# FOURTH FIVE-YEAR REVIEW REPORT FOR INDIAN BEND WASH AREA SUPERFUND SITE MARICOPA COUNTY, ARIZONA

**U.S. Environmental Protection Agency**

Region 9

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# Executive Summary

This is the fourth Five-Year Review of the Indian Bend Wash Area Superfund Site in Maricopa County, Arizona (Site). The purpose of this Five-Year Review is to assess information to determine whether the remedy is and will continue to be protective of human health and the environment.

In 1987, the United States Environmental Protection Agency divided the Site into two sub-sites encompassing approximately 13 square miles of the Paradise Valley Groundwater Basin. The Site includes 10 square miles as the North Indian Bend Wash, located in the City of Scottsdale, and 3 square miles as the South Indian Bend Wash, located in Tempe. Groundwater within the Indian Bend Wash footprint is an important source of drinking water for the Phoenix metropolitan area. In 1981, trichloroethene was detected in groundwater from several City of Scottsdale municipal wells at concentrations exceeding the Arizona Department of Health Services action levels in effect at that time. In 1983, the United States Environmental Protection Agency placed the Site on the National Priorities List due to the widespread presence of chlorinated solvents, particularly trichloroethene and tetrachloroethene, in groundwater.

The United States Environmental Protection Agency selected the remedy for the North Indian Bend Wash in the 1988 Scottsdale Groundwater Operable Unit Record of Decision, 1991 Shallow Soils and Groundwater Record of Decision, 2001 Final Record of Decision Amendment (which consolidates the 1988 and 1991 Records of Decision), and 2012 Explanation of Significant Differences. The United States Environmental Protection Agency selected the remedy for the South Indian Bend Wash in the September 1993 Vadose Zone Record of Decision, 1998 Groundwater Record of Decision, and 2004 Record of Decision Amendment.

**North Indian Bend Wash**

In the 2001 Final Record of Decision Amendment for the North Indian Bend Wash, the United States Environmental Protection Agency selected the final remedy to address aquifer restoration by containment, treatment, and monitoring of volatile organic compounds in groundwater to protect long-term human health and the environment. In the 2012 Explanation of Significant Differences, the United States Environmental Protection Agency required a change in the treatment location and technology for one of the extraction wells. Components of the North Indian Bend Wash remedy include:

- Construction of five groundwater extraction and treatment systems. The five groundwater extraction and treatment systems continue to operate as part of the ongoing groundwater remedial efforts for North Indian Bend Wash. These include the Area 7 and Area 12 Groundwater Extraction and Treatment Systems which treat

historical source areas, and three additional plants that contribute treated water to the municipal water supply: the Central Groundwater Treatment Facility, North Indian Bend Wash Granular Activated Carbon Treatment Facility, and the Miller Road Treatment Facility.

- Areas 6, 7, 8, and 12 soil vapor extraction systems that prevented further impacts to groundwater. The Area 6, 8, and 12 soil vapor extraction systems began operating in the mid-1990s and were decommissioned by 2000 by the North Indian Bend Wash Participating Companies based on performance data and groundwater protection criteria. The Area 7 soil vapor extraction system operated intermittently from July 1994 to December 2000 with pauses for rebound testing and initial shakedown of the Area 7 Groundwater. After long-term rebound testing, the Area 7 soil vapor extraction system then briefly operated between 2008 and 2010. The Area 7 soil vapor extraction treatment system was decommissioned in 2015 based on performance data and meeting groundwater protection criteria specified in the ROD.

The ongoing remedy (Area 7 Groundwater Extraction and Treatment System, Area 12 Groundwater Extraction and Treatment System, Central Groundwater Treatment Facility, Miller Road Treatment Facility, and North Indian Bend Wash Granular Activated Carbon Treatment Facility) is focused on groundwater treatment and extraction.

The Area 7 Groundwater Extraction and Treatment System extracts groundwater in the middle alluvial unit and is a critical component of the remedy. It removes volatile organic compounds and is intended to prevent contamination from migrating to the southwest margin of the Site and subsequently into the lower alluvial unit. Additionally, the Area 12 Groundwater Extraction and Treatment System extracts and treats groundwater from the middle alluvial unit and is also intended to prevent volatile organic compounds from migrating to the southwest margin and then into the lower alluvial unit. The Central Groundwater Treatment Facility extracts and treats groundwater from the middle and lower alluvial units. The Miller Road Treatment Facility and North Indian Bend Wash Granular Activated Carbon Treatment Facility extract and treat groundwater from the lower alluvial unit. The Central Groundwater Treatment Facility, Miller Road Treatment Facility, and North Indian Bend Wash Granular Activated Carbon Treatment Facility prevent impacts to downgradient drinking water production wells and also contribute treated water to the municipal water supply.

The North Indian Bend Wash remedial actions are contributing to the restoration of groundwater for beneficial use. Treated groundwater is supplied to the City of Scottsdale water system, to the Salt River Project water supply system, and to shallow injection wells that recharge the upper alluvial unit aquifer and provide hydrological containment. The groundwater extraction and treatment at the Area 7 Groundwater Extraction and Treatment System, Area 12 Groundwater Extraction and Treatment System, and Central Groundwater

Treatment Facility are controlling exposure to contaminated groundwater through hydraulic containment and treatment of contaminated groundwater. Production wells to the north of the Site are protected from contaminants related to the Site because the Miller Road Treatment Facility and North Indian Bend Wash Granular Activated Carbon Treatment Facility extract northward-moving contaminants.

The North Indian Bend Wash remedy is currently protective of human health and the environment. The remedy is contributing to the restoration of beneficial use of the groundwater in the short term and preventing potential exposure through vapor intrusion from impacted groundwater. While the remedy is functioning as intended, there are known opportunities to increase its efficiency. To increase remedy efficiency, planned remedial enhancements such as reinstating COS-71A and beginning extraction at PG-41 should be implemented, and other enhancements, particularly at Area 7, should be considered.

Short-term vapor intrusion mitigation measures are in place at two buildings adjacent to Area 7. Because these are only short-term protective measures, the Third Five-Year Review concluded that the vapor intrusion source at Area 7 should be characterized and addressed to ensure long-term protectiveness of the Site. In July 2026, EPA entered into an agreement with Siemens and the City of Scottsdale to perform a remedial investigation and feasibility study for vapor intrusion at Area 7.

In addition, per- and polyfluoroalkyl substances (PFAS) have been detected in groundwater above drinking water standards at the Indian Bend Wash Area. Additional groundwater data related to PFAS have been collected at North Indian Bend Wash but not yet evaluated. These PFAS data collected at North Indian Bend Wash should be reported and evaluated to determine whether unacceptable exposure of PFAS to the public may be occurring through discharge to water supply systems.

**South Indian Bend Wash**

The United States Environmental Protection Agency completed and approved the Remedial Action Completion Report in June 2020, indicating that all remedial actions objectives defined in the South Indian Bend Wash Record of Decision for Operable Units 3 and 7 have been achieved. PFAS were detected in South Indian Bend Wash groundwater monitoring wells and in City of Tempe municipal supply wells. In 2022 the United States Environmental Protection Agency initiated an investigation to understand the nature and extent of PFAS contamination at South Indian Bend Wash. The PFAS investigation is nearing completion and will be reported in the next Five-Year Review period.

**Sitewide Protectiveness Statement**

The Indian Bend Wash Area OU3, OU7, and OU8 remedies are protective of human health and the environment. The OU8 remedy is contributing to the restoration of beneficial use of groundwater in the short term and preventing potential exposure through vapor intrusion from impacted groundwater. However, to be protective in the long-term, the following actions need to be taken to ensure protectiveness:

- Report and evaluate PFAS data from NIBW to determine whether unacceptable exposure of PFAS to the public may be occurring through discharge to water supply systems.

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# List of Acronyms and Abbreviations

| | |
|---|---|
| 1,1-DCE | 1,1-dichloroethene |
| 1,1,1-TCA | 1,1,1-trichloroethane |
| ADEQ | Arizona Department of Environmental Quality |
| ARAR | applicable or relevant and appropriate requirement |
| bgs | below ground surface |
| COC | Contaminant of Concern |
| COS | City of Scottsdale |
| EPA | U.S. Environmental Protection Agency |
| ESD | Explanation of Significant Difference |
| FS | Feasibility Study |
| LAU | Lower Aquifer Unit |
| LGAC | Liquid-phase granular activated carbon |
| MCL | Maximum Contaminant Level |
| MRTF | Miller Road Treatment Facility |
| NGTF | NIBW Granular Activated Carbon Treatment Facility |
| NIBW | North Indian Bend Wash |
| PCE | perchloroethene or tetrachloroethene |
| PFAS | per- and polyfluoroalkyl substances |
| RI | Remedial Investigation |
| ROD | Record of Decision |
| SIBW | South Indian Bend Wash |

| | |
|---|---|
| Site | Indian Bend Wash Area Superfund Site |
| SRP | Salt River Project |
| SVE | Soil Vapor Extraction |
| TCE | trichloroethene |
| TGTF | Thomas Groundwater Treatment Facility |
| UAU | Upper Alluvial Aquifer |
| µg/L | micrograms per liter |
| USACE | United States Army Corps of Engineers |
| VGAC | Vapor-phase granular activated carbon |
| VOCs | volatile organic compounds |

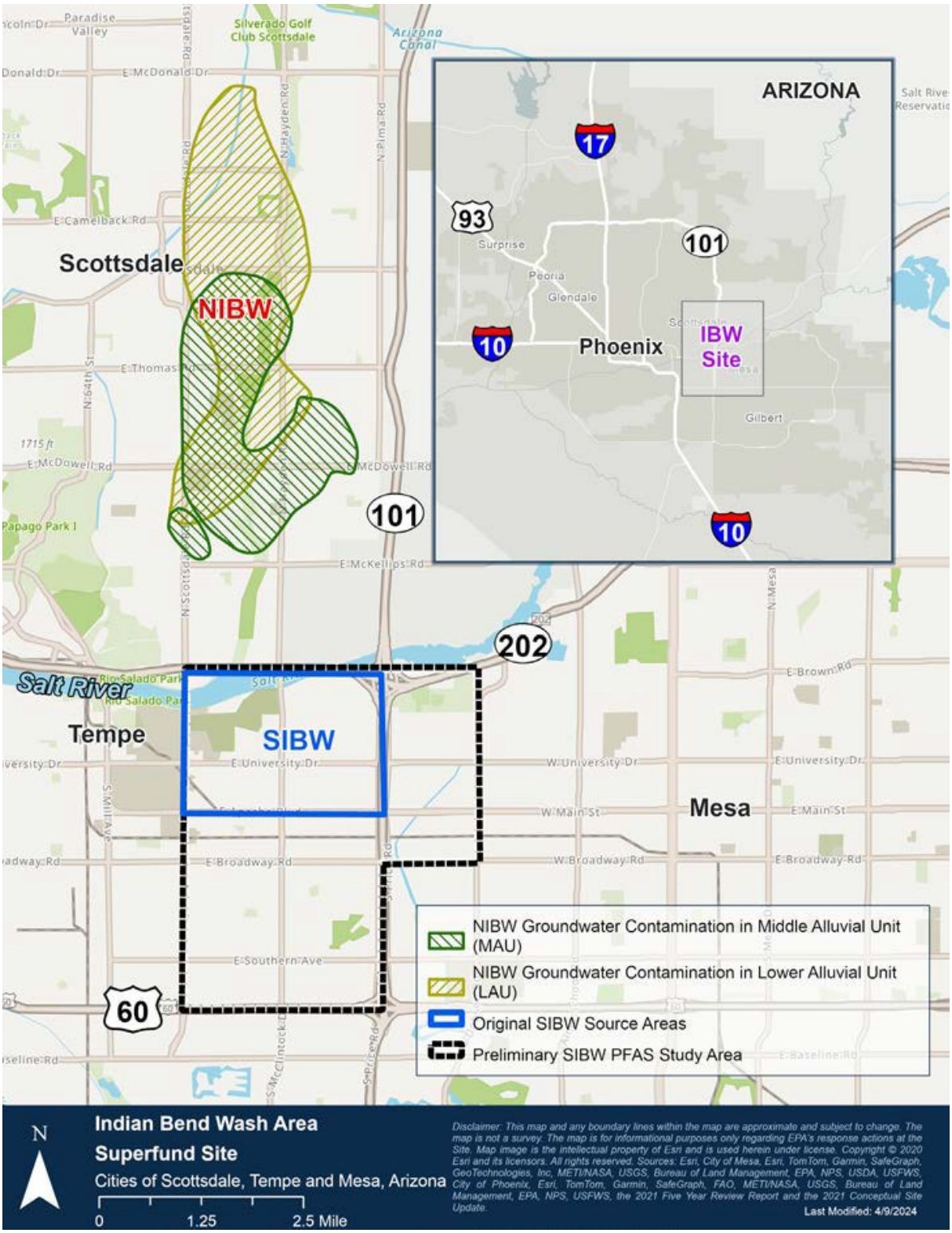
# 1. Introduction

The purpose of a Five-Year Review is to evaluate the implementation and performance of a remedy to determine whether it currently is and will continue to protect human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify any issues found during the review and document recommendations to address them.

The United States Environmental Protection Agency (EPA) is preparing this Five-Year Review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act Section 121, 40 Code of Federal Regulation Section 300.430(f)(4)(ii) of the National Contingency Plan and EPA policy.

This is the fourth Five-Year Review for the Indian Bend Wash Area Superfund Site (Site). The triggering action for this statutory review is the completion date of the previous Five-Year Review on September 27, 2021. The Five-Year Review has been prepared because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

The Site consists of two sub-sites: the North Indian Bend Wash (NIBW) and the South Indian Bend Wash (SIBW) (Figure 1).




Source: EPA, 2024, December 2024 Community Involvement Plan

**Figure 1. Indian Bend Wash Area Location Map**

The table below describes the Operable Units (OUs) at the Indian Bend Wash Area Superfund Site.

## Table 1. Operable Units

| Operable Unit | Sub-site | Media in Remedy | Remedy Status | Year of Completion | Included in this FYR |
|---|---|---|---|---|---|
| 01 North Area | North | Soil, Groundwater | Consolidated into OU8 | NA | Yes (as part of OU8) |
| 02 Scottsdale | North | Groundwater | Consolidated into OU8 | NA | Yes (as part of OU8) |
| 03 South Area Groundwater | South | Groundwater | Completed | 2020 | Yes |
| 04 Beckman Instruments | North | Soil, Groundwater | Consolidated into OU8 | NA | Yes (as part of OU8) |
| 05 Motorola | North | Soil, Groundwater | Consolidated into OU8 | NA | Yes (as part of OU8) |
| 06 Siemens | North | Soil, Groundwater | Consolidated into OU8 | NA | Yes (as part of OU8) |
| 07 South Area Soils | South | Soil | Completed | 2020 | Yes |
| 08 North Final Groundwater and Soil (Former OUs 1, 2, 4, 5, and 6) | North | Soil<br>Groundwater | Soil: complete<br>Groundwater: active | Soil: 2019<br>Groundwater: Ongoing | Yes |
| 09 PFAS Groundwater | South | Groundwater | Remedial Investigation phase | NA | No |
| 10 NIBW Area 7 Vapor Intrusion | North | Soil | Remedial Investigation phase | NA | No |

Though the NIBW sub-site has multiple Operable Units, the current remedy is consolidated in OU8 North Final Groundwater and Soil Remedy (includes former OUs 1, 2, 4, 5, and 6), which is evaluated in this Five-Year Review. The remedies at the SIBW sub-site (OU3 and OU7) have been successfully implemented and completed. The 2020 SIBW Remedial Action Completion Report documented that all media meet cleanup levels specified in the various SIBW Records of Decision. Additionally, an investigation at SIBW due to the presence of PFAS in groundwater is nearing completion (OU9). A new investigation is being conducted at NIBW to characterize the vapor intrusion source at historical source Area 7 (OU10). Because OUs 9 and 10 are in the remedial investigation phase and do not have remedies, they are not included in this Five-Year Review.

The Indian Bend Wash Area Superfund Site Five-Year Review was led by Vicky Wiraatmadja and Ethan Finkel, EPA Region 9 Remedial Project Managers. Participants included Cynthia Ruelas, EPA Region 9 Superfund Five-Year Review Coordinator; Jason Hermening, EPA Region 9 Five-Year Review Support; Renan Havill, Environmental Protection Specialist; and Dawson-HDR Services JV, LLC. The Arizona Department of Environmental Quality (ADEQ) oversees the Indian Bend Wash Area Site and works closely with the EPA as a regulatory peer. The review began on October 20, 2025.

## Table 2. Five-Year Review Summary Form

| SITE IDENTIFICATION | | |
|---|---|---|
| **Site Name:** Indian Bend Wash Area Superfund Site | | |
| **EPA ID:** AZD980695969 (North Indian Bend Wash and South Indian Bend Wash) | | |
| **Region:** 9 | **State:** AZ | **City/County:** Scottsdale and Tempe / Maricopa |
| **SITE STATUS** | | |
| **National Priorities List Status:** Final | | |
| **Multiple Operable Units?** Yes | **Has the site achieved construction completion?** Yes | |
| **REVIEW STATUS** | | |
| **Lead agency:** EPA | | |
| **Author name (Federal or State Project Manager):** Vicky Wiraatmadja | | |
| **Author affiliation:** U.S. Environmental Protection Agency, Region 9 | | |
| **Review period:** 10/20/2025 - 6/18/2026 | | |
| **Date of site inspection:** 3/10/2026 | | |
| **Type of review:** Statutory | | |
| **Review number:** 4 | | |
| **Triggering action date:** 9/27/2021 | | |
| **Due date *(five years after triggering action date)*:** 9/25/2026 | | |

## *1.1. Background*

The Site spans about 13 square miles across Scottsdale and Tempe, Arizona. Numerous industrial facilities are located in and near the Indian Bend Wash Area Site. Until the 1970s, industrial solvents containing volatile organic compounds (VOCs) were typically disposed of directly onto the ground or in dry wells by industrial facilities. These disposal practices, along with other releases, resulted in soil and groundwater contamination at the Site. In 1987, EPA divided the Indian Bend Wash Area Site into two sub-sites: NIBW, located north of the Salt River within the City of Scottsdale (Figure 2), and SIBW, located within the City of Tempe. NIBW includes 14 historical source areas, which are also shown in Figure 1.

## *1.2. Physical Characteristics*

### 1.2.1. North Indian Bend Wash

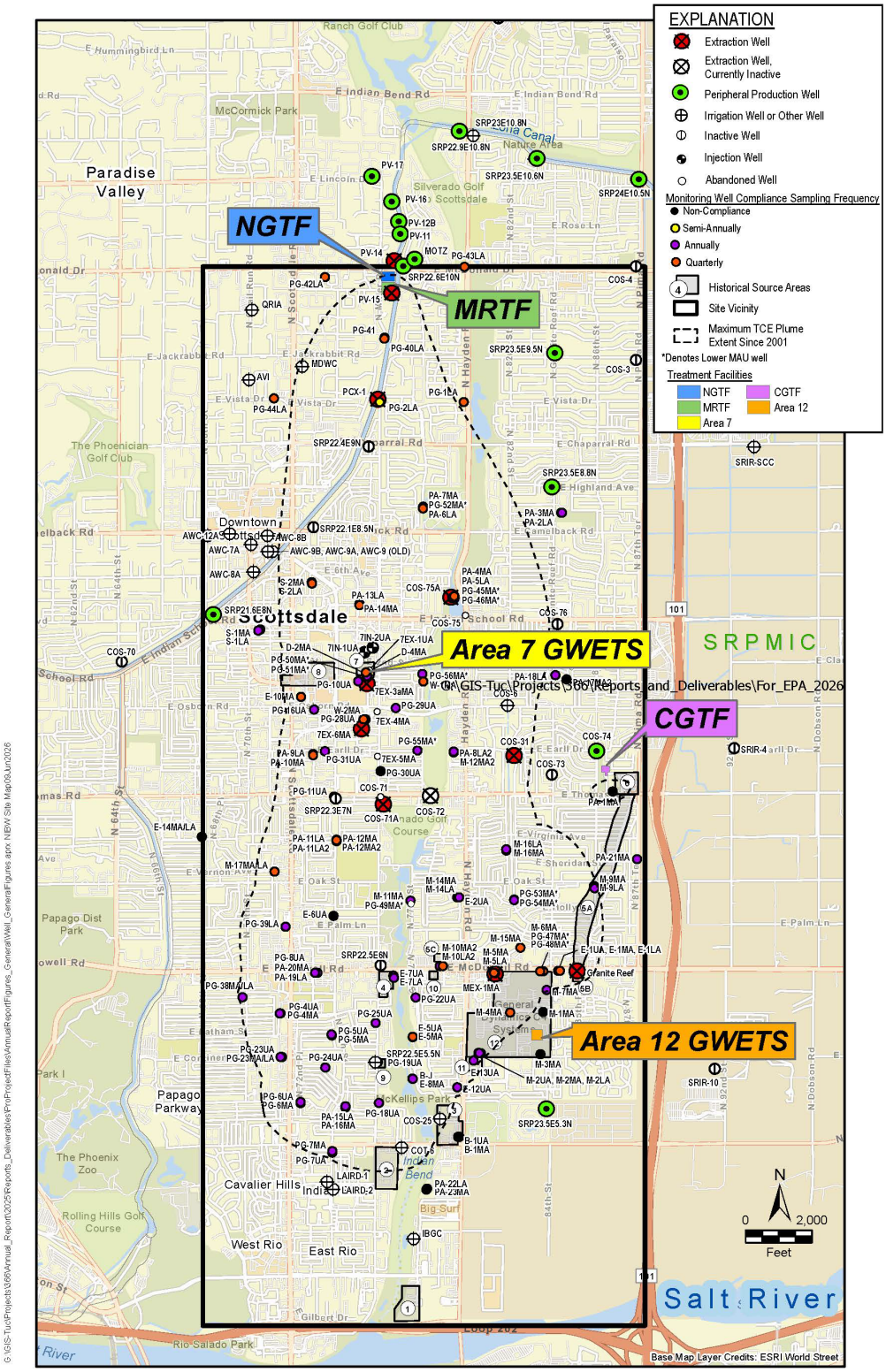
The NIBW is located north of the Salt River within the City of Scottsdale, Arizona (approximately 10 square miles). According to the United States Census Bureau, the City of Scottsdale, Arizona has an estimated population of 246,170 as of July 1, 2024. The North Indian Bend Wash lies within the southern portion of the Paradise Valley Basin physiographic region. The Paradise Valley Basin is bounded to the northeast by the McDowell Mountains, to the west by the Phoenix Mountains, and to the southwest by Camelback Mountain and Papago Buttes. The Paradise Valley Basin continues and deepens to the east. The NIBW is in the eastern portion of the Salt River Valley, an irrigated region around the lower course of the Salt River. The Salt River is seasonally fed by mountain streams near the Mogollon Rim of the Mogollon Plateau and, if there is an adequate supply of water, it flows southwest to join the Gila River in south-central Arizona. Otherwise, the Salt River is typically dry downstream of Tempe, as it flows only during major rainfall and snow events, and all water is diverted upstream of Tempe and Scottsdale.

In the NIBW area, a small number of large industrial facilities including semiconductor production, electroplating and finishing, and the aerospace industry have operated since the 1950s for various periods of time. Currently, land use in the NIBW is a mix of residential, industrial/commercial, agricultural, public parks, a cemetery, undeveloped space, and waterways. Land uses are anticipated to remain the same. The North Indian Bend Wash groundwater plume is located in a highly developed urban setting and generally bound by the Salt River to the south, McDonald Drive to the north, Pima Freeway (Loop 101) to the east, and Scottsdale Road to the west.

Environmentally sensitive areas in the North Indian Bend Wash are associated with the Indian Bend Wash and the Salt River. The United States Fish and Wildlife Service National Wetland Inventory map classifies the Salt River as a Riverine System and characterizes the numerous lakes (e.g.,

McKellips Lake) along the Indian Bend Wash as Freshwater Ponds. The southern portion of the North Indian Bend Wash lies within the 100-year flood zone of the Salt River, and the Indian Bend Wash and associated green belt areas are designated as a regulatory floodway.

Groundwater is primarily used for municipal and irrigation purposes. Complex water rights and apportionment of groundwater among various municipal, quasi-governmental, and private entities govern groundwater use in the NIBW. Several municipalities and water purveyors extract groundwater from within or adjacent to the NIBW groundwater plume. Potable water is provided by regulated water providers rather than domestic wells.




Source: NIBW PCs. 2026a. 2025 Site Monitoring Report, North Indian Bend Wash Superfund Site

**Figure 2. North Indian Bend Wash Location Map**

### 1.2.2. Hydrology

The North Indian Bend Wash lies within the Basin and Range geologic province, and the groundwater basin consists primarily of sedimentary deposits derived from erosion and uplift of the surrounding mountain blocks. Principal geologic characteristics of the sedimentary alluvial deposits in the vicinity of the North Indian Bend Wash are characterized by three distinct groundwater units: the upper alluvial unit (UAU), middle alluvial unit (MAU), and lower alluvial unit (LAU) (Figure 3).

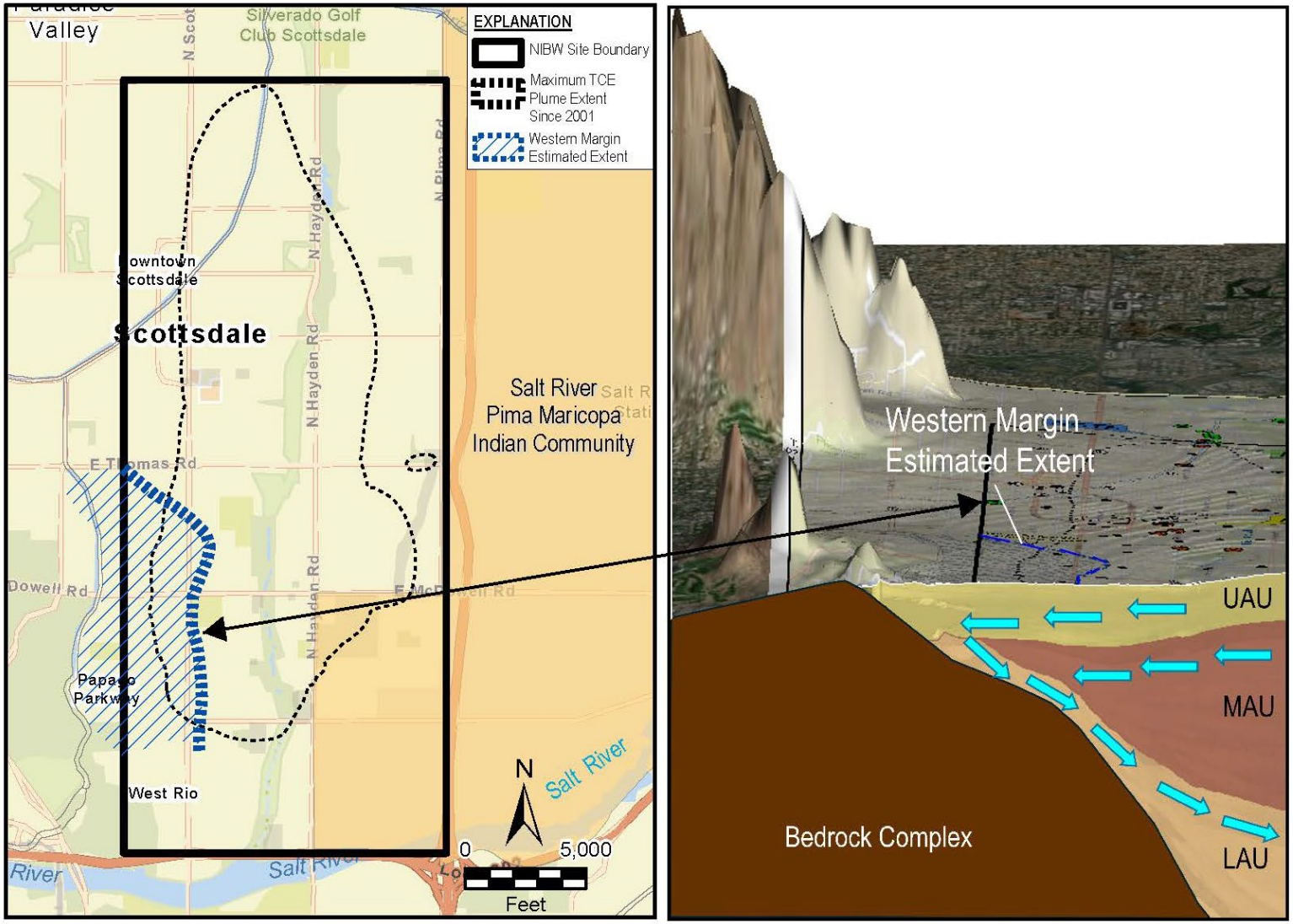
The UAU consists primarily of sand, coarse gravel, cobbles, and boulders. The depth to the water table in this unit ranges from approximately 65 feet to 104 feet below ground surface (bgs), with saturated thicknesses of 40 to 100 feet. Groundwater movement in the UAU south of McDowell Road is east to west and, in the northern part of the area near Thomas Road, shifts to northeast to southwest. Groundwater in the UAU flows toward the southwest margin of the NIBW Site boundary, where bedrock is encountered, and there it moves vertically into the underlying alluvial units. The UAU is not used for potable supply.

The MAU primarily consists of silt, clay, and interbedded fine sands that transmit most of the water within the unit. The unit's thickness ranges from approximately 360 to 660 feet. Water elevations in wells screened within this unit are hydraulically confined and occur at depths of approximately 90 and 150 feet bgs. Groundwater flow within the MAU is generally from the northeast to the southwest toward the western margin where bedrock is encountered and the Papago Buttes form an alluvial fan. At the western margin, groundwater in the middle alluvial unit merges with the lower alluvial unit and flows northward toward the Paradise Valley extraction wells.

The LAU consists of cemented gravel, boulders, sand, sandy clay, and silty sand, with some interbedded clayey zones. The LAU is coarser-grained than the MAU and is the principal alluvial unit in the region for irrigation and drinking water. This unit is at least 500 feet thick and likely exceeds 700 feet in some parts of the Site. The LAU thins out at the basin margin, near the southwest margin where bedrock is exposed, and near the mountainous part of Paradise Valley. Water elevations in wells screened in the lower alluvial unit are under confined conditions and occur at depths of approximately 129 to 341 feet.

Large production wellfields located north of the NIBW groundwater plume draw groundwater primarily from the LAU and, to a lesser extent, the MAU. At the western margin of the basin, groundwater in the upper and middle alluvial units flows into the LAU due to its lower hydraulic head. Groundwater flow in the NIBW plume is complex and although recent conceptual site

model and particle tracking updates in 2024 and 2025 have shown that the current conceptual site model is reflective of Site and Regional conditions, additional model updates and refinements should continue as needed. Further discussion of the hydrogeology of the NIBW can be found in Section 4.2.1 and Appendix C.




Source: NIBW PCs. 2026a. 2025 Site Monitoring Report, North Indian Bend Wash Superfund Site

**Figure 3. Groundwater Flow in Alluvial Units and Western Margin**

# 2. Remedial Actions Summary

## *2.1. Basis for Taking Action*

In 1981, trichloroethene (TCE) was detected in the groundwater at several Scottsdale and Salt River Project municipal wells at concentrations exceeding the Arizona Department of Health Services action levels and federal drinking water standards (also known as Maximum Contaminant Levels [MCLs]). EPA then sampled additional wells in the surrounding areas, including the City of Tempe production wells, and found TCE and tetrachloroethene (PCE) concentrations in some of the City of Tempe production wells were above federal drinking water standards. The presence of these contaminants in the drinking water, above federal drinking water standards, was the initial basis for taking action in groundwater. The results on subsequent investigations indicated vadose zone[1] contamination could threaten ground-water quality, and this was the basis for taking action in soil.

