2020

Site Monitoring Report

North Indian Bend Wash Superfund Site

Prepared for:

U.S. Environmental Protection Agency

Region IX

Prepared by:

NIBW Participating Companies

February 26, 2021

North Indian Bend Wash Superfund Site

SITE MONITORING REPORT

January - December 2020

North Indian Bend Wash Superfund Site

Scottsdale, Arizona

February 26, 2021

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1 EXECUTIVE SUMMARY

The North Indian Bend Wash (NIBW) Superfund Site (Site) was listed on the Environmental Protection Agency (EPA) National Priorities List in September 1983 as a result of detection of volatile organic compounds (VOCs) in drinking water wells in south Scottsdale, Arizona. VOCs, chiefly trichloroethene (TCE), entered the subsurface from historical manufacturing and other industrial operations. Groundwater containment, treatment, and monitoring are conducted at the NIBW Site for the purposes of restoring groundwater for public water supply and for protecting unimpacted existing public supply wells (peripheral production wells), all within the context of effectively managing groundwater resources in the state of Arizona.

The 2020 Site Monitoring Report (SMR) summarizes remedial activities and data collected by the NIBW Participating Companies (PCs) pursuant to compliance requirements described in the Amended Consent Decree (Amended CD). The performance evaluation is conducted pursuant to the Amended CD Statement of Work (SOW) Performance Standards and metrics outlined in the Site Groundwater Monitoring and Evaluation Plan (GM&EP).

The Site remedy has been designed and implemented based on an understanding of the geologic framework and the groundwater flow system (which is driven by pumping) to capture groundwater with VOCs above applicable standards at a series of extraction wells tied in to treatment at five facilities. The five treatment facilities are Central Groundwater Treatment Facility (CGTF), NIBW Granular Activated Carbon Treatment Facility (NGTF), Miller Road Treatment Facility (MRTF), Area 7 Groundwater Extraction and Treatment System (Area 7 GWETS), and Area 12 Groundwater Extraction and Treatment System (Area 12 GWETS).

Three principal alluvial aquifer units exist at the Site: Upper Alluvium Unit (UAU), Middle Alluvium Unit (MAU), and Lower Alluvium Unit (LAU). Monitoring wells in these units are used to track and evaluate groundwater levels and concentrations of VOCs of concern at the Site, principally TCE, both spatially and temporally.

Most groundwater pumping in the vicinity of the Site occurs in the LAU, with a substantial contribution of groundwater pumping also occurring from wells screened in the MAU. Soil vapor extraction (SVE), at multiple locations, and UAU groundwater extraction and treatment (Area 7) were conducted during the early phases of the remediation at the Site. Evaluation of modeling and monitoring data indicated that the threat to groundwater at those source areas was below the Cleanup Standards, and EPA approved closure of SVE operations as well as UAU groundwater extraction (Area 7). TCE groundwater concentrations are now below the Cleanup Standard in almost all UAU monitoring wells. The highest TCE concentrations at the Site are observed in the upper portion of the MAU. The plume area continues to be reduced over time. TCE concentrations are analyzed using a Mann-Kendall statistical trend analysis to evaluate whether wells are showing a statistically significant trend. Decreasing trends or no statistically significant trend are observed at the majority of wells in all three alluvial units, and UAU groundwater is approaching restoration.

Groundwater extraction and treatment in the upper MAU is focused on containment of areas with relatively higher concentrations (Source Control Programs at Area 7 and Area 12). MAU containment is demonstrated using water level data. Remaining mass in the UAU, and MAU mass outside of capture by Source Control and CGTF extraction wells, migrates into the LAU, principally along the Western Margin, and is captured by LAU extraction wells. Capture by LAU extraction wells is demonstrated using water level data and simulated particle tracks generated using the NIBW groundwater flow model, which is currently going through a comprehensive update.

For 2020, containment as required by performance standards in the Amended CD SOW was achieved both for the MAU/LAU plume and for the Source Control Programs. Most of the GM&EP metrics established to evaluate the remedy were also achieved in 2020 as described below.

- For the UAU Program, based on the 2020 5-year running average, UAU VOC mass is decreasing with time compared to the 2019 5-year running average.
- For the MAU/LAU Program, the direction of groundwater movement along the periphery of MAU/LAU plume is toward either extraction wells or the Western Margin based on contoured October 2020 water level data. The lateral extent of the 5 micrograms per liter (µg/L) TCE concentration contour in the MAU or LAU has not shifted more than 1,000 feet relative to the October 2001 baseline plumes, except as anticipated in the Northern LAU where the edge of the TCE plume is demonstrated to be migrating toward extraction wells tied in to treatment. TCE concentrations in all assigned wells were less than the achievement measure concentrations, with the exception of S-2LA, which corresponds to the region in the Northern LAU where the TCE plume has shifted somewhat to the west as it migrates toward Northern LAU extraction wells tied in to treatment. The achievement measure at S-2LA has been consistently exceeded since 2011 and is currently being closely monitored under an approved contingency response plan; however, TCE concentrations over the last 5-year period indicate a decreasing trend.
- For the Northern LAU Program, the direction of groundwater movement along the Northern LAU plume periphery was toward Northern LAU extraction wells based on October 2020 water level contours and the outermost extent of capture at the farthest upgradient extraction well (PV-14). Additionally, TCE concentrations in PG-42LA, PG-43LA, and PV-14 were all below 2 µg/L during the October 2020 annual monitoring

round. TCE at PG-42LA was equal to or greater than 2 µg/L during the other three quarterly monitoring rounds.

- For the Source Control Programs, the 5-year running average of TCE concentration in select wells was achieved for both Area 7 and Area 12. Capture to the vicinity of PA-12MA was not demonstrated at Area 7 and capture to the vicinity of Hayden Road was achieved.

Progress is being made toward achievement of the Remedial Action Objectives (RAOs) outlined in the Amended Record of Decision (Amended ROD). Treated water was put to beneficial use for municipal supply by the City of Scottsdale (COS), EPCOR Water USA (EPCOR), and Salt River Project (SRP) (CGTF, MRTF, and NGTF). Treated water from the Area 7 GWETS was returned to the UAU, and treated water from the Area 12 GWETS was delivered to SRP for irrigation use. Groundwater treatment performance standards were achieved at the five treatment facilities in 2020.

2 DOCUMENT CONTENT & PURPOSE

The 2020 Site Monitoring Report (SMR) summarizes remedial activities performed and data collected by the North Indian Bend Wash (NIBW) Participating Companies (PCs) (which include Motorola Solutions, Inc., Siemens, and GlaxoSmithKline) pursuant to the Amended Consent Decree (Amended CD), CV-91-1835-PHX-FJM, entered by the U.S. District Court for the District of Arizona on June 5, 2003. A detailed summary of the components and work requirements of the remedial action program can be found in the Record of Decision Amendment – Final Operable Unit (OU), Indian Bend Wash Area (Amended ROD), dated September 27, 2001, and Statement of Work (SOW), Appendix A to the Amended CD. An organizational chart identifying the key parties involved at the NIBW Superfund Site (the Site) is provided in **Appendix J**, along with contact information for current personnel. Additional information describing remedial activities conducted at the NIBW Site in 2020 was provided in quarterly reports submitted to the U.S. Environmental Protection Agency (EPA) and Arizona Department of Environmental Quality (ADEQ) on May 29, August 28, and November 25, 2020. Consistent with requirements defined in the Amended CD and SOW, operational summaries and updates for fourth quarter 2020 are included in the annual SMR as **Appendix I**.

This SMR presents a summary and overview of compliance monitoring data collected and acquired to demonstrate performance of the remedial action program. In conjunction with development of the 2020 SMR, the NIBW PCs compiled compliance monitoring data, laboratory analytical reports, quality assurance reports, and other monitoring data required by the Amended CD, SOW, governing work plans, and agency requests which are included in supplemental data reports that will be issued as electronic files on compact discs. Information covered in the SMR or submitted in supplemental data reports includes the following:

- An overview of the Site background, including regulatory history, a description of the remedy and treatment facilities, an overview of the conceptual site model (CSM), and applicable standards and metrics used for performance evaluation.
- Presentation of annual data and analyses, including groundwater pumping data, water level elevations, water quality sample results collected and analyzed for specific volatile organic compounds (VOCs) of concern, and annual operation of treatment facilities.
- An evaluation of remedy performance with respect to applicable performance standards and metrics.
- A summary of supplemental activities, including additional data collected in 2020, ongoing data collection and evaluations for remedy optimization, and follow-up work from the 2016 Five-Year Review.
- Results of NIBW PCs' annual audit activities at TestAmerica.

- Level 4 data analytical reports and a quality assurance (QA) report issued by TestAmerica (primary NIBW analytical laboratory contractor) for analyses conducted for the NIBW groundwater monitoring program during 2020.
- Level 4 data analytical reports and a QA report issued by TestAmerica for analysis of compliance process water samples obtained at NIBW groundwater treatment systems during 2020.
- Level 4 analytical reports issued by Trans West Analytical Services, LLC (dba XENCO Laboratories, the backup NIBW analytical laboratory contractor) for split sampling conducted at the Area 7 Groundwater Extraction Treatment System (GWETS).
- Data summary and TestAmerica laboratory analytical reports for inorganic water quality samples collected from four Area 7 wells (PG-10UA, PG-16UA, PG-28UA and PG-29UA) and the Area 7 GWETS effluent sample port (SP-105).
- 2020 air sampling summary and Air Toxics laboratory reports for the Area 7 GWETS and Area 12 GWETS.

3 SITE BACKGROUND

3.1 Regulatory History and Major Events

The Site was listed on the EPA National Priorities List in September 1983 as a result of detection of VOCs in drinking water wells in south Scottsdale, Arizona. VOCs entered the subsurface from historical manufacturing and other industrial operations. The following constituents of concern (COCs) were identified at the Site: trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichloroethene (1,1- DCE), 1,1,1-trichloroethane (1,1,1-TCA), and chloroform (TCM). The primary COC at the Site is TCE, since the magnitude and extent of TCE has consistently exceeded that of other VOCs during the monitoring history at the Site. **Table 1** provides a timeline which summarizes historical documents and major events for the Site.

Table 1. Timeline of Historical Documents and Major Events

Timeframe	Historical Document and/or Major Event
1981	Volatile organic compounds first detected in groundwater
1983	NIBW Site placed on National Priorities list
1984-1991	Initial Remedial Investigation and Report
1988-1992	Operable Unit I - Middle and Lower Alluvial Unit groundwater ○ Feasibility Study ○ Record of Decision ○ Consent Decree
1991-1993	Operable Unit II - Upper Alluvial Unit groundwater and vadose zone ○ Record of Decision ○ Consent Decree
1994 - 1999	Central Groundwater Treatment Facility online to treat volatile organic compounds (1994) Area 7 and Area 12 SVE Systems Voluntary actions ○ Groundwater extraction and treatment at Area 7 and Area 12 historical source areas in Middle Alluvial Unit (1999) ○ Northern LAU extraction to provide protection of Paradise Valley wells (Miller Road Treatment Facility)
1999	Feasibility Study Addendum ○ Voluntary actions evaluated
2001	Amended Record of Decision ○ Remedy selected ○ Voluntary actions incorporated into selected remedy

Timeframe	Historical Document and/or Major Event
2002	Groundwater Monitoring and Evaluation Plan ○ Prepared prior to signing of Amended Consent Decree ○ Documents agreed-upon activities and metrics
2003	Amended Consent Decree ○ Documents agreed-upon compliance obligations, including Performance Standards (Appendix A of Statement of Work) ○ References Groundwater Monitoring and Evaluation Plan metrics for remedy performance and clarifies agreed upon additional work ○ Performance Standards and Groundwater Monitoring and Evaluation Plan metrics evaluated annually in Site Monitoring Report (see **Section 5** and evaluation in **Section 9**)
2006	Remedy construction complete
2011	First Five-Year Review ○ Remedy deemed protective of human health and environment ○ Groundwater plume containment demonstrated
2012	Explanation of Significant Difference for treating PCX-1 at NIBW Granular Activated Carbon Treatment Facility
2013	NIBW Granular Activated Carbon Treatment Facility start-up
2015	EPA approved close-out and decommissioning of final soil vapor extraction system (Area 7) to address threat to groundwater
2016	Second Five-Year Review ○ Remedy protectiveness determination deferred to evaluate potential exposure related to treatment facility emissions and soil vapor intrusion at historical sources ○ Groundwater plume containment demonstrated
2016-2020	Post Second Five-Year Review evaluations ○ Developed air dispersion model and conducted confirmatory sampling to demonstrate concentrations in vicinity of treatment systems are below appropriate risk levels ○ Conducted vapor intrusion investigations at multiple historical source areas and indoor air investigations and mitigation at Area 7 where concentrations exceeded screening levels

3.2 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site, as outlined in the 2001 Amended ROD, are listed below.

