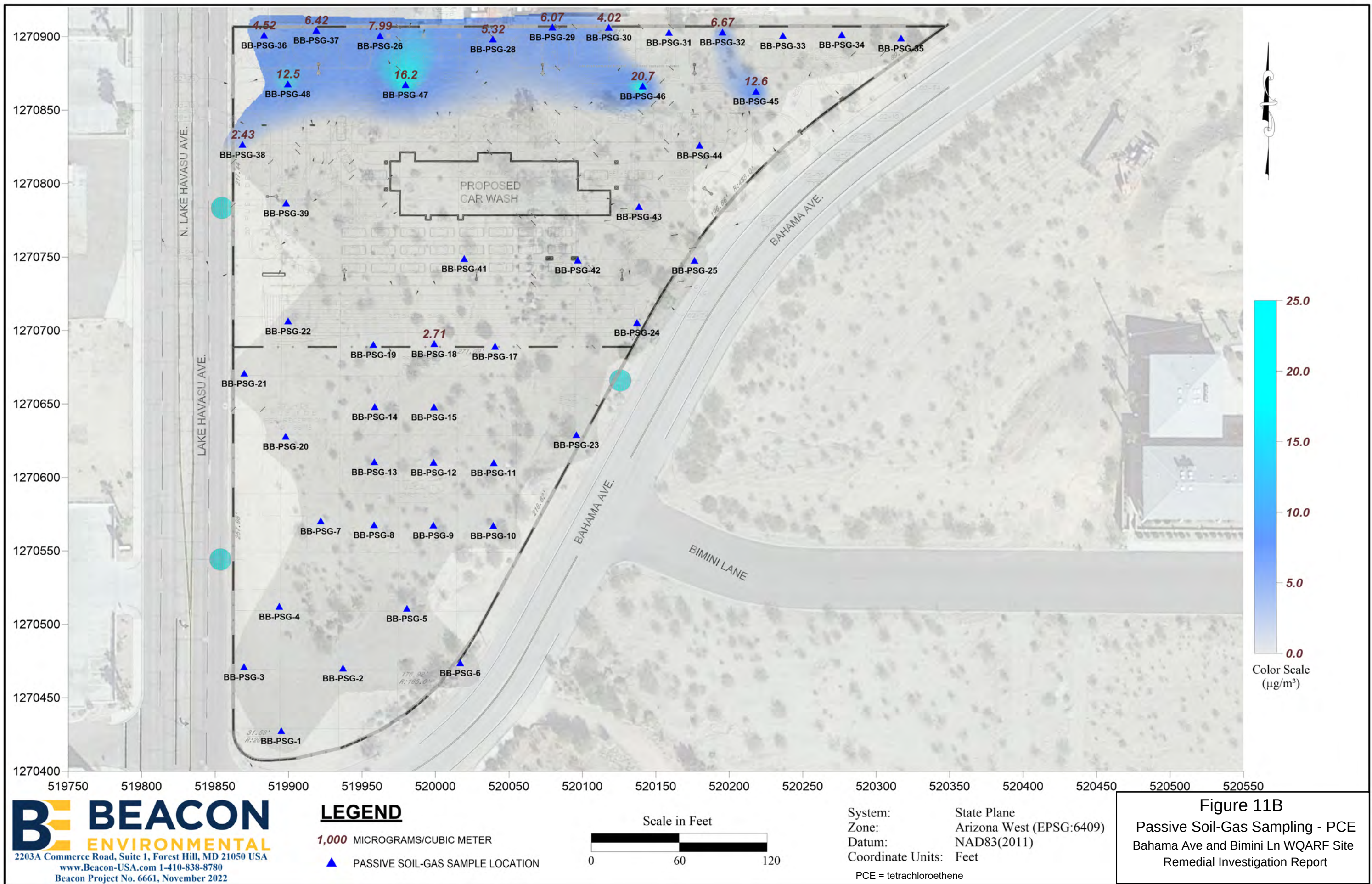
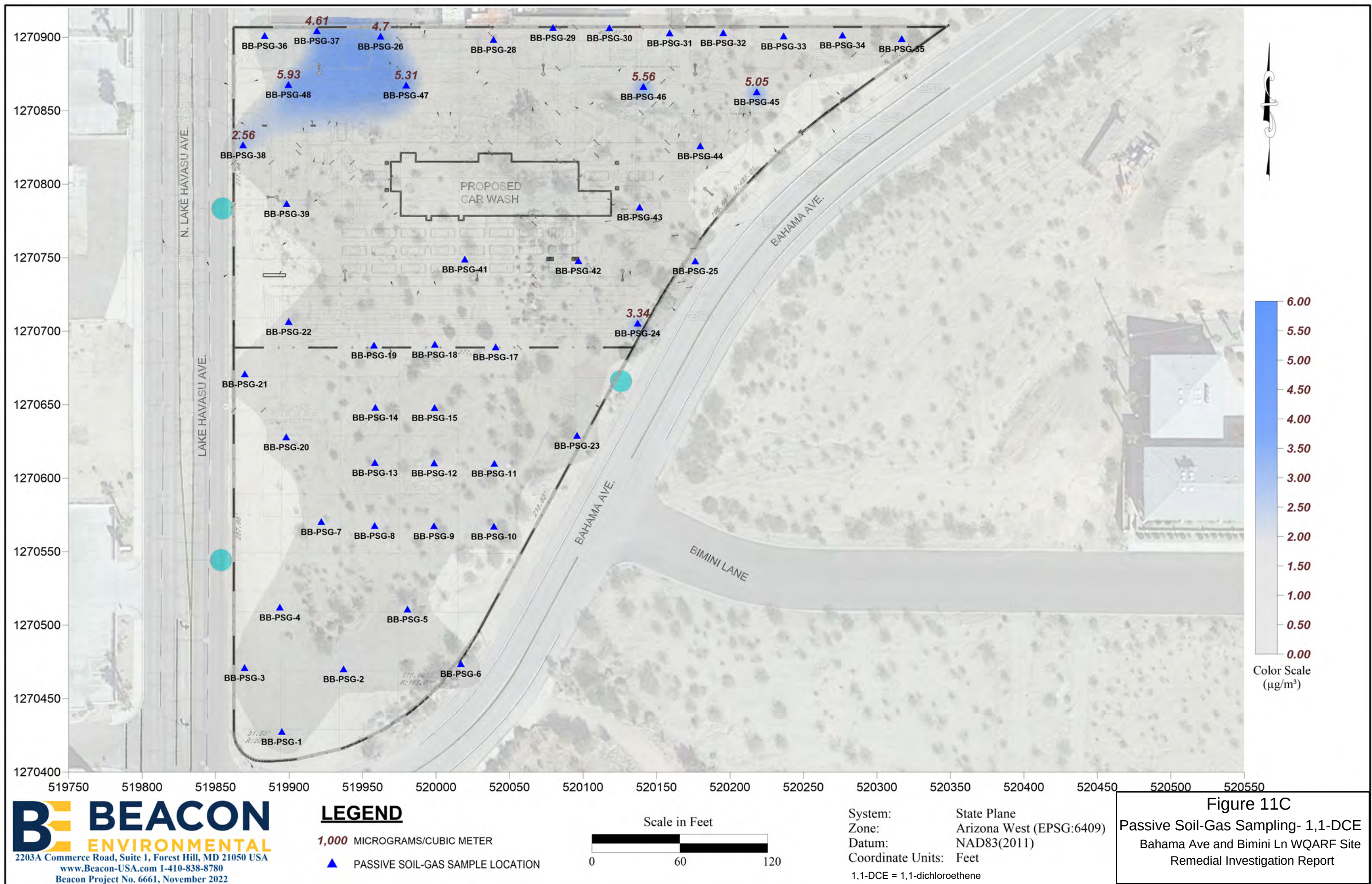
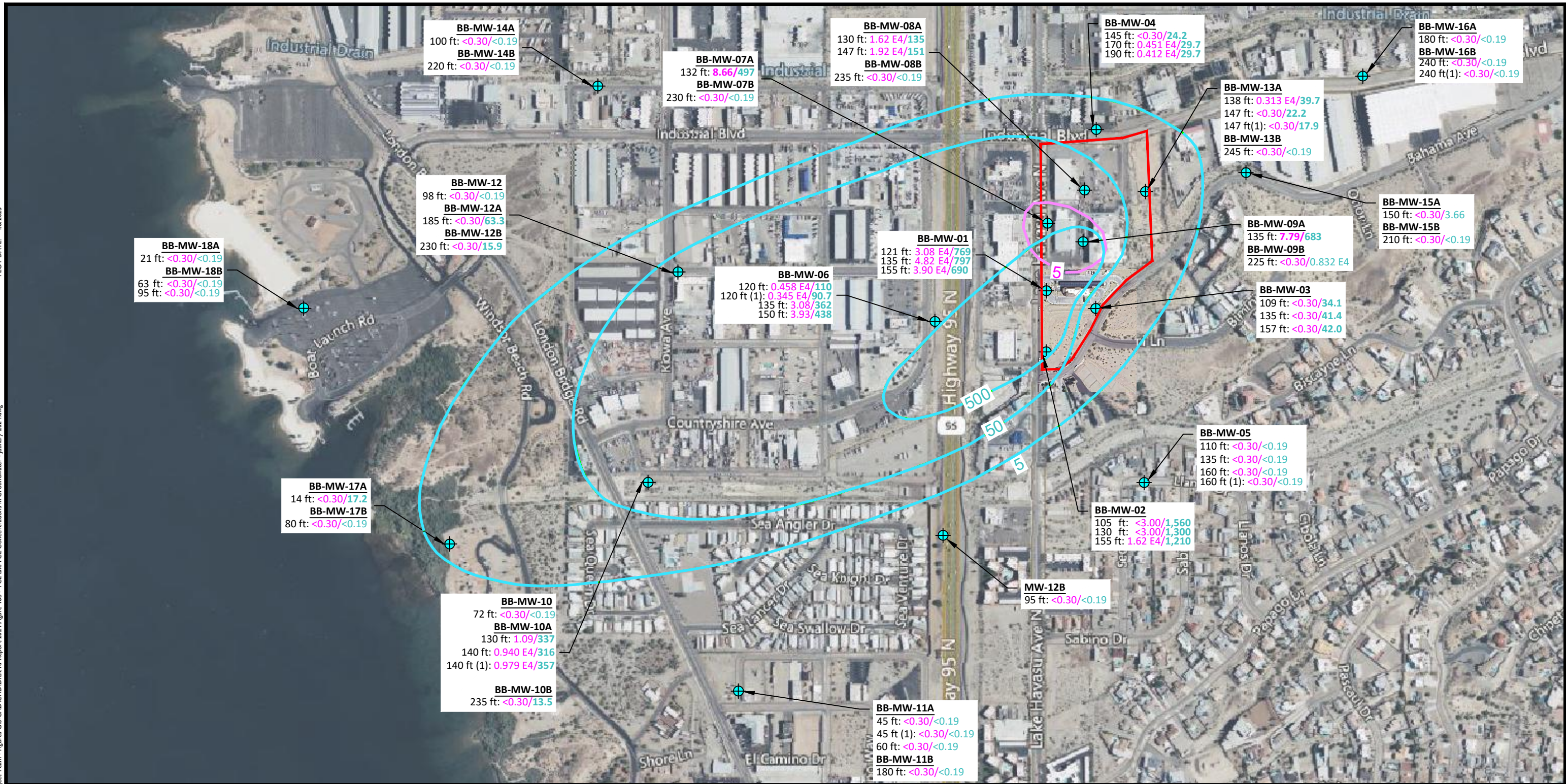