At NIBW, the contaminants are TCE, PCE, chloroform, 1,1-dichloroethene (1,1- DCE), and 1,1,1-trichloroethane (1,1,1-TCA) in soil and groundwater. Risk assessments were performed for both groundwater and soil. The risk assessment for groundwater concluded the highest potential cancer risk would have been approximately $3.8 \times 10^{-5}$ if water from contaminated supply wells within the NIBW was served to individuals without treatment. Since those drinking supply wells were taken out of service, there has been no long-term human exposure to the contamination in the groundwater. The risk assessment for soils concluded that the greatest risk associated with contaminated soil was impact to groundwater. Thus, soil cleanup actions were taken at specific areas of NIBW because it was determined that VOCs in the soil, if left unaddressed, would contribute to the groundwater contamination. A review of potential ecological receptors concluded there were no significant completed pathways of significance.

[1] The vadose zone, also termed the unsaturated zone, extends from the top of the ground surface to the water table.

## *2.2. Remedy Selection*

### 2.2.1. North Indian Bend Wash

**Summary of 1988 Groundwater ROD**

The remedy established in the 1988 ROD for NIBW groundwater included extraction and treatment to address VOCs in the middle alluvial unit and lower alluvial unit in the Scottsdale area. The remedial action objectives in the 1988 ROD are to protect public health and the environment by protecting unaffected public supply wells from VOCs; to provide a mechanism for the long-term management of the contaminated groundwater; and to provide a potable water source for the City of Scottsdale within the constraints of projected water demands.

**Summary of 1991 Shallow Soils and Groundwater ROD**

In September 1991, EPA issued the Shallow Soils and Groundwater ROD (EPA, 1991) and selected additional remedial actions for the vadose zone and upper alluvial unit, neither of which were addressed in the 1988 ROD (EPA, 1991).

Soil vapor extraction was chosen as the selected remedy for the vadose zone for Areas 3, 5, 6, 7, 8, 9, 11, and 12. The remaining Areas (Areas 1, 2, 4, 10, and City of Scottsdale wells) were determined by EPA to not warrant further action unless additional data indicated those Areas required action. Subsequent field investigation data and results of modeling indicated concentrations of VOCs in the vadose zone in Areas 3, 5, 6, 9, and 11 did not represent a threat to underlying groundwater and therefore did not require vadose zone remediation. The remedy also included expanded groundwater monitoring in the upper and middle alluvial units. The remedial action objectives for the vadose zone and upper alluvial unit were to: remove the potential for continued groundwater contamination due to migration of contamination from the vadose zone and reduce VOC mass in the vadose zone to levels that no longer threaten to contaminate underlying groundwater.

**Summary of the 2001 ROD Amendment**

The purpose of the 2001 ROD Amendment was to select a final remedial action for the NIBW and consolidate previous actions, including the former voluntary actions, into one final document. The 2001 ROD Amendment addresses aquifer restoration by containment, treatment, and monitoring of contaminants in groundwater, as well as soil remediation actions. The remedial action objectives for the NIBW, as outlined in the 2001 ROD Amendment, are:

- Restore the Upper, Middle, and Lower Aquifers to drinking water quality by decreasing the concentrations of the contaminants of concern to below the Cleanup Standards.
- Protect human health and the environment by eliminating exposure to contaminated groundwater.
- Provide the City of Scottsdale with a water source that meets MCLs for North Indian Bend Wash volatile organic compounds.
- Achieve containment of the groundwater contamination plume by preventing any further lateral migration of contaminants in groundwater.
- Reuse of the water treated at the Site to the extent possible in accordance with Arizona's Groundwater Management Act.
- Mitigate any soil contamination that continues to impact groundwater.
- Provide long-term management of contaminated groundwater to improve the regional aquifer's suitability for potable use.

The selected remedy included the following requirements and actions:

- Groundwater containment in the middle and lower aquifers to prevent further migration of the groundwater contamination plumes;
- Localized focus on groundwater containment including contingency actions at Areas 7 and 12 to prevent migration of the contaminants in these specific areas from migrating to the southwest margin;
- Restoration of the upper, middle, and lower aquifers to drinking water quality by decreasing the concentrations of the contaminants of concern to below the cleanup standards;
- Treatment of extracted groundwater using ultraviolet oxidation at the Area 7 treatment system and air stripping technologies at all treatment systems;
- Groundwater monitoring in the upper, middle, and lower aquifers to verify and evaluate plume control and overall effectiveness of the remedy;
- Continued evaluation of remedy effectiveness based on periodic updates to the groundwater model; and
- Completion of soil cleanup actions using soil vapor extraction which were required by a North Indian Bend Wash ROD issued in 1991.

The remedy enhancements, which were conducted voluntarily outside the scope of the previous RODs and necessary to achieve capture of the groundwater contamination plume, were adopted as part of the selected remedy described in the 2001 ROD Amendment.

Standards for discharging treated groundwater into the municipal supply include the North Indian Bend Wash cleanup levels for potable end use, Arizona Pollutant Discharge Elimination System requirements for discharge of treated groundwater to surface water, and Aquifer Protection Permit substantive requirements for injection back into the aquifer.

The NIBW cleanup levels were selected from the EPA Safe Drinking Water Act standards, with the exception of chloroform, which was selected from the EPA health-based guidance (Table 3). Soil gas cleanup levels were not selected; rather, the goal of soil vapor extraction was to achieve a residual distribution and mass of VOCs in the vadose zone that does not threaten to contaminate underlying ground water. Soil gas cleanup was evaluated based on whether the mass indicated that VOC flux would impact groundwater to above the groundwater cleanup levels.

## Table 3. Groundwater Cleanup Levels from 2001 ROD Amendment

| Chemical | Cleanup Levels (µg/L) | Basis for Cleanup Level[2] |
|---|---|---|
| PCE | 5 | Federal MCL |
| 1,1-DCE | 6 | Federal MCL |
| 1,1,1-TCA | 200 | Federal MCL |
| Chloroform (trichloromethane) | 6 | Federal Ambient Water Quality Criteria |
| TCE | 5 | Federal MCL |

**Summary of the 2012 Explanation of Significant Differences**

In 2012, EPA signed an Explanation of Significant Differences (ESD) and selected a change in the treatment technology and end-use for one remedy well only (well PCX-1), which had been part of the groundwater remedy for the Miller Road Treatment Facility selected in the 2001 ROD Amendment. For PCX-1, the treatment technology and facility were changed to liquid granular activated carbon at the North Indian Bend Wash Granular Activated Carbon Treatment Facility, and the delivery of treated water to was changed to the City of Scottsdale's Chaparral Water Treatment Plant. These changes were in response to two incidents of contaminated groundwater entering the Arizona American Water Company Paradise Valley Arsenic Removal Facility and, subsequently, the potable supply system in 2007 and 2008 (one incident each

[2]The more stringent of the Federal or State drinking water standard was selected as the basis for the groundwater cleanup level. Drinking water standards are the maximum permissible concentration of a chemical in water considered safe to drink, as established by the Safe Drinking Water Act. These are also referred to as MCLs.

year). Immediately following the 2008 incident, Arizona American Water Company indicated it was no longer willing to accept the treated water from PCX-1.

The ESD changed the treatment technology to a liquid-phase granular activated carbon system from air stripping, the previous remedy. The Remedial Action Objectives and cleanup standards specified in the 2001 ROD Amendment did not change as a result of the ESD.

## *2.3. Remedy Implementation*

### 2.3.1. North Indian Bend Wash

There are five treatment facilities associated with the remedy: the Central Groundwater Treatment Facility, North Indian Bend Wash Granular Activated Carbon Treatment Facility, Miller Road Treatment Facility, Area 7 Groundwater Extraction and Treatment System, and Area 12 Groundwater Extraction and Treatment System (Figure 4 and Table 4). More than 85 percent of extracted groundwater is treated and recycled for use as a municipal water supply by the City of Scottsdale, EPCOR Water USA, and the Salt River Project.

The Central Groundwater Treatment Facility began operating in 1994 and was constructed by the North Indian Bend Wash Participating Companies[3] (Participating Companies) and is owned and operated by the City of Scottsdale. Groundwater extraction is performed at up to three supply wells to the Central Groundwater Treatment Facility. The Central Groundwater Treatment Facility treats the contaminated groundwater using air stripping and provides treated water to the City of Scottsdale for use as part of their municipal water supply. Treated water can also be discharged to the Salt River Project water supply system.

The Miller Road Treatment Facility was constructed in 1997 by the North Indian Bend Wash Participating Companies to capture and remove groundwater affected by contaminants in the northern area's lower alluvial unit. Groundwater extraction is performed at two supply wells that are individually connected to the Miller Road Treatment Facility by buried piping. The treatment facility consists of three air stripper towers and provides treated water to EPCOR Water USA.

The North Indian Bend Wash Granular Activated Carbon Treatment Facility, adjacent to the Miller Road Treatment Facility, began operating in 2013, is owned by the North Indian Bend

[3] Companies that are potentially responsible for, or contributing to, a spill or other contamination at a Superfund site. At North Indian Bend Wash, these companies are conducting the cleanup of the Site under EPA oversight.

Wash Participating Companies, operated by City of Scottsdale, and provides plume containment for the northern extent of the groundwater plume. The North Indian Bend Wash Granular Activated Carbon Treatment Facility was constructed to treat groundwater extracted from well PCX-1. Liquid-phase granular activated carbon is used to remove contaminants, and the treated water is blended into the potable supply for the City of Scottsdale. Treated water can also be discharged to the Salt River Project water supply system.

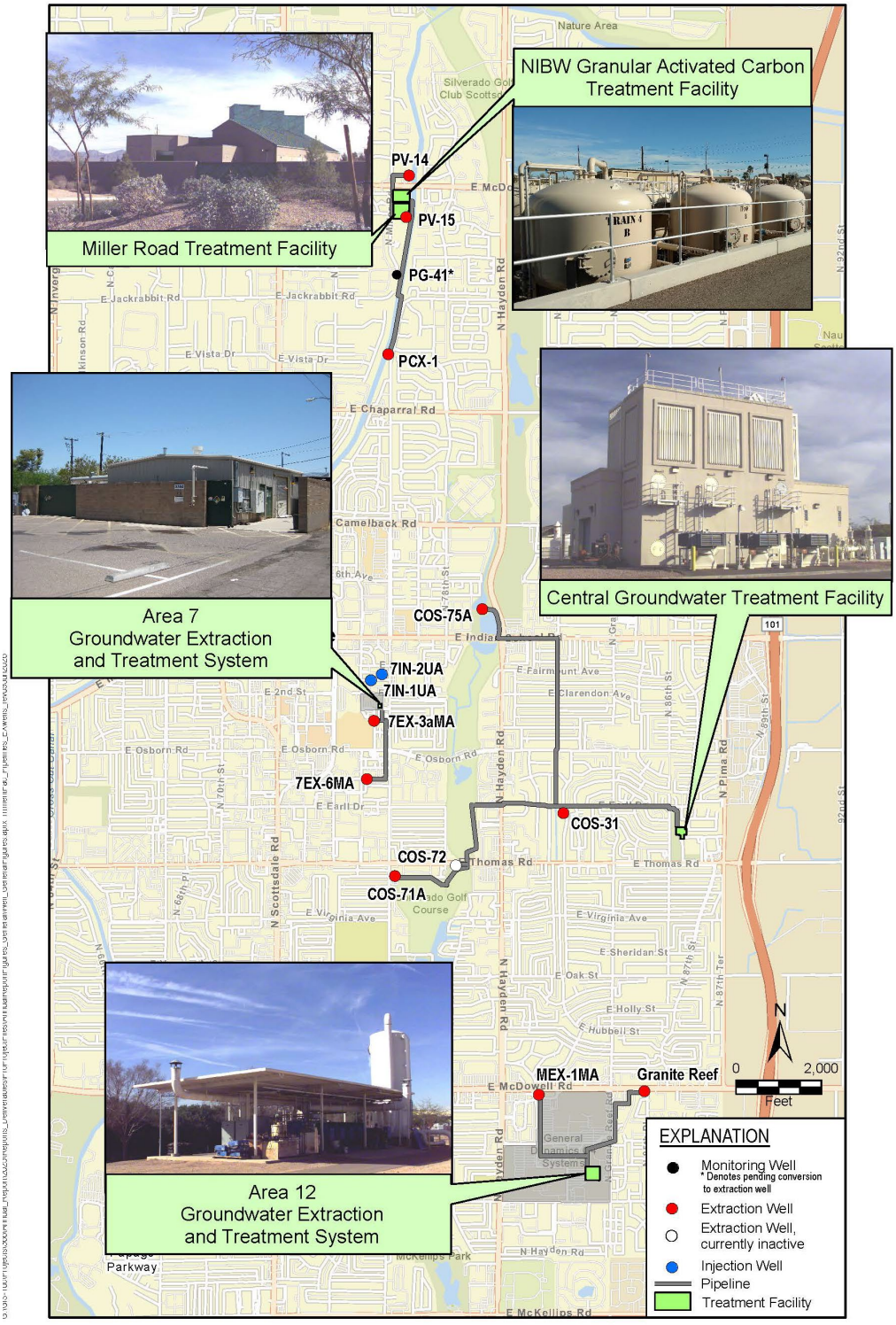
The Source Area 7 Groundwater Extraction and Treatment System was constructed in 1999 by the North Indian Bend Wash Participating Companies to extract groundwater from two middle alluvial unit wells. It includes a 5,000-gallon equalization tank to balance influent flows; ultraviolet light/chemical oxidation system; low-profile air stripper to remove any remaining volatile organic compounds from the effluent stream; and vapor-abatement system using granular activated carbon. At Area 7, extracted water is re-injected into the upper alluvial unit as part of plume containment.

The Source Area 12 Groundwater Extraction Treatment System was constructed in 1999 by the North Indian Bend Wash Participating Companies to extract groundwater from two middle alluvial unit wells and is located at the former Motorola facility. Extracted water is treated by air stripping before being discharged to the Salt River Project water supply system through a connection to a Salt River Project lateral pipeline located in Granite Reef Road.

The Area 6, 8, and 12 soil vapor extraction systems began operating in the mid-1990s and were decommissioned by 2000 by the North Indian Bend Wash Participating Companies based on performance data and groundwater protection criteria specified in the ROD. The Area 7 soil vapor extraction system operated intermittently from July 1994 to December 2000 with pauses for rebound testing and initial shakedown of the Area 7 Groundwater. After long-term rebound testing, the Area 7 soil vapor extraction system then briefly operated between 2008 and 2010. The Area 7 soil vapor extraction treatment system was decommissioned in 2015 based on performance data and meeting groundwater protection criteria specified in the ROD. All soil vapor extraction systems at North Indian Bend Wash have been decommissioned.

In addition, the state of Arizona implements institutional controls that limit potential exposure to contaminated groundwater. These include well installation permits, regulation of well construction, and the Arizona Well Spacing and Impact Rules, which prevent adverse effects on wells used for cleanup activities.

The remedy was considered construction complete in 2006, after documenting that the remedy facilities are operational and functional.




Source: NIBW PCs. 2026a. 2025 Site Monitoring Report, North Indian Bend Wash Superfund Site

**Figure 4. North Indian Bend Wash Treatment Facilities**

## Table 4. North Indian Bend Wash Groundwater Extraction and Treatment Facilities

| Treatment Facility | CGTF | MRTF | NGTF | Area 7 GWETS | Area 12 GWETS |
|---|---|---|---|---|---|
| **Treatment System Owner** | City of Scottsdale | EPCOR | NIBW PCs | NIBW PCs | NIBW PCs |
| **Primary Operator** | City of Scottsdale | EPCOR | City of Scottsdale | NIBW PCs | NIBW PCs |
| **Start of Operation to Treat VOCs** | 1994 | 1997 | 2013 | 1999 | 1999 |
| **Principal Remedy Function** | MAU/LAU capture and treatment | Northern LAU capture and treatment | Northern LAU capture and treatment | MAU source control capture and treatment | MAU source control capture and treatment |
| **Extraction Wells tied to Treatment and (Aquifer Unit)** | COS-75A (LAU)<br>COS-71A (MAU)<br>COS-72 (MAU/LAU)*<br>COS-31 (MAU/LAU) | PV-14 (LAU)**<br>PV-15 (LAU)** | PCX-1 (LAU)** | 7EX-3aMA (MAU)<br>7EX-6MA (MAU) | MEX-1MA (MAU)<br>Granite Reef (MAU) |
| **Treatment Technologies** | Air stripping | Air stripping | Granular Activated Carbon | Ultraviolet oxidation and air stripping | Air stripping |
| **Treatment Standards** *** | NIBW Cleanup Standards | NIBW Cleanup Standards | NIBW Cleanup Standards & AZPDES Permit | NIBW Cleanup Standards | NIBW Cleanup Standards & AZPDES Permit |
| **Treated Groundwater End Use** | Municipal supply for the City of Scottsdale or discharged to the SRP water supply system via the Grand Canal | Delivered to EPCOR for municipal use | Municipal supply for the City of Scottsdale or delivered to the SRP water system via the Arizona Canal | Injection to UAU using wells 7IN-1UA and 7IN-2UA | Discharged to the SRP water supply system via McKellips Lake |

**EXPLANATION:**

APP = Aquifer Protection Permit
EPCOR = EPCOR Water USA
SRP = Salt River Project

* The pump motor at COS-72 failed in January 2024 and its status is currently inactive, pending results of further evaluation.
** Extraction wells are also used as influent samples for treatment facilities.
*** See **Table 2** for NIBW Cleanup Standards; AZPDES compliance monitoring is submitted under separate cover in monthly Discharge Monitoring Reports (DMRs).

Source: NIBW Participating Companies (2026), 2025 North Indian Bend Wash Annual Site Monitoring Report.

## *2.4. System Operations/Operation and Maintenance*

### 2.4.1. Operations and Maintenance Requirements

#### 2.4.1.1 North Indian Bend Wash

The February 2026 Operation and Maintenance Plan outlines the general operation and maintenance activities for the groundwater extraction well network and five treatment plants associated with the NIBW remedy. NIBW operation and maintenance activities include groundwater monitoring, extraction, and treatment conducted by the North Indian Bend Wash Participating Companies.

Groundwater monitoring at North Indian Bend Wash includes the collection, analysis, and reporting of water level, water quality, and pumping data from a network of groundwater monitoring, extraction, peripheral production, irrigation, and other water wells completed in the upper, middle, and lower alluvial units. Groundwater level monitoring is conducted semi-annually, using a network of 76 monitoring wells in April and 104 in October. For the groundwater monitoring program, EPA approved the use of HydraSleeve™ sampling when aging dedicated pumps failed, making their use impractical at monitor wells. Between 2016 and 2020, 23 wells were transitioned to long-term use of the HydraSleeve™ sampling protocol after their pumps failed. Twelve additional wells were transitioned to HydraSleeve™ sampling until the pump in the well could be replaced within that period.

Groundwater extracted at the five treatment systems is discharged either to municipal water systems or into Salt River Project water system, except in Area 7, where treated water is reinjected into the upper alluvial unit. Sampling is conducted in accordance with the requirements of the approved Sampling and Analysis Plan and the treatment facility Operation & Maintenance Plans. The groundwater extraction well sites are visited at least monthly for routine operation and maintenance and contaminant sampling. Well sites may be visited more frequently at the operators' discretion.

### 2.4.2. Significant Operations and Maintenance over the Past Five Years

- A temporary alternative communication system was implemented at the Area 7 groundwater extraction and treatment system (GWETS) in March and April 2022 due to an electrical storm that caused a failure of the communication system. The new communication system was received in October 2022 and installed in November 2022.
- Extraction well 7EX-4MA in Area 7 of the North Indian Bend Wash was rehabilitated but not reinstated after a failed attempt to install a pre-packed casing liner. As a result, the well was deemed impracticable in 2022 and decommissioned in December 2023.

- Extraction Well COS-71A was rehabilitated in April 2023 and will be reinstated to improve capture from the middle aquifer unit.
- Communication system upgrades for the Central Groundwater Treatment Facility (CGTF) were completed in 2023 and 2024. These upgrades included a voltage regulator and new process logic controllers. Additionally, a logic timer was added to the newly installed cellular modem at extraction well 7EX-6MA to improve well uptime.
- Monitoring well PG-49MA, a Lower MAU monitoring well, was abandoned due to an obstruction in the well in December 2025.

# 3. Progress Since the Last Five-Year Review

## *3.1. Previous Five-Year Review Protectiveness Statement and Issues*

The protectiveness statement from the 2021 Five-Year Review for the North Indian Bend Wash Site stated the following:

> *The North Bend Indian Wash remedy is currently protective of human health and the environment. Short-term vapor intrusion mitigation measures are in place at the two buildings adjacent to Area 7. However, to be protective in the long term, the vapor intrusion concerns at Area 7 need to be permanently addressed, the extent of the vapor intrusion source at Area 7 needs to be defined and remediated. The Northern Groundwater Treatment Facility provides plume containment for the northern extent of the groundwater plume and prevents the groundwater plume from moving further north into the production wells. For the remedy to be protective in the long-term, the extent of the groundwater flow at the Western Margin needs to be more thoroughly defined. The communication system at the Central Groundwater Treatment Facility needs to be upgraded to prevent further accidental releases. The Remedy Optimization study, once completed, is expected to provide specific recommendations that ensure long term protectiveness.*

The protectiveness statement from the 2021 Five-Year Review for the South Indian Bend Wash Site stated the following:

> *The South Indian Bend Wash remedy is currently protective, following successful attainment of remedial action objectives for volatile organic contaminants, which now meet drinking water standards. The vapor intrusion evaluation required by the second Five-Year Review has been completed; the results of recent soil gas sampling concluded no further action was necessary to address vapor intrusion risk as health-based criteria*

*were not exceeded for either commercial/industrial or residential use at any of the former source areas. However, for the remedy to be protective in the long term, the recent finding of PFAS in monitoring wells and the shutdown of City of Tempe Municipal Supply wells due to the presence of PFAS requires starting a remedial investigation to determine the extent and sources of the PFAS contamination and ultimately a new remedy. The monitored natural attenuation remedy is not expected to be effective for PFAS contaminants that do not naturally degrade. The PFAS Remedial Investigation is expected to begin next year.*

The Third Five-Year Review included seven issues and recommendations. Each recommendation and the current status is discussed below.

## Table 5. Status of Recommendations from the 2021 Five-Year Review

| OU # | Issue | Recommendations | Current Status | Current Implementation Status Description | Completion Date (if applicable) |
|---|---|---|---|---|---|
| North Indian Bend Wash (OU8) | The trend of increasing concentrations of PCE in the lower aquifer monitoring well S-1LA in the North Indian Bend Wash could indicate that the plume may not be contained on the western edge of the lower aquifer potential impacting peripheral production wells. | Model the impact of pumping of peripheral production wells on plume containment in the vicinity of well S-1LA. Perform additional field investigation as warranted to determine if groundwater is contained or migrating off-site north and west of monitoring well S-1LA. | Completed | A 2024 Conceptual Site Model Update was finalized in December 2025. Additionally, the 2024 Groundwater Flow and Particle Tracking Model Update Report was finalized April 3, 2026. | 4/3/2026 |

| OU # | Issue | Recommendations | Current Status | Current Implementation Status Description | Completion Date (if applicable) |
|---|---|---|---|---|---|
| North Indian Bend Wash (OU8) | The NIBW groundwater flow and 3D visualization models are still under review.<br>An independent Remedy Optimization Study is currently underway by EPA Headquarters to improve the conceptual site model, identify data gaps and recommend specific actions that could be implemented to improve long term protectiveness and cost-efficiency to facilitate progress towards site completion. | Complete the review of the groundwater model and Remedy Optimization Study. | Completed | EPA Optimization Review was completed in December 2024. The 2024 Groundwater Flow and Particle Tracking Model Update Report was finalized April 3, 2026. | 4/3/2026 |
| North Indian Bend Wash (OU8) | Although the remedy has been in operation for several years, the timeframe to achieve remedial action objectives is unknown, which complicates evaluation of remedy effectiveness or effectiveness of optimization enhancements. | Integrate a contaminant fate and transport model into the existing groundwater flow model and estimate remedial timeframes. | Ongoing | There are ongoing discussions regarding the integration of contaminant fate and transport into an updated model. | |

| OU # | Issue | Recommendations | Current Status | Current Implementation Status Description | Completion Date (if applicable) |
|---|---|---|---|---|---|
| North Indian Bend Wash (OU8) | There is a remaining small, localized mass of contamination source within Area 7. A confirmed complete pathway for vapor intrusion exists near this source area. Soil Vapor Extraction was previously employed at Area 7 to address impacts to groundwater but did not remove contamination within the tight caliche soils in the shallow vadose zone. | Collect soil core samples within the vicinity of the source area using high resolution site characterization to better delineate the extent of contamination in this area. Consider conducting a pilot test of thermal remediation to permanently reduce contaminant concentrations and vapor intrusion risk. | Ongoing | Vapor intrusion investigation initiated under new Operable Unit (OU10) in 2026 and will be tracked in OU10 in the future. | |
| North Indian Bend Wash (OU8) | There continues to be system communication issues between the extraction network and treatment system at the Area 7 Treatment Facility which have resulted in additional accidental leaks at the air relief valves. | Complete the upgrade for the communications system for the Area 7 Treatment Facility. | Completed | The communications system has been upgraded. | 11/1/2022 |
| North Indian Bend Wash (OU8) | Pumping efficiency at Area 7 has been reduced since the shutdown of higher concentration well 7EX-4MA in 2016 due to reduced pumping efficiency; rehabilitation of Well 7EX4-MA has yet to be completed. | Complete the rehabilitation of well 7EX-4MA as soon as possible or consider well replacement to optimize the hydraulic capture and remediate the highest concentrations. | Completed | Well 7EX-4MA was rehabilitated but due to a failed attempt to install a pre-packed casing liner, the well was abandoned in 2023. | 12/1/2023 |

| OU # | Issue | Recommendations | Current Status | Current Implementation Status Description | Completion Date (if applicable) |
|---|---|---|---|---|---|
| South Indian Bend Wash (OU3) | PFAS were detected in the South Indian Bend Wash monitoring wells above the EPA health advisory level, warranting additional investigation beyond the scope of the RODs. | Initiate a new Remedial Investigation and Feasibility Study and the selection of a new remedy to address PFAS. | Completed | PFAS investigation initiated under new Operable Unit (OU9) in 2022 and is no longer tracked as part of OU3. | 7/7/2022 |

In addition, the recommendations that improve performance of the remedy but do not affect current and/or future protectiveness and were identified during the previous Five-Year Review are presented in Table 6.

## Table 6. Status of Other Findings from the 2021 Five-Year Review

| OU Name | Recommendation | Current Status | Current Implementation Status Description | Completion Date (if applicable) |
|---|---|---|---|---|
| North Indian Bend Wash (OU8) | Field work to collect additional confirmation indoor samples from the apartment has been on hold due to travel and access issues resulting from the COVID-19 pandemic. EPA will resume working with the property owner to improve mitigation measures for vapor intrusion in the event center as restrictions are lifted. | Completed | Indoor air sampling at the apartments resumed in October 2021. A sub-slab depressurization system was installed at the Event Center in April 2023, and subsequent indoor air monitoring was reported in 2024. | 11/25/2024 |

## *3.2. Work Completed at the Site During this Five-Year Review Period*

### 3.2.1. North Indian Bend Wash

Five groundwater treatment systems have operated over the past five years at North Indian Bend Wash. A total of 79,222 acre-feet of water has been treated and 7,709 pounds of TCE removed via these treatment systems between 2021 and 2025. Table 7 presents the volume of groundwater extracted and mass of TCE removed at each of the five North Indian Bend Wash treatment facilities (NIBW PCs, 2022, 2023, 2024, 2025a, and 2026a).

**Table 7. Groundwater Extraction and TCE Mass Removed (2021-2025)**

| Treatment Facility | Year | Volume Pumped and Treated (acre feet) | TCE Mass Removed (pounds) |
|---|---|---|---|
| Central Groundwater Treatment Facility | 2021 | 4,476 | 307 |
| | 2022 | 4,075 | 287 |
| | 2023 | 2,870 | 114 |
| | 2024 | 3,930 | 219 |
| | 2025 | 4,149 | 231 |
| Miller Road Treatment Facility | 2021 | 5,121 | 48 |
| | 2022 | 6,743 | 54 |
| | 2023 | 6,242 | 43 |
| | 2024 | 6,465 | 48 |
| | 2025 | 6,818 | 46 |
| North Granular Activated Carbon Treatment Facility | 2021 | 2,916 | 377 |
| | 2022 | 3,281 | 396 |
| | 2023 | 2,948 | 339 |
| | 2024 | 3,251 | 396 |
| | 2025 | 3,188 | 350 |
| Area 7 Groundwater Extraction and Treatment System | 2021 | 229 | 301 |
| | 2022 | 187 | 201 |
| | 2023 | 482 | 652 |
| | 2024 | 505 | 634 |
| | 2025 | 434 | 447 |
| | 2021 | 2,435 | 526 |

| Treatment Facility | Year | Volume Pumped and Treated (acre feet) | TCE Mass Removed (pounds) |
|---|---|---|---|
| Area 12 Groundwater Extraction and Treatment System | 2022 | 2,276 | 450 |
| | 2023 | 2,182 | 419 |
| | 2024 | 1,822 | 402 |
| | 2025 | 2,197 | 422 |

The North Indian Bend Wash Participating Companies finalized the following update reports for North Indian Bend Wash over the past five years: Conceptual Model Update, and Groundwater Flow and Particle Tracking Model Update. EPA finalized an Optimization Review in December 2024.

A 2024 Conceptual Site Model Update was finalized in December 2025 to support groundwater remedy optimization, model refinement, and this Five-Year Review. The updates provided integrated evaluations of hydrogeologic conditions, TCE plume behavior, and remedy performance at the North Indian Bend Wash Superfund Site.

Additionally, North Indian Bend Wash Participating Companies finalized a 2024 Groundwater Flow and Particle Tracking Model Update in April 2026, which refined and improved the groundwater flow model used by the technical team to support remedy evaluations. Site-specific and regional data available through 2024 were used to create this numerical model to support evaluation of (1) overall hydraulic containment for the Site Monitoring Report, (2) remedy performance in relation to specific Groundwater Monitoring and Evaluation Plan metrics, (3) impacts on remedy capture from planned or potential changes to groundwater pumping and/or recharge, (4) benefits from planned or potential remedy enhancements, (5) impacts from potential worst-case remedy downtime situations, and (6) impacts from future surface water shortages and drought conditions.

In January 2024, EPA requested that the North Indian Bend Wash Participating Companies voluntarily conduct PFAS sampling of the CGTF and NGTF, active extraction wells, and monitoring wells at the North Indian Bend Site. In April and October 2024, the Participating Companies conducted PFAS sampling at treatment systems and at associated active extraction and monitoring wells. At the time of this Five-Year Review, results for this sampling have not been reported and validated and are, therefore, not included herein.

In December 2024, the EPA completed an Optimization Review of the North Indian Bend Wash Superfund Site. The Optimization Review included recommendations on mass removal effectiveness at Area 7, groundwater fate and transport modeling, and a better understanding of the role back-diffusion plays in TCE plume stability and the rate of natural attenuation, as well as other potential recommendations for the technical team to consider.

The North Indian Bend Wash Participating Companies submitted a Technical Memorandum regarding a Groundwater Monitoring and Evaluation Plan Update to the North Indian Bend Groundwater Monitoring and Evaluation Plan Working Group, which includes Technical Committee representatives from the Salt River Project, the City of Scottsdale, Arizona Department of Environmental Quality, and the EPA, in December 2025. This Technical Memorandum includes proposed revisions to the evaluation of remedy performance, which will be re-evaluated following the 2025 Site Monitoring Report. Following this evaluation, final recommendations will be developed, and an updated Groundwater Monitoring and Evaluation Plan will be prepared for review, revision, and adoption by the Working Group for future Site Monitoring Reports.