A. *"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.*

B. *Protect human health and the environment by eliminating exposure to contaminated groundwater.*

C. *Provide the City of Scottsdale with a water source that meets MCLs for NIBW contaminants of concern.*

D. *Achieve containment of the groundwater contamination plume by preventing any further lateral migration of contaminants in groundwater.*

E. *Reuse of the water treated at the Site to the extent possible in accordance with Arizona's Groundwater Management Act.*

F. *Mitigate any soil contamination that continues to impact groundwater.*

G. *Provide long-term management of contaminated groundwater to improve the regional aquifer's suitability for potable use."*

3.3 Constituents of Concern and Applicable Standards

Standards for treated groundwater include the NIBW Cleanup Standards for potable end use, the Arizona Pollutant Discharge Elimination System (AZPDES) requirements for discharge of treated groundwater to surface water, and the APP substantive requirements for injection back into the aquifer. The NIBW Cleanup Standards are based on EPA drinking water Maximum Contaminant Levels (MCLs) with the exception of TCM and 1,1 DCE; the MCL for 1,1, DCE is 7 µg/L. At the time of the Amended ROD, the MCL for TCM was 100 µg/L (Amended ROD, 2001). Cleanup Standards for the NIBW constituents of concern (COCs) are shown in **Table 2**.

Table 2. NIBW COCs and Cleanup Standards

NIBW Cleanup Standards In Micrograms per Liter (µg/L)				
TCE	PCE	1,1 DCE	TCM	1,1,1 TCA
5 µg/L	5 µg/L	6 µg/L	6 µg/L	200 µg/L

3.4 Historical Sources and Vadose Zone Clean Ups

Historical COC sources at the NIBW Site were primarily from industrial activities during the 1950s through the 1970s. VOCs, disposed of at or near land surface during this period, percolated downward through the vadose zone to the groundwater. Fourteen historical source areas were originally identified across the Site, as shown on **Figure 1**. Four historical source areas (Area 1, 2, 4, and 10) required no further action while the other 10 required additional soil gas sampling. Soil vapor extraction (SVE) was conducted at four historical source areas to address the threat to groundwater; these include Area 6, Area 7, Area 8, and Area 12. SVE conducted at Area 6 was voluntary. All vadose zone SVE systems were approved for decommissioning with regard to threat to groundwater by the middle of 2015, with Area 7 being the final treatment system to be closed.

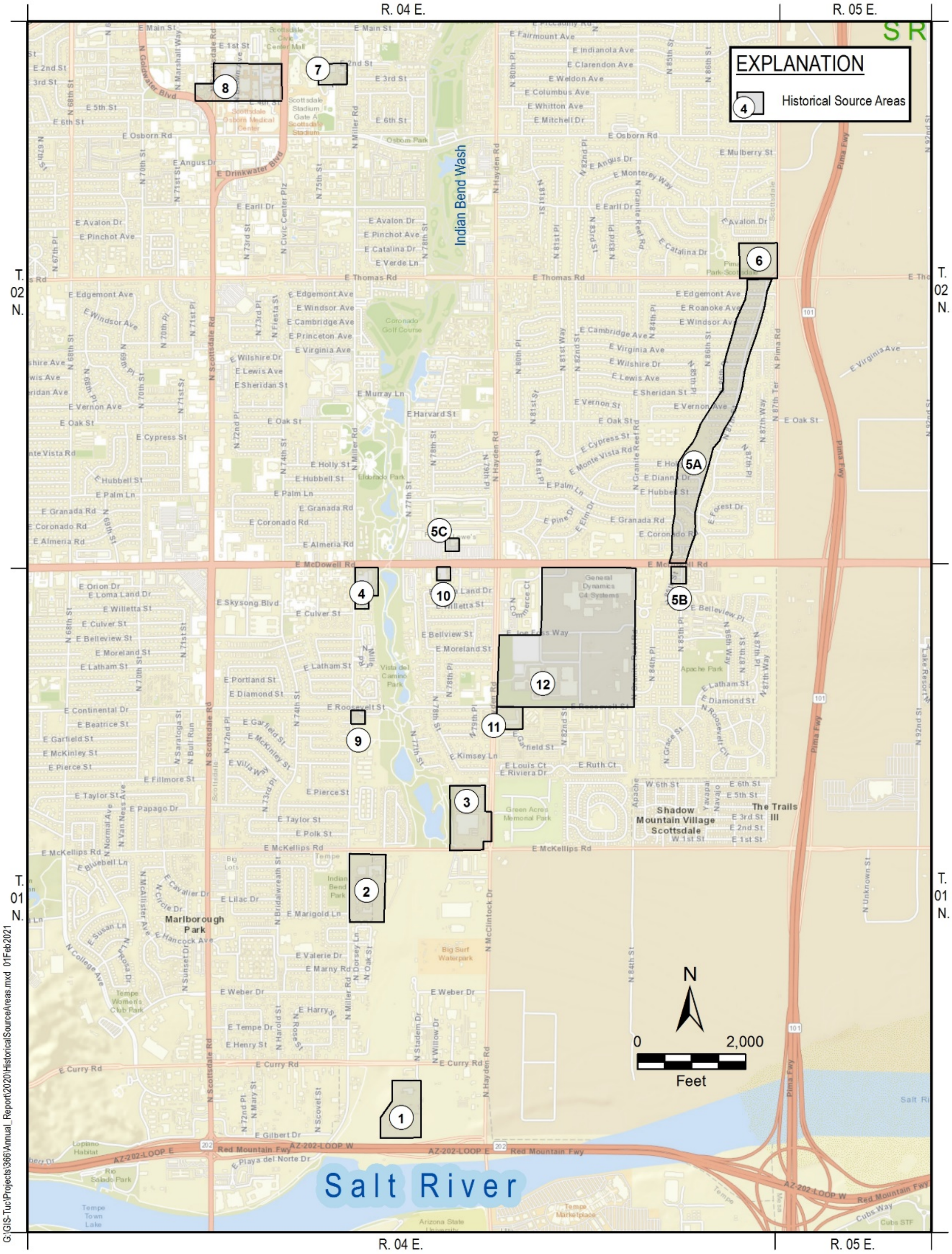

Figure 1. Location of Historical Source Areas at the NIBW Superfund Site

3.5 Groundwater Remedy Description

With the consideration of effectively managing groundwater resources in the state of Arizona, groundwater containment, treatment, and monitoring are conducted at the NIBW Site to restore groundwater for use as public water supply and to protect unimpacted existing public supply wells. The Site remedy has been designed and implemented based on an understanding of the geologic framework and the groundwater flow system (which is driven by pumping) to capture groundwater with VOCs above applicable standards at a series of extraction wells tied in to treatment at five facilities. The five treatment facilities are Central Groundwater Treatment Facility (CGTF), NIBW Granular Activated Carbon Treatment Facility (NGTF), Miller Road Treatment Facility (MRTF), Area 7 GWETS, and Area 12 GWETS. The three principal alluvial aquifer units at the Site are the Upper Alluvial Unit (UAU), Middle Alluvial Unit (MAU), and Lower Alluvial Unit (LAU). UAU groundwater extraction and treatment was conducted during the early phases of the remediation at Area 7. Evaluation of vadose zone modeling and monitoring data indicated that the threat to groundwater was below Cleanup Standards and EPA approved closure of SVE and UAU groundwater extraction at Area 7 (**Section 3.4**). Groundwater extraction and treatment in the MAU is focused on containment of areas with relatively higher concentrations, which includes Source Control Programs related to the Area 7 and Area 12. Remaining mass in the UAU, and MAU outside of capture by Source Control and CGTF extraction wells, migrates into the LAU, principally along the Western Margin, and is captured by LAU extraction wells.

3.5.1 Groundwater Extraction & Treatment Systems

The locations of treatment facilities, pipelines, and extraction wells tied in to treatment at the Site are shown on **Figure 2**.

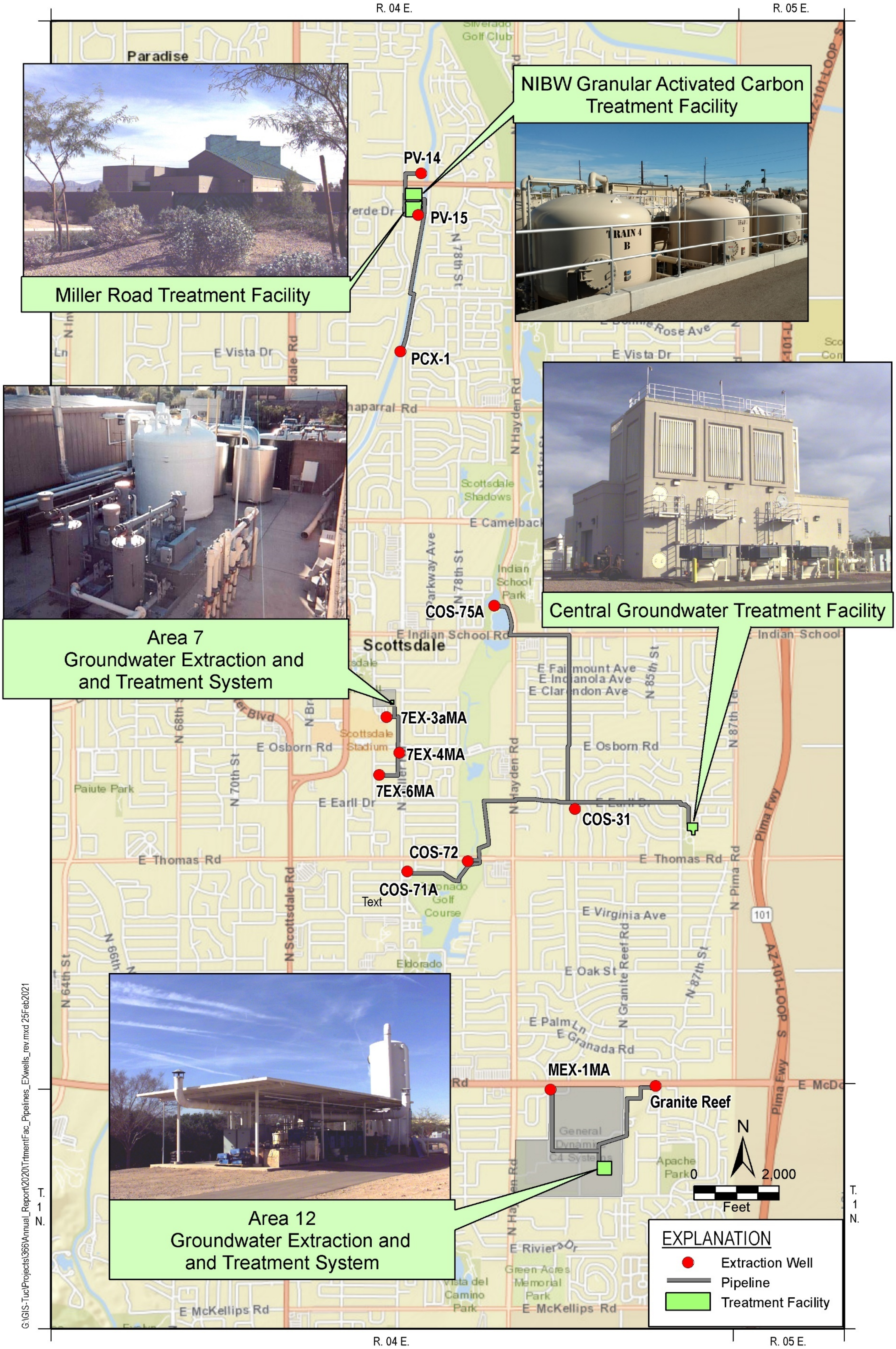

Figure 2. Location of Extraction Wells, Pipelines, and Treatment Facilities at the NIBW Superfund Site

An overview of treatment facility information, including the primary operator(s), the year of VOC treatment system start-up, the principal remedy function, names of associated extraction wells, facility treatment technologies and standards, and specified beneficial end uses, are summarized in **Table 3**. Additional information for each of the treatment facilities is discussed below. Treatment technologies, standards, and groundwater end uses for each of the treatment facilities comply with the Amended CD SOW Performance Standards for groundwater treatment.