Figure from: 2019, Beacon Environmental, Certificate of Analysis, Project Site: Bahama & Bimini, Lake Havasu AZ, January 19



C:\Users\yanjinh\OneDrive - CDM Smith\304583-Bahama&Bimini-Project Team - Figures GIS-CAD\CAD\Draft RI Report 2024\Figure 16b - TCE and PCE Concentrations in Groundwater - January 2024.dwg
PLOT DATE: 4/8/2025



N

LEGEND

Potential Source Area

PCE Isopleths

TCE Isopleths

Groundwater Monitoring Well Location

Notes:

Ft - Feet

Teal- Trichloroethene (TCE)

Pink - Tetrachloroethene (PCE)

Concentrations are reported in µg/L - micrograms per liter

(1) - Duplicate sample

E4 - Concentration estimated. Analyte was detected below the laboratory Minimum Reporting Level (MRL) but above the Minimum Detection Level (MDL).

Samples collected 1/15/2024-1/17/2024

Bold = Over Aquifer Water Quality Standards

0

500'

1000'

SCALE: 1" = 500'

Pinyon

Environmental, Inc.

TCE AND PCE CONCENTRATIONS IN GROUNDWATER - JANUARY 2024

Remedial Investigation Report

Bahama Avenue and Bimini Lane

Water Quality Assurance Revolving Fund Site

Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-100-602.012.REM001.34

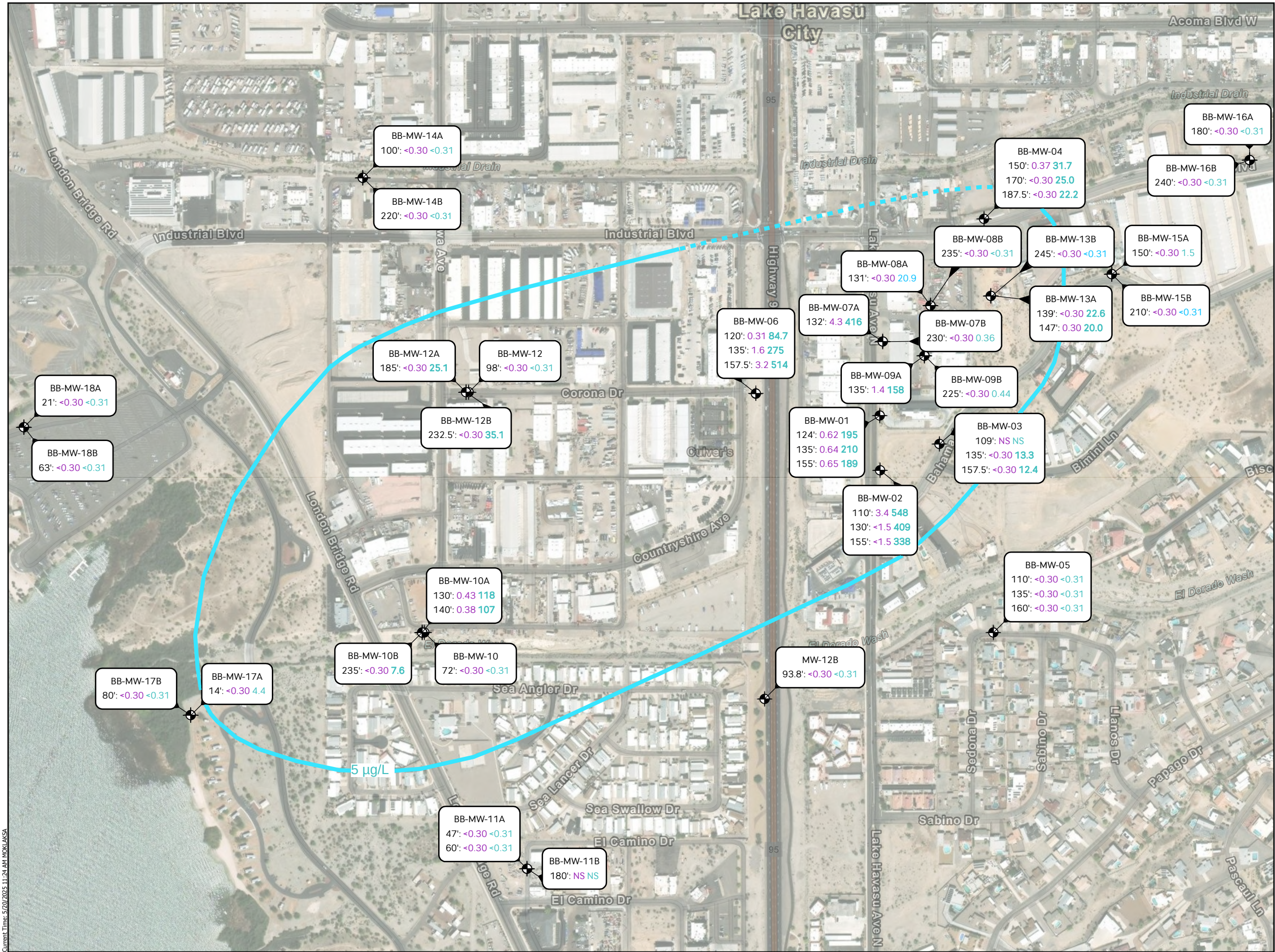
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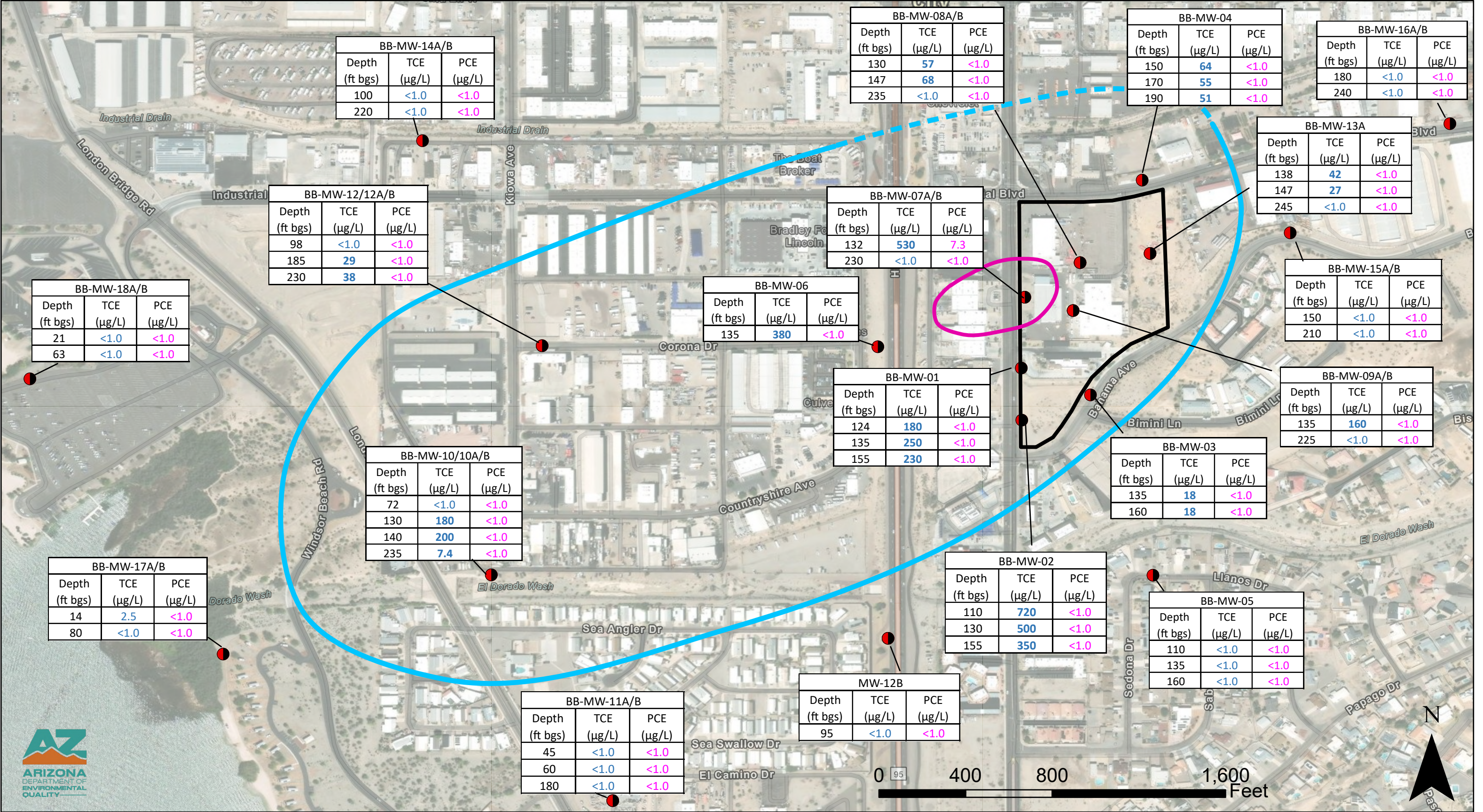
Reviewed By: ABP