Based on findings in the second Five-Year Review, the North Indian Bend Participating Companies conducted activities to evaluate and address potential vapor intrusion risk at the Site between 2016 and 2018, with follow-up activities focused on mitigating vapor intrusion risk at Area 7 continuing between 2018 and 2025. These activities included installation, operation, and maintenance of vapor mitigation systems. The third Five-Year Review concluded that the vapor intrusion source area at Area 7 should be characterized and addressed to ensure long-term protectiveness at the Site. In July 2026, EPA entered into an agreement with Siemens Corporation and the City of Scottsdale to perform a remedial investigation and feasibility study for vapor intrusion at Area 7 of the North Indian Bend Wash Superfund Site.

# 4. Five-Year Review Process

## *4.1. Community Notification, Involvement and Site Interviews*

### 4.1.1. Five-Year Review Community Notification

EPA issued a public notice on February 12, 2026, (https://www.epa.gov/aboutepa/f9-fy2026-superfund-reviews) stating that EPA will be reviewing site cleanups and remedies at Superfund sites in California and Arizona, including the Indian Bend Wash Superfund Site. A copy of the public notice is presented in Appendix F.

In addition to the website publication, EPA posted a notice on the Site website: (Indian Bend Wash Area Superfund Site Profile) stating that the Site was undergoing a Five-Year Review. EPA did not receive public questions or comments regarding the Five-Year Review in response to the public notice or Site website notice. Results of the review and the report will be made available electronically on the Site's website (Indian Bend Wash Area Superfund Site Profile) and at the Site information repository located at:

EPA Superfund Records Center
75 Hawthorne Street, Room 3110
San Francisco, California, 94105

#### 4.1.2. Site Interviews

During the Five-Year Review process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. Questionnaires were sent to state agencies, local entities, and community groups. Responses were received from the Arizona Department of Environmental Quality, City of Scottsdale Water Quality Director, North Indian Bend Wash Participating Companies, and Salt River Project. The results of these interviews are summarized below. The Five-Year Review Interview Forms can be found in Appendix G.

The Arizona Department of Environmental Quality notes that the remedy appears to be meeting cleanup standards and is overall effective. They encourage continued open communication among the project teams, agencies, cities, and stakeholders regarding the optimization of remedial actions and monitoring. They also note that some topics generally do not affect protectiveness but are recommendations for improvement. These recommendations include soil vapor issues near Area 7, identified PFAS contamination, and some public concerns associated primarily with real estate due-diligence assessments.

The City of Scottsdale notes that the cleanup is going well, with monitoring wells showing a significant decrease over the course of the project, and that the Site's requirements are adequate to protect public health and the environment.

The North Indian Bend Wash Participating Companies provided background information on their role in the project, details of historical contamination of any private or public water system, monitoring and contaminant trend data, remedy performance, and O&M activities. The Participating Companies note that the remedy performance evaluations indicate that groundwater capture of the TCE plume remains effective and that the overall remedy is

functioning as intended, while acknowledging that continued optimization and efforts to support and improve long-term remedy performance are ongoing and needed.

The Salt River Project provided information about its role in the project, noting generally favorable progress toward meeting remedial action objectives.

## *4.2. Data Review*

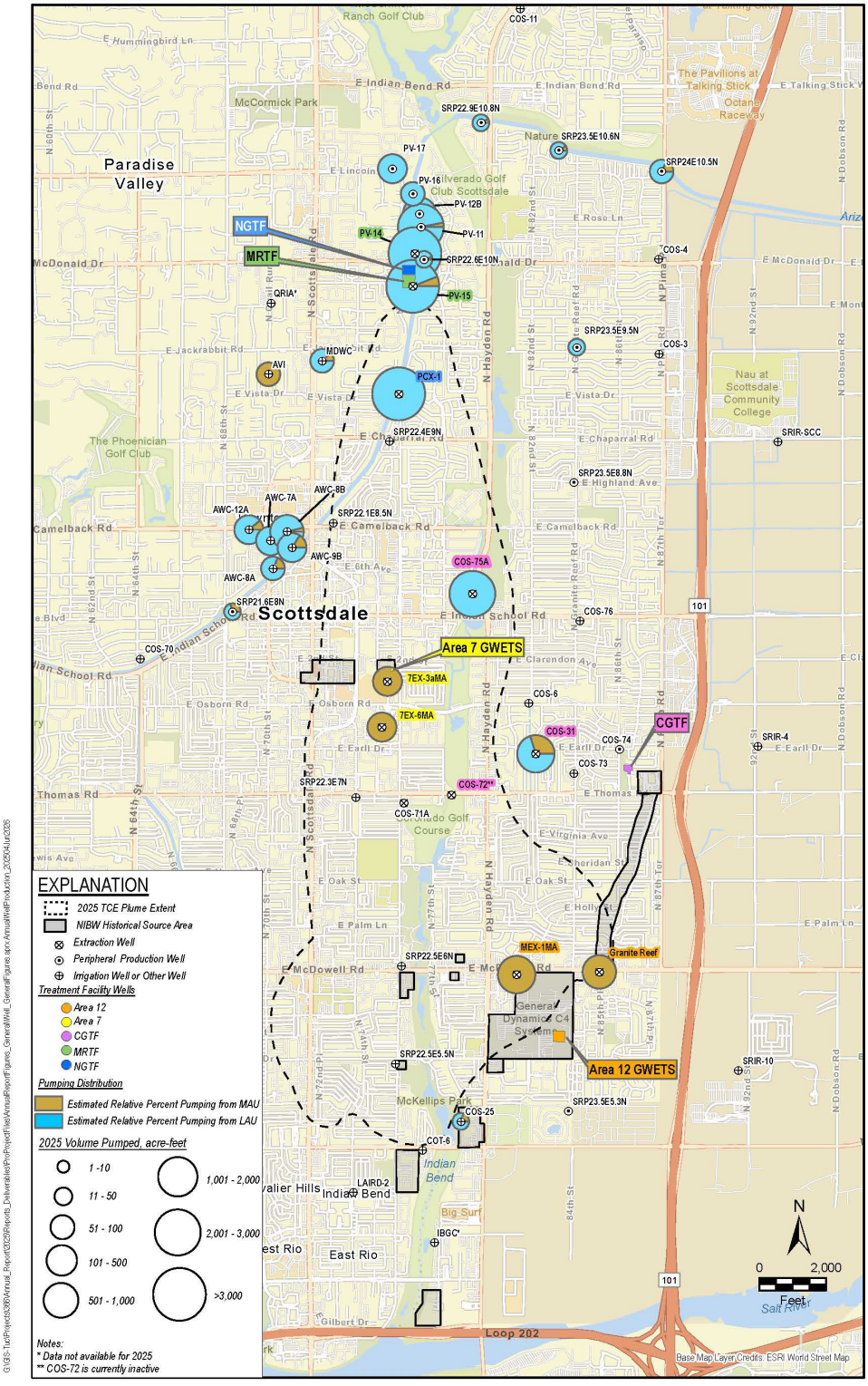
### 4.2.1. Groundwater

Data collected over the past five years were used to evaluate whether the remedial action objectives of plume containment and aquifer restoration for the Indian Bend Wash Area Site continue to be effective and protective of human health and the environment. The following section summarizes the data review. Appendix C contains a more in-depth data review.

#### 4.2.1.1 North Indian Bend Wash

Groundwater contamination occurs within the upper, middle, and lower alluvial units underlying the North Indian Bend Wash area. Contaminants of concern for the Site are 1,1-DCE, 1,1,1-TCA, chloroform, TCE, and PCE. However, over the past ten years, 1,1-DCE; 1,1,1-TCA; and chloroform concentrations in monitoring wells have been generally below Cleanup Standards and, in most cases, below detection limits. Therefore, the remaining primary contaminants of concern across the Site are PCE and TCE, with TCE as the principal contaminant and the focus of performance standards since the magnitude and extent of TCE has consistently exceeded that of PCE.

Groundwater containment, treatment, and monitoring are conducted at the North Indian Bend Wash Site to meet remedial action objectives. The remedy is designed to capture groundwater with VOCs above applicable standards using a series of extraction wells tied to treatment at five facilities: the Central Groundwater Treatment Facility, the North Indian Bend Wash Granular Activated Carbon Treatment Facility, the Miller Road Treatment Facility, the Area 7 Groundwater Extraction and Treatment System, and the Area 12 Groundwater Extraction and Treatment System. Following EPA's approval to close the UAU soil vapor extraction and UAU groundwater extraction at Area 7 in 2015, the remedy focuses on groundwater extraction and containment in the MAU and LAU. Figure 5 shows the 2025 annual groundwater pumping volume for each extraction well and its treatment facility.




Source: NIBW PCs. 2026a. 2025 Site Monitoring Report, North Indian Bend Wash Superfund Site

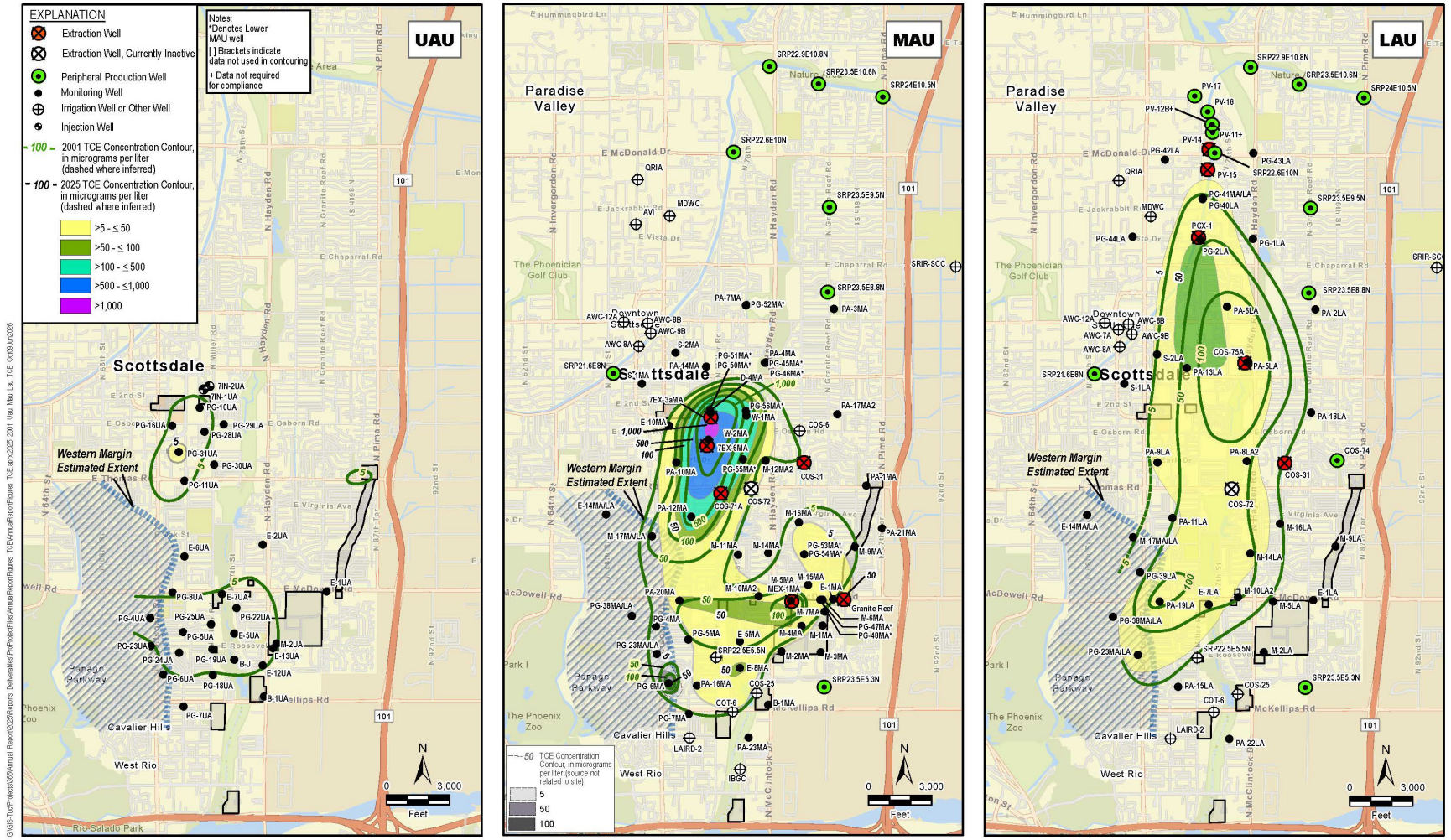
## Figure 5. Annual Extraction Well Production

TCE Extent

For the UAU, groundwater results indicate that TCE concentrations have remained below the 5 micrograms per liter (µg/L) Cleanup Standard for TCE at all but one monitoring well (PG-31UA) since 2022. The UAU plume has decreased significantly over time, and the remaining TCE mass is moving toward the Western Margin and into underlying units for capture, as indicated by concentrations reported downgradient from Area 7 at PG-31UA (Figure 6). The estimated total mass of VOCs in the saturated portion of the UAU, which includes elevated PCE concentrations at PG-4UA attributed to an offsite source as well as TCE, has decreased from over 11,000 pounds in 1993 to an estimated 131 pounds in 2025 (NIBW PCs, 2026). This represents a 99% decrease in VOC mass. Although VOC mass reduction has become asymptotic in recent years (e.g., VOC mass for 2023 and 2024 remained unchanged), the most recent 5-year running average of VOC mass, calculated in 2025, was 126 pounds, representing a relative decrease from the previous 5-year average of 133 pounds, indicating continued mass reduction (NIBW PCs, 2026).

Although TCE concentrations in the MAU have decreased significantly over the years, groundwater in the MAU continues to exhibit the highest TCE concentrations above the cleanup level of 5 µg/L, particularly within the Area 7 and Area 12 capture zones (Figure 6). The highest TCE concentrations at the Site occur in Area 7 monitoring wells D-4MA, W-1MA, and W-2MA, with maximum TCE concentrations of 1,000 µg/L, 550 µg/L, and 3,800 µg/L, respectively, for this reporting period.

TCE concentrations in the LAU groundwater are generally intermediate between those in the UAU and MAU. Over the past five years, the highest concentrations above the cleanup level of 5 µg/L in the LAU have typically occurred in the north-central portion of the Site, near PA-5LA, PA-6LA, PA-13LA, and PG-2LA.




Source: NIBW PCs. 2026a. 2025 Site Monitoring Report, North Indian Bend Wash Superfund Site

**Figure 6. Concentration of TCE in the UAU, MAU, and LAU for October 2001 and 2025**

TCE Concentration Trends

The North Indian Bend Wash Participating Companies conduct trend analyses of UAU, MAU, and LAU monitoring wells annually as part of the Annual Site Monitoring Reports. In the 2025 Site Monitoring Report, Mann-Kendall analyses were performed on twenty-two UAU monitoring wells, thirty-five MAU monitoring wells, three MAU/LAU monitoring wells, twenty-six LAU monitoring wells, and ten extraction wells (NIBW PCs, 2026). Of the 86 monitoring wells analyzed, only ten showed increasing trends. Of these ten, two were in the UAU, five in the MAU, and three in the LAU. One extraction well, MEX-1MA, exhibited an increasing trend over the past five years. Six of the ten monitoring wells with increasing trends had concentrations greater than the TCE Cleanup Standard of 5 µg/L. Additionally, for this Five-Year Review, Mann-Kendall trend analyses were conducted independently on 56 monitoring wells. These independent analyses included nine UAU monitoring wells, thirty MAU monitoring wells, and seventeen LAU monitoring wells. Of the 56 monitoring wells analyzed, ten had increasing trends, twenty had stable trends, fourteen had no trend, and twelve had decreasing or probably decreasing trends. An in-depth discussion of TCE concentration trends can be found in Appendix C.

Observed TCE concentration trends across the UAU, MAU, and LAU generally align with expectations for a mature remedy that has been operating for nearly three decades. Most wells exhibit stable, decreasing, or no statistically significant trends, consistent with long-term plume containment and mass removal. Where increasing trends are observed, they can typically be attributed to known operational changes, particularly variations in extraction well system operation, or to residual mass moving along flow paths toward extraction wells (NIBW PCs, 2025b). However, concentration trend analyses cannot be readily used to estimate remedy completion because concentrations typically become asymptotic and progress toward aquifer restoration slows as time goes on. This is particularly true for the MAU, where the bulk of contamination in this unit resides in the fine-grained matrix, resulting in low-permeability zones in contact with interbedded coarse-grained zones with higher permeability, creating matrix back-diffusion of TCE. This back-diffusion of TCE adds mass to these preferential flow paths and contributes to elevated concentrations in downgradient monitoring wells. A statistical Mann-Kendall trend analysis, which employs linear regression of past monitoring data to project future trends, is not reliable because matrix back-diffusion of TCE controls the rate of contaminant release and the ability of extraction wells to recover mass.

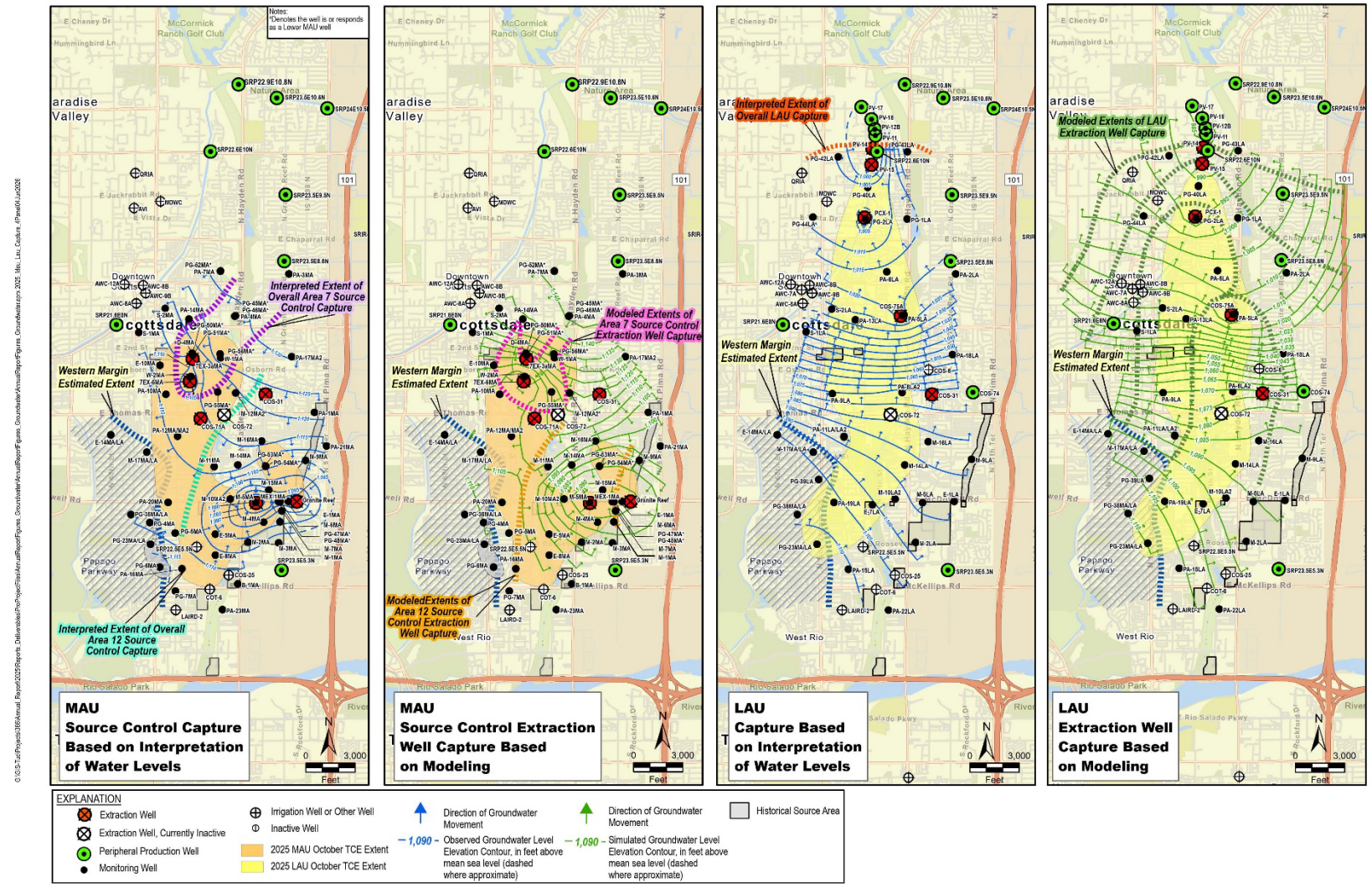
Hydraulic Containment

The extraction and treatment remedies are used to provide hydraulic control in the MAU and LAU to prevent VOC-impacted groundwater from reaching production wells and to prevent higher-concentration groundwater in the vicinity of Area 7 and Area 12 from migrating away from source areas. Although increasing trends are observed in some MAU wells outside source areas, evaluation of groundwater-level data and updated modeling simulations continue to demonstrate containment of the highest-concentration areas in the MAU, and overall capture in the MAU and LAU protects peripheral production wells (Figure 7).

Although recent updates to the conceptual site model and particle-tracking model in 2024 and 2025 show that the current conceptual site model reflects Site conditions, these updates also noted observations that affect remedy performance. Uncertainty regarding groundwater extraction well shutdowns and changing regional water-user pumping dynamics, particularly those affecting CGTF extraction wells, can contribute to plume persistence. When pumping is reduced or halted, back-diffusion can add mass to preferential flow paths and contribute to elevated concentrations in downgradient monitoring wells. To help address this, opportunities such as bringing extraction well COS-71A back online and converting monitoring well PG-41 to an extraction well should continue to be pursued to increase remedy efficiency with the MAU (particularly at Area 7) and the LAU. Additional opportunities to enhance the remedy should be considered using the updated groundwater model. Additionally, the PCs and the City of Scottsdale should continue working together to develop new approaches and optimize source control programs to meet the needs of regional water users while maximizing remedy effectiveness.

PFAS

In 2024 EPA requested that the North Indian Bend Wash Participating Companies sample both treatment systems, active extraction wells, and monitoring wells in the North Indian Bend Wash area. In response, the North Indian Bend Wash Participating Companies voluntarily collected extraction well samples and treatment system process samples (influent and effluent) from the NGTF, MRTF, Area 7, and Area 12 treatment systems, as well as samples from 43 monitoring wells in the UAU, MAU, and LAU. At the time of this Five-Year Review, the results of this investigation have not been reported (NIBW PCs, 2025a). These results should be reported and evaluated to determine potential appropriate response options.




Source: NIBW PCs. 2026a. 2025 Site Monitoring Report, North Indian Bend Wash Superfund Site

## Figure 7. Source Control Capture for Extraction Wells in MAU and LAU

Soil Gas/Indoor Air

As discussed in the Second and Third Five-Year Reviews, the North Indian Bend Wash Participating Companies conducted activities to evaluate and address potential vapor intrusion risk at the Site in coordination with EPA between 2016 and 2018, with follow-up activities focused on vapor intrusion risk at Area 7 continuing between 2018 and 2023. The Third Five-Year Review concluded that the vapor intrusion source at Area 7 should be characterized and addressed to ensure long-term protectiveness at the Site. In July 2026, EPA entered into an agreement with Siemens and the City of Scottsdale to perform a remedial investigation and feasibility study for vapor intrusion at Area 7.

In addition to the upcoming remedial investigation, the North Indian Bend Wash Participating Companies conducted annual supplemental vapor intrusion-related activities at Area 7. The latest activities in 2025 included (NIBW PCs, 2026):

- Annual operation and maintenance inspection on vapor mitigation systems in the four apartments in the northwest quadrant of the apartment complex located southeast from Area 7 on January 19, 2025. During the inspection, it was verified that a negative pressure vacuum was present beneath the floors of the four apartments that would prevent vapor intrusion.

- Annual Indoor air sampling at the apartments with mitigation systems in January 2026. Results of the indoor air monitoring reported no detectable TCE within any of the four apartments with mitigation systems for the third consecutive year. The laboratory detection limit was below the EPA residential screening level of 0.48 micrograms per cubic meter.

In addition to work conducted by the North Indian Bend Wash Participating Companies, EPA led the assessment and mitigation of TCE indoor air concentrations at an event center in the northern portion of Area 7. EPA worked with the property owner to seal pathways and adjust the heating, ventilation, and air conditioning system to address potential vapor intrusion (EPA, 2021). In April 2023, the property owner of the event center installed a vapor mitigation system. Subsequent monitoring after installation verified that TCE concentrations in indoor air were at levels protective of human health.

## *4.3. Site Inspection*

The Site was inspected on March 10, 2026. Attendees included Vicky Wiraatmadja of EPA; Kelly Malone of DHS JV; Katelyn Kane-DeVries and Wayne Miller of the Arizona Department of

Environmental Quality; John Pekala of Motorola Solutions; Leslie Katz of Montgomery & Associates; Jim Lutton of NIBW; Larry Lynch of EnSolutions; Suzanne Grendahl, Krystal Heyer, and Taylor Schudde of the City of Scottsdale; and Michael Kraus and Karol Wolf of Salt River Project. The inspection aimed to assess the condition of the remedy and verify that it is operating as intended.

The site inspection included a visual assessment of overall site conditions, an inspection of the remedy's active and past components, and a general overview of the Site's history. Each of the five treatment systems in the North Indian Wash Bend Area was evaluated. Relevant documents were on site and readily available, including operation and maintenance manuals, maintenance logs, health and safety plans, discharge permits, and security records. At all treatment systems, access controls were deemed adequate, and there were no signs of vandalism. The groundwater treatment systems, including extraction and injection wells, pumps, plumbing, and security systems, were functioning as intended.

The site inspection also included an evaluation of a select number of extraction, monitoring, and injection wells. Extraction wells inspected included COS-75A, PCX-1, PV-15, 7EX-6MA, MEX-1MA, and Granite Reef. Monitoring and injection wells inspected included D-4MA (monitoring) and 71N-1UA (injection). Monitoring well PG-41, which is planned for conversion to an extraction well by the end of 2026, was also inspected. No compliance issues were noted for any of the wells evaluated during the site inspection. The Final Site Inspection Report, along with associated inspection photographs, is included in Appendix H.

# 5. Technical Assessment

## *5.1. Question A: Is the remedy functioning as intended by the decision documents?*

Yes, the OU8 North Final Groundwater and Soil Remedy is functioning as intended. Regular groundwater monitoring data over the past five years, along with updated groundwater modeling, continue to support the conclusion that the collective remediation efforts are progressing toward the long-term goal of aquifer restoration, while providing plume containment and the beneficial use of vital groundwater resources primarily used for drinking water supply, as well as irrigation and reinjection. TCE concentration areas of the plume continue to decrease over time. Since the inception of the NIBW groundwater remedy in 1994, approximately 161 billion gallons of groundwater have been extracted to remove an estimated 103,970 pounds of TCE. In addition, the state of Arizona continues to implement institutional

controls that limit potential exposure to contaminated groundwater. These include well installation permits, regulation of well construction, and the Arizona Well Spacing and Impact Rules, which prevent adverse effects on wells used for cleanup activities.

Although water-level data and modeling support the conceptual site model that containment of the TCE-contaminated groundwater plume in the MAU/LAU is being achieved and that the extent and concentrations of the TCE plume have declined over the years, elevated TCE concentrations continue to persist in the MAU, specifically near Area 7 and Area 12. Influent concentrations from extraction wells in Area 7 and Area 12 have been relatively stable since 2005, indicating significant remaining mass in the area. These persistent, high concentrations are attributed to matrix back-diffusion of TCE. This occurs when pumping is reduced or halted, and TCE diffuses from fine-grained sediments with lower hydraulic conductivity and higher TCE concentrations into interbedded zones of coarse-grained sediments with lower concentrations, which have higher hydraulic conductivity and are where groundwater is extracted from.

While the remedy is functioning as intended, there are known opportunities to increase its efficiency. The recent CSM update noted a significant decrease in CGTF well pumping is evident after 2016. These long-term reductions in CGTF extraction reduced capture outside of the influence of the Area 7 extraction wells and remedy efficiency in the MAU. The CSM update and groundwater model update discussed enhancing capture within the MAU and maintaining redundancy of capture in the LAU. To increase remedy efficiency, planned remedial enhancements such as reinstating COS-71A and beginning extraction at PG-41 should be implemented, and other enhancements, particularly at Area 7, should be considered using the updated groundwater model.

The remedy also included soil vapor extraction to prevent further impact to groundwater, and this portion of the remedy is no longer active. All soil vapor extraction systems were decommissioned by 2015.

## *5.2. Question B: Are the exposure assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of Remedy Selection Still Valid?*

No, though the remedial action objectives and cleanup standards used at the time of remedy selection remain valid, the toxicity data and exposure assumptions have changed.

As noted in the previous five-year review, soil gas investigations in 2018 identified an unacceptable risk of TCE inhalation from vapor intrusion in the adjoining apartment building

and event center due to a significant source of TCE mass remaining at Area 7 (EPA, 2016). Short-term vapor intrusion mitigation measures were implemented at the two buildings. Because these are only short-term protective measures, the Third Five-Year Review concluded that the vapor intrusion source at Area 7 should be characterized and addressed to ensure long-term protectiveness of the Site (EPA, 2021). In July 2026, EPA entered into an agreement with Siemens and the City of Scottsdale to perform a remedial investigation and feasibility study for vapor intrusion at Area 7.

***PFAS (Federal)***

The purpose of this section is to present current information related to PFAS contamination at the Site and to evaluate whether there are any potential impacts to remedy protectiveness from PFAS.

On April 17, 2024, EPA designated two per- and polyfluoroalkyl substances —perfluorooctanoic acid ("PFOA") and perfluorooctanesulfonic acid ("PFOS"), including their salts and structural isomers, as hazardous substances under section 102(a) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA").

On April 10, 2024, EPA issued the following drinking water MCLs for six PFAS contaminants, including PFOA, PFOS, PFNA, HFPO-DA (Gen-X), PFHxS, and PFBS:

| **Compound** | **Final MCL** |
|---|---|
| PFOA | 4 ppt |
| PFOS | 4 ppt |
| PFHxS | 10 ppt |
| PFNA | 10 ppt |
| HFPO-DA (Gen X) | 10 ppt |
| Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS | 1 (unitless)<br>Hazard Index 1 |

***PFAS (State)***

Arizona has not promulgated drinking water or groundwater standards for PFAS.

***PFAS (Site)***

PFAS groundwater contamination at the Site has been confirmed; however, the extent and sources remain unknown. PFAS was detected in City of Tempe municipal supply wells in 2013/2014, which were subsequently suspended, so there are no known drinking water

exposures at this time. Groundwater samples were collected for PFAS analysis at North Indian Bend Wash in 2024 and have not been reported or evaluated yet. Appendix E discusses the relevant PFAS toxicity values and state standards that are currently available.

## *5.3. Question C: Has Any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?*

No. No other information has come to light that calls into question the protectiveness of the remedy. However, current assumptions about the protectiveness of remediation and containment methods may not reflect changing climate impacts. Periodic evaluations of implemented remedies may not fully account for climate change impacts, including shifts in frequency and intensity that could affect remedy effectiveness. The 2019 GAO Superfund Climate Change report was accessed and indicated that no hazards were identified for the Indian Bend Wash Area Site. However, increasing reliance on groundwater supplies is likely to be a future concern, given that the Phoenix Valley is rapidly warming at a rate of 1 degree Celsius per decade. The incidence of widespread summer drought, reduced snowpack, and higher evaporation rates with rising temperatures may reduce the availability of surface water resources.