Table 3. Overview of NIBW Treatment Facilities

Treatment Facility	CGTF	MRTF	NGTF	Area 7 GWETS	Area 12 GWETS
Treatment System Owner	COS	EPCOR	PCs	PCs	PCs
Primary Operator	COS	EPCOR	COS	PCs	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 in to Treatment and (Aquifer Unit)	COS-75A (LAU) COS-71A (MAU/LAU) COS-72 (MAU/LAU) COS-31 (MAU/LAU)	PV-14 (LAU)* PV-15 (LAU)*	PCX-1 (LAU)*	7EX-3aMA (MAU) 7EX-4MA (MAU) 7EX-6MA (MAU)	MEX-1MA (MAU) 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 COS or discharged to SRP water supply system via Grand Canal	Delivered to EPCOR for municipal use	Municipal supply for COS or delivered to SRP water system via Arizona Canal	Injection to UAU using wells 7IN-1UA and 7IN-2UA	Discharged to SRP irrigation water supply system via McKellips Lake

Notes:
* Extraction wells are also 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).

3.5.2 CGTF

The CGTF was the first treatment system constructed at the NIBW Site. The NIBW PCs constructed the CGTF and transferred ownership to COS on March 18, 1994, after which time the treatment plant went into service. Several modifications were made to the treatment system in 1995, 1998, and 2000 and documented in the FSA. The CGTF has operated in accordance with EPA-approved design specifications since December 1995. The CGTF is located at 8650 East Thomas Road in Scottsdale, Arizona (**Figure 2**). It was constructed and modified to restore a potable water supply to COS and to support capture of NIBW COCs in groundwater.

Groundwater extraction is performed at up to four COS-owned or contract supply wells designated as COS-31, COS-71A, COS-72, and COS-75A. Extracted groundwater is pumped through buried transmission pipelines to the CGTF where it is treated by air stripping. Treated groundwater from the CGTF is primarily used in the COS drinking water system but may be discharged to the SRP water distribution system via an irrigation lateral. Treated groundwater from the CGTF has consistently met NIBW Cleanup Standards.

In late 2016, COS approached EPA and the NIBW PCs to request changes to routine operations for CGTF extraction wells to address water quality issues associated with inorganic constituents unrelated to the Site COCs. In a letter to EPA, dated December 7, 2016, COS indicated that fiscal impacts of treating groundwater extracted from the CGTF wells for non-Site constituents (nitrate, total dissolved solids [TDS], and arsenic) had become significant, and operational changes were required. While a new reverse osmosis system to address inorganics is anticipated to come on line in 2021, it will only have a treatment capacity of about 2,000 gallons per minute (gpm), or roughly the equivalent of extraction from one CGTF well. After consideration of its drinking water provider obligations, review of groundwater flow model results, and discussions with the Technical Committee regarding remedial action priorities, COS now follows a regimen to prioritize pumping at well COS-75A and makes well COS-71A available for the remedy only as a last priority during contingency conditions. Wells COS-72 and COS-31 are operated as needed based on system demands.

3.5.3 MRTF

MRTF began operation in 1997 and is owned and operated by EPCOR. The MRTF is located at 5975 North Miller Road in Scottsdale, Arizona (**Figure 2**). It was constructed to capture and treat groundwater containing NIBW COCs in the Northern LAU, to provide beneficial use of groundwater pumped from remedy extraction wells, and to prevent migration of the LAU plume to peripheral production wells.

Groundwater extraction is currently performed at two groundwater wells, designated as PV-14 and PV-15, which are individually connected to the MRTF. COCs in extracted groundwater are reduced by air stripping at the MRTF. Treated groundwater from wells PV-14 and PV-15 is pumped to the Paradise Valley Arsenic Removal Facility (PVARF) for subsequent distribution by EPCOR for drinking water use. Treated groundwater from the MRTF has consistently met NIBW Cleanup Standards.

3.5.4 NGTF

NGTF began operation in 2013. The NIBW PCs own and are responsible for NGTF operations, maintenance, and performance; however, COS operates the treatment facility under contract to the NIBW PCs, as the treated water may be used in COS's system. The NGTF is located at 5985 Cattletrack Road, at the southeast corner of the intersection of Miller Road and McDonald Drive in Scottsdale, Arizona (**Figure 2**). It was constructed by the NIBW PCs to treat groundwater extracted to provide hydraulic capture of the Northern LAU plume and limit migration of the plume toward the EPCOR wellfield.

Groundwater extraction and treatment is currently performed at one groundwater well tied in to treatment at the NGTF, designated as PCX-1. The NGTF includes a granular activated carbon (GAC) treatment system. Groundwater extracted from PCX-1 is treated using four parallel treatment trains, each consisting of two GAC contactors in lead/lag configuration. EPA selected GAC treatment of groundwater at the NGTF as the long-term solution for extraction well PCX-1 in an Explanation of Significant Differences (ESD), dated March 2012. Treated water from NGTF is delivered to the Chaparral Water Treatment Plant (CWTP) for use by COS in its municipal system. In the event COS does not need or cannot take PCX-1 treated water, it is discharged for SRP use to the adjacent SRP Arizona Canal. Treated groundwater from the NGTF has consistently met NIBW Cleanup Standards and AZPDES permit requirements.

3.5.5 Area 7 GWETS

Area 7 GWETS began operation in 1999. The NIBW PCs own and are responsible for operation of the Area 7 GWETS. Area 7 is a former electronics manufacturing site located at the southeast corner of 75th and 2nd Streets in Scottsdale, Arizona (**Figure 2**). The Area 7 GWETS was constructed to enhance the NIBW groundwater remedy by extracting and treating MAU groundwater containing relatively higher COC concentrations associated with the source area, thereby reducing COC mass allowed to migrate to the LAU extraction wells for removal and treatment.

Groundwater extraction and treatment is currently performed at two groundwater wells, designated as 7EX-3aMA and 7EX-6MA. Well 7EX-5MA became inoperable in 2012 and was abandoned in 2015. Well 7EX-6MA was constructed and added to the system in 2015. Well 7EX-4MA was removed from service in October 2016 due to poor performance. While well 7EX-6MA was principally installed to replace well 7EX-5MA, it was also located and designed to serve as a replacement well for 7EX-4MA, should ongoing rehabilitation efforts prove to be ineffective. Well 7EX-6MA and 7EX-4MA share a common pipeline that connects the wells to the treatment system. As such, increased pumping from well 7EX-6MA is possible when well 7EX-4MA is off-line.

Groundwater from the Area 7 extraction wells is treated by ultraviolet oxidation (UV/OX) followed by air stripping. Treated water is discharged to the UAU using two up-gradient groundwater injection wells (7IN-1UA and 7IN-2UA). UAU injection of Area 7 treated groundwater provides flushing to enhance UAU migration toward the Western Margin. Treated water used to recharge the UAU aquifer must meet substantive requirements of the federal Underground Injection Control (UIC) Program and the Arizona Aquifer Protection Permit (APP) Program administered by ADEQ. In Arizona, all groundwater is classified for drinking water protected use, so the Aquifer Water Quality Standards (AWQS) are primary drinking water standards by rule. If an AWQS is already exceeded at the point of compliance in groundwater, then the discharge must not cause further degradation of the aquifer with respect to the parameter that exceeds the standard. Treated groundwater from Area 7 has consistently met NIBW Cleanup Standards and substantive requirements of UIC and APP.

3.5.6 Area 12 GWETS

Area 12 GWETS began operation in 1999. The NIBW PCs own and are responsible for operation of the Area 12 GWETS. The Area 12 GWETS is located at the former Motorola facility at 8201 East McDowell Road in Scottsdale, Arizona (**Figure 2**). It was installed to enhance the NIBW groundwater remedy by extracting and treating MAU groundwater containing relatively higher COC concentrations at the source area, reducing COC mass allowed to migrate to the Western Margin for removal and treatment at the LAU extraction wells.

Groundwater extraction is performed using two MAU groundwater extraction wells designated as MEX-1MA and SRP well 23.6E,6.0N, also known as the Granite Reef well. The extracted groundwater is treated by air stripping and delivered to the SRP irrigation system at McKellips Lake to replace other SRP irrigation pumping within and near the Site. Treated groundwater from the Area 12 GWETS has consistently met NIBW Cleanup Standards and the AZPDES permit requirements.

4 CONCEPTUAL SITE MODEL

The NIBW CSM was initially developed by the EPA in the late 1980s and documented in the Remedial Investigation Feasibility Study (RIFS, 1990); the CSM was further refined in the 1999 Feasibility Study Addendum (FSA). In 2021, the CSM was updated to incorporate information and understanding developed over the period since the 1999 FSA. The updated CSM is currently in draft form and going through review by EPA and ADEQ. Hydrogeologic features and groundwater flow regimes have generally been consistent throughout the history of the Site, and the remedy that has been built around the CSM continues to be relevant. Over time, the understanding of the CSM has been clarified and refined with additional data collection, specifically with regard to the understanding of aquifer responses to changes in local and regional system stresses. An overview of the current CSM is provided below. An evaluation of the CSM with regard to the consistency of data collected in 2020 is discussed in **Section 9.10**.

4.1 Setting and Key Features

The NIBW Site is geographically situated in the southwestern part of the Paradise Valley Basin in the eastern Salt River Basin. The Paradise Valley Basin is bounded to the east by the McDowell Mountains and to the west and southwest by Camelback Mountain, Mummy Mountain, and the Papago Buttes. The Site is located in the southern portion of Scottsdale. The actual Site boundaries are defined by the extent of COCs in excess of Cleanup Standards documented in the Amended ROD. Since TCE is the COC with the largest extent and highest concentrations, the TCE plume defines the boundaries of the Site, which is generally bounded by McDonald Road to the north, Pima Road to the east, the Salt River to the south and 68th Street to the west, as shown on **Figure 3**. East of the Site, occupying the majority of the land between the NIBW Site and the McDowell Mountains, are the Salt River Pima Maricopa Indian Community (SRPMIC) lands, which are primarily used for agriculture or are undeveloped.

In the vicinity of the Site, the land surface generally slopes southward toward the Salt River floodplain. Principal surface-water features in the vicinity of the Site include the Indian Bend Wash, the Salt River, the Salt River Project (SRP) canal system, Tempe Town Lake, and several artificial recharge projects. Groundwater recharge in the vicinity of the Site is conceptualized to be principally from Salt River flows, infiltration of irrigation water on SRPMIC lands, and artificial recharge facilities, primarily the Granite Reef Underground Storage Project (GRUSP). **Figure 3** shows the location of the NIBW Site, nearby land use, and surrounding cities and mountains.