Figure: 12A

Date: 4/8/2025

Coordinate System: NAD83 ARIZONA STATE PLANES, WEST ZONE, US FOOT - AZ83-WF





Legend

-  Monitoring Wells
-  Source Area
-  TCE plume
-  PCE plume

Notes:
TCE = trichloroethene
PCE = tetrachloroethene
µg/l = micrograms per liter
ft bgs = feet below ground surface
Bold = over Aquifer Water Quality Standards (AWQS)
AWQS PCE and TCE: 5 µg/L

5/8/2026

HAC

Figure 12C
TCE and PCE Concentratons
In Groundwater - October 2025

Remedial Investigation Report, Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site, Lake Havasu City, Arizona



LEGEND



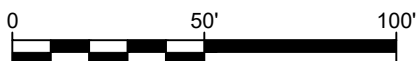
Potential Source Area



Existing Groundwater Monitoring Well Location



Soil Vapor Extraction Well Locations



SCALE: 1" = 50'



SOIL VAPOR EXTRACTION WELL LOCATIONS

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3 and 4, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-100-602.012.REM001.34

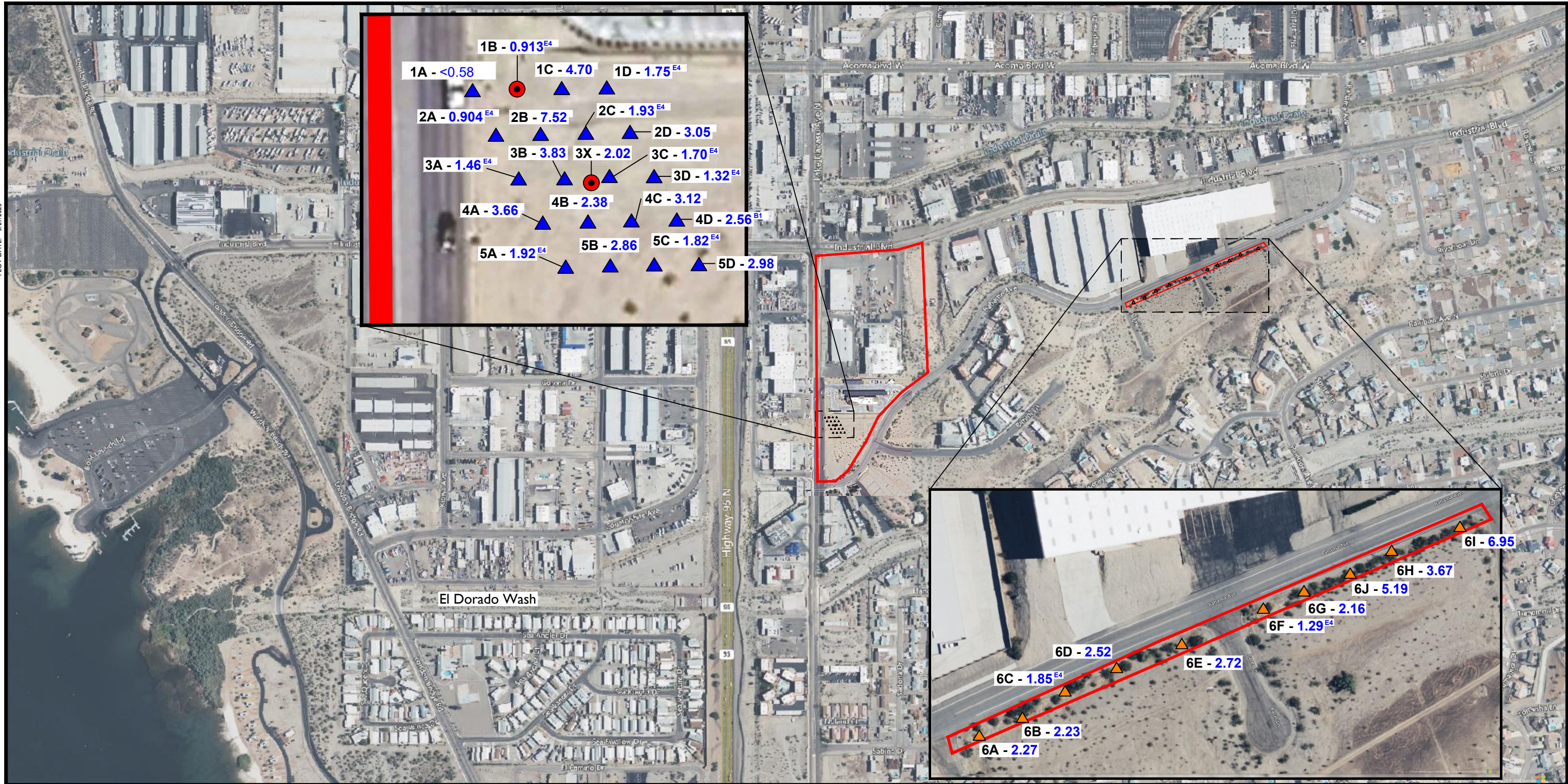
Drawn By: SJA

Figure: 13

Reviewed By: ABP

Date: 3/27/2025

PLOT DATE: 3/27/2025



LEGEND



Source Area



Historical Soil Sample Location



Soil Sample Location



Background Soil Sample Location

Notes:

mg/kg - milligrams per kilogram

Blue - Arsenic concentration

B1 - Target analyte detected in method blank at or above the method detection limit

E4 - Concentration estimated. Analyte was detected below laboratory minimum reporting limit but above the laboratory minimum detection limit.