The southern portion of the North Indian Bend Wash lies within the 100-year flood zone of the Salt River, and the Indian Bend Wash and associated green belt areas are designated as a regulatory floodway. The northern portion of the South Indian Bend Wash lies within the 100-year flood zone of the Salt River. Salt River flows are regulated by releases from the Roosevelt Dam, approximately 40 miles upstream, so flooding would not have a significant impact on the Indian Bend Wash Area Site. However, because the operation of some of the North Indian Bend Wash treatment plants depends on canal capacity to accept treated water, the remedy may be affected by the increased potential for flash floods due to climate change. Thunderstorms frequently cause power outages which can cause unexpected extraction well shutdowns at the North Indian Bend Wash treatment plants that can impact short-term remedy performance, and these events may become more frequent and intense with the changing climate.

# 6. Issues/Recommendations

| OU(s) without Issues/Recommendations Identified in the Five-Year Review: |
|---|
| 03 South Area Groundwater<br>07 South Area Soils |

**Table 8. Issues and Recommendations Identified in the Five-Year Review**

| Issues and Recommendations Identified in the Five-Year Review: | | | | |
|---|---|---|---|---|
| **North Indian Bend Wash (OU8)** | **Issue Category: Changed Site Conditions** | | | |
| | **Issue:** PFAS have been detected in groundwater above drinking water standards at the Site. Additional groundwater data have been collected at NIBW but not yet evaluated. | | | |
| | **Recommendation:** Report and evaluate collected PFAS data at NIBW to determine whether unacceptable exposure of PFAS to the public may be occurring through discharge to water supply systems. | | | |
| **Affect Current Protectiveness** | **Affect Future Protectiveness** | **Party Responsible** | **Oversight Party** | **Milestone Date** |
| No | Yes | PRP | EPA/State | 11/30/2027 |

## *6.1. Other Findings*

In addition, the following are recommendations identified during the Five-Year Review that may improve performance of the remedy and accelerate site close out but do not affect current and/or future protectiveness:

- OU8: While the remedy is functioning as intended at NIBW, there are known opportunities to increase its efficiency to offset previous reductions in efficiency in the MAU and maintain redundancy of capture in the LAU. To improve remedy efficiency, implement planned remedial enhancements such as reinstatement of extraction well COS-71A in the MAU and additional extraction at PG-41 in the LAU. Consider additional enhancements, particularly at Area 7, using the updated groundwater model.

# 7. Protectiveness Statement

## Table 9. Protectiveness Statements

| OU3 Protectiveness Statement |
|---|
| *Protectiveness Determination:* Protective |
| Protectiveness Statement:<br><br>The South Indian Bend Wash OU3 remedy is protective of human health and the environment. The remedial action objectives have been achieved and all response actions completed. |
| **OU7 Protectiveness Statement** |
| *Protectiveness Determination:* Protective |
| Protectiveness Statement:<br><br>The South Indian Bend Wash OU7 remedy is protective of human health and the environment. The remedial action objectives have been achieved and all response actions completed. |
| **OU8 (includes Former OUs 1, 2, 4, 5, and 6) Protectiveness Statement** |
| *Protectiveness Determination:* Short-term Protective |
| Protectiveness Statement:<br><br>The North Indian Bend Wash OU8 remedy is protective of human health and the environment. The remedy is contributing to the restoration of beneficial use of groundwater in the short term and preventing potential exposure through vapor intrusion from impacted groundwater. However, for the OU8 remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness:<br><br>• Report and evaluate PFAS data from NIBW to determine whether unacceptable exposure of PFAS to the public may be occurring through discharge to water supply systems. |

| Sitewide Protectiveness Statement |
| --- |
| *Protectiveness Determination:* Short-term Protective |
| *Protectiveness Statement:*<br><br>The Indian Bend Wash Area OU3, OU7, and OU8 remedies are protective of human health and the environment. The OU8 remedy is contributing to the restoration of beneficial use of groundwater in the short term and preventing potential exposure through vapor intrusion from impacted groundwater. However, to be protective in the long-term, the following actions need to be taken to ensure protectiveness:<br><br>• Report and evaluate PFAS data from NIBW to determine whether unacceptable exposure of PFAS to the public may be occurring through discharge to water supply systems. |

# 8. Next Review

The next Five-Year Review report for the Indian Bend Wash Area Superfund Site is required five years from the completion date of this review.

South Indian Bend Wash OU3 and OU7 remedies have achieved the remedial action objectives and all associated response actions completed, therefore, they will be excluded from future Five-Year Reviews.

# Appendix A: List of Documents Reviewed


Adanta. 2022. 2020 Annual Water Treatment Plant Inspection Report: Groundwater Treatment Facilities North Indian Bend Wash Superfund Site, Scottsdale, Arizona. January.

EPA. 1988. Final Record of Decision Scottsdale Groundwater Operable Unit Indian Bend Wash Superfund Site, Scottsdale, Arizona. September.

EPA. 1991. Record of Decision North Indian Bend Wash Superfund Site, Scottsdale, Arizona. September.

EPA. 1993. Record of Decision Operable Unit: VOCs in Vadose Zone Indian Bend Wash Superfund Site, South Area Tempe, Arizona. September.

EPA. 1998. Record of Decision VOCs in Groundwater Operable Unit Indian Bend Wash Superfund Site, South Area Tempe, Arizona. September.

EPA. 2001. Record of Decision Amendment for the North Indian Bend Wash Superfund Site Final Operable Unit, Scottsdale, Arizona. September.

EPA. 2004. Record of Decision Amendment for the South Indian Bend Wash Superfund Site, Tempe, Arizona. June.

EPA. 2011. First Five-Year Review Report for Indian Bend Wash Superfund Site, Maricopa County, Arizona. September.

EPA. 2012. Explanation of Significant Differences for the North Indian Bend Wash Superfund Site Remedy Well PCX-1, Scottsdale, Arizona. March.

EPA. 2016. Second Five-Year Review Report for Indian Bend Wash Superfund Site, Maricopa County, Arizona. September.

EPA. 2021. Third Five-Year Review Report for Indian Bend Wash Superfund Site, Maricopa County, Arizona. September.

EPA. 2023a. Site Update Fact Sheet: North Indian Bend Wash Area Superfund Site, Scottsdale, Arizona. October.

EPA. 2023b. Site Update Fact Sheet: South Indian Bend Wash Area Superfund Site, Tempe, Arizona. October.

EPA. 2024a. Indian Bend Wash Site Community Involvement Plan. December.

EPA. 2024b. 3DVA-Supported Optimization Review North Indian Bend Wash Superfund Site, Scottsdale, Arizona. December.

HGL. 2023. Final Remedial Investigation/Feasibility Study Work Plan for South Indian Bend Wash Superfund Site, Mesa, Scottsdale, and Tempe, Maricopa County, Arizona. June.

HGL. 2024. 2023 Annual Water Treatment Plant Inspection Report: Groundwater Treatment Facilities North Indian Bend Wash Superfund Site, Scottsdale, Maricopa County, Arizona. March.

Gilbane. 2020. Remedial Action Completion Report South Indian Bend Wash Superfund Site, Tempe, Arizona. June.

NIBW PCs. 2022. 2021 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona. March (Revised).

NIBW PCs. 2023. 2022 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona. February.

NIBW PCs. 2024. 2023 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona. April.

NIBW PCs. 2025a. 2024 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona. February.

NIBW PCs. 2025b. Conceptual Site Model Update for North Indian Bend Wash Superfund Site. December.

NIBW PCs. 2026a. 2025 Site Monitoring Report, North Indian Bend Wash Superfund Site, Scottsdale, Arizona. March.

NIBW PCs. 2026b. North Indian Bend Wash Superfund Site 2024 Groundwater Flow and Particle Tracking Model Update Report. April.

# Appendix B: Site Chronology

| Event | Date |
|---|---|
| Trichloroethylene (TCE) detected in groundwater samples from several City of Scottsdale and City of Phoenix municipal wells exceeding state standards | October 1981 |
| Indian Bend Wash Area listed on EPA's National Priorities List (NPL) | September 1983 |
| Remedial Investigation initiated by EPA | July 1984 |
| Remedial Investigation and Feasibility Study (RI/FS) for middle and lower alluvial units | April 1988 |
| EPA divides the Indian Bend Wash Area Site into the North Indian Bend Wash (NIBW) and the South Indian Bend Wash (SIBW) | 1987 |
| Record of Decision issued for middle and lower alluvial units | September 1988 |
| EPA issues a Unilateral Administrative Order to Scottsdale parties to install and sample four groundwater monitor wells in the NIBW. | July 1989 |
| EPA issues the NIBW RI/FS for the upper alluvial unit and the vadose zone. | April 1991 |
| Record of Decision (ROD) issued for NIBW upper alluvial unit and the vadose zone | September 1991 |
| Consent Decree is signed to implement cleanup actions selected in the 1988 ROD for NIBW Groundwater | April 1992 |
| Central Groundwater Treatment Facility construction begins. | September 1992 |
| Consent Decree is signed to implement cleanup actions selected in the 1991 ROD for NIBW groundwater and vadose zone | August 1993 |
| EPA issued a ROD for SIBW Vadose Zone Soils | September 1993 |
| EPA issues a Certificate of Completion for NIBW Areas 5B and 9. | December 1993 |
| NIBW Central Groundwater Treatment Facility begins operation to extract and treat groundwater from the middle and lower alluvial units. | February 1994 |
| EPA issues a Letter of Determination that performance standards have been achieved at NIBW Area 5C. | April 1994 |
| Construction of a soil vapor extraction (SVE) system for NIBW Area 7 is complete and start up begins | July 1994 |
| EPA issues a Letter of Determination that the performance standards have been achieved at NIBW Area 5A. | March 1995 |
| Construction begins on the NIBW Miller Road Treatment Facility | March 1996 |

| Event | Date |
|---|---|
| NIBW Area 8 SVE system is decommissioned upon achieving performance goals | July 1997 |
| Final SIBW Groundwater Feasibility Study is released for the three groundwater plumes | August 1997 |
| Construction of Area 12 groundwater extraction and treatment system is complete | December 1997 |
| EPA issues ROD for SIBW VOCs in Groundwater | September 1998 |
| EPA issues Area 12 SVE attained remedial performance standards | August 2000 |
| EPA issues Area 6 closure letter and SVE system is decommissioned | October 2000 |
| Feasibility Study Addendum for OU1 is complete | November 2000 |
| NIBW Miller Road Treatment Facility experiences control malfunction following area wide power loss | January 2001 |
| Monitoring wells are installed to determine southern boundary of Western Plume SIBW | February 2001 |
| EPA issues ROD Amendment for NIBW | September 2001 |
| EPA issues a second SIBW “plug-in” document to seven additional PRPs requiring SVE in the vadose zone | January 2002 |
| Monitoring wells are installed for Eastern Plume SIBW | March 2002 |
| EPA issues ROD Amendment for SIBW Groundwater | June 2004 |
| Amended NIBW Consent Decree is finalized | June 2003 |
| EPA and ADEQ enter into discussions regarding air emission control systems | February 2004 |
| EPA determines that all physical construction of cleanup systems complete for Indian Bend Wash Area | September 2006 |
| SIBW Consent Decree is signed with Unitog Rentals, IMC Magnetics, Circuit Express, Janstar, K&S Interconnect, Sherman Leibovitz, Prestige Cleaners, Service & Sales | March 2007 |
| Rehabilitation of the Miller Road Treatment Facility is complete | May 2010 |
| First Five-Year Review is complete | September 2011 |
| EPA issues ESD for NIBW for treatment of well PCX-1 | March 2012 |
| North Indian Bend Wash Granular Activated Carbon Treatment Facility complete | 2013 |
| 25 monitoring wells in SIBW are abandoned due to contaminants below cleanup levels | 2013 |

| Event | Date |
|---|---|
| 45 monitoring wells in SIBW are abandoned due to contaminants below cleanup levels | 2014 |
| Following EPA approval, Area 7 SVE system is decommissioned | April 2015 |
| Second Five-Year Review is complete | September 29, 2016 |
| EPA samples groundwater for PFAS at SIBW | 2019 |
| The Remedial Action Completion Report is complete following approval by EPA indicating all remedial actions are complete, and remediation goals defined in the RODs are complete for SIBW Site. | June 2020 |
| Third Five-Year Review is completed | September 27, 2021 |
| Modification of Well COS-71A to pump only from the MAU | April 2023 |
| Remedial Investigation/Feasibility Study for South Indian Bend Wash PFAS begins | July 2022 |
| Abandonment of Area 7 extraction well 7EX-4MA | December 2023 |
| 2019 Conceptual Site Model Update Report finalized | July 2023 |
| NIBW Sampling for PFAS | April/October 2024 |
| EPA NIBW Optimization Review Memorandum | November 2024 |
| 2024 NIBW Conceptual Site Model Update Report is finalized | December 2025 |
| Groundwater Monitoring and Evaluation Plan Update Technical Memorandum | December 2025 |
| 2024 NIBW Groundwater Flow and Particle Tracking Model Update Report is finalized | April 2026 |
| Administrative Settlement Agreement and Order on Consent for Area 7 Vapor Intrusion Remedial Investigation/Feasibility Study is signed | July 2026 |
| NIBW Area 7 Vapor Intrusion Remedial Investigation/Feasibility Study begins | August 2026 |

# Appendix C: Data Review

This data review examined data collected over the past five years to assess whether the remedial action objectives for plume containment at the North Indian Bend Wash Superfund Site (Site) remain effective and protective of human health and the environment. The Participating Companies (PCs) operate five groundwater extraction wells and treatment systems within the North Indian Bend Wash area to contain the plume and treat extracted groundwater.

For the North Indian Bend Wash (NIBW) area, the main historical contaminants of concern are 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), and tetrachloroethene (PCE). However, TCE is the primary contaminant of concern because its magnitude and extent have consistently exceeded those of other volatile organic compounds (VOCs) throughout the Site's monitoring history. Over the past ten years, only TCE and PCE were detected at concentrations above their federal drinking water standards.

**Hydrogeology**

An understanding of groundwater flow directions, vertical hydraulic gradients, and water level trends is critical for evaluating contaminant migration, remedy effectiveness, and long-term site management at the NIBW. Three principal hydrostratigraphic alluvial units underlie the NIBW area. These units are the Upper, Middle, and Lower Alluvial Units. The Upper Alluvial Unit (UAU) forms the uppermost water-bearing unit and functions as a water-table aquifer over much of the Site, responding relatively rapidly to recharge and pumping stresses. South of McDowell Road, groundwater within this unit generally flows from east to west toward the Western Margin, a bedrock feature that bounds the Site to the west. However, in the northern portion, near Thomas Road, flow shifts to the northeast from the southwest. The Middle Alluvial Unit (MAU) acts as a confining layer beneath the UAU, restricting vertical groundwater movement from the UAU to underlying units across most of the Site. Near the Western Margin, where the MAU pinches out, increased permeability enhances vertical hydraulic connectivity. Groundwater in this unit generally flows from the northeast to the southwest toward the Western Margin, except near Source Control Program pumping centers at Area 7 and Area 12, where pumping creates a cone of depression. The Lower Alluvial Unit (LAU) is regionally extensive and exhibits moderate to high horizontal hydraulic conductivity. This unit serves as the principal aquifer targeted by regional supply wells and local remediation extraction wells. Groundwater in the LAU generally flows from the south/southwest to the north, which differs

substantially from the Upper and Middle Alluvial Units. Water level contours are consistent with inflow from overlying units and with flow away from the Western Margin toward extraction wells (NIBW PCs, 2026a & NIBW PCs, 2026b).

**Groundwater Remedy**

Groundwater containment, treatment, and monitoring are conducted at the North Indian Bend Wash Site to meet remedial action objectives. The remedy is designed to capture groundwater with VOCs above applicable standards using a series of extraction wells connected to treatment at five facilities: the Central Groundwater Treatment Facility (CGTF), the NIBW Granular Activated Carbon Treatment Facility (NGTF), the Miller Road Treatment Facility (MRTF), the Area 7 Groundwater Extraction and Treatment System, and the Area 12 Groundwater Extraction and Treatment System. Following EPA's approval to close the UAU soil vapor extraction and UAU groundwater extraction at Area 7, the remedy focuses on groundwater extraction and containment in the MAU and LAU.

Groundwater extraction and treatment in the Upper MAU focus on containing areas with relatively higher TCE concentrations. Currently, the highest TCE concentrations at the Site are near Area 7 and at the Granite Reef extraction well (Area 5B), part of the Area 12 Groundwater Extraction and Treatment System. Capture of the Area 7 MAU source includes source control pumping at Area 7 extraction wells, which pump from the MAU. The Area 12 extraction wells from the MAU. MAU containment is demonstrated using water level data. Remaining mass in the MAU outside the source control and CGTF well capture migrates into the LAU, principally along the Western Margin, and is captured by downgradient LAU extraction wells. Capture by MAU and LAU extraction wells has been demonstrated over time using water level data (from both units) and simulated particle tracks generated using the NIBW groundwater flow model, which underwent a comprehensive update by the NIBW Participating Companies (NIBW PCs) through a collaborative process with the NIBW Technical Committee in 2024 (Figure C-1, C-2, and C-3). Capture interpretations for 2024 pumping conditions and for operations that began in 2026 (with enhanced MAU extraction at COS-71A and Lower MAU and LAU extraction at PG-41) were provided in the 2024 Model Update Report.

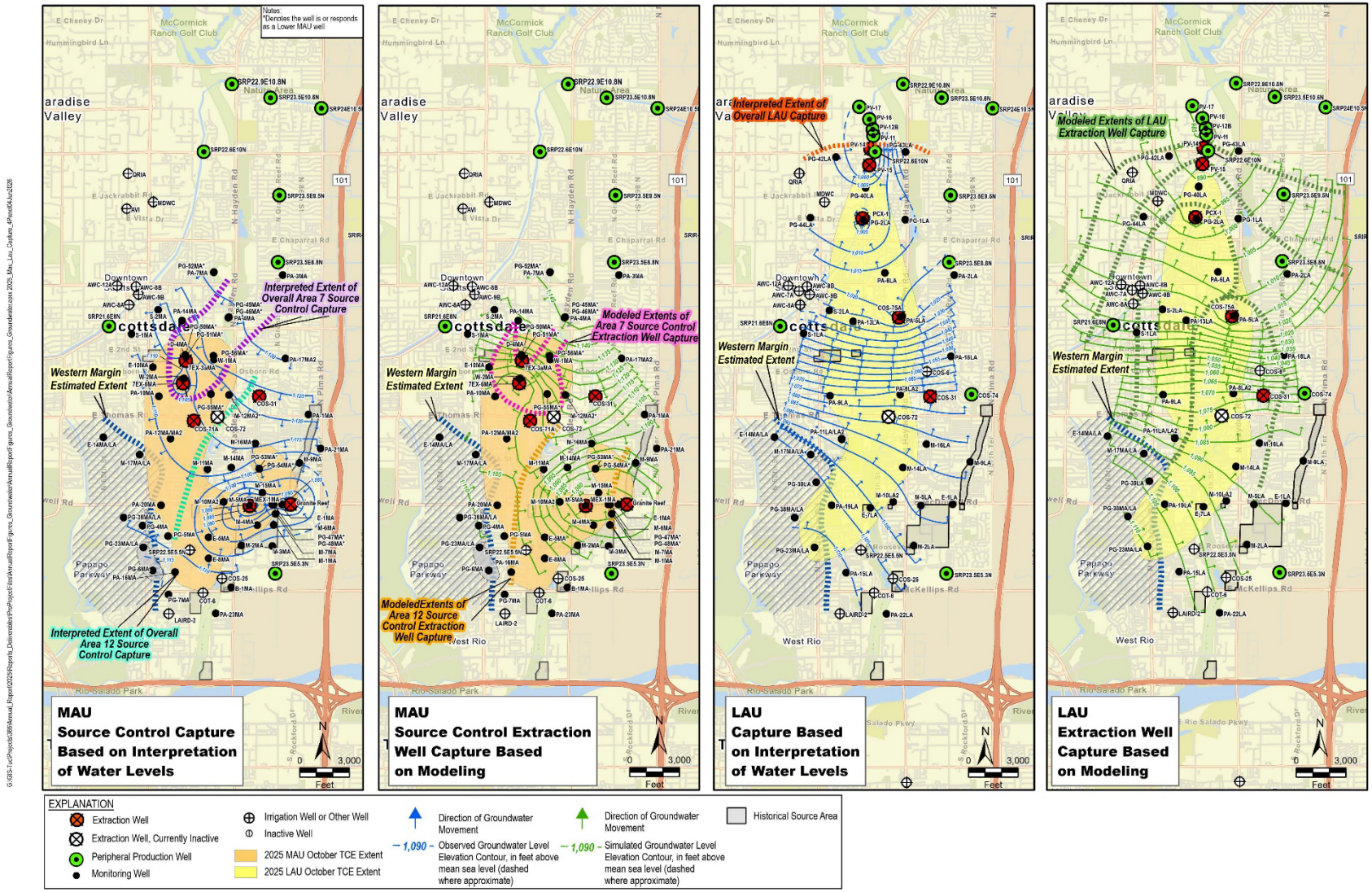



**Figure C-1. Source Control Capture for Extraction Wells in MAU and LAU**

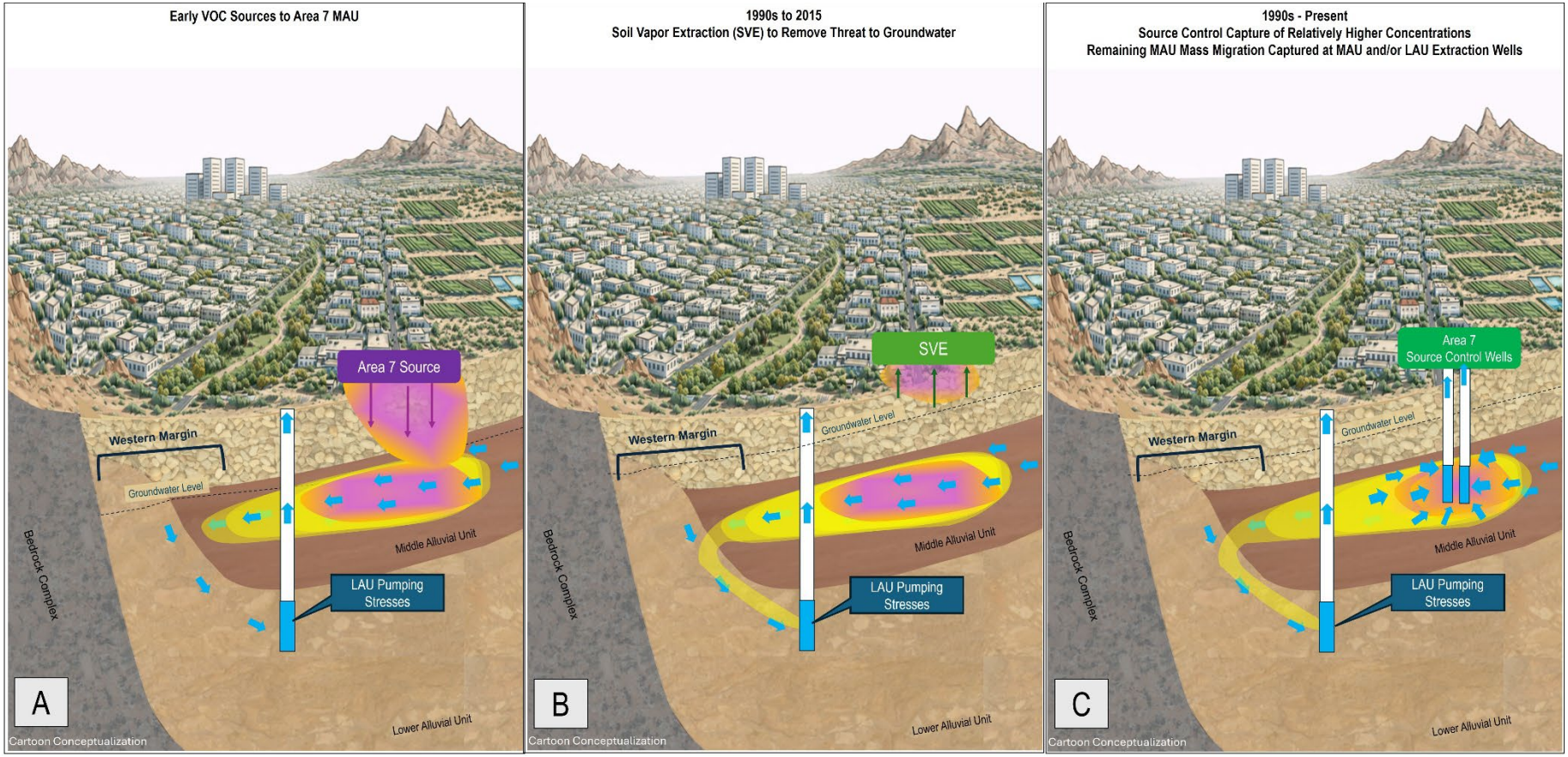



**Figure C-2. Area 7 Source Control Conceptual Model**

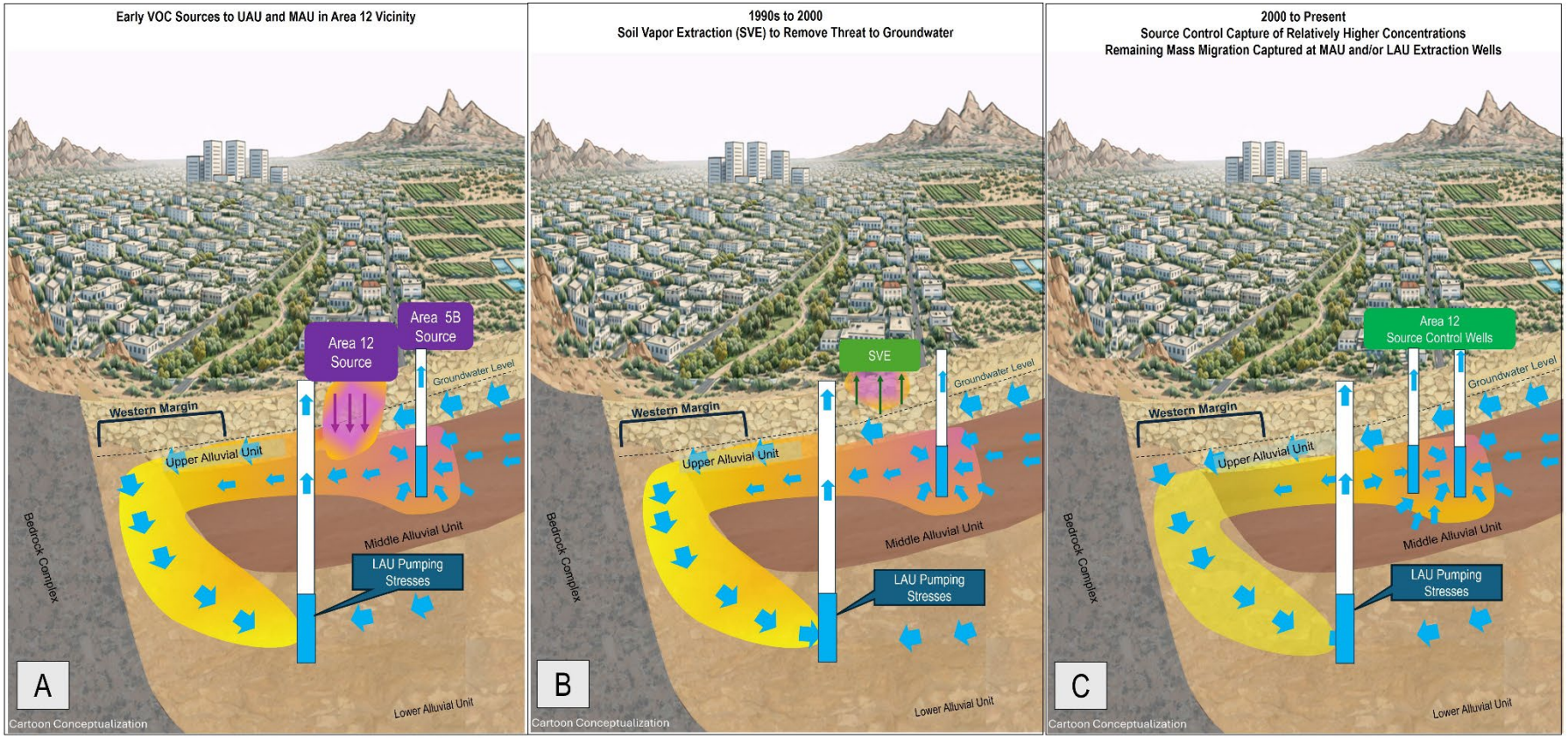



**Figure C-3. Area 12 Source Control Conceptual Model**

**Nature and Extent of COCs**

Historically, the UAU had the highest concentrations of constituents of concern (COCs) in groundwater at the Site in the 1980s and early 1990s. However, following the completion of vadose zone remediation programs at Areas 6, 7, 8, and 12, which successfully addressed the threat to UAU groundwater, the vadose zone is no longer contributing significant mass of COCs to the groundwater system at the Site. This is evidenced by low and decreasing TCE concentrations in the UAU. Figure C-4 shows TCE concentration contours from 2001 and 2025, indicating that the extent of the TCE plume has decreased over time. Since October 2022, TCE concentrations have consistently been below Cleanup Standards in all UAU monitoring wells in 2024, with the only exceedances during this Five-Year Review period occurring at PG-31UA in 2021 and 2025 (7.6 µg/L and 11.3 µg/L, respectively) and at E-5UA in 2021 (5 µg/L). Measurable TCE mass in the UAU is still migrating toward the Western Margin and into underlying units for capture, as indicated by reported concentrations in PG-31UA and VOC mass flux analyses (NIBW PCs, 2026a).

TCE concentrations in the MAU groundwater are generally higher than in the UAU and LAU, with elevated concentrations occurring in three distinct areas: the Area 7 vicinity, the Area 12 vicinity, and an alternate source from the southwest of the Site.

- Area 7 wells with the highest concentrations during this Five-Year Review period were from monitoring wells D-4MA, W-1MA, W-2MA, and PA-12MA. Monitoring well D-4MA, located north of Area 7 extraction wells, had a maximum concentration of 1,000 µg/L in October 2021. W-1MA, located east of Area 7, had a maximum concentration of 550 µg/L in January 2025. W-2MA, located downgradient from Area 7, had a maximum concentration of 3,800 µg/L in July 2022. PA-12MA, also located downgradient from Area 7, had a maximum concentration of 381 µg/L in July 2025.

- Concentrations in Area 12 exceed the Cleanup Standards but are generally much lower than those in Area 7. The highest concentrations during this Five-Year Review period were recorded in monitoring wells E-5MA, E-8MA, and M-10MA2. E-5MA is west of Area 12 and had a maximum concentration of 76 µg/L in January 2021. E-8MA is southwest of Area 12 and had a maximum concentration of 53.5 µg/L in November 2025. M-10MA2 is located west-northwest of Area 12, at the edge of the highest-concentration plume extending from Area 12 to the Western Margin. M-10MA2 had a five-year maximum concentration of 97.1 µg/L in April 2024.

- An alternate source to the southwest is a localized region associated with monitoring well PG-6MA in the southern portion of the Western Margin. PG-6MA had a maximum concentration of 109 µg/L in October 2024. Because this plume is accepted as unrelated to the NIBW site, it has not been included in the MAU plume map since 2018 (NIBW SMR, 2026).

TCE concentrations in the LAU groundwater are generally intermediate between those in the UAU and MAU. The highest concentrations in the LAU over the past five years have typically occurred in the north-central portion of the Site, near PA-5LA, PA-6LA, PA-13LA, and PG-2LA. PA-5LA is adjacent to extraction well COS-75A and had a 5-year maximum of 54.4 µg/L in April 2024. PA-6LA is north of COS-75A and historically had the highest concentrations in the LAU but has been steadily declining since 2020 due to extraction. PA-6LA had a 5-year maximum of 120 µg/L in January 2021. PA-13LA is west of COS-75A but within the capture zone of extraction well PCX-1. PA-13LA had a 5-year maximum of 85 µg/L in January 2021. PG-2LA is adjacent to PCX-1 and had a maximum concentration of 100 µg/L in April 2023.