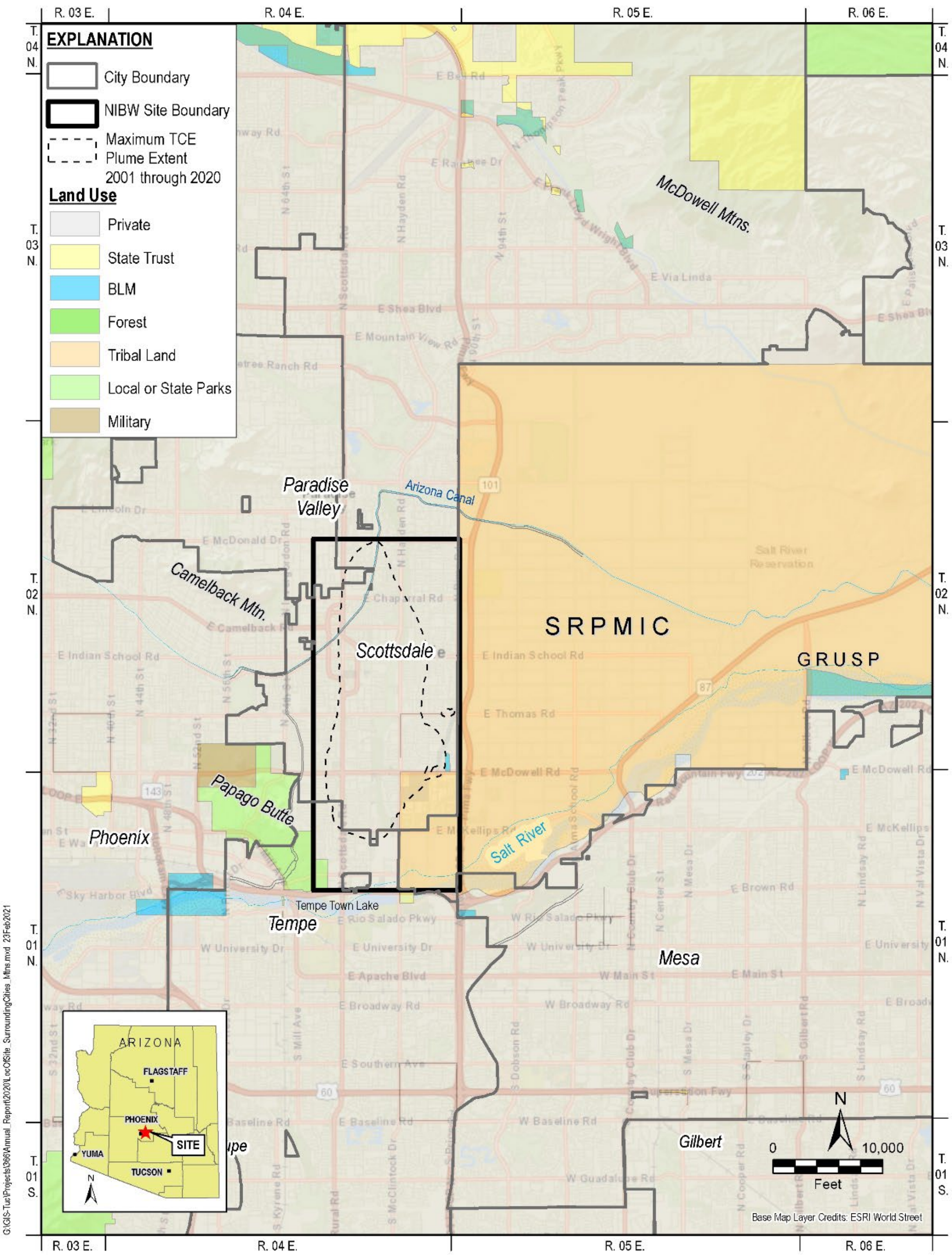

Figure 3. Location of the NIBW Superfund Site and Surrounding Land Area

4.2 Hydrogeologic Framework

The NIBW Site is situated in the Basin and Range geologic province, with the groundwater basin consisting primarily of Quaternary and late Tertiary age sedimentary deposits derived from erosion and uplift of the surrounding mountain blocks. Below the alluvial sedimentary deposits is a strongly lithified sandstone/conglomerate known as the Red Unit, which is of Tertiary age, and the basement bedrock complex, consisting primarily of Precambrian age crystalline rocks and some Tertiary age volcanics. As it relates to the NIBW CSM, the Red Unit is included as part of the hydrologic bedrock complex. Principal geologic characteristics of the sedimentary alluvial deposits in the vicinity of the NIBW Site are described below.

4.2.1 Upper Alluvial Unit

UAU sediments are interpreted to have been deposited as channel, floodplain, terrace, and alluvial fan deposits in an open basin with a through-flowing stream system. This unit consists of unconsolidated silt, sand, gravel, cobbles, and boulders, with occasional interbeds of finer-grained materials. Caliche is also present in some areas. Thickness of the UAU is relatively uniform across the Site, averaging about 150 feet. Consisting of generally coarse-grained material, the hydraulic conductivity in this unit is high relative to underlying sediments. Saturated thickness of the UAU reaches a maximum of about 100 feet south of Indian School Road.

4.2.2 Middle Alluvial Unit

MAU sediments are generally much finer-grained and heterogeneous than either the UAU or the LAU. Deposition of the MAU sediments is interpreted to have been from low-energy playa lake and/or alluvial fan environments in an essentially closed basin. This unit consists of unconsolidated to weakly cemented clay and silt strata interbedded with fine- to coarse-grained sands. Overall, the fraction of silt and clay in the MAU in the Site vicinity is large, resulting in a relatively low hydraulic conductivity. However, the variation in properties between fine-grained zones and coarse-grained interbeds is significant. The uppermost part of the MAU is generally more fine-grained with some sandy interbeds. The zone that underlays the uppermost MAU is referred to as the Upper MAU aquifer zone at the Site and corresponds to the primary monitored interval in the MAU. The Upper MAU is generally less fine-grained and contains thicker and more continuous coarse-grained interbeds than either the uppermost or lower portion of the MAU. Thickness of the MAU varies across the Site from 0 to about 600 feet, averaging about 460 feet across the Site. Thickness generally increases eastward toward the center of the basin. To the west/southwest of the Site, MAU sediments are observed to thin and ultimately “pinch out” near the Western Margin, as described below. The MAU is fully saturated across the NIBW Site.

4.2.3 Lower Alluvial Unit

The LAU is generally recognized as a coarse-grained, heterogeneous unit comprising materials ranging from boulders to clay. The unit is interpreted to have been deposited in a closed, subsiding basin environment that was generally coincident with normal faulting associated with Basin and Range tectonic activity. Sediments were believed to have been derived locally from the uplifting mountain blocks and to have been deposited in playa lake, alluvial fan, and fluvial environments. Sediments in the LAU consist of primarily weakly to strongly lithified gravels and sands interbedded with silty and clayey strata. Percent silt and clay is variable and generally ranges from about 5% to 30%. The LAU is generally the thickest of the three alluvial units at the Site, with thickness exceeding 700 feet in certain areas of the Site. Similar to the MAU, the LAU thickens to the east toward the center of the basin and thins toward the exposed bedrock mountains to the west. The LAU constitutes the principal alluvial aquifer in the region. The LAU is fully saturated across the NIBW Site.

4.2.4 Western Margin

To the west and southwest of the Site approaching the basin margin, MAU and LAU sediments thin, the lithologic distinction between units reduces, and shallow bedrock is encountered. In this region, water levels and piezometric heads in the three alluvial units approach the same values, suggesting increased hydraulic communication and vertical connectivity between the units. This region is referred to as the Western Margin and its generalized extent is shown on **Figure 4**. Since the Western Margin is recognized as a region of enhanced vertical movement of groundwater from the UAU and MAU into the LAU, its generalized extent is defined based upon MAU thickness and vertical hydraulic gradient data. Specifically, the Western Margin is defined to extend across an area where both MAU thickness and vertical gradients from the UAU and MAU to underlying units decrease significantly. The MAU, which otherwise serves as an impediment to vertical flow, is generally 150 feet thick or less in this area and vertical gradients are small. An understanding of the Western Margin hydrogeology, flow regimes, and importance to the Site remedy has been part of the CSM since the original 1991 RI/FS, and data collected in the last 20-plus years continue to support this conceptualization. Movement of UAU groundwater into the LAU is conceptualized to occur in the southern part of the margin region and movement of MAU groundwater into the LAU in the central and north part of the margin region.

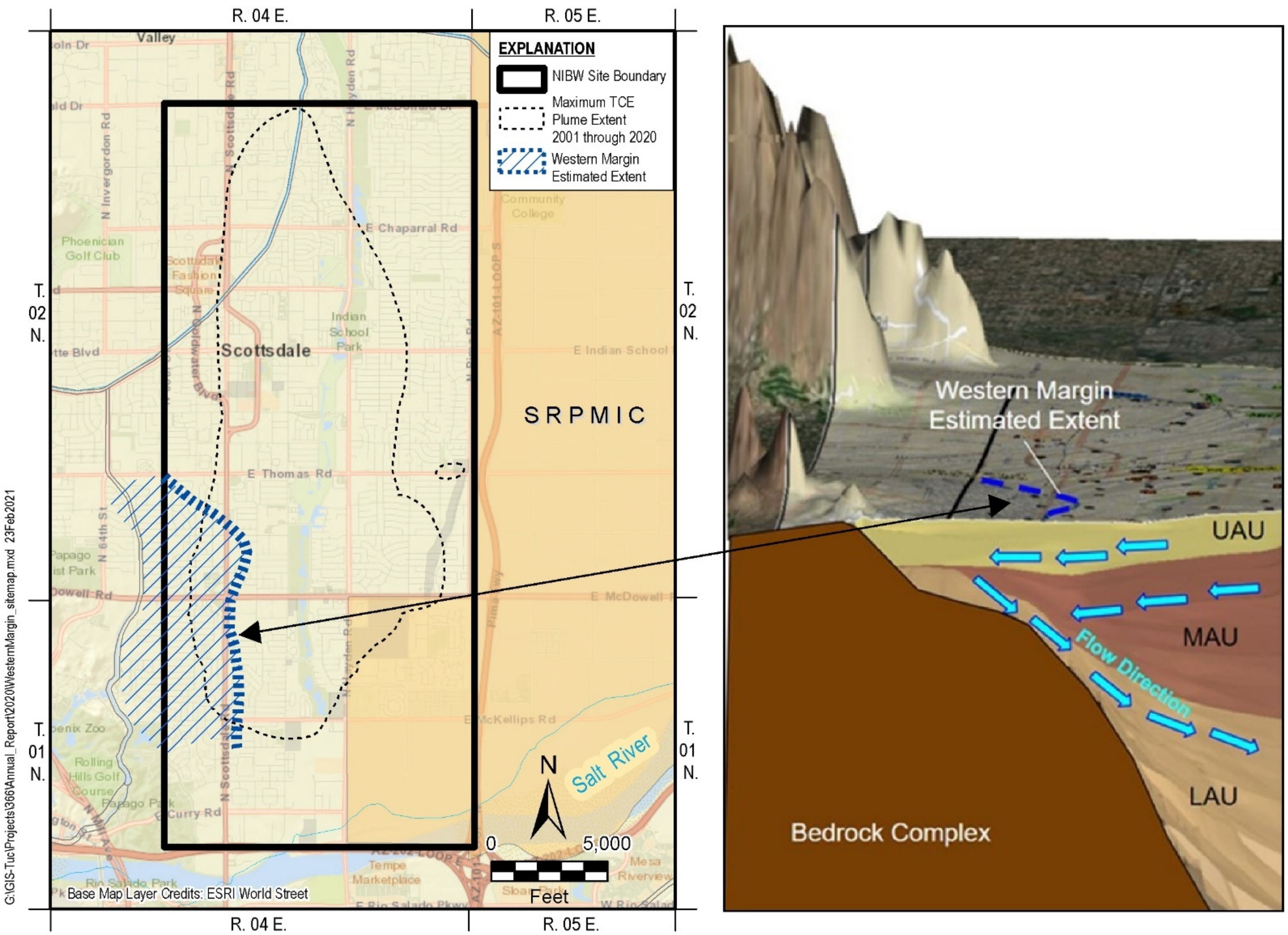

Figure 4. Western Margin Estimated Extent and Conceptual Diagram

4.3 Nature and Extent of COCs

The primary COC at the Site is TCE, since the magnitude and extent of TCE are consistently larger than that of other VOCs over the monitoring history at the Site. The maximum extent of the TCE plume, since 2001, is shown on **Figure 3**. The TCE plume extent is delineated by the estimated extent of groundwater with concentrations above 5 µg/L (the Cleanup Standard). The overall extent of the plume has decreased over time and concentrations within the plume have generally reduced. Groundwater TCE concentrations are now below the Cleanup Standard in almost all UAU monitoring wells. The highest TCE concentrations at the Site are observed in the MAU, specifically near historical source areas (Area 7 and Area 12). The TCE plume in the LAU has the largest footprint; groundwater with TCE from overlying units moves into the LAU where it flows toward LAU extraction wells.