Bold - Analyte detected above laboratory reporting limits

Samples taken at 2 feet below ground surface

Samples collected 11/14/2023 - 11/21/2023



SCALE: 1" = 500'



ARSENIC IN SHALLOW SOILS

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3 and 4, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-100-602.012

Drawn By: SJA

Figure: 14

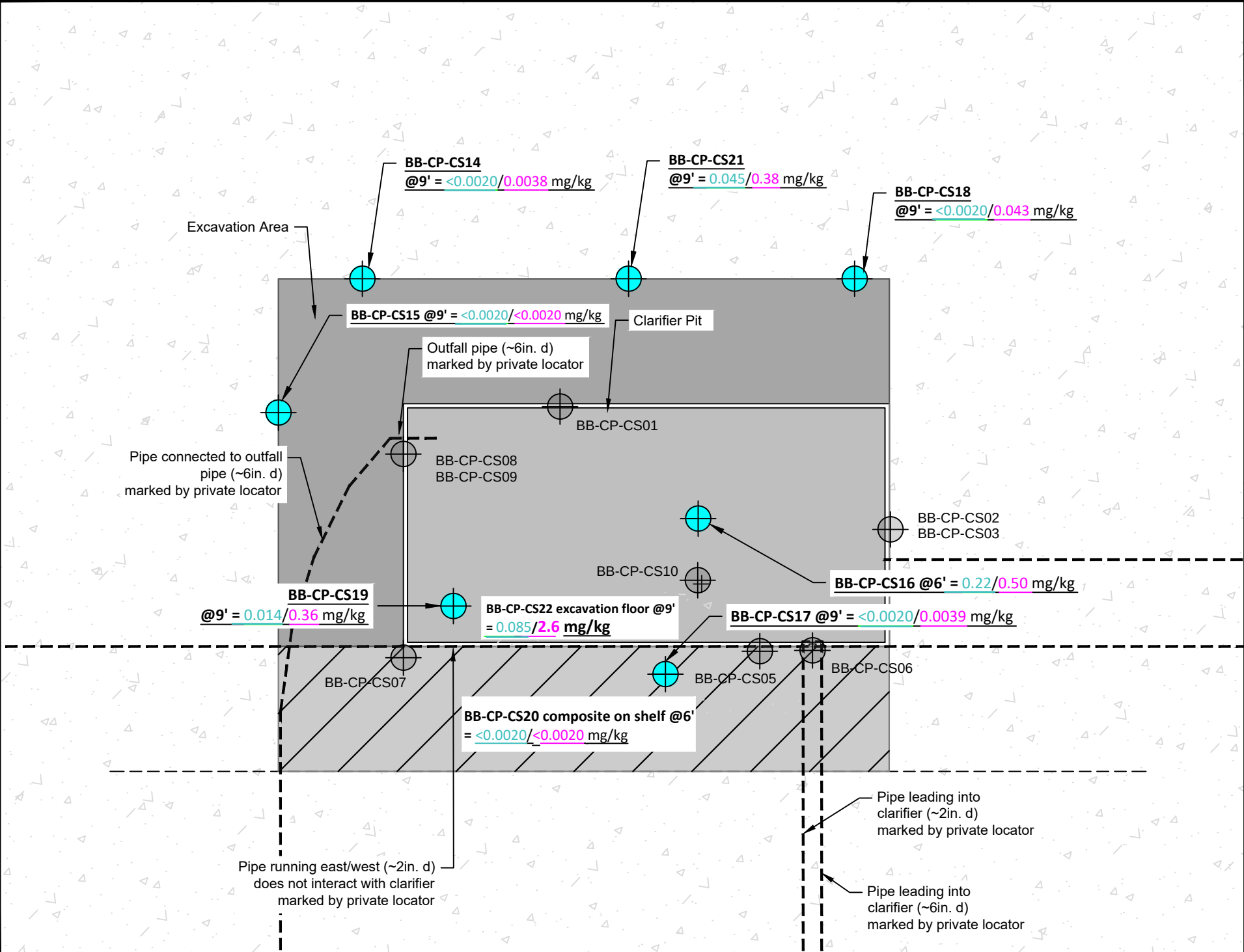
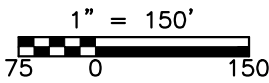
Reviewed By: ABP

Date: 3/27/2025



KEY MAP

RESULTS FROM DECEMBER 2022 SOIL SAMPLES - SOIL WAS SUBSEQUENTLY EXCAVATED AND DISPOSED			
SAMPLE ID	DEPTH (ft)	PCE (mg/kg)	TCE (mg/kg)
BB-CP-CS01	5	16.5	<1.24
BB-CP-CS02	8	0.0606	<0.0146
BB-CP-CS03	4.5	0.0618	<0.157
BB-CP-CS04	NA (INSIDE PIPE)	0.675	0.0359
BB-CP-CS05	8	13	<1.18
BB-CP-CS06	3	<0.0224	<0.0146
BB-CP-CS07	3	<0.0224	<0.0146
BB-CP-CS08	8	1.16	<0.0146
BB-CP-CS09	5	0.157	<0.0146
BB-CP-CS10	8.5	1.03	<0.0146



DOMN8ER POWER BOATS BUILDING

LEGEND

- Concrete
- Approximate Location of Existing Pipes left in place
- Location of initial soil samples - December 2022 - Soil was subsequently excavated and disposed
- Post-Excavation Soil Samples - February 2023
- Initial Excavation Area, ~8 feet Depth
- Additional Excavation, ~6 feet Depth due to Building Proximity
- Additional Excavation Area, ~9 feet Depth

Notes:
TCE/PCE Concentrations
CS17 Collected at base of excavation in that area - depth limited by proximity to building
CS14, 15, 18 Sidewall Samples
CS16, 19 Floor Samples
Bold = Over Soil Remediation Level
SCALE: Not to Scale



CLARIFIER PIT EXCAVATION

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

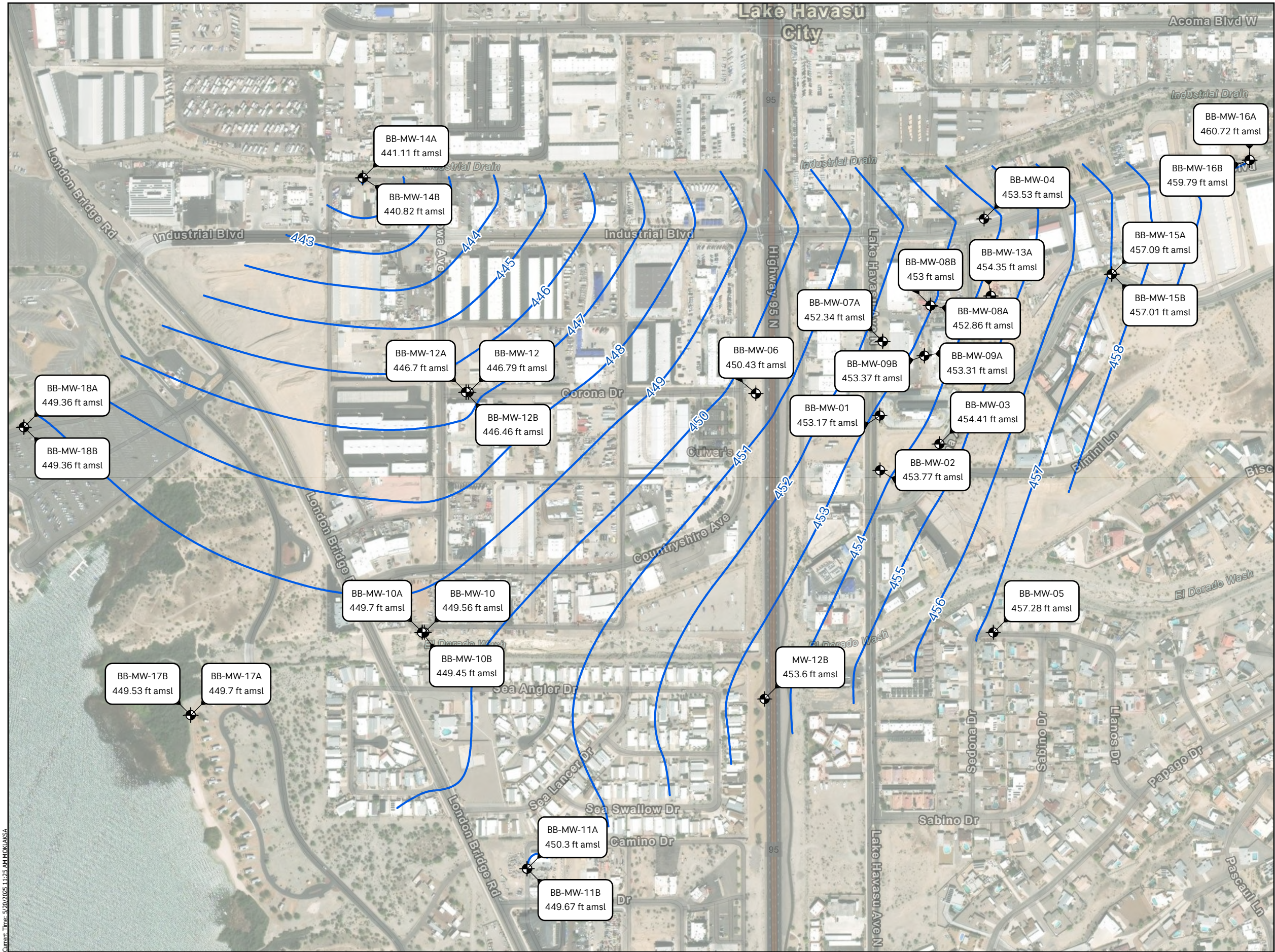
Pinyon Project Number: 7/19-100-602.012.REM001.34