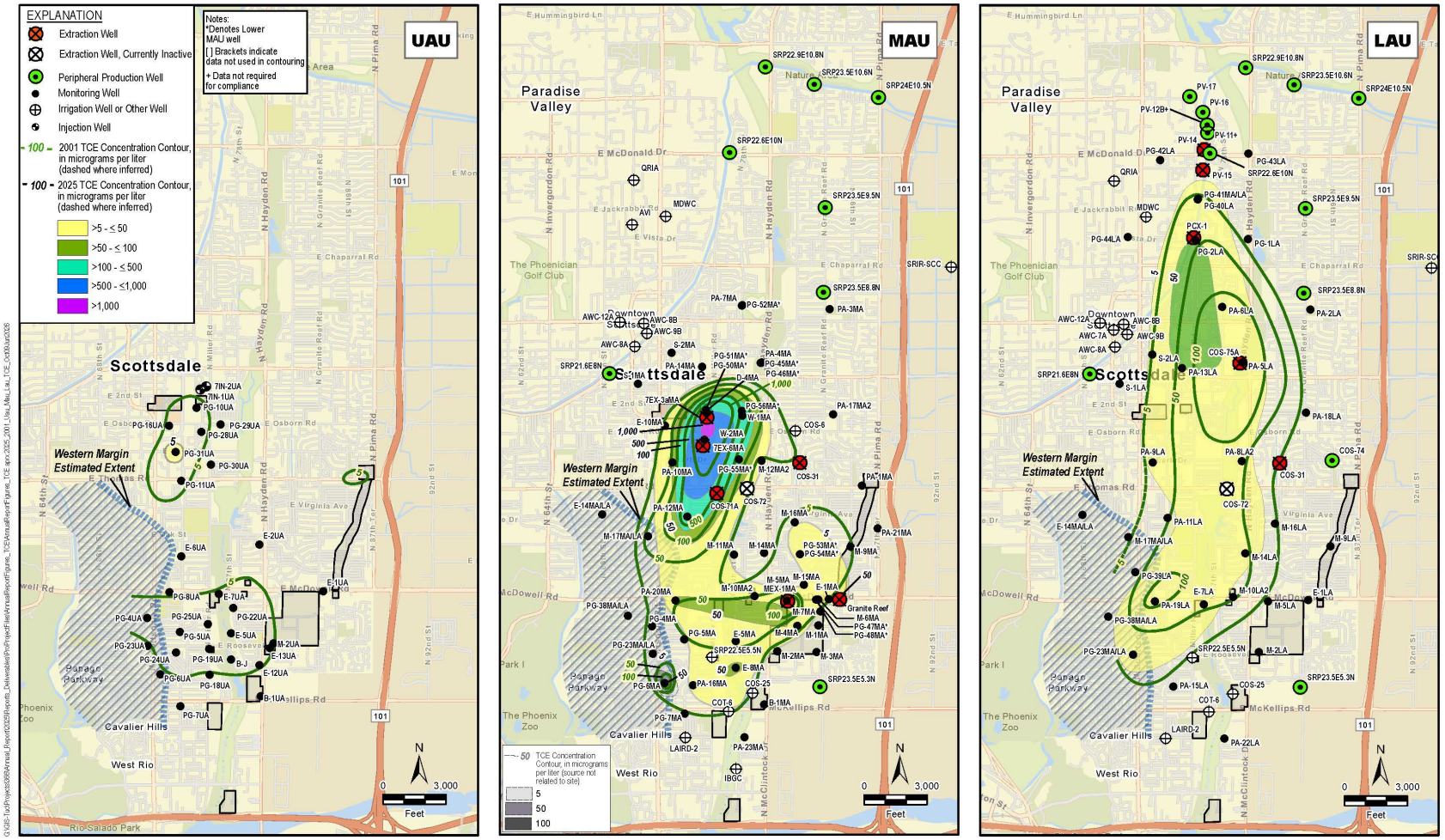



**Figure C-4. Concentrations of TCE in the UAU, MAU, and LAU for October 2001 and 2025**

**TCE Concentration Trends**

The NIBW PCs conduct annual trend analyses of UAU, MAU, and LAU monitoring wells as part of the Site Monitoring Report (SMR). During the 2025 SMR, the NIBW PCs conducted Mann-Kendall analyses of twenty-two UAU monitoring wells, thirty-five MAU monitoring wells, three MAU/LAU monitoring wells, twenty-six LAU monitoring wells, and ten extraction wells (NIBW PCs, 2026). Of the 86 monitoring wells analyzed, only ten showed increasing trends. Of these, two were in the UAU, five in the MAU, and three in the LAU. One extraction well, MEX-1MA, exhibited an increasing trend over the past five years. Six of the ten monitoring wells with increasing trends had concentrations greater than the TCE Cleanup Standard of 5 µg/L. Figure C-5 shows concentration trends for the UAU, MAU, MAU (lower), and LAU, as analyzed by the NIBW PCs.

Additionally, for this Five-Year Review, Mann-Kendall trend analyses were conducted independently for 56 monitoring wells. These analyses included nine UAU monitoring wells, thirty MAU monitoring wells, and seventeen LAU monitoring wells. Of the 56 monitoring wells analyzed, ten showed increasing trends, twenty showed stable trends, fourteen showed no trend, and twelve showed decreasing or probably decreasing trends. Independent Mann-Kendall trend graphs are presented in Figures C-5 to C-14.

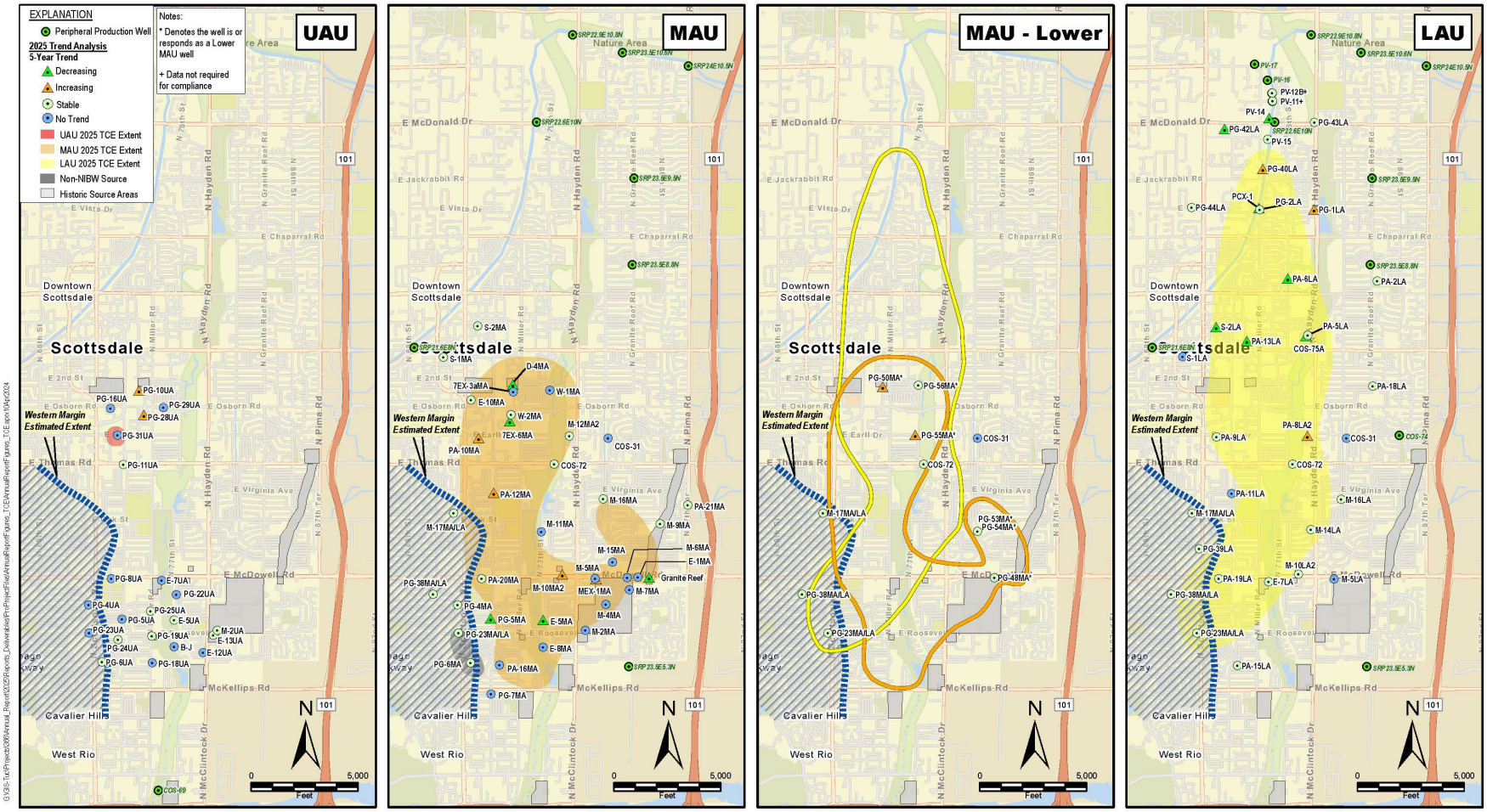



**Figure C-5. 5-Year Concentration Trends for UAU, MAU, MAU-Lower, and LAU**

*Upper Alluvial Unit*

Of the nine UAU monitoring wells selected, only two (PG-10UA and PG-28UA) show an increasing trend over the previous five years. Both PG-10UA and PG-28UA are below the 5 µg/L Cleanup Standard. The remaining seven wells had either stable trends or no trend, and all but one well (PG-31UA) reported TCE concentrations below 5 µg/L in 2025. While some variability in concentrations is expected within the UAU, the data continue to support the absence of ongoing sources of COC mass to the UAU, and modeling suggests that the remaining TCE mass in the UAU will migrate toward the Western Margin and ultimately to the remedy extraction wells in the LAU (NIBW PCs, 2025b). Mann-Kendall trend graphs for selected UAU monitoring wells are presented in Figures C-5 to C-6.

*Middle Alluvial Unit*

Thirty MAU monitoring wells were selected for Mann-Kendall trend analysis. Of these, only five exhibited increasing trends over the past five years (M-10MA2, PA-10MA, PA-12MA, PG-50MA, and PG-55MA). All monitoring wells with an increasing trend are located within modeled capture zones of either MAU or LAU extraction wells. Of the remaining twenty-five wells analyzed, eleven have a stable trend, nine exhibit no trend, and five have a decreasing or probably decreasing trend. Mann-Kendall graphs for selected MAU monitoring wells are presented in Figures C-7 to C-11.

Consistent with previous years' observations, wells with increasing trends in the MAU are largely downgradient of historical source areas Area 7 and Area 12/Area 5B and are primarily attributed to changes in groundwater extraction operations that have affected hydraulic capture of portions of the plume and hydraulic gradients toward the Western Margin (NIBW PCs, 2025b). Downgradient of Area 7, increasing concentrations at monitoring wells PA-10MA, PA-12MA, PG-50MA, and PG-55MA can be correlated with long-term reductions in CGTF extraction, particularly at wells COS-71A and COS-72, and Area 7 system shut down from July 2021 to April 2022 due to communications system failure and repair. The increasing trend at M-10MA2, located downgradient of Area 12, is attributed to periodic shutdowns of Area 12 extraction wells and to the overall flattening and, locally, reversal of gradients toward the Western Margin (NIBW PCs, 2025b & NIBW PCs, 2026a). Additionally, matrix back-diffusion is evident at Area 7 and Area 12 monitoring wells. This diffusion from surrounding fine-grained sediments replenishes the coarser-grained sediment zones with higher-TCE-concentration water, particularly when extraction is interrupted or diminished.

*Lower Alluvial Unit*

Three of the seventeen LAU monitoring wells selected for Mann-Kendall trend analysis showed increasing trends over the past five years (PA-8LA2, PG-1LA, and PG-40LA). The increasing trends at PG-2LA and PG-40LA are consistent with the anticipated and modeled northward mass migration toward PCX-1 and the MRTF extraction wells, whereas PA-8LA2's increasing trend is attributed to mass migration along a flow path from the Western Margin toward the COS-75A extraction well (NIBW PCs, 2025b & NIBW PCs, 2026a).

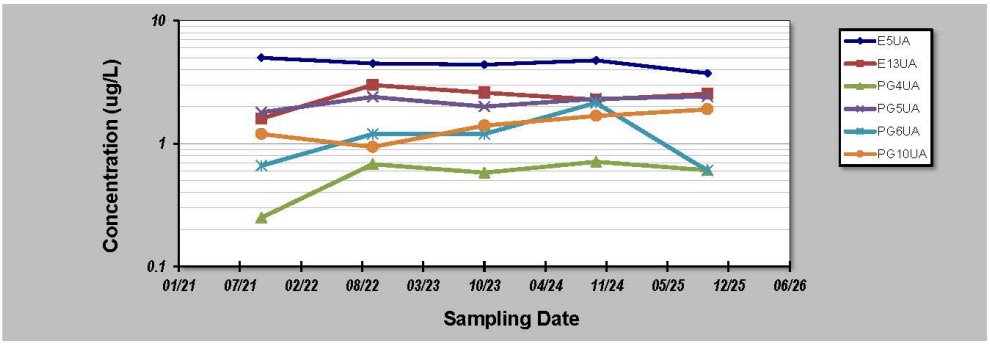
Of the three aquifer units, the LAU had the highest percentage of wells analyzed showing decreasing or probably decreasing trends, with seven wells. These decreasing and stable trends demonstrate that containment and mass removal from the LAU plume are effective. Additionally, the general stabilization and decline in TCE concentrations, coupled with the absence of increasing trends near the Western Margin and decreasing concentration trends at wells PA-6LA and PA-13LA, indicate a decreasing mass flux from overlying units (NIBW PCs, 2025b). Mann-Kendall graphs for selected MAU monitoring wells are presented in Figures C-13 to C-14.

## Figure C-6. Upper Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

| | | | |
|---|---|---|---|
| Evaluation Date: | | Job ID: | Upper Alluvial Unit - Five-Year Review |
| Facility Name: | NIBW | Constituent: | TCE |
| Conducted By: | DAWSON | Concentration Units: | ug/L |

| Sampling Point ID: | E5UA | E13UA | PG4UA | PG5UA | PG6UA | PG10UA | |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | |
| 1 | 1-Oct-21 | 5 | 1.6 | 0.25 | 1.8 | 0.66 | 1.2 |
| 2 | 1-Oct-22 | 4.5 | 3 | 0.68 | 2.4 | 1.2 | 0.94 |
| 3 | 1-Oct-23 | 4.4 | 2.6 | 0.58 | 2 | 1.2 | 1.4 |
| 4 | 1-Oct-24 | 4.75 | 2.28 | 0.713 | 2.32 | 2.15 | 1.68 |
| 5 | 1-Oct-25 | 3.74 | 2.54 | 0.608 | 2.42 | 0.603 | 1.9 |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
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| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| Coefficient of Variation: | | 0.11 | 0.22 | 0.33 | 0.13 | 0.53 | 0.27 |
| Mann-Kendall Statistic (S): | | -6 | 0 | 4 | 6 | 1 | 8 |
| Confidence Factor: | | 88.3% | 40.8% | 75.8% | 88.3% | 50.0% | 95.8% |
| Concentration Trend: | | Stable | Stable | No Trend | No Trend | No Trend | Increasing |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

4 0.25 = Red number denotes half the detection limit was used.

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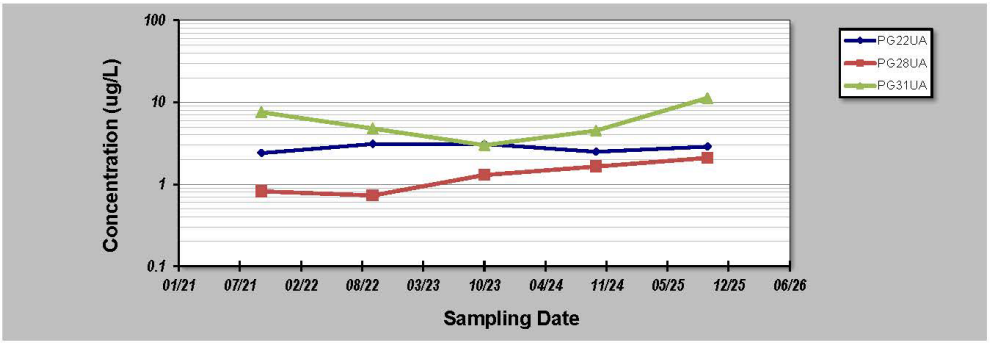
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## Figure C-7. Upper Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

| | | | |
|---|---|---|---|
| Evaluation Date: | | Job ID: | Upper Alluvial Unit - Five-Year Review |
| Facility Name: | NIBW | Constituent: | TCE |
| Conducted By: | DAWSON | Concentration Units: | ug/L |

| Sampling Point ID: | PG22UA | PG28UA | PG31UA | | | | |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Oct-21 | 2.4 | 0.82 | 7.6 | | | | |
| 2 | 1-Oct-22 | 3.1 | 0.73 | 4.8 | | | | |
| 3 | 1-Oct-23 | 3.1 | 1.3 | 3 | | | | |
| 4 | 1-Oct-24 | 2.5 | 1.64 | 4.52 | | | | |
| 5 | 1-Oct-25 | 2.88 | 2.1 | 11.3 | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| Coefficient of Variation: | | 0.12 | 0.43 | 0.52 | | | | |
| Mann-Kendall Statistic (S): | | 1 | 8 | 0 | | | | |
| Confidence Factor: | | 50.0% | 95.8% | 40.8% | | | | |
| Concentration Trend: | | No Trend | Increasing | Stable | | | | |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.
4. 0.25 = Red number denotes half the detection limit was used.

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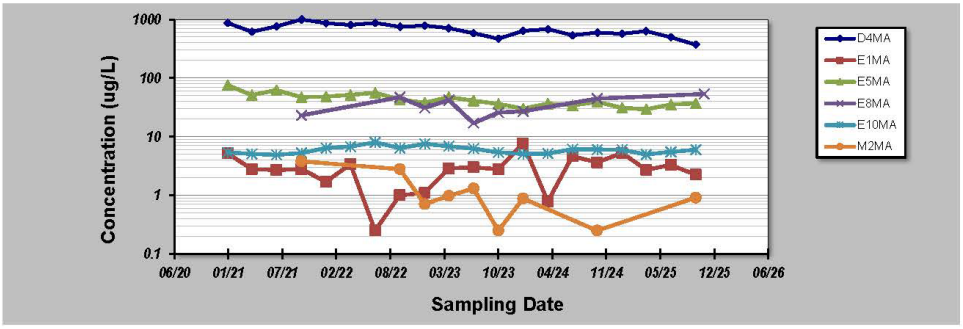
## Figure C-8. Middle Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Middle Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | D4MA | E1MA | E5MA | E8MA | E10MA | M2MA | M4MA |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Jan-21 | 870 | 5.2 | 76 | | 5.4 | | 12 |
| 2 | 1-Apr-21 | 620 | 2.8 | 51 | | 5.1 | | 27 |
| 3 | 1-Jul-21 | 760 | 2.7 | 62 | | 4.9 | | 33 |
| 4 | 1-Oct-21 | 1000 | 2.8 | 47 | 23 | 5.3 | 3.8 | 12 |
| 5 | 1-Jan-22 | 860 | 1.7 | 48 | | 6.4 | | 25 |
| 6 | 1-Apr-22 | 800 | 3.4 | 52 | | 6.8 | | 44 |
| 7 | 1-Jul-22 | 870 | 0.25 | 56 | | 8 | | 19 |
| 8 | 1-Oct-22 | 750 | 1 | 43 | 47 | 6.4 | 2.8 | 19 |
| 9 | 1-Jan-23 | 790 | 1.1 | 38 | 31 | 7.5 | 0.71 | 9.3 |
| 10 | 1-Apr-23 | 710 | 2.9 | 47 | 42 | 6.9 | 0.98 | 22 |
| 11 | 1-Jul-23 | 580 | 3 | 41 | 17 | 6.3 | 1.3 | 27 |
| 12 | 1-Oct-23 | 470 | 2.8 | 36 | 26 | 5.4 | 0.25 | 9.1 |
| 13 | 1-Jan-24 | 640 | 7.7 | 30 | 27 | 5.1 | 0.88 | 16 |
| 14 | 1-Apr-24 | 681 | 0.788 | 36.8 | | 5.18 | | 8.93 |
| 15 | 1-Jul-24 | 536 | 4.66 | 34.3 | | 6.11 | | 23.7 |
| 16 | 1-Oct-24 | 599 | 3.65 | 39 | 44.6 | 6.07 | 0.25 | 12.1 |
| 17 | 1-Jan-25 | 570 | 5.25 | 31.3 | | 6.01 | | 10.5 |
| 18 | 1-Apr-25 | 629 | 2.72 | 29.3 | | 4.98 | | 31.8 |
| 19 | 1-Jul-25 | 493 | 3.28 | 35.4 | | 5.55 | | 37.4 |
| 20 | 1-Oct-25 | 371 | 2.25 | 36.9 | | 6 | 0.913 | 46.2 |
| 21 | 1-Nov-25 | | | | 53.5 | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| Coefficient of Variation: | | 0.23 | 0.58 | 0.27 | 0.36 | 0.14 | 0.91 | 0.52 |
| Mann-Kendall Statistic (S): | | -115 | 19 | -125 | 10 | -17 | -17 | 9 |
| Confidence Factor: | | >99.9% | 71.8% | >99.9% | 82.1% | 69.6% | 95.1% | 60.1% |
| Concentration Trend: | | Decreasing | No Trend | Decreasing | No Trend | Stable | Decreasing | No Trend |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.
4. 0.25 = Red number denotes half the detection limit was used.

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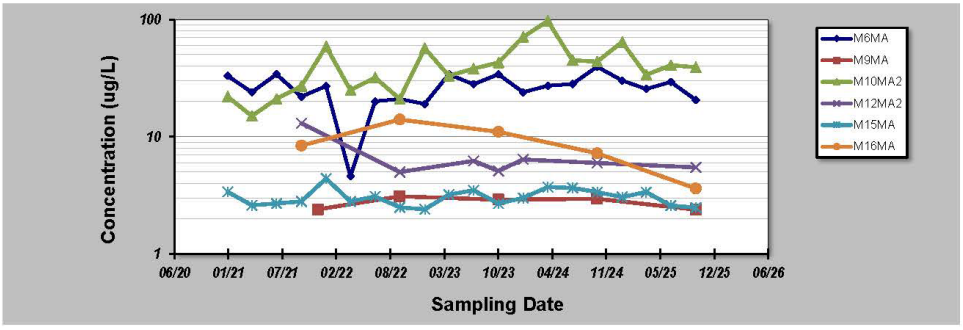
## Figure C-9. Middle Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Middle Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | M6MA | M9MA | M10MA2 | M12MA2 | M15MA | M16MA | |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Jan-21 | 33 | | 22 | | 3.4 | | |
| 2 | 1-Apr-21 | 24 | | 15 | | 2.6 | | |
| 3 | 1-Jul-21 | 34 | | 21 | | 2.7 | | |
| 4 | 1-Oct-21 | 22 | | 27 | 13 | 2.8 | 8.4 | |
| 5 | 1-Dec-21 | | 2.4 | | | | | |
| 6 | 1-Jan-22 | 27 | | 59 | | 4.4 | | |
| 7 | 1-Apr-22 | 4.6 | | 25 | | 2.8 | | |
| 8 | 1-Jul-22 | 20 | | 32 | | 3.1 | | |
| 9 | 1-Oct-22 | 21 | 3.1 | 21 | 5 | 2.5 | 14 | |
| 10 | 1-Jan-23 | 19 | | 57 | | 2.4 | | |
| 11 | 1-Apr-23 | 34 | | 33 | | 3.2 | | |
| 12 | 1-Jul-23 | 28 | | 38 | 6.2 | 3.5 | | |
| 13 | 1-Oct-23 | 34 | 2.9 | 43 | 5.1 | 2.7 | 11 | |
| 14 | 1-Jan-24 | 24 | | 71 | 6.4 | 3 | | |
| 15 | 1-Apr-24 | 27.2 | | 97.1 | | 3.72 | | |
| 16 | 1-Jul-24 | 28.2 | | 45 | | 3.66 | | |
| 17 | 1-Oct-24 | 39.5 | 2.96 | 43.7 | 5.96 | 3.38 | 7.21 | |
| 18 | 1-Jan-25 | 30.2 | | 64.1 | | 3.06 | | |
| 19 | 1-Apr-25 | 25.5 | | 33.6 | | 3.37 | | |
| 20 | 1-Jul-25 | 29.3 | | 40.7 | | 2.59 | | |
| 21 | 1-Oct-25 | 20.6 | 2.39 | 39 | 5.46 | 2.48 | 3.62 | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| Coefficient of Variation: | | 0.29 | 0.12 | 0.49 | 0.42 | 0.17 | 0.44 | |
| Mann-Kendall Statistic (S): | | 20 | -2 | 81 | -3 | 2 | -6 | |
| Confidence Factor: | | 72.9% | 59.2% | 99.6% | 61.4% | 51.3% | 88.3% | |
| Concentration Trend: | | No Trend | Stable | Increasing | Stable | No Trend | Stable | |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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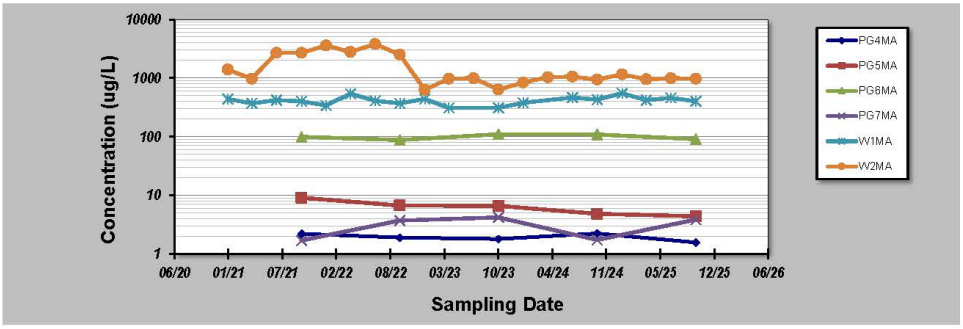
## Figure C-10. Middle Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Middle Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | PG4MA | PG5MA | PG6MA | PG7MA | W1MA | W2MA |
|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | |
| 1 | 1-Jan-21 | | | | | 440 | 1400 |
| 2 | 1-Apr-21 | | | | | 370 | 970 |
| 3 | 1-Jul-21 | | | | | 420 | 2700 |
| 4 | 1-Oct-21 | 2.2 | 9.1 | 100 | 1.7 | 400 | 2700 |
| 5 | 1-Jan-22 | | | | | 340 | 3600 |
| 6 | 1-Apr-22 | | | | | 540 | 2800 |
| 7 | 1-Jul-22 | | | | | 410 | 3800 |
| 8 | 1-Oct-22 | 1.9 | 6.7 | 88 | 3.7 | 370 | 2500 |
| 9 | 1-Jan-23 | | | | | 440 | 630 |
| 10 | 1-Apr-23 | | | | | 310 | 980 |
| 11 | 1-Jul-23 | | | | | | 1000 |
| 12 | 1-Oct-23 | 1.8 | 6.6 | 110 | 4.2 | 310 | 640 |
| 13 | 1-Jan-24 | | | | | 380 | 840 |
| 14 | 1-Apr-24 | | | | | | 1030 |
| 15 | 1-Jul-24 | | | | | 468 | 1060 |
| 16 | 1-Oct-24 | 2.24 | 4.84 | 109 | 1.74 | 428 | 947 |
| 17 | 1-Jan-25 | | | | | 550 | 1160 |
| 18 | 1-Apr-25 | | | | | 422 | 958 |
| 19 | 1-Jul-25 | | | | | 463 | 996 |
| 20 | 1-Oct-25 | 1.57 | 4.39 | 91 | 3.84 | 401 | 970 |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | | | | | | |
| 24 | | | | | | | |
| 25 | | | | | | | |
| Coefficient of Variation: | | 0.14 | 0.29 | 0.10 | 0.40 | 0.16 | 0.64 |
| Mann-Kendall Statistic (S): | | -4 | -10 | 0 | 4 | 20 | -50 |
| Confidence Factor: | | 75.8% | 99.2% | 40.8% | 75.8% | 76.2% | 94.4% |
| Concentration Trend: | | Stable | Decreasing | Stable | No Trend | No Trend | Prob. Decreasing |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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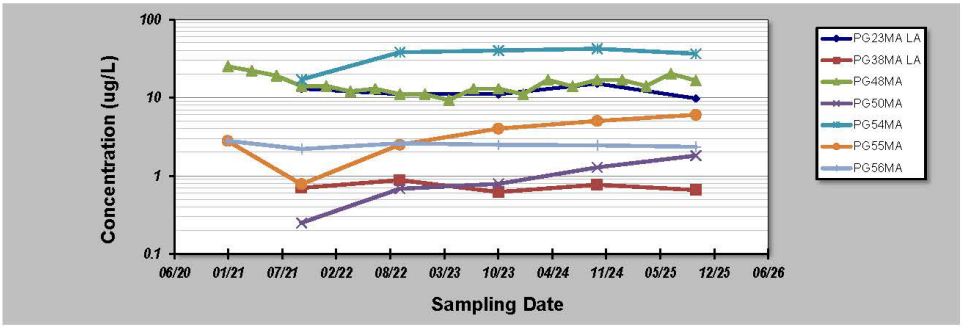
## Figure C-11. Middle Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Middle Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | PG23MA LA | PG38MA LA | PG48MA | PG50MA | PG54MA | PG55MA | PG56MA |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Jan-21 | | | 25 | | | 2.8 | 2.8 |
| 2 | 1-Apr-21 | | | 22 | | | | |
| 3 | 1-Jul-21 | | | 19 | | | | |
| 4 | 1-Oct-21 | 13 | 0.7 | 14 | 0.25 | 17 | 0.78 | 2.2 |
| 5 | 1-Jan-22 | | | 14 | | | | |
| 6 | 1-Apr-22 | | | 12 | | | | |
| 7 | 1-Jul-22 | | | 13 | | | | |
| 8 | 1-Oct-22 | 11 | 0.88 | 11 | 0.68 | 38 | 2.5 | 2.6 |
| 9 | 1-Jan-23 | | | 11 | | | | |
| 10 | 1-Apr-23 | | | 9.3 | | | | |
| 11 | 1-Jul-23 | | | 13 | | | | |
| 12 | 1-Oct-23 | 11 | 0.62 | 13 | 0.79 | 40 | 4 | 2.5 |
| 13 | 1-Jan-24 | | | 11 | | | | |
| 14 | 1-Apr-24 | | | 16.9 | | | | |
| 15 | 1-Jul-24 | | | 13.9 | | | | |
| 16 | 1-Oct-24 | 15.1 | 0.769 | 16.9 | 1.28 | 42.2 | 5.02 | 2.46 |
| 17 | 1-Jan-25 | | | 16.8 | | | | |
| 18 | 1-Apr-25 | | | 14 | | | | |
| 19 | 1-Jul-25 | | | 20.2 | | | | |
| 20 | 1-Oct-25 | 9.77 | 0.656 | 16.6 | 1.81 | 36.5 | 6.03 | 2.35 |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| Coefficient of Variation: | | 0.18 | 0.14 | 0.27 | 0.62 | 0.29 | 0.54 | 0.08 |
| Mann-Kendall Statistic (S): | | -3 | -2 | -6 | 10 | 4 | 11 | -7 |
| Confidence Factor: | | 67.5% | 59.2% | 56.4% | 99.2% | 75.8% | 97.2% | 86.4% |
| Concentration Trend: | | Stable | Stable | Stable | Increasing | No Trend | Increasing | Stable |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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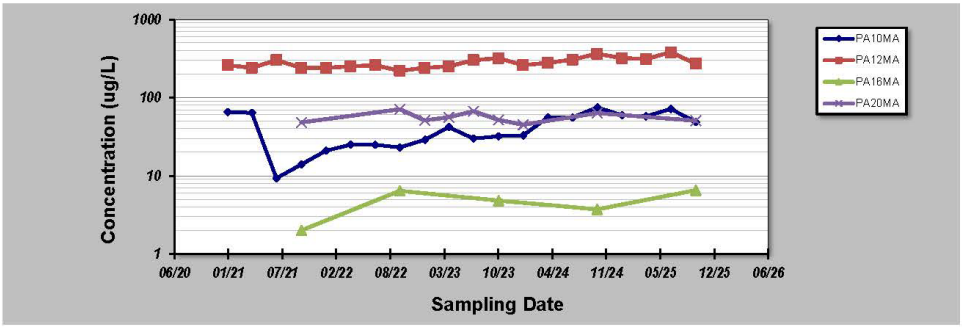
## Figure C-12. Middle Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Middle Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | PA10MA | PA12MA | PA16MA | PA20MA | | | |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Jan-21 | 65 | 260 | | | | | |
| 2 | 1-Apr-21 | 64 | 240 | | | | | |
| 3 | 1-Jul-21 | 9.3 | 300 | | | | | |
| 4 | 1-Oct-21 | 14 | 240 | 2 | 48 | | | |
| 5 | 1-Dec-21 | | | | | | | |
| 6 | 1-Jan-22 | 21 | 240 | | | | | |
| 7 | 1-Apr-22 | 25 | 250 | | | | | |
| 8 | 1-Jul-22 | 25 | 260 | | | | | |
| 9 | 1-Oct-22 | 23 | 220 | 6.4 | 71 | | | |
| 10 | 1-Jan-23 | 29 | 240 | | 51 | | | |
| 11 | 1-Apr-23 | 42 | 250 | | 56 | | | |
| 12 | 1-Jul-23 | 30 | 300 | | 67 | | | |
| 13 | 1-Oct-23 | 32 | 320 | 4.8 | 52 | | | |
| 14 | 1-Jan-24 | 33 | 260 | | 45 | | | |
| 15 | 1-Apr-24 | 55.9 | 279 | | | | | |
| 16 | 1-Jul-24 | 55.7 | 307 | | | | | |
| 17 | 1-Oct-24 | 74.9 | 364 | 3.71 | 63.4 | | | |
| 18 | 1-Jan-25 | 59.8 | 319 | | | | | |
| 19 | 1-Apr-25 | 57.9 | 312 | | | | | |
| 20 | 1-Jul-25 | 71.6 | 381 | | | | | |
| 21 | 1-Oct-25 | 48.8 | 272 | 6.53 | 50.8 | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| Coefficient of Variation: | | 0.48 | 0.16 | 0.41 | 0.16 | | | |
| Mann-Kendall Statistic (S): | | 91 | 93 | 4 | -4 | | | |
| Confidence Factor: | | 99.9% | 99.9% | 75.8% | 61.9% | | | |
| Concentration Trend: | | Increasing | Increasing | No Trend | Stable | | | |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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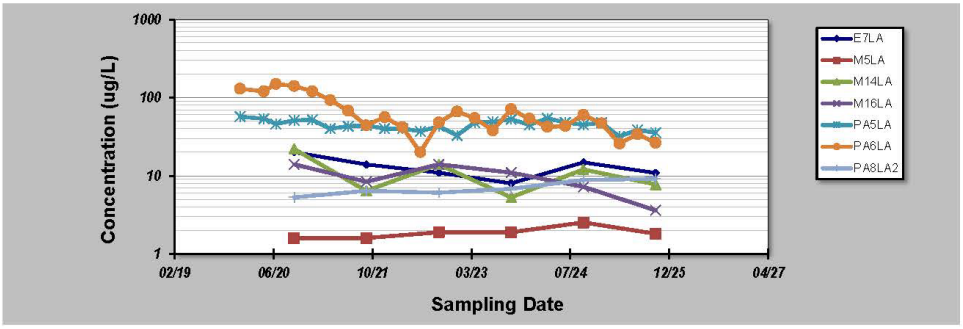
## Figure C-13. Lower Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Lower Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | | E7LA | M5LA | M14LA | M16LA | PA5LA | PA6LA | PA8LA2 |
|---|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Jan-20 | | | | | 57 | 130 | |
| 2 | 1-May-20 | | | | | 54 | 120 | |
| 3 | 1-Jul-20 | | | | | 46 | 150 | |
| 4 | 1-Oct-20 | 20 | 1.6 | 22 | 14 | 51 | 140 | 5.3 |
| 5 | 1-Jan-21 | | | | | 52 | 120 | |
| 6 | 1-Apr-21 | | | | | 40 | 93 | |
| 7 | 1-Jul-21 | | | | | 43 | 68 | |
| 8 | 1-Oct-21 | 14 | 1.6 | 6.4 | 8.4 | 44 | 44 | 6.4 |
| 9 | 1-Jan-22 | | | | | 40 | 56 | |
| 10 | 1-Apr-22 | | | | | 40 | 42 | |
| 11 | 1-Jul-22 | | | | | 37 | 20 | |
| 12 | 1-Oct-22 | 11 | 1.9 | 14 | 14 | 43 | 48 | 6.1 |
| 13 | 1-Jan-23 | | | | | 33 | 66 | |
| 14 | 1-Apr-23 | | | | | 48 | 55 | |
| 15 | 1-Jul-23 | | | | | 49 | 38 | |
| 16 | 1-Oct-23 | 8 | 1.9 | 5.3 | 11 | 53 | 71 | 6.8 |
| 17 | 1-Jan-24 | | | | | 45 | 54 | |
| 18 | 1-Apr-24 | | | | | 54.4 | 42.2 | |
| 19 | 1-Jul-24 | | | | | 48.3 | 43.4 | |
| 20 | 1-Oct-24 | 14.9 | 2.53 | 12.1 | 7.21 | 45 | 60.4 | 8.85 |
| 21 | 1-Jan-25 | | | | | 47.7 | 47 | |
| 22 | 1-Apr-25 | | | | | 31.7 | 25.8 | |
| 23 | 1-Jul-25 | | | | | 38.6 | 34.1 | |
| 24 | 1-Oct-25 | 10.9 | 1.81 | 7.77 | 3.62 | 35.6 | 26.6 | 9.18 |
| 25 | | | | | | | | |
| Coefficient of Variation: | | 0.32 | 0.18 | 0.55 | 0.42 | 0.15 | 0.57 | 0.22 |
| Mann-Kendall Statistic (S): | | -7 | 7 | -5 | -10 | -69 | -155 | 13 |
| Confidence Factor: | | 86.4% | 86.4% | 76.5% | 95.2% | 95.4% | >99.9% | 99.2% |
| Concentration Trend: | | Stable | No Trend | Stable | Decreasing | Decreasing | Decreasing | Increasing |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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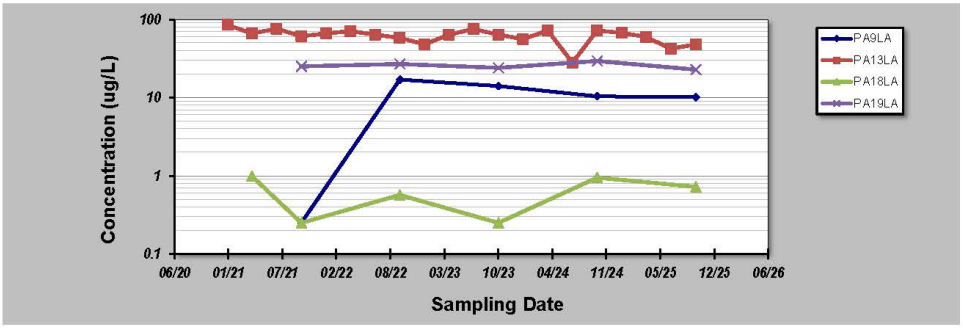
## Figure C-14. Lower Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Lower Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | PA9LA | PA13LA | PA18LA | PA19LA | | | |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Jan-21 | | 85 | | | | | |
| 2 | 1-Apr-21 | | 66 | 0.99 | | | | |
| 3 | 1-Jul-21 | | 76 | | | | | |
| 4 | 1-Oct-21 | 0.25 | 61 | 0.25 | 25 | | | |
| 5 | 1-Jan-22 | | 66 | | | | | |
| 6 | 1-Apr-22 | | 71 | | | | | |
| 7 | 1-Jul-22 | | 64 | | | | | |
| 8 | 1-Oct-22 | 17 | 58 | 0.57 | 27 | | | |
| 9 | 1-Jan-23 | | 48 | | | | | |
| 10 | 1-Apr-23 | | 64 | | | | | |
| 11 | 1-Jul-23 | | 75 | | | | | |
| 12 | 1-Oct-23 | 14 | 64 | 0.25 | 24 | | | |
| 13 | 1-Jan-24 | | 56 | | | | | |
| 14 | 1-Apr-24 | | 71.8 | | | | | |
| 15 | 1-Jul-24 | | 28 | | | | | |
| 16 | 1-Oct-24 | 10.4 | 71.8 | 0.947 | 29.4 | | | |
| 17 | 1-Jan-25 | | 67.5 | | | | | |
| 18 | 1-Apr-25 | | 59.8 | | | | | |
| 19 | 1-Jul-25 | | 42.3 | | | | | |
| 20 | 1-Oct-25 | 10.1 | 47.9 | 0.721 | 22.8 | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| Coefficient of Variation: | | 0.61 | 0.21 | 0.52 | 0.10 | | | |
| Mann-Kendall Statistic (S): | | -2 | -67 | 0 | -2 | | | |
| Confidence Factor: | | 59.2% | 98.5% | 39.3% | 59.2% | | | |
| Concentration Trend: | | Stable | Decreasing | Stable | Stable | | | |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.
4. 0.25 = Red number denotes half the detection limit was used.