5 PERFORMANCE STANDARDS AND METRICS

Evaluation of the NIBW remedy is based on Performance Standards set forth in the Amended CD SOW and metrics described in the GM&EP. Performance Standards for groundwater containment and GM&EP metrics are outlined below in **Section 5.1 and 5.2** and evaluated relative to 2020 data in **Section 9**.

5.1 Amended CD SOW Performance Standards for Groundwater Containment

The specific requirements for groundwater containment identified in the Amended CD SOW Performance Standards are summarized below:

5.1.1 MAU/LAU

1. Provide sufficient hydraulic control to prevent groundwater in the MAU/LAU with VOC concentrations above the Cleanup Standards from migrating toward and ultimately impacting production wells that did not contain NIBW COCs exceeding MCLs prior to the Effective Date of the Amended CD and which are not currently connected to an existing treatment facility.
2. Demonstrate that NIBW COC concentrations in the MAU outside the source areas (Area 7 and Area 12) are being reduced.

5.1.2 Area 7 and Area 12

1. Reduce the mass of NIBW COCs in groundwater at the Area 7 and Area 12 sources.
2. Achieve overall concentration reductions for NIBW COCs.
3. Provide sufficient hydraulic control to prevent MAU groundwater in the vicinity of Area 7 and Area 12 with concentrations higher relative to the surrounding vicinity from migrating away from the source areas.
4. Minimize the total amount of NIBW COCs that are allowed to migrate toward the Western Margin.

5.2 GM&EP Metrics

Performance of the NIBW remedy is evaluated based on a rigorous approach established in the GM&EP. In the GM&EP, monitoring program objectives are matched with specific performance criteria, a methodology for measuring achievement of performance criteria, a definition of when contingency evaluations or actions would be initiated, and alternative contingency response actions that may be taken.

A process is underway to work with the NIBW Technical Committee to make targeted updates to the GM&EP to align the performance metrics more directly to the Site RAOs and performance standards. In the meantime, the PCs will continue to use the structure laid out in the 2002 GM&EP to evaluate progress and performance of the various remedy components.

The five remedy components identified for evaluation in the GM&EP are: 1) UAU mass flux and restoration; 2) MAU/LAU containment and restoration; 3) Northern LAU hydraulic capture; 4) Area 7 MAU Source Control; and 5) Area 12 MAU Source Control. Performance criteria and contingency actions associated with each component are summarized in **Table 4**.

Table 4. GM&EP Performance Criteria and Contingency Initiation Criteria by Program

Program	Performance Criteria	Contingency Initiation Criteria	GM&EP Section
UAU	A. Reduction in total VOC mass in UAU attributable to NIBW sources	A. UAU VOC mass increasing with time, based on 5-year running average	4.1
MAU/LAU	A. Hydraulic gradients and TCE plume consistent with overall capture of MAU/LAU plume by CGTF, MRTF, [and NGTF beginning in 2013] extraction wells B. VOC concentrations below Cleanup Standards in peripheral production wells	A. Direction of groundwater movement along periphery of MAU/LAU plume is not toward either extraction wells or Western Margin for two consecutive monitoring rounds (1 year) B. Shift of >1,000 ft in 5 µg/L TCE concentration contour in MAU or LAU relative to October 2001 (other than from movement toward extraction wells tied in to treatment) C. Water quality data indicating TCE equal to or greater than achievement measure concentrations (**Table 12**)	4.2
Northern LAU	A. Consistent presence of cone of depression in vicinity of Northern LAU extraction wells B. Capture of Northern LAU plume C. VOC concentrations below Cleanup Standards in peripheral production wells	A. Direction of groundwater movement along Northern LAU plume periphery is not toward Northern LAU extraction wells for 1 year B. TCE concentrations in PG-42LA, PG-43LA, or PV-14 greater than 2 µg/L	4.3
Area 7 MAU Source Control	A. Generally declining TCE concentrations within capture zone associated with Area 7 extraction wells B. Hydraulic capture zone extending south to vicinity of PA-12MA	A. Increasing 5-year combined running average TCE concentration for: D-2MA, E-10MA, PA-10MA, PA-12MA, W-1MA, and W-2MA B. Capture to vicinity of PA-12MA not demonstrated	4.4

Program	Performance Criteria	Contingency Initiation Criteria	GM&EP Section
Area 12 MAU Source Control	A. Generally declining TCE concentrations within capture zone associated with Area 12 extraction wells B. Hydraulic capture zone extending west to vicinity of Hayden Rd	A. Increasing 5-year combined running average TCE concentration for: E-1MA, M-4MA, M-5MA, M-6MA, M-7MA, M-9MA, M-15MA, and PA-21MA B. Capture to vicinity of Hayden Rd not demonstrated	4.4

6 GROUNDWATER MONITORING PROGRAM

In addition to performance criteria and contingency response actions, groundwater monitoring requirements for the NIBW Site are also specified in the GM&EP. The GM&EP defines: 1) the scope and frequency of monitoring activities; 2) requirements for data reporting and preparation of interpretive work products; and 3) the approach to conducting groundwater flow model updates. Changes to the UAU monitoring program are documented in the EPA-approved Work Plan for Updated Long-term Groundwater Monitoring Program, Upper Alluvium Unit Groundwater, dated December 13, 2012 (NIBW PCs, 2012). Other monitoring program changes reviewed and approved by EPA have occurred over time, including abandonment of a total of 43 UAU monitoring wells in 2006, 2007, 2010, 2013, 2014, and 2018 (see appropriate annual SMRs for details).

The purpose of the Groundwater Monitoring Program is to:

1. Identify the zone of groundwater contamination in the MAU and LAU requiring remediation.
2. Identify the zone of hydraulic capture resulting from operation of extraction wells.
3. Evaluate the rate of VOC mass reduction in the UAU due to migration out of the unit.
4. Identify areas within the UAU, MAU, and LAU to which VOC mass is moving.
5. Provide long-term monitoring to verify the ongoing effectiveness of remedial actions.
6. Demonstrate capture and containment of the zone of contamination, such that concentrations of VOCs in excess of Cleanup Standards do not impact peripheral production wells.
7. Verify containment has effectively prevented VOC concentrations in excess of the Cleanup Standards from impacting peripheral production wells.
8. Document changes in concentrations to evaluate long-term restoration of the aquifer to drinking water end use.

The GM&EP contains the groundwater monitoring and reporting requirements. The Phase 1 Sampling and Analysis Plan (SAP) which includes a field sampling plan (FSP) and a quality assurance project plan (QAPP) was developed to cover sampling activities presented in the GM&EP.

Groundwater monitoring at the NIBW Superfund Site includes collection, analysis, and reporting of extensive water level, water quality, and pumping data from a network of groundwater monitoring, extraction, peripheral production, irrigation, and other water wells completed in the UAU, MAU, and LAU. Locations of extraction (active, inactive, and abandoned), peripheral production wells, irrigation or other pumping wells (active, and inactive), and monitoring wells (active and recently abandoned or retired) in the vicinity of the NIBW Site are shown on **Figure 5**. Peripheral production or "production" wells are wells, other than remedial extraction wells, that are permitted and used for potable supply and that have not been impacted by COCs above Cleanup Standards prior to the Amended CD. Irrigation or other non-potable supply wells are permitted for specific uses and are not presently used for drinking water supply. Other wells also include pumping wells which are used for potable supply but were impacted prior to the Amended CD. Sampling details are summarized in **Table A-1**, including well type, aquifer unit, and frequency of water level and water quality monitoring. Well construction information is summarized in **Table A-2**.

6.1 Groundwater Level Monitoring Program

Groundwater level monitoring is conducted semi-annually using a network of 71 monitoring wells in April (May in 2020) and 99 monitoring wells in October. A summary of the water level monitoring frequency is included in **Table A-1**. In addition to periodic water level monitoring conducted at unit-specific monitoring wells, continuous water level monitoring is conducted at a group of wells as part of the enhanced Northern LAU monitoring program described in the GM&EP. These wells are identified as "continuous" in **Table A-1** and are summarized in **Table A-3**. The continuously monitored Northern LAU locations include six LAU monitoring wells and four EPCOR production wells. Modifications noted in **Table A-3** were made to provide more useful data regarding capture and control in the Northern LAU plume. The NIBW PCs also obtain continuous water level data at other selected MAU and LAU monitoring wells to evaluate trends.

6.2 Groundwater Quality Monitoring Program

Groundwater quality monitoring of the NIBW COCs is conducted in accordance with requirements of the GM&EP. Water quality monitoring includes the following components:

- Monthly sampling (when operating) at the four (4) CGTF extraction wells, two (2) MRTF extraction wells, and one (1) NGTF extraction well
- Quarterly sampling (when operating) at the three (3) Area 7 extraction wells and two (2) Area 12 extraction wells, and at a network of 24 selected MAU and LAU monitoring wells
- Semi-annual sampling at one (1) LAU monitoring well and
- Annual sampling at an additional 59 UAU, MAU, and LAU monitoring wells.

In general, monitoring is conducted in accordance with the SAP for the NIBW Site, developed by SRP and approved by EPA in 2003. However, in October 2015 the PCs prepared and submitted to EPA an addendum to the Phase 1 SAP to describe standard operating procedures for collection of groundwater samples at monitoring wells using the HydraSleeve™ sampling method (HydraSleeve). Under the original Phase 1 SAP for the NIBW Site, groundwater samples are obtained from monitoring wells using dedicated pumps. A standard volume-based purge method requiring stabilization of water quality field parameters is specified, with treatment of purge water prior to discharge for wells where COCs exceed regulatory limits. The HydraSleeve sampling approach was integrated into the Phase 1 SAP to provide the opportunity to use this passive sampling method at the Site for monitoring wells where dedicated pumps either failed or their use was deemed impractical. In practice, when dedicated pumps have failed, HydraSleeve sampling has been used as a sampling strategy on a case-by-case basis, considering both logistical and technical advantages and disadvantages. HydraSleeve samples have generally shown a good agreement with historical results from traditional purge samples. In wells where inconsistent results were apparent, and inconsistencies could not be explained based on known conditions or trends, dedicated pumps were re-installed in the wells.

Monthly and quarterly groundwater quality monitoring is generally conducted during the first week of the month, beginning in January. The annual groundwater quality monitoring program is initiated at the beginning of October.