Drawn By: AEN

Figure: 15

Reviewed By: ABP

Date: 4/11/2025



Legend

- Monitoring Wells
- Potentiometric
- Surface Line
- Contours

N

0 490 980

Feet

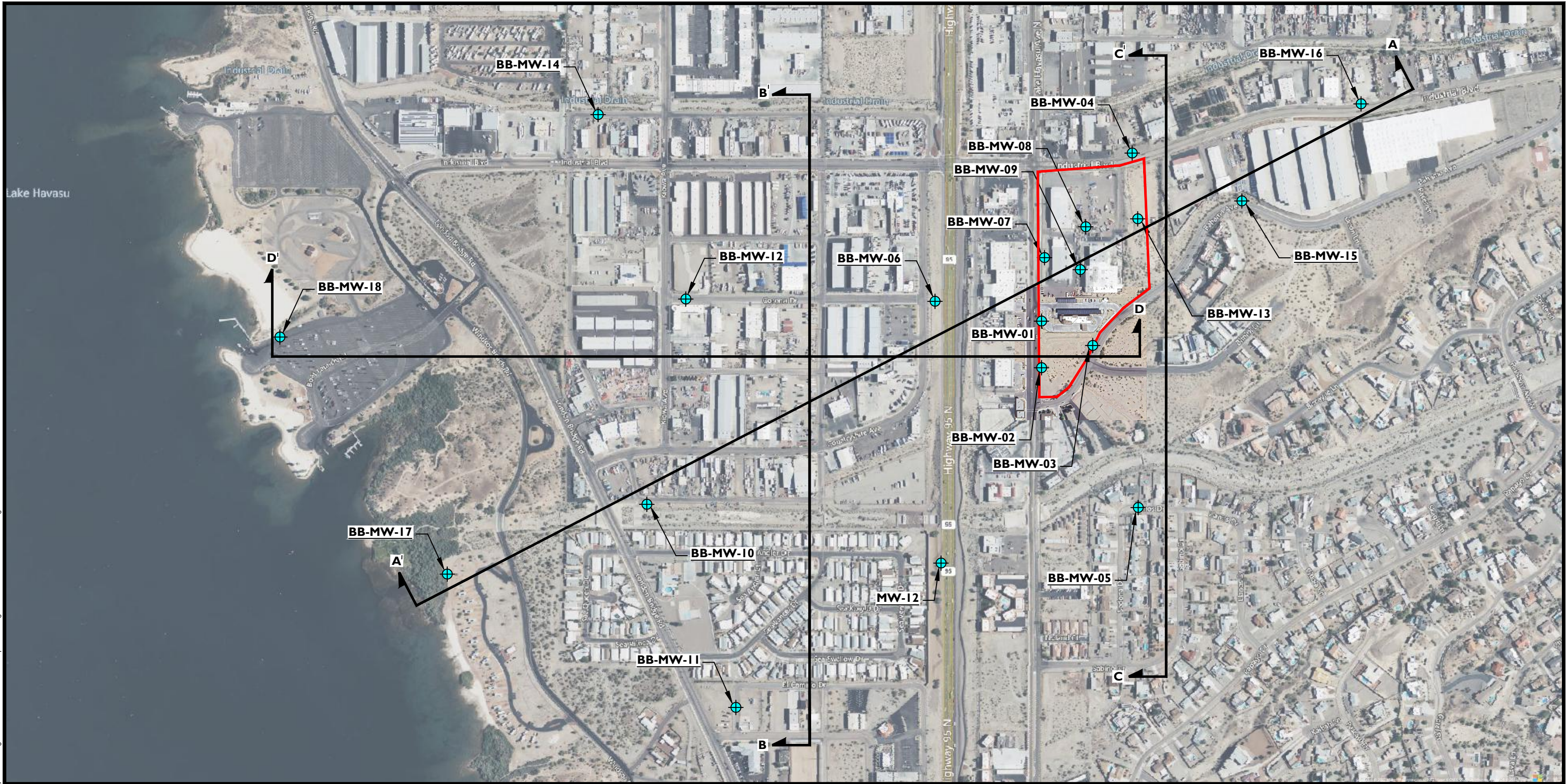
Figure 16

March 2025 Potentiometric Surface Map

Bahama Avenue and Bimini Lane - Water Quality Assurance Revolving Fund Site

PLOT DATE: 4/9/2025

C:\Users\yanjinh\OneDrive - CDM Smith\304583-Bahama&Bimini-Project Team - Figures GIS-CAD\CAD\Draft RI Report 2024\Figure 17 - Cross Section Locations.dwg



LEGEND



Source Area



Groundwater Monitoring Well Location



SCALE: 1" = 500'



CROSS SECTION LOCATIONS

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 719-1006-02.012.REM001.34

Drawn By: SJA

Figure: 17A

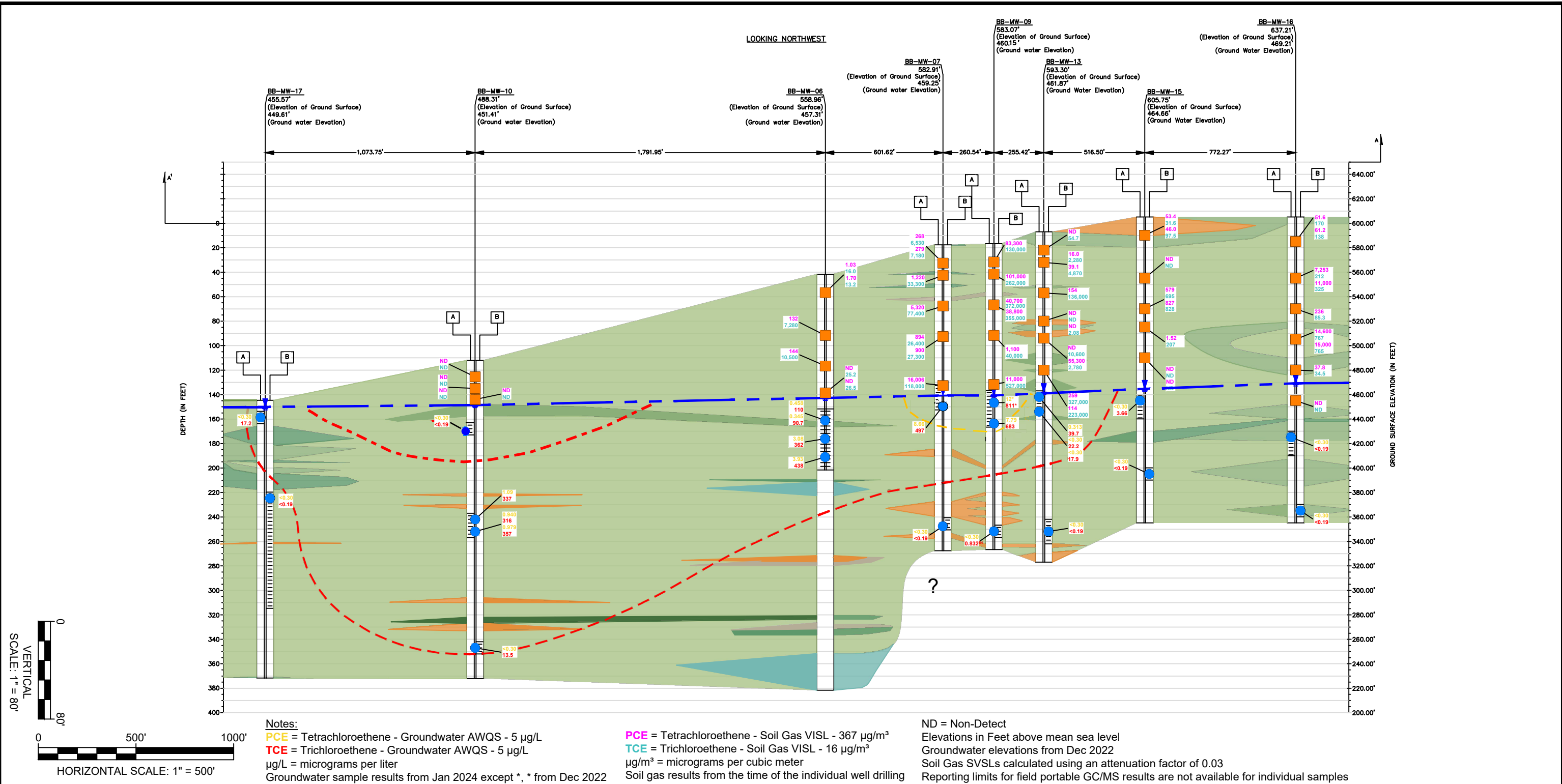
Reviewed By: ABP

Date: 4/9/2025

Coordinate System: NAD83 ARIZONA STATE PLANES, WEST ZONE, US FOOT - AZ83-WF

PLOT DATE: 4/28/2025

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LEGEND				Pinyon Environmental, Inc.	
	SAND		SANDY SILT		SANDY CLAY
	GRAVEL		SILT		GROUNDWATER
	CLAYEY SAND		CLAY		GROUNDWATER SURFACE
	TCE - 5 µg/L BOUNDARY		PCE - 5 µg/L BOUNDARY		GROUNDWATER SAMPLE LOCATION
	SOIL GAS SAMPLE LOCATION		NO INFORMATION		