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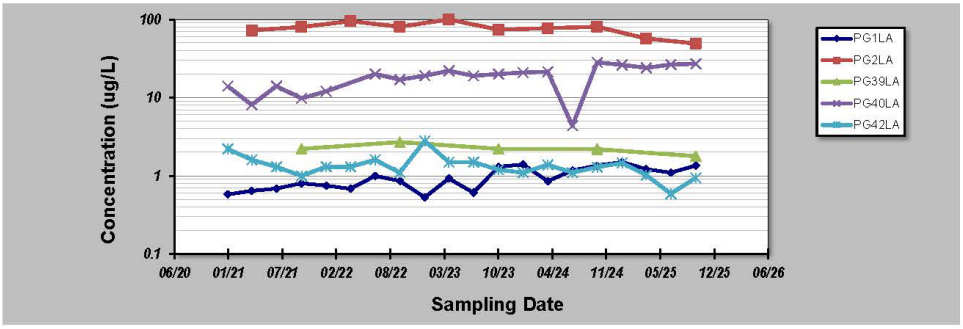
## Figure C-15. Lower Alluvial Unit TCE Mann-Kendall Analyses

# GSI MANN-KENDALL TOOLKIT
## for Constituent Trend Analysis

Evaluation Date:
Facility Name: NIBW
Conducted By: DAWSON

Job ID: Lower Alluvial Unit - Five-Year Review
Constituent: TCE
Concentration Units: ug/L

| Sampling Point ID: | PG1LA | PG2LA | PG39LA | PG40LA | PG42LA | S2LA | |
|---|---|---|---|---|---|---|---|
| Sampling Event | Sampling Date | TCE CONCENTRATION (ug/L) | | | | | | |
| 1 | 1-Jan-21 | 0.58 | | | 14 | 2.2 | 23 | |
| 2 | 1-Apr-21 | 0.64 | 73 | | 8.1 | 1.6 | 16 | |
| 3 | 1-Jul-21 | 0.69 | | | 14 | 1.3 | 14 | |
| 4 | 1-Oct-21 | 0.8 | 80 | 2.2 | 9.8 | 1 | 15 | |
| 5 | 1-Jan-22 | 0.75 | | | 12 | 1.3 | 17 | |
| 6 | 1-Apr-22 | 0.68 | 95 | | | 1.3 | 13 | |
| 7 | 1-Jul-22 | 1 | | | 20 | 1.6 | 10 | |
| 8 | 1-Oct-22 | 0.86 | 81 | 2.7 | 17 | 1.1 | 10 | |
| 9 | 1-Jan-23 | 0.53 | | | 19 | 2.8 | 9.5 | |
| 10 | 1-Apr-23 | 0.92 | 100 | | 22 | 1.5 | 11 | |
| 11 | 1-Jul-23 | 0.61 | | | 19 | 1.5 | 14 | |
| 12 | 1-Oct-23 | 1.3 | 74 | 2.2 | 20 | 1.2 | 14 | |
| 13 | 1-Jan-24 | 1.4 | | | 21 | 1.1 | 14 | |
| 14 | 1-Apr-24 | 0.854 | 77.4 | | 21.4 | 1.38 | 14.1 | |
| 15 | 1-Jul-24 | 1.17 | | | 4.37 | 1.1 | 13.3 | |
| 16 | 1-Oct-24 | 1.35 | 80.5 | 2.19 | 28.2 | 1.29 | 13.1 | |
| 17 | 1-Jan-25 | 1.5 | | | 26.3 | 1.46 | 9.65 | |
| 18 | 1-Apr-25 | 1.22 | 57.3 | | 24 | 1.02 | 9.89 | |
| 19 | 1-Jul-25 | 1.1 | | | 26.4 | 0.59 | 7.32 | |
| 20 | 1-Oct-25 | 1.35 | 49.2 | 1.78 | 27.2 | 0.941 | 7.93 | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| Coefficient of Variation: | | 0.32 | 0.20 | 0.15 | 0.36 | 0.34 | 0.28 | |
| Mann-Kendall Statistic (S): | | 105 | -13 | -7 | 108 | -76 | -93 | |
| Confidence Factor: | | >99.9% | 85.4% | 92.1% | >99.9% | 99.3% | 99.9% | |
| Concentration Trend: | | Increasing | Stable | Prob. Decreasing | Increasing | Decreasing | Decreasing | |




**Notes:**

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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# Appendix D: Applicable or Relevant and Appropriate Requirements Assessment

Section 121 (d)(2)(A) of Comprehensive Environmental Response, Compensation, and Liability Act specifies that Superfund remedial actions must meet any Federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs). ARARs are those standards, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a Comprehensive Environmental Response, Compensation, and Liability Act site.

Changes (if any) in ARARs are evaluated to determine if the changes affect the protectiveness of the remedy. Each ARAR and any change to the applicable standard or criterion are discussed below.

Chemical-specific ARARs identified in the North Indian Bend Wash 1988 Groundwater Operable Unit ROD, 1991 Shallow Soils and Groundwater ROD, subsequent 2001 ROD Amendment or 2012 Explanation of Significant Differences for groundwater treatment were considered for this Five-Year Review. For Arizona, the drinking water standards are applied as aquifer standards. The North Indian Bend Wash ROD contains a standard for chloroform; however, the federal drinking water standard was changed to total trihalomethanes in 1979. The federal standard for trihalomethane is 100 µg/L, which is higher than the ROD criteria (6 µg/L). There have been no chemical specific ARAR changes during this Five-Year Review period (Table D-1)

### Table D-1. Summary of Groundwater Chemical-Specific ARAR Changes for North Indian Bend Wash

| Chemical | Decision Document Cleanup Levels (µg/L) | Basis for Cleanup Level | Current Regulations (µg/L) | | ARARs More or Less Stringent than Cleanup Levels? | Year ROD Standard Enacted |
|---|---|---|---|---|---|---|
| | | | State | Federal | | |
| PCE | 5 | Federal MCL | 5 | 5 | Same | 1991 |
| 1,1-DCE | 6 | Federal MCL | 7 | 7 | Less | 2001 |
| 1,1,1-TCA | 200 | Federal MCL | 200 | 200 | Same | 1998 |

| Chemical | Decision Document Cleanup Levels (µg/L) | Basis for Cleanup Level | Current Regulations (µg/L) | | ARARs More or Less Stringent than Cleanup Levels? | Year ROD Standard Enacted |
|---|---|---|---|---|---|---|
| | | | State | Federal | | |
| Chloroform (trichloromethane) | 6 | Federal Ambient Water Quality Criteria | 80 | 100 | Less | 1991 |
| TCE | 5 | Federal MCL | 5 | 5 | Same | 1991 |

Federal and State laws and regulations other than the chemical-specific ARARs discussed in Table D-1 that have been promulgated or changed since the specified Decision Document are described in Table D-2 below.

## Table D-2. Other Changes in ARARs

| Requirement and Citation | Document | Description | Effect on Protectiveness | Comments | Recent Amendment Date |
|---|---|---|---|---|---|
| 42 U.S.C. § 300h | 2001 ROD for the NIBW | Regulates the reinjection of groundwater. Injection wells at NIBW will comply with these design, construction, operation and maintenance requirements. | Changes do not affect protectiveness. | Change applies to EPA delegating authority of the Underground Injection Control Program to ADEQ. | October 15, 2025 |

The following action- or location-specific ARARs have not changed in the past five years, and therefore do not affect protectiveness:

- Arizona Administrative Code Section 18-11-406 Numeric Aquifer Water Standards: Drinking Water Protected Use
- Arizona Groundwater Management Act (ARS Section 45-454.01)

- Safe Drinking Water Act (42 U.S.C. 300f)
- Clean Water Act (Pub. L. 92-500)
- RCRA standards for miscellaneous units (e.g., air strippers) (40 CFR Subparts AA, BB, & X)
- Clean Air Act (42 U.S.C. 7401; 40 CFR 50-99)
- Underground Injection of Treated Groundwater (UIC Permit) (40 CFR 144-146)
- Arizona Aquifer Protection Permit (49 ARS 242-249, and AAC R18-9-102 to R18-9-403)
- RCRA Hazardous Waste Management System (40 CFR Part 260)
- Groundwater Monitoring (40 CFR 265 Subpart F)
- Arizona Human Health-Based Guidance Levels set by Arizona Department of Health Services
- Maricopa County Rules 200, 270, 320 and 330-Control of volatile organic compounds
- EPA OSWER Directive 9355.0-28-Control of emissions from air strippers exceeding 3 pounds/hour

# Appendix E: Toxicity Assessment

**PFAS Toxicity Values**

This section presents the toxicity values that EPA currently has available for PFAS compounds.

**2024 Non-Cancer Toxicity Value for PFDA**

In July 2024, EPA released a non-cancer organ specific reference dose (RfD) value for PFDA of $2 \times 10^{-9}$ mg/kg-day based on a new IRIS value. Previously there was no toxicity value available for PFDA.

**2024 Cancer and Non-cancer Toxicity Values for PFOA and PFOS**

On April 10, 2024, EPA Office of Water released new toxicity values for PFOA and PFOS for cancer and non-cancer effects. The new oral cancer slope factors are $2.93 \times 10^{4}$ $[mg/kg/day]^{-1}$ for PFOA and $3.95 \times 10^{1}$ $[mg/kg/day]^{-1}$ for PFOS. For noncancer, the new oral reference dose values are $3 \times 10^{-8}$ (mg/kg/d) for PFOA and $1 \times 10^{-7}$ (mg/kg/d) for PFOS. It is noted that toxicity values for PFHxS, PFNA, HFPO-DA (Gen-X), and PFBS are not changed with the new MCLs.

**2023 Non-cancer Toxicity Values for PFODA, PFTetA, PFDoDA, PFUDA, PFHxA, PFPrA, HQ-115**

In November 2023, EPA adopted new non-cancer oral (RfD) values for multiple PFAS compounds based on toxicity values developed by the State of Wisconsin Department of Health Services which include Perfluorooctadecanoic acid (PFODA) $4 \times 10^{-2}$ mg/kg-day, Perfluorotetradecanoic acid (PFTetA) $1 \times 10^{-3}$ mg/kg-day, Perfluorododecanoic acid (PFDoDA) $5 \times 10^{-5}$ mg/kg-day, and Perfluoroundecanoic acid (PFUDA) $3 \times 10^{-4}$ mg/kg-day.

Additionally, new oral RfD values were released for two PFAS compounds based on toxicity values published by the EPA Office of Research and Development (ORD) which include Perfluoropropanoic acid (PFPrA) $5 \times 10^{-4}$ mg/kg-day and Lithium bis[(trifluoromethyl)sulfony azanide (HQ-115) $3 \times 10^{-4}$ mg/kg-day, also known as 1,1,1-Trifluoro-N-(trifluoromethanesulfonyl)methanesulfonamide (TFSI).

These values were determined to be based on similar methods and procedures as those used for other Tier 3 toxicity values. It is noted that currently there are no analytical methods available for PFODA and the two ORD compounds PFPrA and HQ-115/TFSI.

In April 2023, EPA released a new non-cancer oral reference dose (RfD) of $5 \times 10^{-4}$ mg/kg-day for Perfluorohexanoic acid (PFHxA) based on an IRIS value.

2022 Non-cancer Toxicity Value for PFBA

In December 2022, EPA released a new non-cancer oral reference dose (RfD) of $1 \times 10^{-3}$ mg/kg-day for Perfluorobutanoic acid (PFBA) based on a new IRIS value.

# Appendix F: Press Release



EPA

# EPA Pacific Southwest (Region 9) to perform Five-Year Reviews at 25 Superfund sites in 2026

In an important marker of progress achieved on long-term Superfund cleanups across the Pacific Southwest region, in 2026 the U.S. Environmental Protection Agency (EPA) will perform comprehensive Five-Year Reviews of cleanups at 25 Superfund sites across Arizona and California. EPA will undertake these legally required reviews to ensure that cleanup efforts, some of which were completed years ago, continue to be protective of public health and the environment.

Once the Five-Year Reviews are complete, the findings will be posted to each Superfund site's webpage. The reviews to be completed in 2026 are:

## Arizona

- Hassayampa Landfill <https://epa.gov/superfund/hassayampalandfill>, Arlington, Ariz.
- Indian Bend Wash Area <https://epa.gov/superfund/indianbendwash>, Scottsdale,

### Learn More

- Superfund and Other Cleanup Sites in the Pacific Southwest <https://www.epa.gov/aboutepa/epa-region-9-pacific-southwest>
- EPA's Superfund Program <https://www.epa.gov/superfund>
- EPA's Pacific Southwest Region <https://epa.gov/pacific-southwest-media-center>

Login

- Motorola, Inc. (52nd Street Plant) <https://epa.gov/superfund/motorola52ndst>, Phoenix, Ariz.
- Williams Air Force Base <https://epa.gov/superfund/williamsafb>, Chandler, Ariz.

## California

- Aerojet General Corp. <https://epa.gov/superfund/aerojet>, Rancho Cordova, Calif.
- Alameda Naval Air Station <https://epa.gov/superfund/alamedanavalairstation>, Alameda, Calif.
- Atlas Asbestos Mine <https://epa.gov/superfund/atlasasbestos>, Coalinga, Calif.
- Brown & Bryant, Inc. (Arvin Plant) <https://epa.gov/superfund/brown-bryant>, Arvin, Calif.
- Coalinga Asbestos Mine <https://epa.gov/superfund/coalingaasbestos>, Coalinga, Calif.
- Coast Wood Preserving <https://epa.gov/superfund/coastwoodpreserving>, Ukiah, Calif.
- Concord Naval Weapons Station <https://epa.gov/superfund/concordnavalweapons>, Concord, Calif.
- Cooper Drum Co. <https://epa.gov/superfund/cooperdrum>, South Gate, Calif.
- Edwards Air Force Base <https://epa.gov/superfund/edwardsafb>, Edwards AFB, Calif.
- George Air Force Base <https://epa.gov/superfund/georgeafb>, Victorville, Calif.
- Lava Cap Mine <https://epa.gov/superfund/lavacap>, Nevada City, Calif.
- Lawrence Livermore Natl Lab (Site 300) (USDOE) <https://epa.gov/superfund/lawrencelivermore300>, Tracy, Calif.
- Pacific Coast Pipeline <https://epa.gov/superfund/pacificcoastpipeline>, Fillmore, Calif.
- Purity Oil Sales, Inc. <https://epa.gov/superfund/purityoil>, Malaga, Calif.
- Riverbank Army Ammunition Plant, Riverbank <https://epa.gov/superfund/riverbankarmy>, Calif.
- San Gabriel Valley (Area 1) <https://epa.gov/superfund/sangabrielelmonte>, El Monte, Calif.
- San Gabriel Valley (Area 4) <https://epa.gov/superfund/sangabrielpuentevalley>, La Puente, Calif.

- Connect with us on Facebook <https://www.facebook.com/epapacificsouthwest/>, Instagram <https://www.instagram.com/epa_pacificsouthwest/>, and X <https://x.com/eparegion9>

- Selma Pressure Treating Company <https://epa.gov/superfund/selma>, Selma, Calif.
- Stringfellow <https://epa.gov/superfund/stringfellow>, Jurupa Valley, Calif.
- United Heckathorn Co. <https://epa.gov/superfund/unitedheckathorn>, Richmond, Calif.
- Westinghouse Electric Corp. (Sunnyvale Plant) <https://epa.gov/superfund/westinghouse>, Sunnyvale, Calif.

## Background

Throughout the process of designing and constructing a Superfund cleanup (also called a remedy) at a hazardous waste site, EPA's primary goal is to make sure the remedy will be protective of public health and the environment. After the remedy has begun to move forward, EPA continues to ensure it remains protective by requiring reviews of cleanups every five years. It is important for EPA to regularly check on these sites to ensure the remedy is working properly. These reviews identify issues (if any) that may affect the protectiveness of the constructed remedy and, if necessary, recommend action(s) necessary to address them.

There are many phases of the Superfund cleanup process, including considering future use and redevelopment of sites as well as conducting post cleanup monitoring of sites. EPA must ensure that any redevelopment will uphold the protectiveness of the remedy into the future.

## More information

The Superfund program, a federal program established by Congress in 1980, investigates and cleans up the most complex, uncontrolled or abandoned hazardous waste sites in the country and endeavors to facilitate activities to return them to productive use. In total, there are 140 Superfund sites (this includes sites currently on the National Priorities List, deleted sites, and sites under the Superfund Alternative Approach program) across EPA's Pacific Southwest Region.

Last updated on February 12, 2026

# Appendix G: Interview Forms

| Five-Year Review Interview Record | | | | |
|---|---|---|---|---|
| **Site:** | North Indian Bend Superfund Site | | **EPA ID No:** | AZD980695969 |
| Date: | Interview Questionnaire | | | |
| **(Fill in the components below, one line per person if multiple persons are providing responses)** | | | | |
| **Name** | **Organization** | **Title** | **Telephone** | **Email** |
| Katelyn Kane-DeVries | Arizona Department of Environmental Quality | Project Manager | 602-771-0167 | Kane-devries.katelyn@azdeq.gov |
| Wayne Miller | Arizona Department of Environmental Quality | Associate Engineer | 602-771-4121 | Miller.wayne@azdeq.gov |
| | | | | |
| | | | | |

**(Record responses to the questions below)**

What is your overall impression of the project?

Katelyn's Response: I have been the ADEQ project manager for the site since May 2022, the activities conducted at the North Indian Bend Wash (NIBW) Site have been in accordance with the record of decision. The NIBW Site's project team works continuously to contain the plumes, updating the conceptual site model and keep the agencies informed.

Wayne's Response: Overall impression is favorable. The Participating Companies are providing multiple remedial actions and are implementing a generally successful cleanup program. The stakeholders are cooperating and considerate with other team members.
Groundwater remedy is achieving cleanup standards for the known groundwater contaminants addressed within the Record of Decision. The annual groundwater monitoring reports indicate successful contaminant removal.
Past vapor Intrusion studies and mitigation methods have helped minimize exposure.
Progress is being made on updating groundwater monitoring and evaluation plans. Progress is being made on expanding vapor intrusion source investigation and mitigation. Progress is being made investigating emerging contaminants not specifically addressed within a Record of Decision and Consent Decree. The team is working together to address property redevelopment as land use changes occur over release, monitoring, and remediation sites.

2) Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

Katelyn's Response: Communications and activities regarding the NIBW Site are routine on a monthly basis via virtual or in-person meetings, in 2025 ADEQ was part of a subcommittee which met monthly to discuss an update to the Groundwater Monitoring and Evaluation Plan. I have also attended site inspections of the treatment systems conducted annually. Should a treatment system shutdown or other site related issue arise the project managers relay via email or in the monthly meetings those issues in a timely manner to ADEQ. ADEQ believes the communication stream with the NIBW Site project teams are effective. ADEQ is involved in reviews of quarterly groundwater monitoring reporting, Annual Site Monitoring Report, O&M update documents, work plans, conceptual site model and groundwater model updates, and other reporting related to the site.

Wayne's Response: The Arizona Department of Environmental Quality (ADEQ) is included in routine communication with the principal parties and select stakeholders. Regular monthly meetings provide groundwater monitoring and remedial action updates. These meetings also provide forums to discuss other topics involving logistics, ongoing maintenance, proposed optimization, and stakeholder issues. Recurring, program remediation facility site reports and annual summary reports are submitted to the regulatory agencies to present results, evaluate progress, and introduce potential issues. Remedial facilities and monitoring sites are available for regulatory inspection and tour. ADEQ is invited to, and does participate in, technical meeting topics such as groundwater modeling and remedial progress evaluation methodology. ADEQ is afforded a review opportunity for most documents and actions. A notification program is in place to notify regulatory agencies of unauthorized water releases and unscheduled remedial facility shutdowns.

3) Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

Katelyn's Response: None that I am aware of.

Wayne's Response: For the period covering this Five-Year Review Report, ADEQ's Federal Project Unit has not received violation notices involving the North Indian Bend Wash groundwater remediation program. The ADEQ Federal Project Unit has not served a complaint citation with regard to the North Indian Bend Wash groundwater remediation program.

4) Do you feel well informed about the site's activities and progress?

Katelyn's Response: Yes, the NIBW project teams are responsive and keep ADEQ well informed.

Wayne's Response: Yes. The Participating Companies, impacted municipalities, and local water providers are informing the regulatory agencies of site activities, applicable progress, stakeholder activities, and stakeholder concerns. The U.S. Environmental Protection Agency is promoting communication and concurrence amongst the regulatory agencies, the Participating Companies, and the local stakeholders.

5) Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Katelyn's Response: ADEQ is open to suggestions and recommendations to optimize both NIBW Site's remedial efforts and discuss modifications to groundwater monitoring which are technically reasonable.
Though the no revisions to the protectiveness of the remedy or how cleanup is conducted, the EPA delegated the authority of the Underground Injection Control (UIC) Program to ADEQ on October 15, 2025. Therefore, ADEQ expects the substantive requirements of the UIC program under ADEQ be an ARAR if a decision document is issued in the future for this Site (e.g. ROD amendment or ESD), as the Site's treated groundwater is reinjected into the subsurface at Area 7. ADEQ requested documentation related to the UIC at the Site from the PCs on December 9, 2025 to be comprised as an inventory for ADEQ.
Additionally, ADEQ has noted during the last five years treatment system emissions appear to be similar to the concentration entering the treatment system suggesting issues in emission controls regulated by Maricopa County. ADEQ has requested an evaluation into reducing the emissions on multiple occasions.

Wayne's Response: The project team is effective. The project team reports most operations are generally stable and showing results. The project team is discussing, with the regulatory agencies, potential remedy optimization and evaluation metrics as the remedial program ages. The project team is continuing to address prior Five-Year Review topics such as Vapor Intrusion. The project team is developing a plan to investigate a lingering soil vapor source (Area 7).

6) Do you have any comments, suggestions, or recommendations regarding the project?

Katelyn's Response: ADEQ encourages the continued open communication between the Project teams, agencies, cities, and stakeholders. Continued discussion on optimization of the remedial actions and monitoring is important as the plumes continue to reduce in size and concentration.
ADEQ notes concerns related to the identified PFAS and looks forward to working with the EPA and the Participating Companies to address these contaminants.