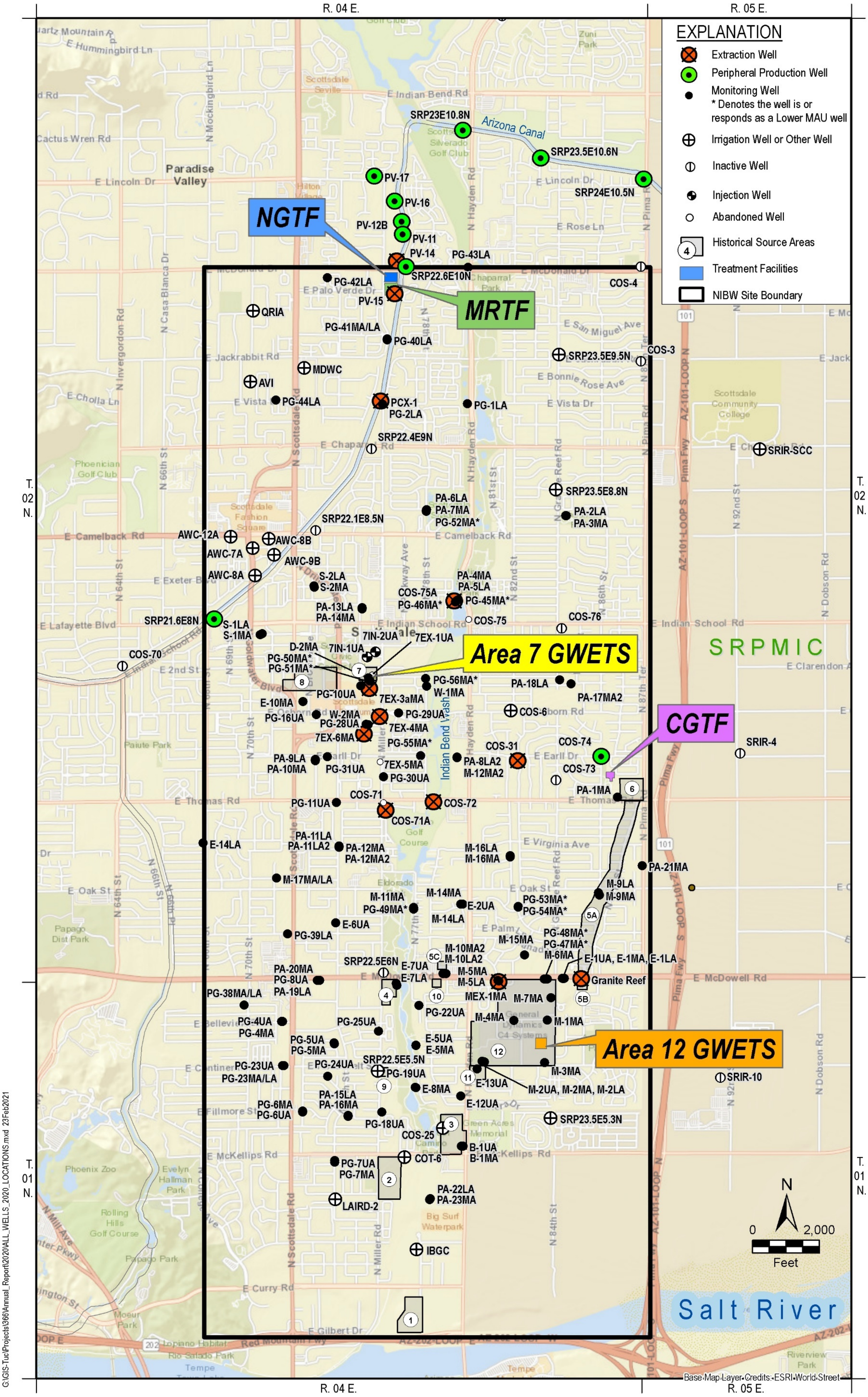

Figure 5. Well Locations and Identifiers in the NIBW Superfund Site Vicinity

6.3 Groundwater Pumping Reporting Program

Monthly data for total groundwater pumped are compiled for all wells that pump at rates greater than 35 gpm and are located in the area bounded by Indian Bend Road to the north, 1 mile south of McKellips Road to the south, Dobson Road to the east, and Invergordon Road to the west. Groundwater pumping data are obtained from municipal and private water providers, SRP, and the Arizona Department of Water Resources (ADWR).

6.4 Treatment System Monitoring Program

Treated groundwater from the NIBW treatment facilities is required to meet treatment standards described in **Table 3** and sampling is conducted in accordance with requirements of the Phase 2 SAP and treatment facility Operation & Maintenance (O&M) Plans. Treatment system sampling locations and frequency are summarized in Table 5.

Table 5. Summary of Treatment System COC Monitoring Program

Treatment Facility	CGTF*	MRTF	NGTF	Area 7	Area 12
Sample Points	CD (eff) Raw (inf)	PV-14 (inf) PV-15 (inf) Tower 1 Tower 2 Tower 3	PCX-1 (inf) NGTF-CP or AZCO (eff)	SP-102 (inf) SP-103 (UV/Ox eff) SP-105 (Air Stripper eff)	WSP-1 (inf) WSP-2 (Air Stripper eff)
Sample Frequency	Weekly	Monthly	Weekly - eff Monthly - inf (PCX-1)	Monthly	Monthly

*CGTF is reported by COS in its CMRs
inf = influent
eff = effluent

6.4.1 COC Water Quality Monitoring at Treatment Facilities

Results of analyses for process and treated groundwater samples from the MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS conducted by TestAmerica are summarized in **Table C-3**.

- CGTF - Treatment system influent samples, labeled "Raw," and an effluent sample, labeled "CD," are collected each week (when the treatment system is operational) and submitted to TestAmerica for analysis of NIBW COCs. The "Raw" sample is only analyzed for TCE. Process and treated groundwater sampling results for the CGTF are reported directly to EPA and ADEQ by COS on a quarterly basis.
- MRTF - Treatment system influent is collected during the first week of the month at extraction wells PV-14 and PV-15. Extraction well (influent) results are summarized in **Table C-2**. Treatment system effluent samples from air stripping treatment train towers

1, 2, and 3 are collected during the first week of each month (when the treatment system is operational) by EnSolutions and submitted to TestAmerica for analysis of NIBW COCs. Process and treated groundwater sampling results for the MRTF are reported quarterly by the NIBW PCs.

In addition to the routine monitoring of MRTF extraction wells conducted pursuant to the GM&EP, the NIBW PCs conduct supplemental sampling at wells PV-11 and PV-12B when operating on the scheduled monthly sampling date for the MRTF extraction wells. These two water supply wells are located downgradient from extraction well PV-14.

- NGTF - Treatment system influent is collected during the first week of the month at extraction well PCX-1 by EnSolutions and analyzed for NIBW COCs by TestAmerica. Extraction well (influent) results are summarized in **Table C-2**. Treatment system effluent samples are collected each week (when the treatment system is operational) from either the CWTP (NGTF-CP) or the SRP Arizona Canal (AZCO) and are submitted to TestAmerica for analysis of NIBW COCs. Treated groundwater sampling results for the NGTF are reported quarterly by the NIBW PCs.
- Area 7 GWETS - Treatment system influent from sample port SP-102 (combined influent from Area 7 extraction wells 7EX-3aMA and 7EX-6MA), the UV/Ox reactor effluent from sample port SP-103, and air stripper effluent from sample port SP-105 are collected during the first week of each month (when the treatment system is operational) by EnSolutions and submitted to TestAmerica for analysis of NIBW COCs. Process and treated groundwater sampling results for the Area 7 GWETS are reported quarterly by the NIBW PCs.
- Area 12 GWETS - Treatment system influent from sample port WSP-1 (combined influent from Area 12 extraction wells MEX-1MA and Granite Reef well), and air stripper effluent from sample port WSP-2 samples are collected during the first week of each month (when the treatment system is operational) by EnSolutions and submitted to TestAmerica for analysis of NIBW COCs. Process and treated groundwater sampling results for the Area 12 GWETS are reported quarterly by the NIBW PCs.

6.5 Data Management & Quality Assurance / Quality Control

The following measures are taken in an ongoing manner to ensure collection, analysis, storage, and reporting of quality data:

- Water level and water quality data are collected in accordance with the Phase 1 and Phase 2 SAPs.

- Primary and backup laboratories are designated and are both certified by the Arizona Department of Health Services for EPA method 524.2 for Site COCs.
- The appropriate number of trip blanks, field blanks, and field duplicates are obtained during each sampling round.
- Water level data are reviewed in relation to trends prior to being integrated into the data repository, and water levels are re-measured if data are suspect.
- Laboratory results are reviewed in relation to the laboratories' own published performance criteria as well as historical data trends; re-analysis and potentially re-sampling occur if results are suspect.
- Treatment system effluent samples are given careful and timely scrutiny and re-sampled immediately if results are out of anticipated ranges.
- All compliance data are digitally stored in a secure manner and are associated with specific wells using consistent station identifiers.
- Water quality samples are given unique sample IDs and are linked to supporting laboratory and field information for future reference.
- Annual laboratory audits are conducted and any issues that have surfaced during the year are identified and addressed.
- Periodic blind Performance Evaluation (PE) samples of known concentrations are sent to the primary laboratory and split samples are sent to the backup laboratory.
- All compliance reporting is based on data output from a secure digital data repository.

7 DATA PRESENTATION AND ANALYSES

7.1 Groundwater Pumping

Monthly groundwater pumping data for 2020 are summarized in **Table 7**. Annual groundwater pumping data for 1991 through 2020 are summarized in **Table 8**, and 2020 groundwater pumping data is shown graphically on **Figure 6**, with circle size increasing with pumping volume. The estimated pumping distribution between the UAU, MAU, and LAU for pumping wells in the vicinity of the Site are shown on **Figure 6** (in percentage) and **Table 7** (in acre-feet [AF]).

Review of monthly groundwater pumping data (**Table 7**) indicates seasonal trends in pumping in response to fluctuations in demand for groundwater. In general, maximum groundwater pumping for municipal demand corresponds to the summer months while minimum groundwater pumping for municipal demand corresponds to the winter months. In 2020, combined monthly pumping for all wells at the NIBW Site ranged from 1,042 AF--which is equivalent to about 339 million gallons (MG)--in February 2020, to 2,809 AF (about 915 MG) in July 2020.

Review of the spatial distribution of groundwater pumping for 2020 (**Figure 6**) indicates the presence of several pumping centers. The predominant pumping center is associated with the Paradise Valley (PV) wellfield, located along the Arizona Canal in the vicinity of McDonald Road to the north. Total groundwater pumping for 2020 at the six PV wells was 10,835 AF (3,531 MG). This pumping is principally from the LAU. NGTF extraction well SRP22.5E9.3N (also known as PCX-1) pumped a total of 2,793 AF (910 MG) from the LAU in 2020. Combined pumping at PV wells and PCX-1 in the Northern LAU causes a regional cone of depression that controls groundwater movement in the LAU across the NIBW Site.

Outside of the Northern LAU pumping center described above, groundwater extraction at the CGTF extraction wells (COS-75A, COS-31, COS-72, and COS-71A) is the most significant pumping that occurs within the boundaries of the NIBW Site. Wells COS-75A and COS-71A pump exclusively and primarily from the LAU, respectively. Wells COS-72 and COS-31 pump from both the MAU and LAU. Total groundwater pumping for 2020 at the CGTF extraction wells was 3,691 AF (1,203 MG). CGTF pumping in 2020 was principally focused at well COS-75A, which accounted for approximately 60% of CGTF extraction, with about 2,195 AF of the 3,691 AF pumped.

Pumping associated with the Area 7 and Area 12 GWETSs is also fairly substantial, totaling 560 AF (182 MG) and 1,733 AF (565 MG) for 2020, respectively. Groundwater extraction for the Area 7 and Area 12 Source Control Programs is exclusively from the MAU. The Arcadia Water Company (AWC) wellfield comprises another pumping center in the vicinity of the NIBW

Site. Total groundwater pumping for 2020 at the five AWC wells, which pump from the MAU and LAU, was 2,252 AF (734 MG). When operating, City of Tempe (COT) well COT-6 comprises another significant pumping center. Well COT-6 pumps principally from the MAU. A total of 794 AF (259 MG) was pumped from well COT-6 in 2020.

Table 8 summarizes annual groundwater pumping for wells in the vicinity of the NIBW Site for the period 1991 through 2020. Overall trends in pumping from 1991 through present are summarized in **Table 6**. Annual groundwater pumping in the vicinity of the NIBW Site for 2020 totaled 23,065 AF, or 7,516 MG, which is less than the average since 2005.