CROSS SECTION A-A'
Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 719-1006-02.012.REM001.34

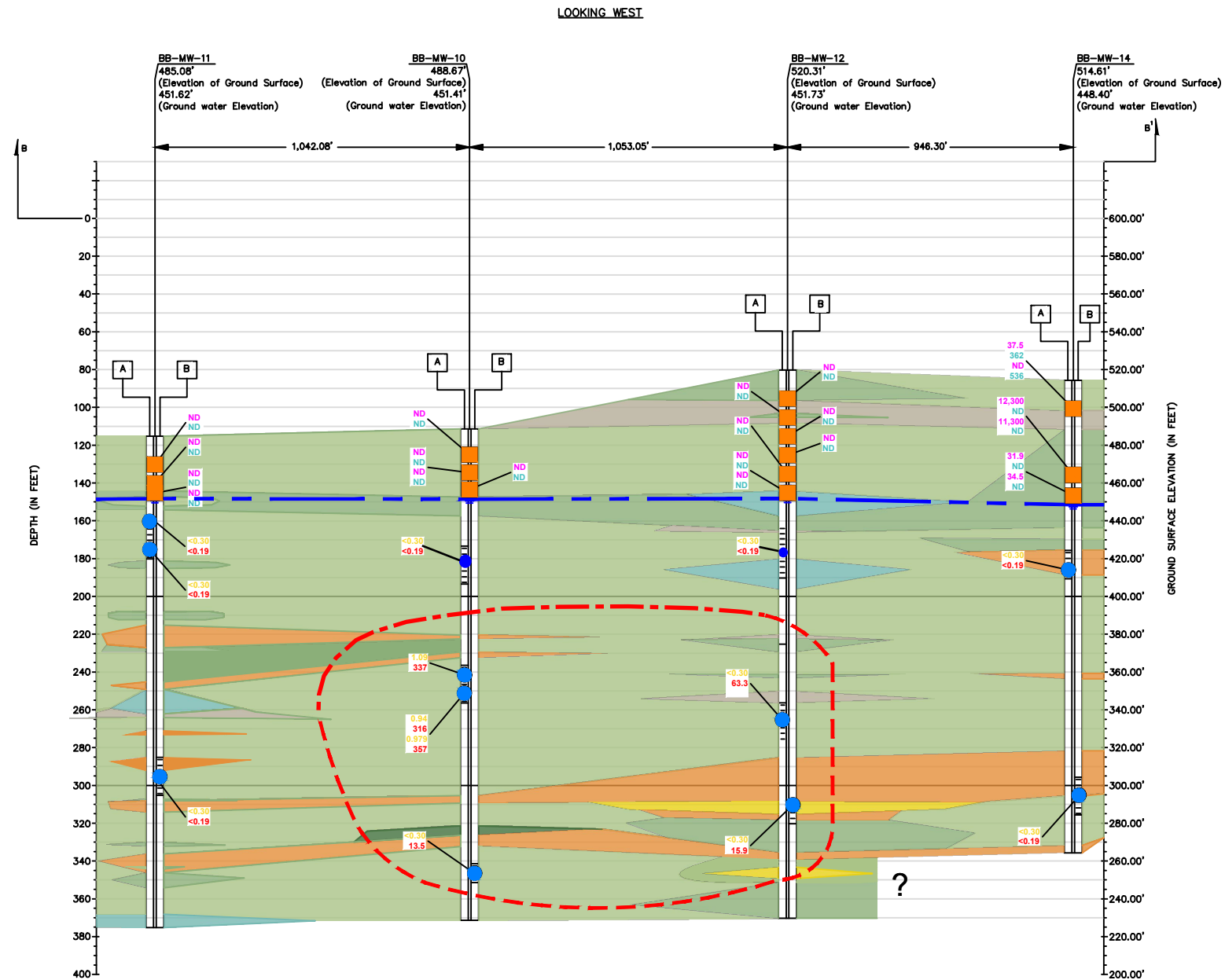
Drawn By: SJA

Reviewed By: ABP

Figure: 17B

Date: 4/28/2025

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PLOT DATE: 4/28/2025



Notes:

PCE = Tetrachloroethene - Groundwater AWQS - 5 µg/L
TCE = Trichloroethene - Groundwater AWQS - 5 µg/L
µg/L = micrograms per liter
Groundwater sample results from Jan 2024

PCE = Tetrachloroethene - Soil Gas VISL - 367 µg/m³
TCE = Trichloroethene - Soil Gas VISL - 16 µg/m³
µg/m³ = micrograms per cubic meter
Soil gas results from the time of the individual well drilling

ND = Non-Detect
Elevations in Feet above mean sea level
Groundwater elevations from Dec 2022
Soil Gas SVSLs calculated using an attenuation factor of 0.03
Reporting limits for field portable GC/MS results are not available for individual samples

LEGEND

	SAND		SANDY SILT		SANDY GRAVEL		TCE - 5 µg/L BOUNDARY		NO INFORMATION
	GRAVEL		CLAY		GROUNDWATER		PCE - 5 µg/L BOUNDARY		GROUNDWATER SAMPLE LOCATION
	CLAYEY SAND		SANDY CLAY		GROUNDWATER SURFACE		SOIL GAS SAMPLE LOCATION		



CROSS SECTION B-B'
Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 719-1006-02.012.REM001.34

Drawn By: SJA

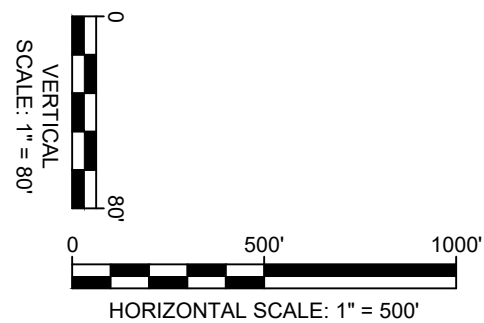
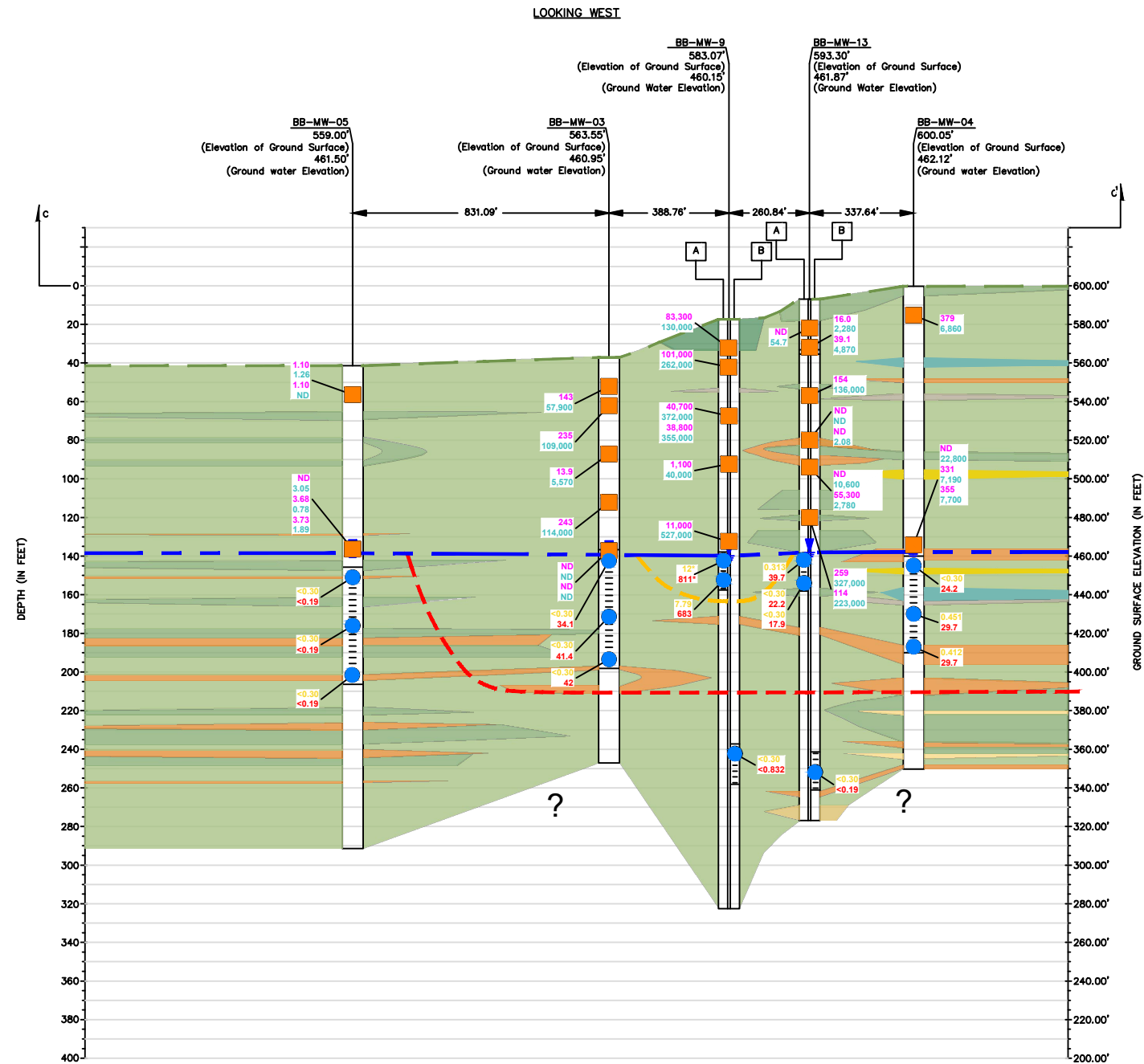
Figure: 17C