Wayne's Response: The current project team actions appear to be protective of human health and the environment.
With regard to other topics, the prior Five-Year Review Report, and the period since the prior Five-Year Review Report, have noted some ancillary topics discussed. These topics generally do not impact the protectiveness but may be beneficial to note:
The Upper Aquifer Unit includes a minor, persistent contaminant area.
Separate, unique contaminant mass is reported in groundwater in certain areas like the southwestern study area region. Some monitoring reports indicate potential other source(s) associated with other contaminant mass location(s).
A vadose zone source for soil vapor appears to exist near Area 7.
The groundwater remediation infrastructure is aging. Limited, unauthorized water releases have occurred. Some equipment has worn out and required replacement. Well maintenance has indicated some subsurface and downhole failure and clogging issues due to decades of subsurface exposure.
While not directly related to the remedial action and human safety, tangential issues have occurred related to public information. The interface with the public has been spotty at times. Specifically, Administrative Record and website information has lagged on some websites and in some aspects such as area maps. ADEQ has noted some public concerns primarily associated with real estate due diligence assessments and also real estate disclosure laws. Some public concerns have noted that CERCLA does not define "site". The real estate community has expressed a confusion about if a property has to disclose if within the Superfund Study Area or only when directly above a groundwater plume.
Other tangential topics have included discussion of CERCLA processes to investigate emerging contaminants, lack of explicit regulatory requirements when properties are sold for redevelopment, historic documents where properties were only inferred to be "closed" or provided an inferred "No Further Action", current sites seemingly excluded from remedial action due to municipal or county jurisdictional hierarchies (impacting persistent vadose contaminants and vapor emission mitigation), jurisdictional authority and processes to investigating alternate contaminant sources within the Superfund Study Area, and adjacent municipality and water provider groundwater extraction and injection impact on contaminant transport and remediation efficiencies.

| Five-Year Review Interview Record | | | | |
|---|---|---|---|---|
| **Site:** | North Indian Bend Superfund Site | | **EPA ID No:** | AZD980695969 |
| Interview Questionnaire<br>Date: | | | | |
| **(Fill in the components below, one line per person if multiple persons are providing responses)** | | | | |
| **Name** | **Organization** | **Title** | **Telephone** | **Email** |
| Suzanne Grendahl | City of Scottsdale | Water Quality Director | 480-312-8719 | sgrendahl@scottsdaleaz.gov |
| | | | | |
| | | | | |
| | | | | |

**(Record responses to the questions below)**

1) What is your role in the project (e.g. property owner, groundwater user, drinking water provider, impacted adjacent property, consultant)?
I serve as the Project Manager and decision maker for NIBW on behalf of the City of Scottsdale unless an action requires legal or City Council approval

2) How do you interact with the Superfund Project Manager regarding concerns with the cleanup?
We have monthly technical meetings, or I will contact Project Manager separately if needed.

3) Has a private well or a non-public water system ever served the property? Can you provide details?
All wells currently being used are operated by public water systems, with the exception of some irrigation wells. I have no knowledge of private wells in operation.

4) Do you have evidence or prior knowledge that a public or private well, water system, or aquifer has been designated contaminated by any government or health agency? Please describe.
Yes, the wells within the NIBW

5) Do you review any of the published data/reports and what is your overall impression of the project? (If the answer is no continue on to question 12). Yes. The project is extremely successful.

6) When you are reviewing the monitoring data, are there any trends that show contaminant levels decreasing?
Yes. The wells have shown significant decrease over the course of the project

7) Is the cleanup functioning as expected and how well is it performing? The clean-up is going very well and is performing as expected.

8) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.
City operations and maintenance staff are onsite almost daily, and the city optimization control room monitors the wells and treatment facilities 24/7/365.

9) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? Please describe changes and impacts. No. All monitoring continues as it has for years. In addition to compliance monitoring of wells and treatment plants, the city performs additional voluntary process control monitoring.

10) Have there been unexpected O&M difficulties at the site in the last five years (e.g. fence damage, vandalism, storm damage)? If so, please give details. No the site has been/is secure and is well taken care of.

11) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and desired results or improved efficiency (e.g. better warning system for groundwater wells, repair/replace outdated equipment). The requirements of the site are adequate to protect public health and the environment.

12) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the recovery of the existing contamination or how the cleanup will be conducted? No

13) Do you have any comments, suggestions, or recommendations regarding the project? No

14) Do you wish to be included in the contact roster for receiving additional data reports or Five-Year Reports? Only for NIBW

| Five-Year Review Interview Record | | | | |
|---|---|---|---|---|
| **Site:** | North Indian Bend Superfund Site | | **EPA ID No:** | AZD980695969 |
| Interview Questionnaire<br>Date: 1/8/2026 | | | | |
| **(Fill in the components below, one line per person if multiple persons are providing responses)** | | | | |
| **Name** | **Organization** | **Title** | **Telephone** | **Email** |
| Michael Kraus | SRP | Senior Environmental Scientist | 602-236-5849 | michael.kraus@srpnet.com |
| Karol Wolf | SRP | Principal Hydrogeologist | 602-236-5767 | karol.wolf@srpnet.com |
| | | | | |
| | | | | |

**(Record responses to the questions below)**

**1) Historically, what has been your organization's role in the project? What is your organization's current and expected future role?**

SRP is both a stakeholder and a water provider at the North Indian Bend Wash Superfund (NIBW) Site. SRP works under the Amended Consent Decree, which defines cleanup roles/responsibilities and is implemented in coordination with the Participating Companies (PCs) and overseen by the EPA and ADEQ. SRP continues to meet its obligations by supporting the ongoing operation, maintenance, and monitoring of cleanup systems alongside other responsible parties and regulators. In the future, SRP expects to remain involved in long-term remediation and monitoring efforts as required to protect water resources and fulfill regulatory commitments until cleanup goals are achieved.

**2) Do you feel that there is adequate communication between the water purveyors, EPA, and other agencies managing or coordinating cleanup efforts at the site?**

Yes. SRP meets and collaborates with the PCs, EPA, ADEQ, and the City of Scottsdale on a monthly to bimonthly basis. SRP values the opportunity to provide written feedback on NIBW reports, models, comment letters, and draft AZPDES permits that authorize treated water into the SRP canal system.

**3) Do you feel that adequate efforts are made to inform the community about the site's activities and progress? Do you have any comments or suggestions on EPA's efforts?**

Yes. Public outreach and community involvement related to the site are adequate.

**4) Are you aware of any complaints, violations, or community concerns about the site in the last few years?**

SRP is not aware of any issues.

**5) What is your overall impression of the project? Do you have any comments, suggestions, or recommendations?**

Generally favorable progress toward remedial objectives.
SRP has no additional comments, suggestions, or recommendations outside of previously submitted comments.

| Five-Year Review Interview Record | | | | |
|---|---|---|---|---|
| **Site:** | North Indian Bend Superfund Site | | **EPA ID No:** | AZD980695969 |
| Interview Questionnaire<br>Date: January 23, 2026 | | | | |
| **(Fill in the components below, one line per person if multiple persons are providing responses)** | | | | |
| **Name** | **Organization** | **Title** | **Telephone** | **Email** |
| Leslie T. Katz | Montgomery & Associates | Project Coordinator | 520-245-4802 | lkatz@elmontgomery.com |
| John Pekala | Motorola Solutions Inc. | Program Manager | 602-859-9294 | john.pekala@motorolasolutions.com |
| James Lutton | Consultant to NIBW PCs | Project Engineer | 480-442-9234 | james.lutton@jalpe.net |
| | | | | |

**(Record responses to the questions below)**

1) What is your role in the project (e.g. property owner, groundwater user, drinking water provider, impacted adjacent property, consultant)?

The North Indian Bend Wash (NIBW) Participating Companies (PCs) comprise the group of potentially responsible parties jointly implementing the remedy at the Site – including Motorola Solutions Inc., Siemens, and GlaxoSmithKline. The PCs are responsible to ensure the remedy meets Performance Standards of the Amended Consent Decree, including associated groundwater extraction, treatment, monitoring, and reporting requirements.

2) How do you interact with the Superfund Project Manager regarding concerns with the cleanup?

The PCs have on-going collaborative contact with the Superfund Project Manager to ensure smooth and successful operation of the remedy. The NIBW Technical Committee, comprised of EPA, ADEQ, the PCs, City of Scottsdale, and Salt River Project, meets about monthly to review the status and direction of Site activities and deliverables, and to share technical and regulatory perspectives. Interim discussions on specific topics with smaller groups that include the Superfund Project Manager occur on a regular basis in response to project needs. Finally, the PCs reach out to the Project Manager individually when questions arise or to report important Site information.

3) Has a private well or a non-public water system ever served the property? Can you provide details?

Critical components of the remedy relate directly to tying existing and newly-installed municipal supply wells into treatment to contain the plume, protect un-impacted peripheral drinking water wells, and ultimately restore the aquifer to drinking water standards for the Site contaminants of concern (COCs). Pumping at these remedial action wells controls plume migration, while treating water for delivery to local end users. To our knowledge there are no active private or non-public wells within or adjacent to the plume boundary.

4) Do you have evidence or prior knowledge that a public or private well, water system, or aquifer has been designated contaminated by any government or health agency? Please describe.

Yes. The NIBW Site was established by EPA to address detections of Site COCs in municipal supply wells and the associated water system in the early 1980s. These wells were shut down and eventually, as appropriate, tied into the groundwater extraction and treatment program. Water entering municipal supply systems at NIBW is generally treated to below the detection limit for Site COCs and exposure to untreated drinking water has not been a concern for more than 40 years at the NIBW Site. In addition, the Arizona Department of Water Resources regulates construction of new wells near a known groundwater contamination area. The ADWR Director will consult with the Arizona Department of Environmental Quality (ADEQ) and cannot approve the drilling if it is determined the well will likely cause the migration of contaminated groundwater from a remedial action site to another well.

5) Do you review any of the published data/reports and what is your overall impression of the project? (If the answer is no continue on to question 12).

The NIBW PCs are responsible for preparing most of the compliance data reports for the Site, and compiling data from other sources for inclusion and interpretation in their reports. Our overall impression is that this is a mature, well-run Site where the groundwater plume is entirely contained, unimpacted wells are being protected, progress is steady and significant, and high-quality treated water is being produced for beneficial use by the community. Some of the recent critical reports produced by the PCs include the Conceptual Site Model Update (December 2025), Groundwater Flow Model Update Report (Draft, October 2025; Final Draft, January 2026), Groundwater Monitoring & Evaluation Plan Update Technical Memorandum (December 2025), and the 2024 Annual Site Monitoring Report (February 2025). The 2025 Annual Site Monitoring Report is due for submittal to EPA by March 31, 2026.

6) When you are reviewing the monitoring data, are there any trends that show contaminant levels decreasing?

Yes! Contaminant concentrations are declining in most places across the Upper Alluvial Unit (UAU), Middle Alluvial Unit (MAU), and Lower Alluvial Unit (LAU) portions of the NIBW plume.

TCE concentrations in the UAU have declined substantially. Beginning in 2022, UAU wells have generally been consistently below performance standards for Site COCs. Reductions are attributed to soil vapor extraction at source areas, flux into underlying units for hydraulic capture driven by pumping from deeper extraction wells, and natural flushing. The UAU appears to be nearing restoration, and the potential to initiate application of the restoration criteria for the UAU will be evaluated based on on-going sampling data.

The MAU contains the highest TCE concentrations at the Site, with levels exceeding 1,000 micrograms per liter (µg/L) near Area 7. Significant concentration reductions in MAU wells in the vicinity of Area 7, in some cases by almost an order of magnitude (D-2MA/D-4MA and W-2MA), reflect the impact of substantial long-term mass removal by the Area 7 Source Control program. Although concentrations in the Area 12 region are lower than those near Area 7, they remain elevated at the Granite Reef well (~100 µg/L) reflecting residual mass associated with former source Area 5B. Recent increasing trends have been observed in a few MAU wells, including M-10MA2, E-10MA, and PA-12MA, down-gradient from MAU Source Areas 7 and 12. Concentration declines have stalled in some areas of the MAU plume outside of Source Control capture in part due to flattening gradients resulting from regional water level recovery. Bringing COS-71A online in 2026 will enhance mass removal in this area.

TCE concentrations in the LAU reflect historical migration from the UAU and MAU, primarily along the Western Margin. Direct vertical flux of mass from the MAU to the LAU outside of the Western Margin is not significant. Since 2001, the extent and magnitude of the LAU plume have declined significantly due to the effectiveness of MAU Source Control Programs and reduced mass flux as UAU concentrations have declined, combined with long-term remedial extraction and treatment of groundwater from the LAU. Current maximum concentrations in the LAU are about 80 µg/L, with most of the plume between 5 and 50 µg/L, a significant reduction since remedial pumping began in the mid-1990s when concentrations in the LAU over 100 ug/L extended throughout more than 50% of the plume area. Localized concentration increases are attributed to mass transport along flow paths toward extraction wells.

7) Is the cleanup functioning as expected and how well is it performing?

Remedy performance evaluations indicate that groundwater capture of the TCE plume continues to be effective and that the overall remedy is functioning as intended. Capture zone analyses and particle tracking simulations confirm that the extraction systems are maintaining hydraulic control and preventing impacts to peripheral production wells. Continued optimization of extraction operations, particularly through strategic increases or redistribution of City of Scottsdale well pumping where feasible, may further enhance efficiency by shortening travel times to extraction wells. Ongoing efforts to support and improve long-term remedy performance include updates to the Groundwater Monitoring and Evaluation Plan (GM&EP), updates to and refinement of the regional groundwater flow model, and evaluation of the monitoring network. These efforts reflect a proactive and adaptive management approach that positions the Site for continued progress toward restoration. EPA conducted an Optimization Evaluation for the Site in 2024 that identified current and potential future recommendations. While the PCs had an opportunity to review the draft Optimization Evaluation, the schedule for finalizing the study report by the end of 2024 did not accommodate addressing the PCs comments, which were submitted in August 2024. Some of the PCs' comments in relation to the Optimization Evaluation recommendations include:

- The PCs' engineering team does not recommend conversion of the Area 7 treatment system to air stripping only at this time, since influent concentrations remain relatively high. As stated, this could be considered in the future, although costs are anticipated to exceed the Optimization Evaluation team estimate of $100,000.
- The City of Scottsdale already utilizes all the water treated at the CGTF for municipal supply, so the reference to "repurposing" the CGTF for primarily potable supply is not appropriate. That said, the PCs agree that CGTF and other extraction well pumping for potable use by the City (including PG-41LA in the future) should be prioritized based on the critical objectives of containment and mass removal.
- MAU-only extraction at COS-71A, when it is brought back online, is anticipated to enhance Area 7 MAU source control containment and mass removal, and its impact should not be undervalued until the well has been operational for some period of time. The PCs recommend that any further evaluation of expanding extraction and treatment at Area 7 be deferred until sufficient COS-71A pumping data is available and the benefits of bringing this well back online can be evaluated.
- While future reductions in pumping at Area 12 may be considered, the need for continued pumping at the Granite Reef well should not be ignored. Down-hole investigations and the persistence of moderate concentrations both point to the likelihood of a localized source at or adjacent to the Granite Reef well that has an impact on down-gradient wells when the well is not actively pumping.

8) Is there a continuous O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

The treatment facilities are visited a minimum of once per week. Operator activities during site visits include: collecting treatment system performance samples; recording locally indicated operating parameters; inspecting the treatment equipment condition; housekeeping; receiving deliveries of consumables and parts; and checking site security. Other routine maintenance activities include calibration of instruments, maintaining process equipment such as pumps, valves, and blowers in accordance with

manufacturers' recommendations; repair or replacement of equipment, as necessary; and cleaning of air strippers internals to maintain optimal treatment performance. All extraction and treatment systems are continuously monitored and system operators are immediately notified of equipment failure, shut downs, or other significant issues so that appropriate staff can be mobilized to promptly address the cause of the disruption.

9) Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines in the last five years? Please describe changes and impacts.

No significant changes in the O&M requirements, maintenance schedules, or sampling routines occurred in the last five years. Updates to the O&M Plans for the treatment facilities, extraction wells, and monitoring network have been reviewed by the agencies and are currently in the process of being finalized. The groundwater monitoring program will be wholistically evaluated as part of the Groundwater Monitoring & Evaluation Plan update process, which will occur in collaboration with EPA and other stakeholders in 2026.

10) Have there been unexpected O&M difficulties at the site in the last five years (e.g. fence damage, vandalism, storm damage)? If so, please give details.

No significant O&M difficulties have occurred at any of the NIBW treatment facilities in the last 5 years.

11) Have there been opportunities to optimize O&M or sampling efforts? Please describe changes and desired results or improved efficiency (e.g. better warning system for groundwater wells, repair/replace outdated equipment).

Area 7: New process pumps and variable frequency drives installed for more reliable control of the treatment system operations.
Area 12: Upgraded main controller to current technology for better remote operations and more streamlined notifications. Upgraded well site communications with fiber-optic ethernet modems for better reliability of communications between the wells and main system.
NGTF: Upgraded NGTF communication pathway from copper to fiber-optic T-1 line to City of Scottsdale central control center.
CGTF: Reduced the air-to-water ratio to optimize treatment performance and reduce electricity and natural gas usage.
MRTF: Upgraded computer servers at MRTF to current technology for better reliability of operations, notifications and alarms, as well as improved communications between EPCOR's main control center, MRTF, and remote systems.

12) Are you aware of any changes in Federal/State/County/Local laws and regulations that may impact the recovery of the existing contamination or how the cleanup will be conducted?

Yes. On January 4, 2024, the U.S. Environmental Protection Agency (EPA) requested the NIBW PCs conduct sampling for PFAS at the Site. At the time, only provisional health advisories were established by the EPA. Shortly after this request, EPA announced the final National Primary Drinking Water Regulation (NPDWR) for six PFAS on April 10, 2024. In response to EPA's January 2024 request, the NIBW PCs conducted voluntary sampling for PFAS in April 2024 (extraction wells and treatment systems) and October 2024 (monitoring wells) in the vicinity of the Site. The PCs are committed to working with the water providers if and when changes are needed to daily operations in order to ensure VOC treatment and the overall success of the remedy and accomplish the Site COC cleanup standards. A general summary of results include:

- Extraction Well and Treatment Systems: Area 7 GWETS, MRTF, NGTF and Area 12 GWETS and all associated extraction well results are below MCLs for the relevant PFAS compounds. Influent MCL exceedances were detected at CGTF only. CGTF well COS-31 was below the MCLs for all PFAS for the 2024 sampling event. CGTF extraction wells COS-71A and COS-75A have concentrations of PFAS just above the MCLs for PFOS (4.3 ng/l and 5.1 ng/L, respectively) and PFOA (5.3 ng/L for COS-71A only). However, after treatment at the CGTF, some of this water is treated using Reverse Osmosis (RO) at the City of Scottsdale's Thomas Road Treatment Facility (TGTF), then blended with the remaining water from CGTF so that the blended water's concentrations of PFAS compounds are below MCLs prior to entering the drinking water supply. Granular Activated Carbon (GAC) (at NGTF) and RO treatment (at TGTF) are effective at reducing PFAS concentrations.
- Groundwater Monitoring Network:
  - The UAU has elevated concentrations of PFOA and PFOS mostly in the central part of the Site. Out of the 8 UAU monitoring wells sampled, five results exceeded the MCL for PFOA (ranging from 5.2 ng/L – 21.6 ng/L) and 7 exceeded the MCL for PFOS (ranging from 4.6 ng/L – 30.9 ng/L).
  - The MAU is generally below MCLs for PFOA and PFOS, and near the MCLs where present. Out of the 17 MAU monitoring wells sampled, only 3 exceeded the MCL for PFOA (ranging from 4.5 ng/L to 5.0 ng/L) and 5 exceeded the MCL for PFOS (ranging from 4.2 ng/L – 5.9 ng/L). MAU wells near Area 12 (extraction and monitoring) are all below MCLs. Area 7 MAU shows one slight exceedance in a monitoring well (D-4MA).
  - MAU and LAU have elevated concentrations of PFOA and PFOS in two non-NIBW Site production wells (COT-6 and COS-25) completed across the MAU and LAU to the southeast, upgradient of the NIBW VOC plume. These data were collected prior to 2024 sampling events.
  - The LAU monitoring well network has increased concentrations to the south of the NIBW Site (upgradient of the NIBW VOC plume). Out of the 18 LAU (including MAU/LAU) monitoring wells sampled, 6 exceeded the MCL for PFOA (ranging from 5 ng/L – 12.9 ng/L) and 12 exceeded the MCL for PFOS (ranging from 4.9 ng/L – 70.3 ng/L). PA-22LA,

the southernmost monitoring well in the network and upgradient of the NIBW VOC plume, has the highest concentration, while all other monitoring wells are below 18 ng/L).

- PFNA and GenX were below laboratory reporting limits in all sample results.

These data were shared with EPA and ADEQ in 2025 and summarized in a presentation during the January 2025 Technical Committee Meeting. A summary report of results is in preparation.

13) Do you have any comments, suggestions, or recommendations regarding the project?

Recommendations include:

- Once COS-71A is available, work with City of Scottsdale to develop an approach to pumping of available CGTF wells that prioritizes pumping of COS-71A to maximize local containment and treatment of the Area 7 MAU plume. Evaluate other remedy enhancements to maximize local containment of the Area 7 MAU plume as needed in the future based on a complete assessment of COS-71A impacts.
- Efforts to bring PG-41 online and tied into treatment at the NGTF will continue. The NIBW PCs anticipate this work to commence in 2026. Extraction at PG-41 is projected to enhance capture of the northern LAU plume, minimizing mass that can migrate toward the MRTF extraction wells. This extraction well also provides assurances that impacts from future downtime at critical extraction well PCX-1 can be managed and minimized.

14) Do you wish to be included in the contact roster for receiving additional data reports or Five Year Reports?

Yes

# Appendix H: Site Inspection Report and Photos

**Site Inspection Report**

North Indian Bend Wash Area, Scottsdale, Arizona (AZD980695969)

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1. INTRODUCTION

   a. Date of Visit: March 10, 2026
   b. Location: Scottsdale, AZ
   c. Purpose: The EPA conducted a site visit to visually inspect and document the conditions of the remedy, the site, and the surrounding area for inclusion in the Five-Year Review Report.
   d. Participants:

| Name | Organization | Email |
|---|---|---|
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2. SUMMARY

The EPA conducted a site inspection at the Indian Bend Wash Area Superfund Site (Site) on March 10, 2026. The site inspection included a visual assessment of overall site conditions, an inspection of the remedy's active and past components, and a general overview of the

Site's history. The EPA site inspection team and other stakeholders evaluated each of the five treatment systems in the North Indian Wash Bend (NIBW) Area of the Site. Other stakeholders included the Participating Companies (PCs), Arizona Department of Environmental Quality (ADEQ), Salt River Project (SRP), and City of Scottsdale (COS). The PCs project manager and engineer were on site to answer any questions. Relevant documents were on site and readily available, including operation & maintenance (O&M) manuals, maintenance logs, health and safety plans, discharge permits, and security records. At all treatment systems, the treatment facility access controls were deemed adequate, and there were no signs of vandalism. The groundwater treatment systems, including extraction and injection wells, pumps, plumbing, and security systems, were all functioning as intended.

## 3. DISCUSSION

On March 10, 2026, at 0800, Kelly Malone of Dawson HDR JV arrived at the Thomas Groundwater Treatment Facility (TGTF) near the Central Groundwater Treatment Facility (CGTF) system building. The weather was sunny with temperatures around 50°F. The site visit team viewed a presentation given by the PCs representatives detailing the site history, groundwater treatment system update, and remediation progress to date.

At 0930, Jim Lutton and Taylor Schudde led the site visit team to the nearby CGTF, which began operations in 1994 and is owned/operated by the COS (Photograph 1). The CGTF and the TGTF are surrounded by a tall security fence, which is only accessible through gated entry points. The CGTF includes three air stripper towers (Photographs 3-6), two of which are operating simultaneously, an acid feed system, and three vapor-phase granular activated carbon (VGAC) vessels (Photograph 7), each holding 20,000 pounds of carbon. The mechanical components of the system appear to be in good condition. The treatment system operates continuously with the exception of scheduled maintenance periods. The system effluent is either conveyed to the COS or discharged into the Salt River Project's (SRP) Grand Canal. The treatment building is well-maintained and shows no signs of rodents or insect activity. Mr. Lutton confirmed that operators inspect the treatment system daily and the control system alarms operation staff when the system detects a problem. Since the last five-year review, the operations team has replaced two duct heater cores, a pump seal, and the COS-75A extraction well pump. Operators replace the carbon in each VGAC vessel after approximately 180 days of use on its contactor. Each year, the operators remove packing from the air stripper and remove calcium carbonate scale by recirculating acid through the system. During this maintenance period, operators also test and recalibrate the control system.

CGTF operates multiple extraction and groundwater monitoring wells. The extraction wells are inspected weekly and secured with either locks or fences. At 1025, the site visit team drove by extraction well COS-71A, which hasn't operated since 2016. The COS converted this extraction well to a Middle Aquifer Unit well in 2023; however, extraction has not begun because the facility is awaiting permitting. At 1030, the site visit team conducted a walking inspection of extraction well COS-75A (Photographs 8-10). The inspected extraction wells were observed to be in good condition and properly secured. At 1050, the site visit team conducted a walking inspection of extraction well PCX-1 (Photographs 10-11). SRP plans to replace PCX-1 with PCX-2 within about the next two years due to the age of PCX-1. The PCX-1 wellhead was located below a surface grate. The electrical cabinet was not covered by a grate; however, the system was locked during the inspection. Jim Lutton confirmed that system operators have not observed vandalism during past inspections and that they inspect the well weekly.

At 1110, the site visit team inspected the North Indian Bend Wash Granulated Activated Carbon Groundwater Treatment Facility (NGTF). The NIBW PCs own the facility, and it is operated by the COS. The facility includes a liquid-phase granular activated carbon (LGAC) system with four separate parallel treatment trains. Three trains were operating in a lead-lag configuration at the time of the inspection (Photograph 13). The system also includes an upgradient pre-filter (Photograph 18) and a valve tree to direct flow (Photographs 14-16). System operators manually control the butterfly valve system. If operators do not configure the valves correctly, the system will not start. The mechanical components appeared to be in good condition. The treatment system operates continuously throughout the year except during maintenance periods. The facility sends effluent primarily to the COS potable supply (Photograph 17) or conveys it to the SRP's Arizona Canal. The building was clean and showed no signs of rodents or insect infestations. A tall security fence surrounds the facility, and the site inspection team observed no evidence of vandalism (Photograph 19). Jim Lutton confirmed that operations staff are present on-site for at least 4 hours each day and that operators perform a system walk-through at least once daily. Since the last five-year review, operators have replaced several ball valves, and they replace carbon in the LGAC vessels every 16 weeks.

At 1150, the site visit team inspected the Miller Road Treatment Facility (MRTF). The facility is located directly adjacent to the NGTF and is owned and operated by the Edmonton Power Corporation (EPCOR). The MRTF includes three air-stripper towers (Photographs 21 and 25). EPCOR runs one tower at a time and rotates operation primarily between Towers 1 and 2.

The facility currently includes three VGAC vessels (Photograph 27). System operators clean the air strippers using an acid cleaning system to prevent scale buildup (Photograph 28). The mechanical components of the system appear to be in good condition. The treatment system operates continuously throughout the year, except during maintenance periods. The facility sends effluent primarily to the EPCOR water supply for the municipal water supply. The system last delivered water to the SRP Arizona Canal in 2017. The building was clean and showed no signs of rodent or insect infestation. The yard outside the building contained miscellaneous equipment dispersed throughout the area. A tall security fence surrounds the facility, and the team observed no evidence of vandalism (Photograph 29). Jim Lutton confirmed that staff are present at the facility every day.

Since the last five-year review, operators have removed and cleaned the discharge pumps every 12 to 18 months to address scale buildup (Photograph 26). EPCOR and the PCs have scheduled a facility rehabilitation project beginning in Spring 2026. Planned upgrades include full renovation of the air strippers by removing existing packing, removing interior linings, recoating walls, repairing eroded floors, and installing new packing. Additional planned improvements include the installation of variable-frequency blowers, the replacement of influent pump manifolds, the upgrading of RIO panels, the improvement of the distributive pump system, electrical equipment/electrical room upgrades, removal of VGAC vessels, the repair and sealing of the parking lot, the rebuilding of the column-cleaning fill/containment basin, and landscaping upgrades.

EPCOR operates multiple extraction and groundwater monitoring wells. The site visit team inspected extraction well PV-15, which operates continuously (Photographs 20 and 22). The well received a new pump in May 2024. PV-15 is not secured with individual locks because it is located within the locked MRTF facility. The site visit team observed monitoring well PG-41, which is planned for conversion to an extraction well by the end of 2026. The conversion is pending completion of permitting and installation of the extraction well infrastructure (Photograph 30).

At 1410, Jim Lutton, Francisco Brown, and Ryan O'Keefe led the site visit team to the Area 7 Treatment Plant. The NIBW PCs own and operate this facility. The treatment facility includes a low-profile air stripper system (Photograph 34) with anti-scaling chemical feed that injects polyphosphate at the air stripper influent (Photographs 35-36). The polyphosphate is stored on an elevated pallet; the site visit team did not identify any secondary containment at this storage location. The facility also includes a 5,000-gallon equalization tank (Photograph 38), two VGAC vessels (Photograph 39), an empty container of hydrogen peroxide, and an

ultraviolet/oxidation (UV/OX) system that removes approximately 80-90% of the influent trichloroethylene (TCE) (Photographs 33 and 37). The mechanical components of the system appear to be in good condition. The treatment system operates continuously throughout the year, except for periods of expected and unexpected maintenance. The system effluent is conveyed to the two upper aquifer unit (UAU) injection wells. During non-routine maintenance, the system may discharge water to the COS sanitary sewer under a temporary discharge permit. The building was clean and showed no signs of rodent or insect infestations. A tall security fence surrounded the facility, and the PCs have observed no evidence of vandalism. Jim Lutton confirmed that staff visit the facility weekly to conduct inspections and the operators monitor the system remotely and receive notifications when alarms occur. Since the last five-year review, the PCs replaced process pumps P1 and P2 and the extraction well pump at 7EX-6MA. The PCs abandoned extraction well 7EX-4MA in December 2023. In 2024, PC installed a new digital cellular communication system protocol. System operators replace the VGAC carbon twice per year. PC upgraded the communication system in 2023 after a storm disabled the previous PROFIBUS network. The initial replacement system experienced frequent daytime connection losses; however, after the PCs replaced part of the system with a different cellular modem (TOSIBOX), the signal reliability improved.

At 1450, the site visit team inspected monitoring well D-4MA (Photograph 40), which is located within the Area 7 Treatment Facility gate. At 1500, the team inspected injection well 7IN-1UA (Photographs 41-42) and extraction well 7EX-6MA (Photograph 43). The wells are located within a residential street and operate 24 hours per day. The wells were not locked. Jim Brown confirmed that operators inspect the wells monthly and that the wells have not experienced vandalism. Extraction well 7EX-6MA includes an intrusion alarm that shuts down the well and sends an alert to operators when the well cover is opened.

At 1550, the team conducted a walking inspection of extraction well MEX-1MA (Photographs 44-45) near the Area 12 treatment facility. A surface grate covers the well location. The electrical cabinet is not located beneath the grate; however, the system was locked. Operators inspect the well monthly. At 1610, Jim Lutton and Larry Lynch led the site visit team to the Area 12 Treatment Facility (Photographs 46-4747). The NIBW PCs own and operate the facility on a parcel owned by General Dynamics. General Dynamics did not allow photographs during the inspection. The facility includes an air stripper tower, two blowers, two VGAC vessels that are currently in use and planned for removal in 2026, and a supervisory control and data acquisition system using a fiber-optic Ethernet repeater. The mechanical components of the system appear to be in good condition. The treatment

system operates continuously throughout the year, except during the SRP dry-up period from early January to early February. The facility primarily discharges treated water to McKillipps Lake. The facility was clean. A tall security fence surrounds the facility, which is continuously monitored because it is located on General Dynamics property. The site visit team observed no evidence of vandalism. Jim Lutton confirmed that staff visit the site three to four times per week. Since the last five-year review, the operators rebuilt the blowers in 2024. Each year during the SRP dry-up period in January, operators clean the air stripper tower with acid to remove calcium carbonate buildup. After cleaning, the operators neutralize the spent acid and transport it off-site to Liquid Environmental for disposal.