Table 6. Annual Groundwater Pumping Trends in the NIBW Superfund Site Vicinity

Timeframe	Annual Groundwater Pumped
1991 through 1995	Remedy build-out in progress - pumping ranged from 18,887 AF (6,154 million gallons) to 31,824 AF (10,370 million gallons)
1996 through 2004	Initial remedy operation - pumping increased to average of 40,165 AF (13,088 million gallons)
2005 through 2016	Increase in surface water supply to COS and SRP - pumping decreased to average of 29,324 AF (9,555 million gallons)
2017 through 2020	COS balancing inorganics not related to Site - pumping decreased to average of 23,762 AF (7,743 million gallons)

Table 7. 2020 Monthly Groundwater Pumping in the NIBW Superfund Site Vicinity

Production Well ID	Estimated Pumping Distribution Percentage			Gallons (x1000)													Total In Acre-Feet	Calculated Pumping Distribution (Acre-Feet)		
	UAU	MAU	LAU	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total		UAU	MAU	LAU
7EX-3aMA	0	100	0	6,650	6,403	6,013	6,330	5,698	4,987	5,810	5,797	6,618	6,994	5,797	6,618	73,716	226.2	0.0	226.2	0.0
7EX-4MA	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
7EX-6MA[a]	0	100	0	10,906	10,500	9,743	9,395	9,428	8,042	9,278	8,566	8,216	9,055	8,438	7,132	108,698	333.6	0.0	333.6	0.0
PV-11	0	18	82	5,378	5,421	6,506	52,350	78,371	74,799	74,628	72,217	63,523	65,850	58,054	65,907	623,004	1,911.9	0.0	344.1	1,567.8
PV-12B[b]	0	0	100	1,058	15,319	435	22,936	48,114	107,601	127,355	123,744	103,819	86,087	48,881	56,443	741,792	2,276.5	0.0	0.0	2,276.5
PV-14	0	0	100	88,840	84,817	73,638	68,540	95,626	91,451	97,332	97,256	93,474	99,168	93,506	0	983,648	3,018.7	0.0	0.0	3,018.7
PV-15	0	18	82	92,987	59,287	64,026	93,803	92,600	87,380	92,613	93,983	93,853	96,333	69,456	97,095	1,033,416	3,171.4	0.0	570.9	2,600.6
PV-16	0	0	100	6	13,341	8,622	0	62	1,506	500	427	259	274	729	197	25,923	79.6	0.0	0.0	79.6
PV-17	0	0	100	41	31	26,370	64	473	5,259	28,398	41,227	13,287	2,651	4,120	1,008	122,929	377.3	0.0	0.0	377.3
AVI **	0	100	0	2,886	2,886	2,886	2,886	2,886	2,886	2,886	2,886	2,886	2,886	2,886	2,886	34,637	106.3	0.0	106.3	0.0
AWC 7A	0	35	65	10,458	5,646	6,025	10,634	15,462	16,510	20,757	12,938	18,276	19,897	14,867	8,438	159,909	490.7	0.0	171.8	319.0
AWC 8/8B***	0	75	25	11,774	12,553	14,599	15,743	16,358	6,599	22,110	25,300	20,978	19,304	12,461	8,595	186,375	572.0	0.0	429.0	143.0
AWC 8A	0	65	35	2,657	1,329	0	12,007	14,087	19,999	0	0	29	9,929	241	4,583	64,861	199.1	0.0	129.4	69.7
AWC 9A/9B	0	45	55	7,116	5,135	3,863	13,477	27,464	22,246	21,285	9,511	9,882	17,259	7,497	3,346	148,082	454.4	0.0	204.5	249.9
AWC 12A	0	66	34	11,555	7,752	16,178	19,082	13,651	13,486	9,556	24,420	28,136	12,471	11,521	6,855	174,663	536.0	0.0	353.8	182.2
COS 3	0	32	68	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 4	0	95	5	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 14	0	53	47	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 25 *	0	70	30	0	0	0	836	2,726	2,648	2,314	2,244	1,190	593	0	4	12,555	38.5	0.0	27.0	11.6
COS 70	0	75	25	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 71A[c]	0	19	81	0	0	0	0	0	0	0	0	0	6,075	0	0	6,075	18.6	0.0	3.5	15.1
COS 72	0	50	50	0	0	0	580	990	96,627	71,784	68,607	55,265	33,425	443	79,527	407,248	1,249.8	0.0	624.9	624.9
COS 73	2	77	21	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COS 74	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
COS 75A	0	0	100	0	0	0	48,631	95,279	97,961	100,475	99,210	96,417	46,225	38,128	92,750	715,078	2,194.5	0.0	0.0	2,194.5
COS 76	0	0	100	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
COT 6	0	70	30	0	0	0	46,351	44,834	51,671	59,911	25,515	0	0	30,553	0	258,834	794.3	0.00	556.03	238.30
IBGC	10	90	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LAIRD 2	4	66	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.00	0.00	0.00
MDWC	0	70	30	0	1,948	0	3,304	3,517	4,753	1,896	3,811	5,120	2,949	1,517	1,324	30,139	92.5	0.0	64.7	27.7
MEX-1MA	0	100	0	0	27,791	44,597	28,575	43,663	42,128	42,954	28,629	40,440	42,527	40,821	41,749	423,872	1,300.8	0.0	1,300.8	0.0
QRIA	0	66	34	0	0	0	783	1,539	1,728	1,566	1,917	1,701	810	0	0	10,044	30.8	0.0	20.3	10.5
SRIR SCC	0	40	60	1,791	1,628	1,687	0	0	9,132	9,565	8,894	0	0	0	317	33,014	101.3	0.0	40.5	60.8
SRIR 4	0	100	0	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	0	0.0	0.0	0.0	0.0
SRIR 10	2	68	30	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	0	0.0	0.0	0.0	0.0

Production Well ID	Estimated Pumping Distribution Percentage			Gallons (x1000)													Total In Acre-Feet	Calculated Pumping Distribution (Acre-Feet)		
	UAU	MAU	LAU	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total		UAU	MAU	LAU
SRP 21.6E,8N[d]				0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
SRP 22.1E,8.5N	0	100	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
SRP 22.3E,7N	2	98	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
SRP 22.4E,9N	NA	NA	NA	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	NA	NA	NA
SRP 22.5E,5.5N	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
SRP 22.5E,6N	0	100	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	0	0.0	0.0	0.0	0.0
SRP 22.5E,9.3N (PCX-1)	0	0	100	113,468	77,697	114,847	108,527	113,249	110,986	110,613	107,484	53,119	0	0	94	910,084	2,792.9	0.0	0.0	2,792.9
SRP 22.6E,10N	0	32	68	0	0	0	0	0	339	0	108	0	8,394	0	0	8,840	27.1	0.0	8.7	18.4
SRP 22.9E,10.8N[e]	0	50	50	0	0	0	0	0	0	0	0	0	117	33	0	150	0.5	0.0	0.2	0.2
SRP 23.3E,7.3N (COS 31)	0	57	43	0	0	0	0	894	0	1,854	2,959	0	6,972	2,416	59,058	74,153	227.6	0.0	129.7	97.9
SRP 23.3E,7.5N (COS 6)	1	79	20	0	0	1,336	20	0	0	0	0	7	0	94	0	1,457	4.5	0.0	3.5	0.9
SRP 23.5E,5.3N	0	70	30	0	0	0	0	0	0	0	0	0	13	0	0	13	0.0	0.0	0.03	0.01
SRP 23.5E,8.8N	0	53	47	0	0	391	59	0	0	0	0	0	7	72	0	528	1.6	0.0	0.86	0.76
SRP 23.5E,9.5N	0	0	100	3	0	0	0	0	0	0	0	0	3	59	0	65	0.2	0.0	0.0	0.2
SRP 23.5E,10.6N[f]	0	32	68	0	3	0	0	0	0	0	0	29	46	0	0	78	0.2	0.0	0.1	0.2
SRP 23.6E,6N (Granite Reef)	0	100	0	0	0	0	32	4,531	0	0	0	24,423	38,278	36,428	37,053	140,744	431.9	0.0	431.9	0.0
SRP 24E,10.5N	0	52	48	0	0	0	0	1,075	62	0	26	91	7	0	0	1,261	3.9	0.0	2.0	1.9
Total Monthly Discharge (Gallons x 1,000)				**367,575**	**339,486**	**401,763**	**564,944**	**732,577**	**880,788**	**915,441**	**867,675**	**741,039**	**634,599**	**489,017**	**580,979**	**7,515,884**				
Total Monthly Discharge (Acre-Feet)				**1,128**	**1,042**	**1,233**	**1,734**	**2,248**	**2,703**	**2,809**	**2,663**	**2,274**	**1,948**	**1,501**	**1,783**	**23,065**	**23,065**	**0**	**6,084**	**16,981**

ABBREVIATIONS:

- 7EX = Area 7 Extraction Wells
- AB = Well Abandoned
- AVI = Arcadia Vista Improvement
- AWC = Arcadia Water Company
- COS = City of Scottsdale
- COT = City of Tempe
- IBGC = Indian Bend (Rio Salado) Golf Course
- LAIRD = Tempe School District No. 3
- MDWC = McDowell Water Company
- MEX = Motorola Extraction Well
- NA = Not Available
- N.I.S. = Not in Service
- PV = Paradise Valley
- QRIA = Quail Run Irrigation Association
- SRIR = Salt River Indian Reservation
- SRP = Salt River Project
- SCC = Scottsdale Community College

NOTES:

* All water from Well 25 goes directly to McKellips Park irrigation and does not go to City of Scottsdale's water delivery system.
** Monthly values are based on an average of the annual total.
***Has pumping for AWC 8 and AWC 8B and is now AWC 8B
[a] Replacement well for 7EX-5MA
[b] Replacement well for PV-12
[c] Replacement well for COS-71
[d] Replacement well for SRP 21.5E,8N (not active yet)
[e] Replacement well for SRP 23E,10.8N
[f] Replacement well for SRP 23.4E,10.6N

Table 8. Annual Groundwater Pumping in the NIBW Superfund Site Vicinity from 1991 through 2020