Reviewed By: ABP

Date: 4/28/2025

PLOT DATE: 4/14/2025

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Notes:
PCE = Tetrachloroethene - Groundwater AWQS - 5 µg/L
TCE = Trichloroethene - Groundwater AWQS - 5 µg/L
µg/L = micrograms per liter
Groundwater sample results from Jan 2024 except *, * from Dec 2022

PCE = Tetrachloroethene - Soil Gas VISL - 367 µg/m³
TCE = Trichloroethene - Soil Gas VISL - 16 µg/m³
µg/m³ = micrograms per cubic meter
Soil gas results from the time of the individual well drilling

ND = Non-Detect
Elevations in Feet above mean sea level
Groundwater elevations from Dec 2022
Soil Gas SVSLs calculated using an attenuation factor of 0.0
Reporting limits for field portable GC/MS results are not available for individual samples

LEGEND

	SAND		SANDY SILT		SANDY CLAY
	GRAVEL		SILT		CLAYEY GRAVELY SAND
	CLAYEY SAND		SANDY GRAVEL		GROUNDWATER SURFACE

	TCE - 5 µg/L BOUNDARY		GROUNDWATER SAMPLE LOCATION
	PCE - 5 µg/L BOUNDARY		SOIL GAS SAMPLE LOCATION

GROUNDWATER



CROSS SECTION C-C'
Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 719-1006-02.012.REM001.34