At 1640, the site visit team inspected the Granite Reef Well 23.6E-6.0N (Photograph 48). The extraction well is located behind a locked gate near a busy street. Larry Lynch confirmed that operators inspect the well at least weekly, that the well has not experienced vandalism, and that it connects to the SRP system via radio and fiber-optic communication.

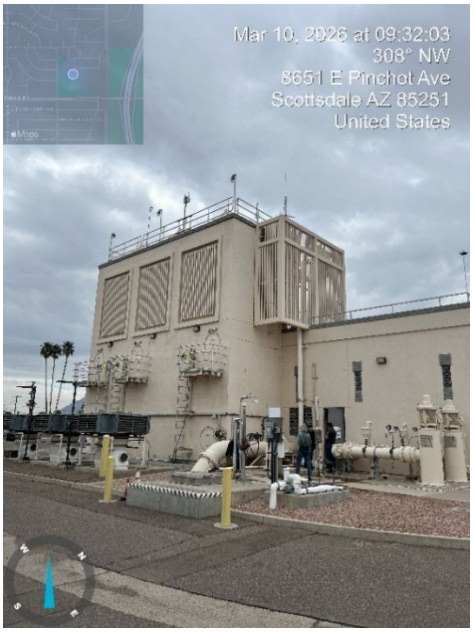
At 1705, the site visit team left the site.

Kelly Malone
Hydrogeologist
Dawson HDR JV

## Appendix – Photograph Log

All photographs were taken at the Indian Bend Wash Area Superfund Site in Scottsdale, Arizona, on March 10, 2026.

### Photograph 1




**Description:** View of the CGTF.

### Photograph 2




**Description:** View of the motor, raw water influent, and aid line inside the CGTF.

**Photograph 3**



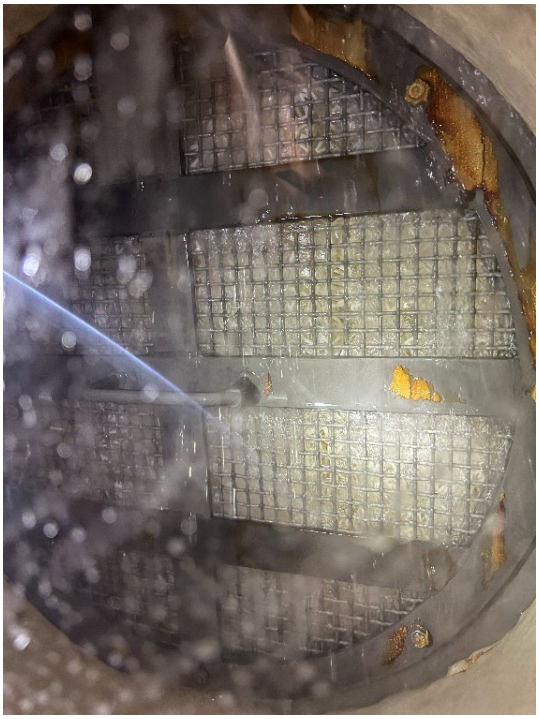

**Description:** View of the raw water inlet, acid cleaning tubing, and air stripper tower inside the CGTF.

**Photograph 4**



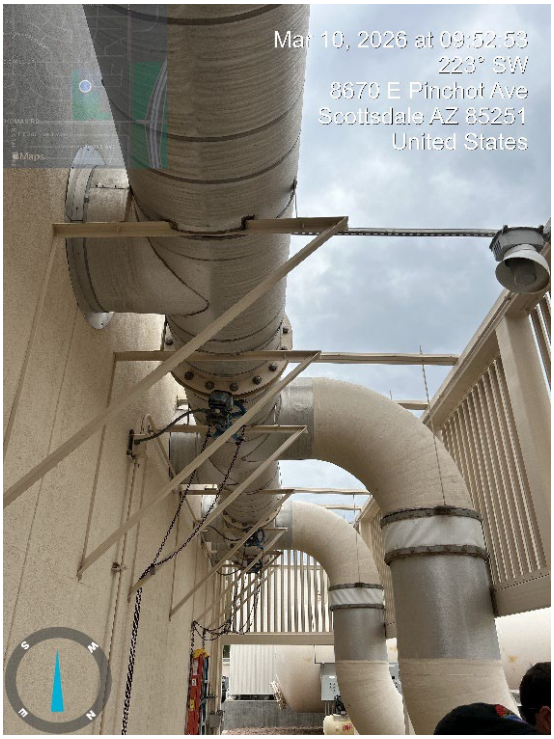

**Description:** View inside the CGTF.

**Photograph 5**



**Description:** View into an air stripper tower in the CGTF.

**Photograph 6**



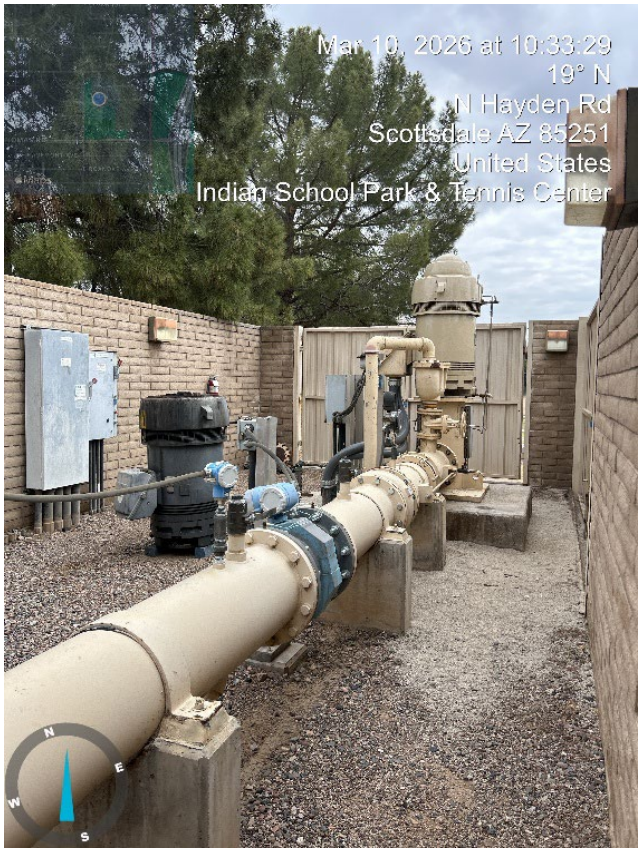

**Description:** View of the air stripper tower outlets outside the CGTF.

**Photograph 7**




**Description:** View of the VGAC vessels and heater outside the CGTF.

**Photograph 8**



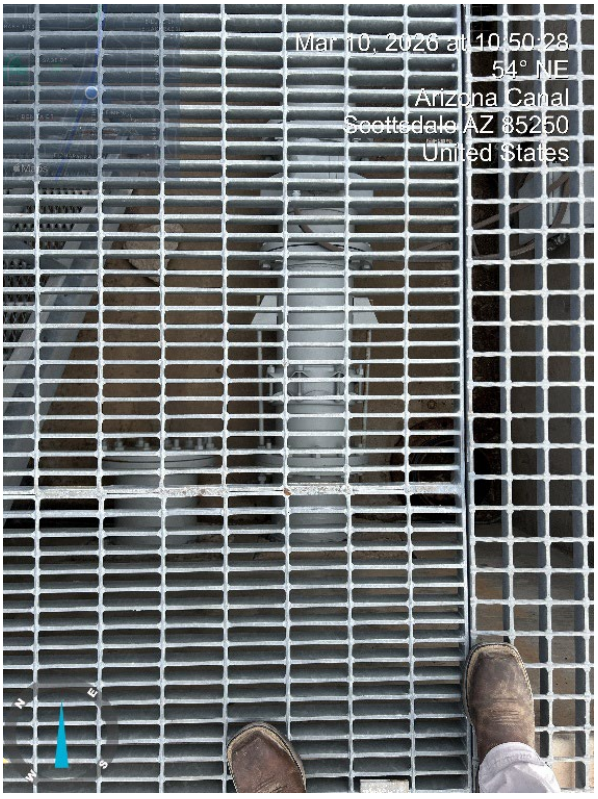

**Description:** View of CGTF extraction well COS-75A.

**Photograph 9**




**Description:** View of the wall and gate leading to extraction well COS-75A.

**Photograph 10**




**Description:** View of NGTF extraction well PCX-1.

**Photograph 11**




**Description:** View of the NGTF extraction well PCX-1 electrical cabinets.

**Photograph 12**




**Description:** View of the NGTF control system inside the office.

**Photograph 13**



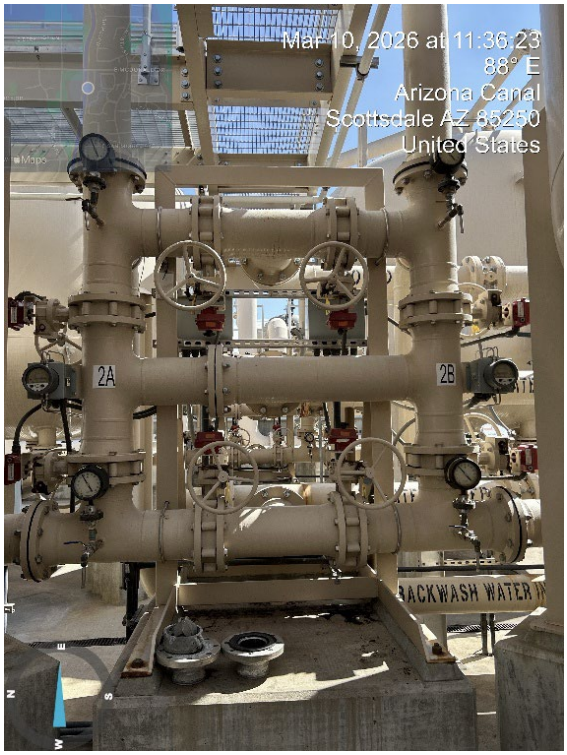

**Description:** View of the NGTF LGAC tanks.

**Photograph 14**




**Description:** View of the effluent pipes to the SRP Canal and COS system at the NGTF.

**Photograph 15**



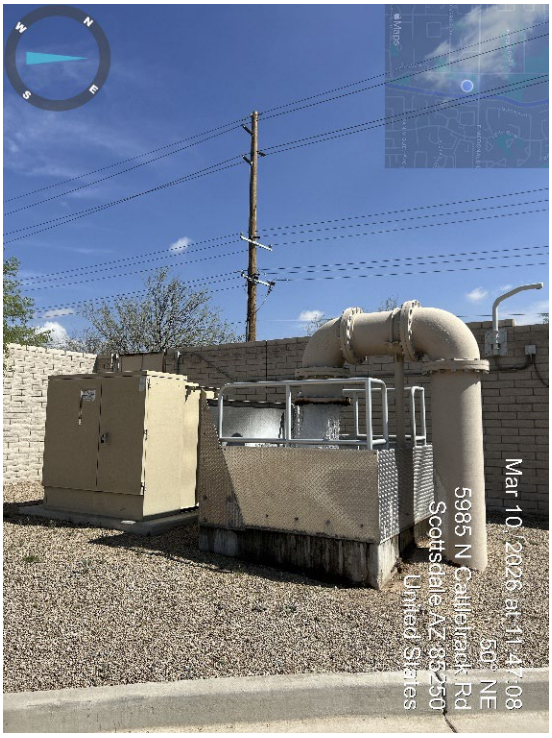

**Description:** View of the butterfly valves connecting to the VGAC vessels at the NGTF.

**Photograph 16**




**Description:** View of piping connecting to the VGAC vessels and butterfly valves at the NGTF.

**Photograph 17**



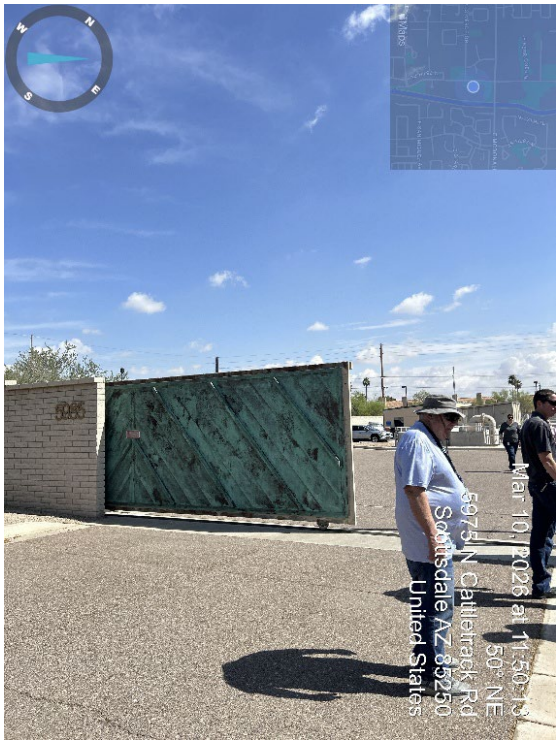

**Description:** View of effluent water discharge to COS at the NGTF.

**Photograph 18**



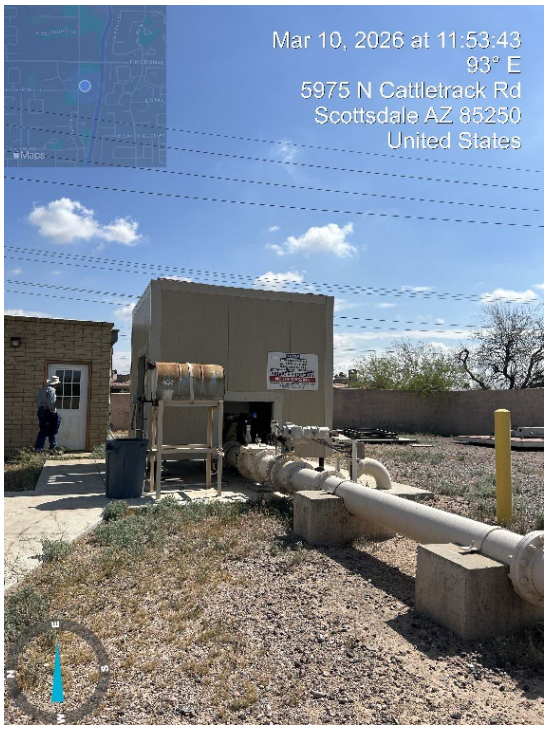

**Description:** View of the pre-filter system at the NGTF.

**Photograph 19**




**Description:** View of the gate leading to the NGTF.

**Photograph 20**



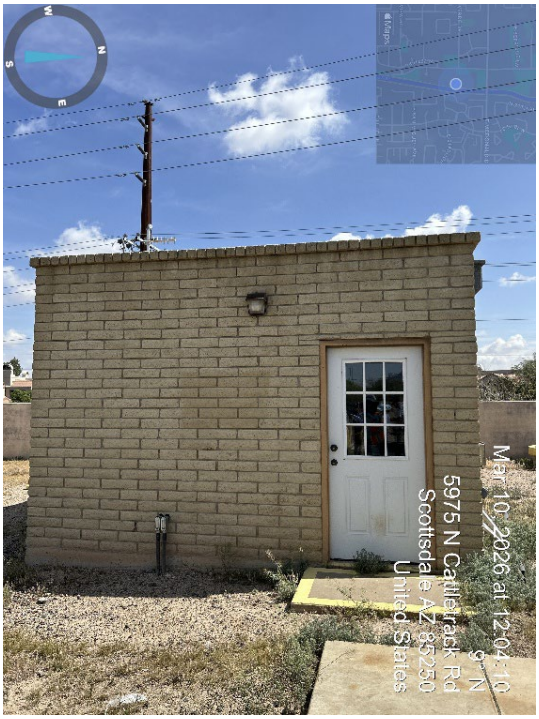

**Description:** View of MRTF extraction well PV-15.

**Photograph 21**



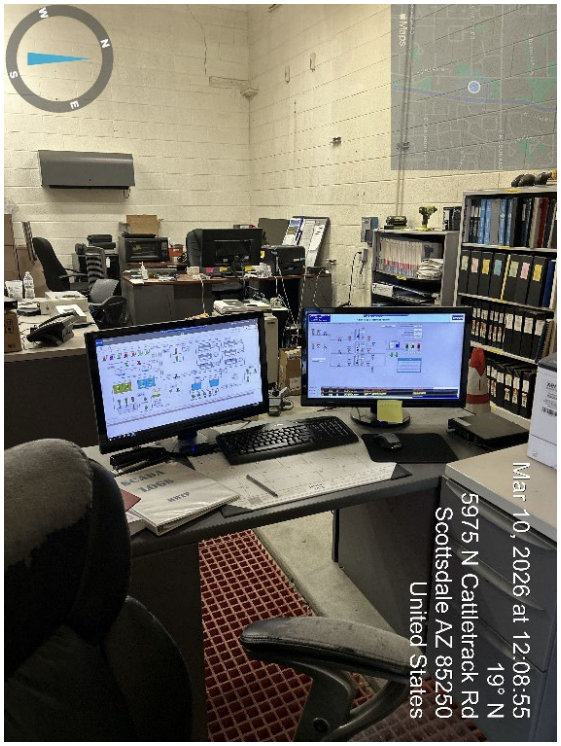

**Description:** View of the treatment facility building and air stripper towers at the MRTF.

**Photograph 22**




**Description:** View of MRTF extraction well PV-15 well house.

**Photograph 23**




**Description:** View of the MRTF control system.

**Photograph 24**



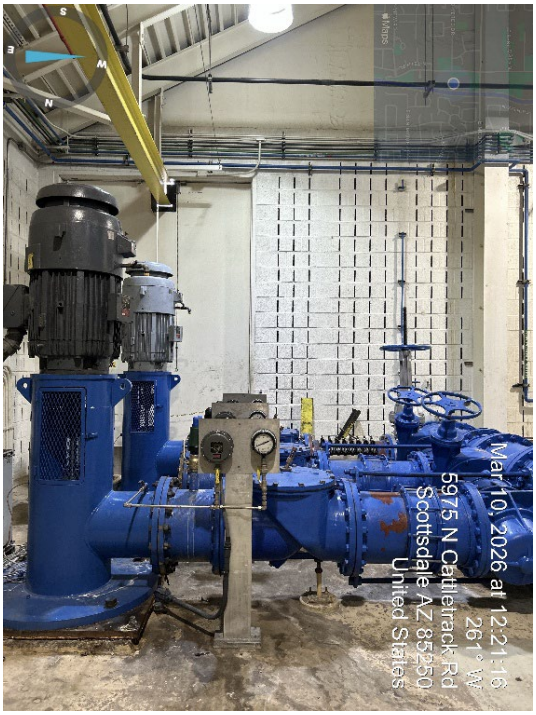

**Description:** View of the manuals inside the MRTF control room.

**Photograph 25**




**Description:** View of the MRTF air stripper tower.

**Photograph 26**



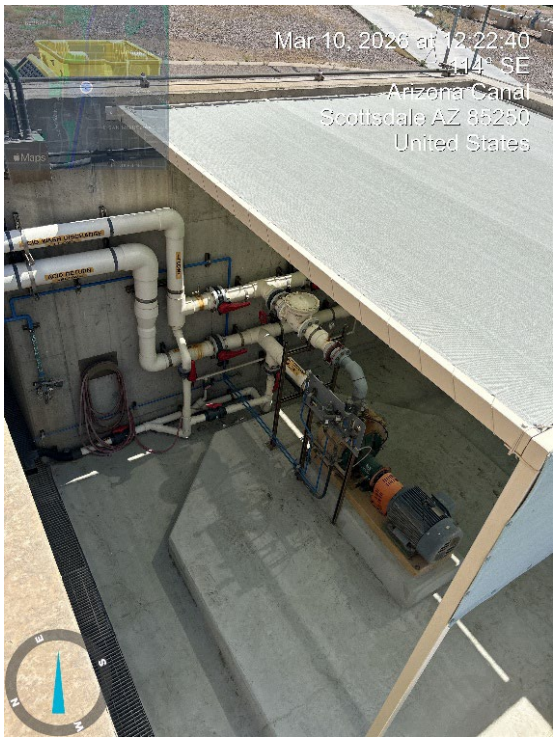

**Description:** View of the MRTF air stripper effluent pumps.

**Photograph 27**




**Description:** View of the MRTF VGAC vessels.

**Photograph 28**




**Description:** View of the MRTF acid cleaning system.

**Photograph 29**



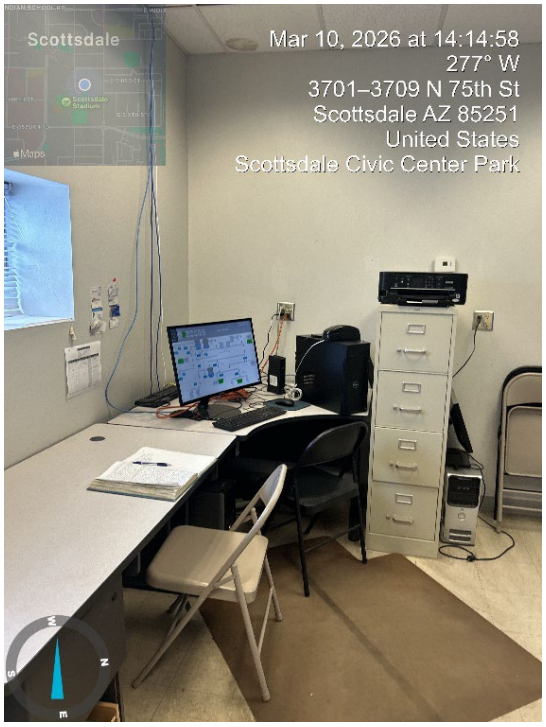

**Description:** View of the gate for the MRTF.

**Photograph 30**




**Description:** View of wells PG-40 and PG-41.

**Photograph 31**




**Description:** View of the control system in the control room at the Area 7 treatment facility.

**Photograph 32**




**Description:** View inside the control room at the Area 7 treatment facility.

**Photograph 33**




**Description:** View of the UV/OX system inside the Area 7 treatment facility.

**Photograph 34**



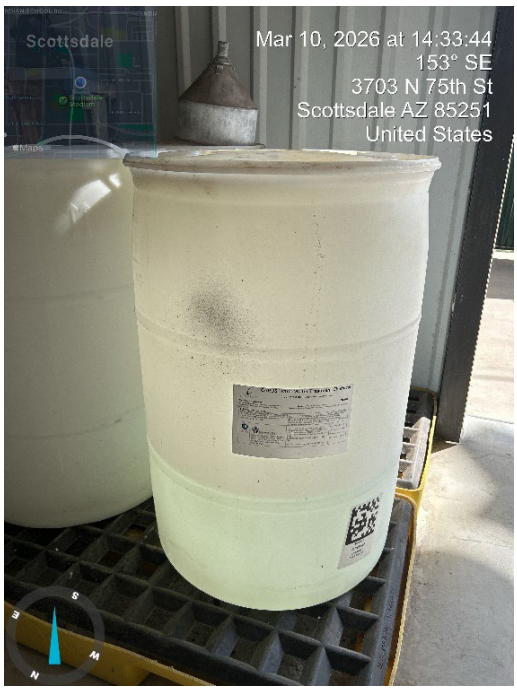

**Description:** View of low-profile air stripper system with anti-scaling chemical feed in the Area 7 treatment facility.

**Photograph 35**




**Description:** View of the anti-scaling and hydrogen peroxide chemical feed inside the Area 7 treatment facility.

**Photograph 36**



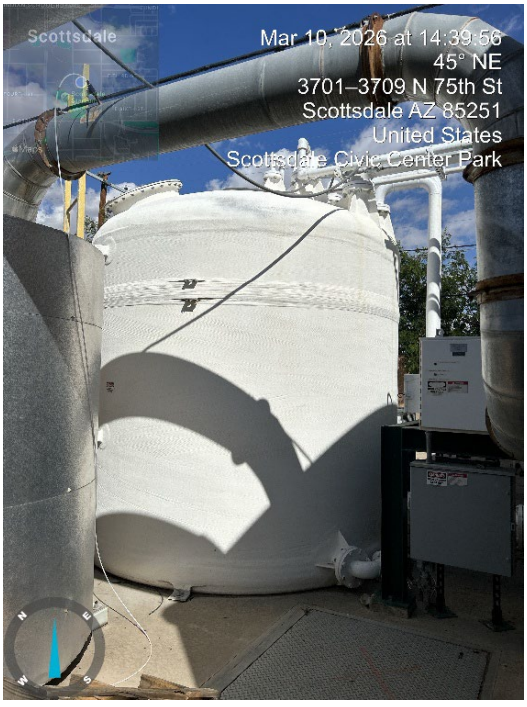

**Description:** Container of the anti-scaling chemical (polyphosphate) inside the Area 7 treatment facility.

**Photograph 37**



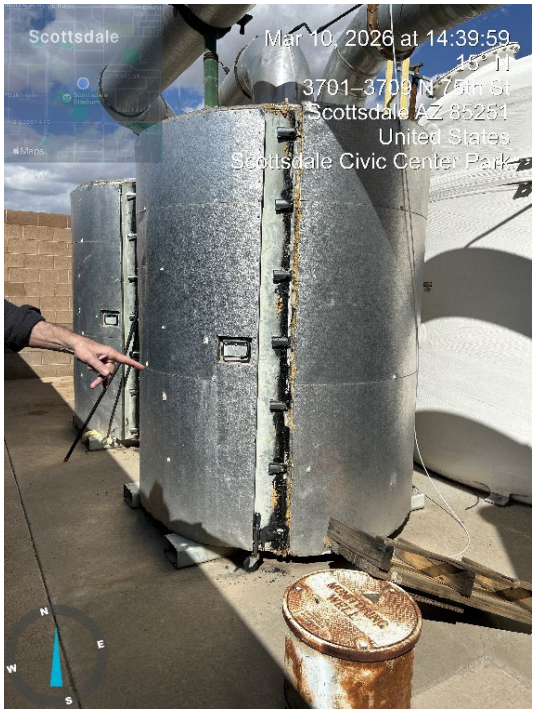

**Description:** Empty container of hydrogen peroxide at the Area 7 treatment facility for the UV/OX system.

**Photograph 38**




**Description:** View of the 5,000-gallon equalization tank at the Area 7 treatment facility.

**Photograph 39**




**Description:** View of the VGAC vessel at the Area 7 treatment facility.

**Photograph 40**




**Description:** View of monitoring well D-4MA at the Area 7 treatment facility.

**Photograph 41**



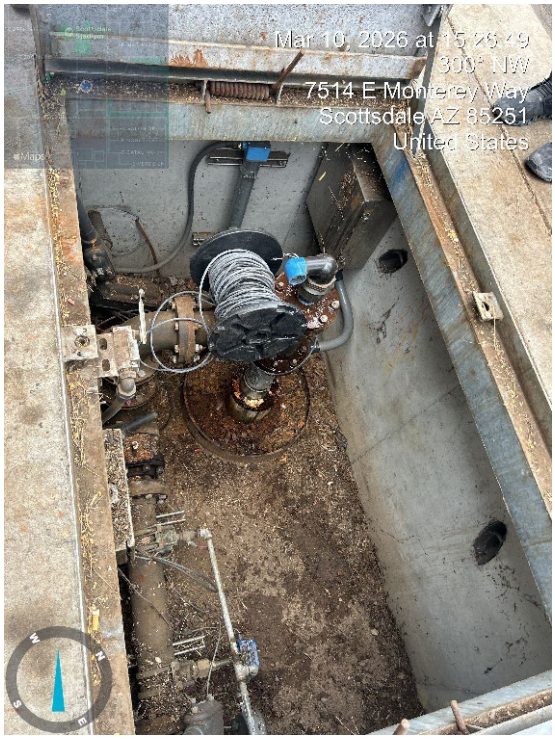

**Description:** View of the closed 7IN-1UA re-injection well vault.

**Photograph 42**



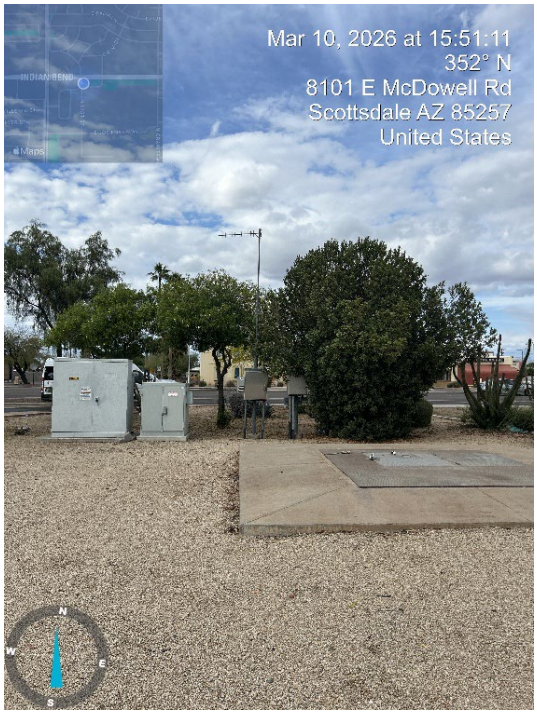

**Description:** View inside the 7IN-1UA re-injection well vault.

**Photograph 43**



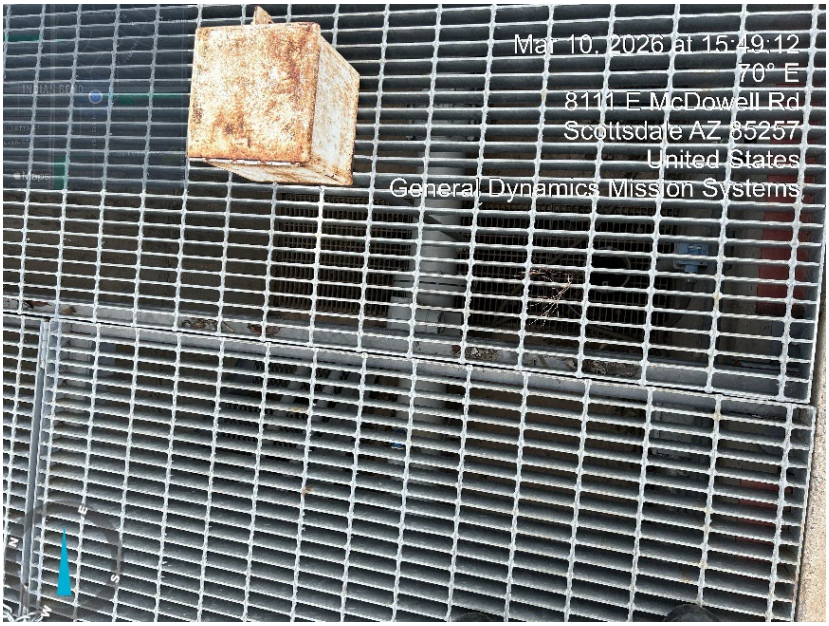

**Description:** View inside the 7EX-6MA extraction well vault.

**Photograph 44**




**Description:** View of the extraction well MEX-1MA near the Area 12 treatment facility.

**Photograph 45**




**Description:** View of the extraction well MEX-1MA near the Area 12 treatment facility.

**Photograph 46**



**Description:** View of the Area 12 treatment facility (photograph provided by NIBW PCs).

**Photograph 47**



**Description:** View of the Area 12 treatment facility (photograph provided by NIBW PCs).

**Photograph 48**




**Description:** View of the Granite Reef Well 23.6E-6.0N.