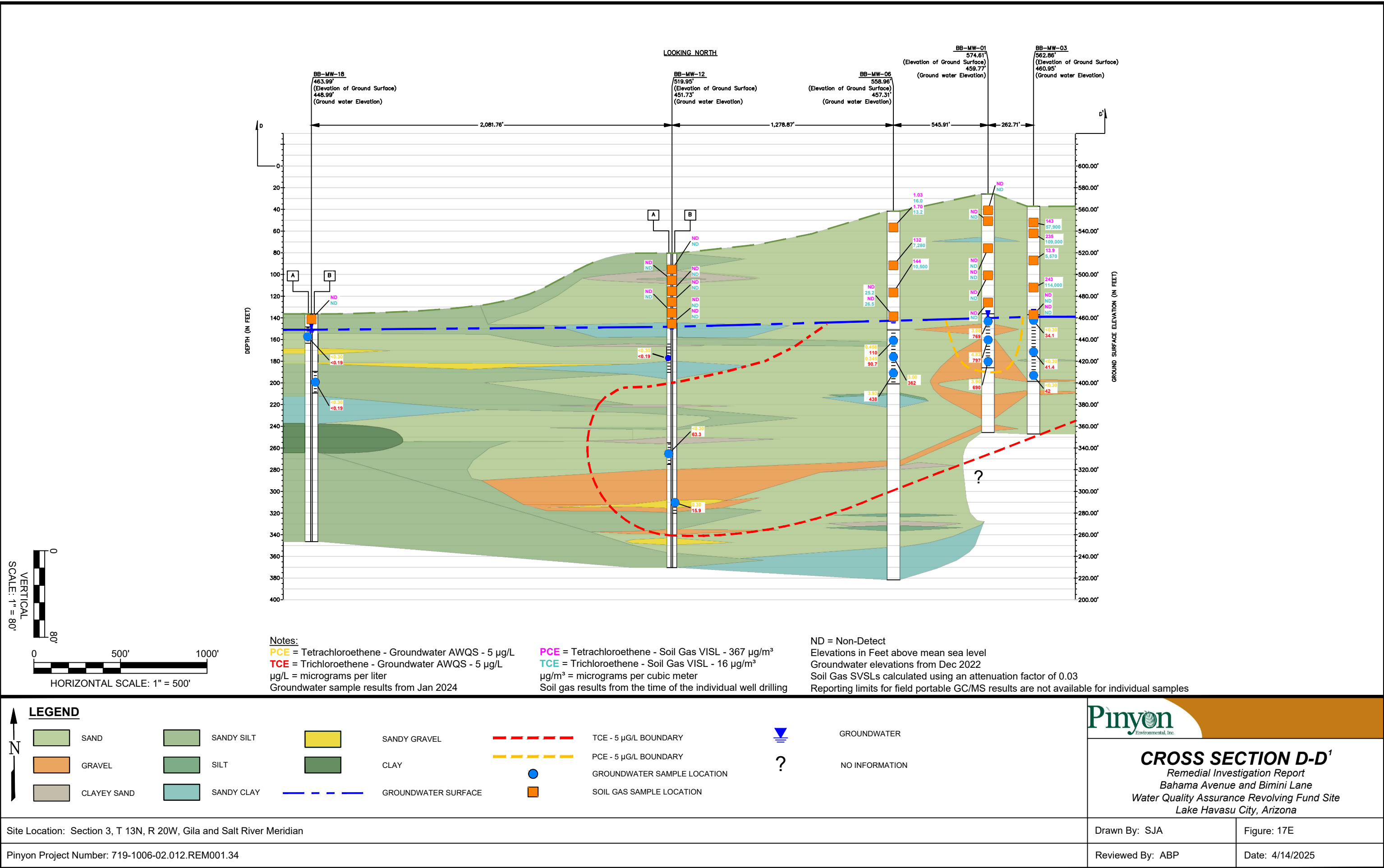
Drawn By: SJA

Figure: 17D

Reviewed By: ABP

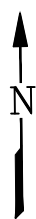
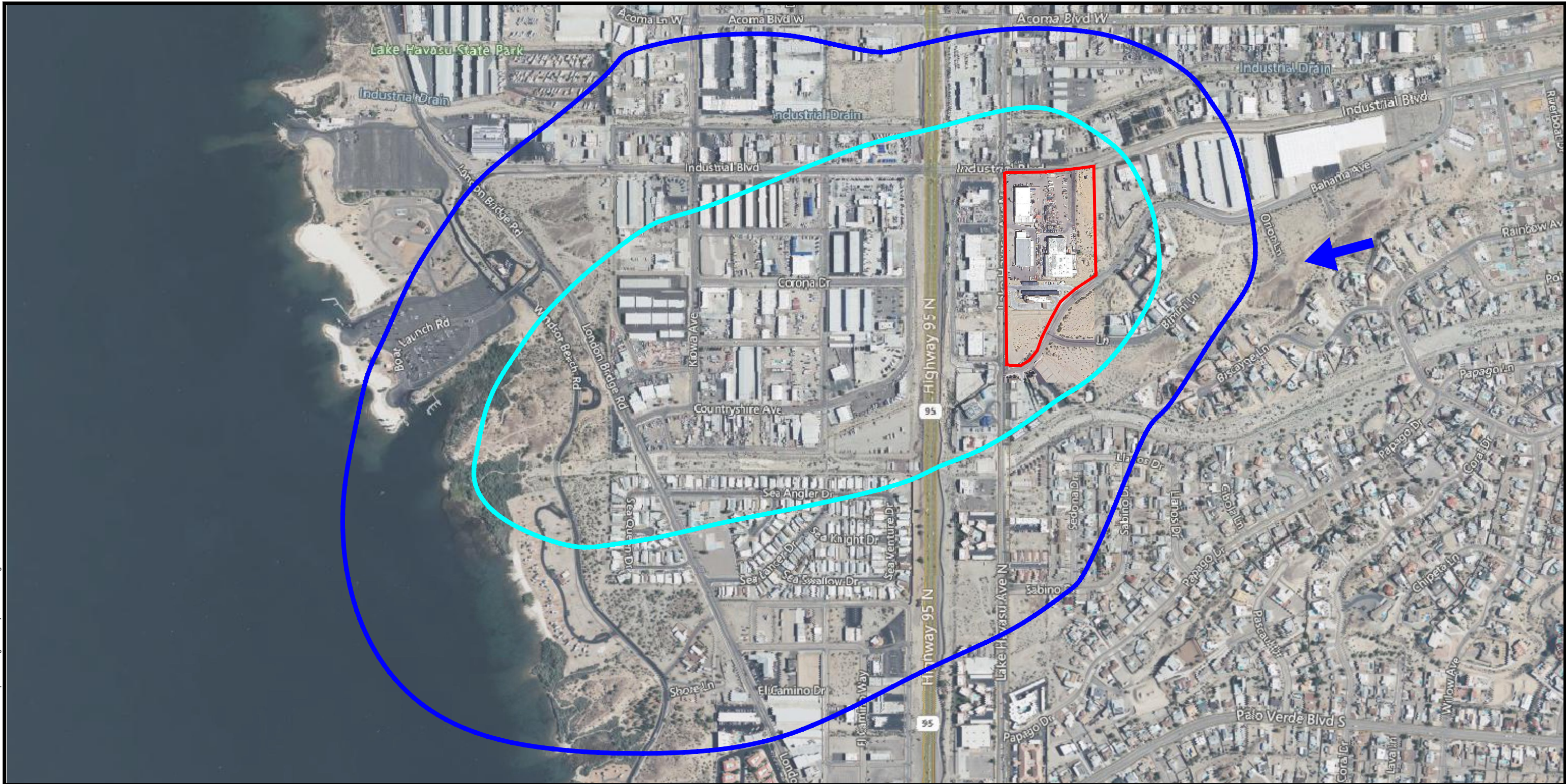
Date: 4/14/2025

Coordinate System: NAD83 ARIZONA STATE PLANES, WEST ZONE, US FOOT - AZ83-WF



PLOT DATE: 3/27/2025

C:\Users\yanjinh\OneDrive - CDM Smith\Desktop\project\2025\3_march\Bahama and Bimini\Draft RI Report 2024\Figure 2 - Project Overview.dwg

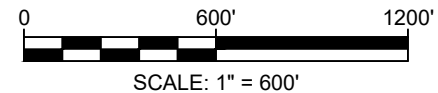


LEGEND

-  Potential Source Area
-  Community Involvement Area
-  Bahama Ave. and Bimini Ln. WQARF Site Boundary



Average Groundwater Flow Direction



COMMUNITY INVOLVEMENT AREA

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian

Pinyon Project Number: 7/19-1006-02.012

Drawn By: SJA

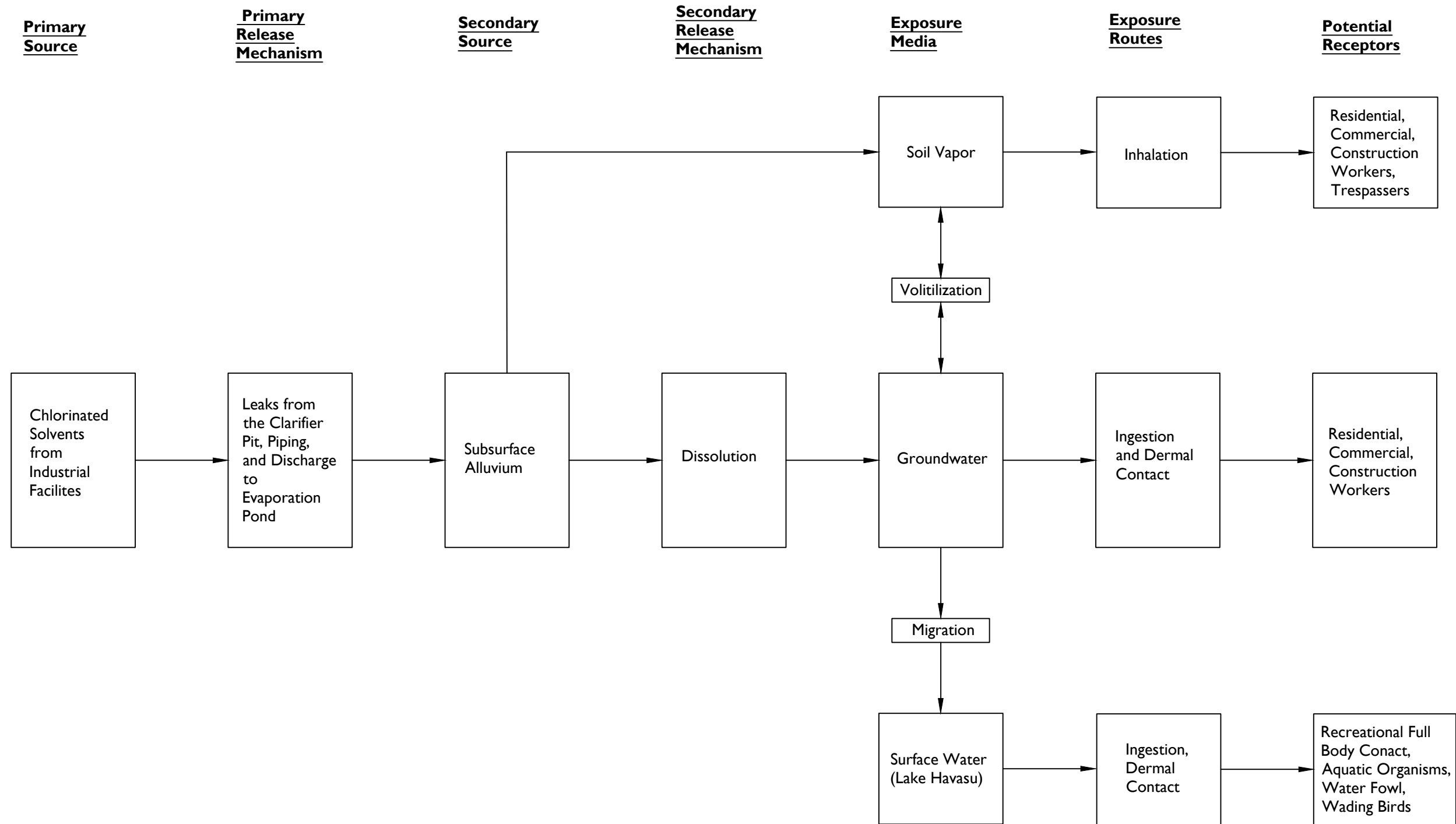
Figure: 18

Reviewed By: ABP

Date: 3/27/2025

Coordinate System: NAD83 ARIZONA STATE PLANES, WEST ZONE, US FOOT - AZ83-WF

Z:\PROJECTS\2019\719-1006-02.012 Bahama Ave and Bimini Ln\Figures\AutoCAD\DWG\REM001_34 Draft RI\Figure 19b - Migration Pathway Exposure CSM Flow Chart.dwg
PLOT DATE: 3/11/2024



LEGEND



MIGRATION EXPOSURE PATHWAYS

Remedial Investigation Report
Bahama Avenue and Bimini Lane
Water Quality Assurance Revolving Fund Site
Lake Havasu City, Arizona

Site Location: Section 3, T 13N, R 20W, Gila and Salt River Meridian	Drawn By: AEN	Figure: 19
Pinyon Project Number: 7/19-1006-02.012.REM001.34	Reviewed By: ABP	Date: 3/11/2024

APPENDIX A
Site Photographs

APPENDIX B

Boring Logs

APPENDIX C
Laboratory Analytical Reports

APPENDIX D
Passive Soil Gas Sampling Results

APPENDIX E
Historical Groundwater Plume Maps

APPENDIX F
Microbial Conditions

APPENDIX G
SVE Technical Memos

APPENDIX H
Clarifier Removal Memo

APPENDIX I
Historical Groundwater Flow Direction Figures

APPENDIX J
Concentration Trends

APPENDIX K
Land and Water Use Study