	Gallons (x1000																													
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
7EX-1UA (1)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13,514	13,654	14,585	12,966	12,627	0	0	0	AB	AB	AB	AB	AB
7EX-3aMA (2)	---	---	---	---	---	---	---	---	13,170	87,375	76,401	64,048	77,690	83,654	72,475	73,094	74,020	64,062	70,290	73,227	68,454	89,646	82,936	85,411	75,046	50,426	55,354	54,202	52,783	73,716
7EX-4MA (2)	---	---	---	---	---	---	---	---	12,498	57,645	50,958	29,736	35,822	27,685	19,076	22,205	12,790	12,225	19,259	24,851	30,447	46,901	51,448	35,461	28,280	16,720	0	0	0	0
7EX-5MA (3)	---	---	---	---	---	---	---	---	---	---	---	42,094	96,280	85,914	102,191	95,534	103,234	78,932	88,997	72,160	69,657	19,315	0	0	0	0	AB	AB	AB	AB
7EX-6MA (4)a	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	25,524	76,991	107,116	105,021	89,539	108,698
PV-11	141,681	10,008	6,048	49,440	147,437	191,702	314,834	234,419	477,245	308,005	541,897	479,842	272,363	317,251	234,580	388,303	237,616	525,273	353,453	108,631	584,592	769,961	823,065	610,793	587,317	667,557	673,419	574,889	433,655	623,004
PV-12	78,760	161,849	160,265	197,764	442,311	766,800	302,222	224,958	317,991	242,826	292,758	269,215	255,925	181,905	190,159	235,528	177,350	415,980	478,840	182,527	416,242	72,486	0	AB	AB	AB	AB	AB	AB	AB
PV-12Bb	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	464,884	769,618	438,959	422,165	809,273	558,911	452,431	835,263	741,792
PV-14	697,184	578,435	747,760	670,253	556,129	387,737	203,056	584,633	575,456	512,210	487,780	593,518	632,011	677,341	771,890	387,497	632,798	232,191	149,512	451,695	854,265	930,498	696,185	1,031,782	1,097,813	1,067,856	1,024,432	1,110,912	1,061,608	983,648
PV-15	607,810	653,910	616,805	404,378	204,347	289,088	629,291	950,086	1,066,526	996,539	811,431	913,461	1,017,488	1,082,598	1,059,244	1,066,791	281,022	418,495	890,424	997,698	1,053,100	1,022,323	831,104	1,078,491	1,006,058	620,398	1,089,449	1,066,873	851,657	1,033,416
PV-16	1,170,129	1,019,287	1,131,036	1,048,376	981,234	1,067,411	1,051,729	583,415	423,634	541,894	699,049	475,143	414,571	319,872	341,430	246,221	567,698	831,067	704,898	842,941	314,954	253,545	184,509	89,102	84,721	125,342	156,143	74,120	5,198	25,923
PV-17	---	---	7,080	715,206	711,787	711,787	906,660	568,588	358,059	54,352	105,121	57,730	128,252	102,762	38,113	173,522	451,742	1,015,459	1,297,930	1,005,540	221,181	10,293	35,513	12,581	12,304	31,554	10,217	173,515	156,611	122,929
AVI	78,763	79,074	89,128	95,840	91,608	88,372	93,030	79,825	84,295	75,740	79,388	76,049	70,533	78,501	68,605	62,650	54,663	67,011	57,627	60,168	60,117	54,030	51,308	48,633	44,140	43,214	40,492	37,393	32,484	34,637
AWC 7A	77,412	338,402	401,431	424,251	374,819	340,712	190,891	223,939	298,585	305,173	276,139	220,294	229,397	170,813	176,534	45,049	40,934	51,903	63,065	38,430	155,622	261,554	229,121	280,630	299,937	221,472	236,670	246,750	220,338	159,909
AWC 8	363,078	418,945	410,874	417,285	233,147	341,332	270,555	370,570	319,651	292,498	138,800	279,501	212,209	321,431	293,885	254,674	365,994	353,379	326,794	313,350	311,522	323,744	153,290	129,982	138,410	83,095	130,116	241,356	159,780	186,375
AWC 8A	0	0	0	215,398	394,624	265,618	271,981	266,446	271,888	184,594	136,050	226,063	257,184	245,347	156,650	195,585	3,353	112,147	117,745	195,986	34,276	54,811	113,073	44,916	67,315	106,568	99,776	101,678	71,389	64,861
AWC 9A	434,580	128,063	97,615	136,891	210,374	226,053	236,429	180,337	166,739	214,811	323,119	213,268	168,569	159,197	133,705	278,127	403,515	221,656	259,969	304,614	280,265	275,173	308,515	263,003	229,236	233,041	196,193	135,204	227,470	148,082
AWC 12A	242,769	182,413	171,403	174,068	329,099	241,366	331,889	272,153	232,164	309,621	329,926	295,895	321,098	312,606	370,420	406,087	405,590	426,091	349,362	365,767	391,746	233,788	337,512	309,414	274,882	297,279	231,665	191,707	135,610	174,663
COS 2	250,311	366,789	246,573	32,587	0	0	0	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
COS 3	226,940	237,611	371,887	410,270	406,218	322,974	386,618	363,730	260,750	91,100	156,906	142,948	129,909	95,897	162,641	2,062	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 4	42,215	39,244	47,984	95,807	56,487	28,646	84,058	146,211	159,421	328,716	411,993	310,812	347,167	308,158	445,980	17,765	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 14	116,505	71,871	214,611	317,726	343,300	265,520	238,930	229,608	306,935	396,650	91,174	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 25	260,701	199,541	48,721	484,574	551,724	242,256	25,618	8,730	0	0	6,482	15,627	14,628	15,460	9,442	25,372	15,728	14,472	12,850	10,148	14,398	14,801	11,768	9,929	11,903	11,450	13,771	12,834	9,678	12,555
COS 69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
COS 70	133,678	2,553	43,066	390,067	110,774	55,201	93,123	2,709	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 71	0	0	6,480	502,719	234,943	1,126,972	958,101	946,903	631,967	787,926	1,013,550	432,044	764,771	638,982	387,740	826,102	492,646	697,198	725,001	557,523	371,970	475,775	370,408	12,211	AB	AB	AB	AB	AB	AB
COS 71Ac	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	52,797	505,229	559,816	4,064	7,011	0	6,075
COS 72	0	0	4,991	394,796	299,685	699,937	662,468	779,085	953,964	763,436	556,347	821,780	560,773	1,028,060	1,016,259	927,729	460,529	327,703	1,087,912	820,643	1,022,055	82,907	169,017	16,847	285,438	380,588	13,068	151,031	263,425	407,248
COS 73	3,271	649,298	1,007,101	3,252	795	9,743	3,157	527	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 74	42,763	38,042	635,564	733,867	825,076	460,914	396,669	790,408	918,226	1,092,783	1,165,908	1,003,371	955,818	1,098,504	1,172,087	424,447	325,721	318,930	426,465	469,534	139,478	382,838	155,871	193,017	65	0	0	0	0	0
COS 75A	0	0	0	0	452,657	796,408	892,870	951,517	830,739	896,406	979,506	836,006	933,512	926,306	936,472	929,487	559,788	821,026	878,726	841,481	848,597	917,870	1,108,302	987,970	777,406	933,858	977,609	1,062,801	1,012,888	715,078
COS 76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
COS 77	0	3,088	1,103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
COS 78	999,204	328	1,029	650	0	0	3,099	0	0	0	0	0	0	0	0	0	0	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
COT 6	150	1,668	2,777	10,122	3,441	160,308	4,197	0	0	446,480	734,304	221,080	26,831	0	22,571	390	0	153	1,666	389,936	355,018	9	506,354	369,685	385,707	417,507	536,592	33,524	24,030	258,834
IBGC	69,987	59,242	65,845	66,839	61,266	79,697	75,740	68,887	344	28,365	64,996	69,982	62,855	65,938	59,087	63,778	63,778	69,938	59,199	60,546	56,053	37,910	68,382	119	0	0	0	0	0	0
LAIRD 2	8,178	1,453	1,827	964	1,655	1,655	4,650	1,573	8,432	9,857	0	0	0	0	0	3,853	3,853	322	530	357	285	365	558	412	119	0	104	207	65	0
MDWC	27,289	27,835	53,587	62,535	58,707	66,855	62,060	59,829	67,278	72,475	59,485	53,208	51,864	45,985	1,352	50,081	50,046	54,355	46,873	48,614	42,379	43,956	37,426	36,964	39,853	54,486	51,438	39,710	36,020	30,139
MEX-1MA (5)	---	---	---	---	---	---	---	---	34,348	256,586	361,409	227,273	119,380	315,708	309,919	311,978	332,752	405,260	394,010	407,090	398,980	273,270	318,740	223,710	200,600	283,710	164,430	240,280	393,191	423,872
QRIA	17,503	16,001	13,437	12,768	13,407	14,166	17,274	16,544	19,832	8,863	16,435	15,212	14,628	13,541	12,883	15,665	14,333	14,718	12,962	10,837	12,140	10,965	11,727	10,510	10,921	9,382	9,234	7,450	8,370	10,044
SRIR SCC	86,231	86,231	78,736	91,777	79,599	84,063	77,791	36,374	69,629	78,217	76,349	76,153	65,411	68,046	76,319	82,780	61,274	68,592	74,861	42,721	67,924	74,567	56,762	65,405	60,768	56,972	61,068	60,161	45,217	33,014
SRIR 4	60,580	7,771	0	31,631	3	0	248	38	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	AB	AB
SRIR 10	47,583	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	AB	AB

	Gallons (x1000																													
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
SRP21.5E,8N	74,479	2,829	5,090	59,887	17,536	19,600	0	1,302	213,170	454,442	247,362	160,470	166,324	254,063	28,797	0	0	0	3,397	5,321	13,803	114,214	116,117	208,382	73,131	18,104	AB	AB	AB	AB
SRP 21.6E,8N[d]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
SRP 22.1E,8.5N	147,778	103,488	14,221	78,782	3,189	21,219	25	1,051	8	488,285	214,764	3,126	0	7,299	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
SRP 22.3E,7N	0	0	0	0	756	22	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
SRP 22.4E,9N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
SRP 22.5E,5.5N	0	0	0	0	0	0	0	0	0	0	123,673	264,377	0	0	0	0	0	0	0	0	0	0	64,101	0	88	212	0	101	7	0
SRP 22.5E,6N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N.I.S.	0	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.	N.I.S.
SRP 22.5E,9.3N (PCX 1)[(6)]	---	---	---	---	---	---	744,308	1,169,490	928,957	1,094,148	709,461	1,080,881	1,032,519	1,002,262	1,003,406	1,109,259	983,481	856,322	1,012,745	1,008,500	891,933	971,762	1,000,902	478,633	1,076,158	1,194,001	1,293,066	1,248,095	718,730	910,084
SRP 22.6E,10N	195,626	9,773	4,636	184,709	22,836	99,731	0	85	261,217	613,096	583,486	699,074	935,270	828,047	97,937	103,237	289,257	79,268	62,767	30,503	66,444	290,043	68,455	228,571	63,629	6,207	81	21,288	0	8,840
SRP 22.9E,10.8N[e]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	128,034	173,499	305,492	183,239	29,066	91	16,957	2,222	150
SRP 23E,10.8N (COS5W)	137,618	60,933	6,744	33,979	115,096	7,607	15,747	5,701	154,864	350,263	337,880	148,376	447,267	174,920	14,322	21,004	120,014	N.I.S.	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
SRP 23.3E,7.3N (COS 31)	0	1,305	21,834	1,007,196	15,974	1,222,373	973,894	493,236	916,864	748,167	983,356	1,091,407	1,019,344	516,934	826,859	560,651	309,239	655,172	5,133	118,375	454,664	713,491	257,409	489,661	208,113	372,149	143,659	189,906	312,312	74,153
SRP 23.3E,7.5N (COS 6)	156,795	24,127	-3	35,527	47,921	192,207	168,263	246,769	101,318	62,194	102,249	80,341	138,380	88,935	1,638	1,769	175,013	0	0	0	0	0	0	0	7,723	4,054	0	1,082	4,920	1,457
SRP 23.4E,10.6N (COS5E)	507,724	565,069	578,233	658,438	663,544	757,582	723,706	779,598	832,331	566,682	392,775	278,701	470,274	576,706	30,001	0	0	N.I.S.	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB	AB
SRP 23.5E,5.3N	122,870	3,077	4,077	3,271	4,920	2,856	0	34,473	111,366	144,215	126,690	226,058	128,631	255,259	3,348	0	78,673	0	2,941	0	0	0	0	7	6,194	1,776	0	0	518	13
SRP 23.5E,8.8N	66,487	1,775	557	2,556	7,176	52	49	685	1,499	132,274	70,905	21,050	213,020	241,944	1,505	2,922	134,579	0	1,551	0	965	0	531	3	101	935	0	0	0	528
SRP 23.5E,9.5N	0	0	0	0	0	0	0	85	502	117,592	131	99,548	30,042	256,542	2,051	1,988	163,479	0	2,021	0	1,303	33	15,054	163	0	352	0	0	0	65
SRP 23.5E,10.6N[f]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	83,907	191,216	217,193	115,912	20,369	0	33,374	251	78
SRP 23.6E,6N (Granite Reef)	0	0	0	0	0	0	0	0	104,439	287,660	174,199	319,110	180,870	42,938	58,781	173,699	44,516	99,160	79,599	70,470	79,880	70,110	77,410	195,150	305,880	348,810	184,350	304,370	150,273	140,744
SRP 24E,10.5N	113,065	3,151	578,233	113,496	16,493	122,709	2,124	2,397	381,364	470,577	408,894	616,127	528,528	428,180	31,260	45,701	188,758	11,621	9,319	0	411	204,488	323,257	332,586	138,399	34,931	173	79,524	2,014	1,261
Total Discharge (Gallons x1000)	7,807,696	6,154,481	7,898,386	10,369,940	9,092,091	11,779,250	11,417,355	11,676,917	12,887,663	14,970,743	14,519,488	13,549,998	13,527,407	13,461,492	10,741,611	9,632,587	8,679,775	9,333,593	10,142,344	9,944,770	9,698,086	9,786,891	9,770,464	8,894,575	8,849,725	9,189,521	8,062,751	8,075,756	7,317,515	7,515,884
Total Discharge (Acre-Feet)	23,961	18,887	24,239	31,824	27,903	36,149	35,039	35,835	39,551	45,943	44,559	41,583	41,514	41,312	32,965	29,561	26,637	28,644	31,126	30,519	29,762	30,035	29,984	27,296	27,159	28,202	24,744	24,784	22,457	23,065

ABBREVIATIONS:

7EX =	Area 7 Extraction Wells	MEX =	Motorola Extraction Well
AB =	Well Abandoned	NA =	Not available
AVI =	Arcadia Vista Improvement	N.I.S. =	Not in Service
AWC =	Arcadia Water Company	PV =	Paradise Valley
COS =	City of Scottsdale	QRIA =	Quail Run Irrigation Association
COT =	City of Tempe	SRIR =	Salt River Indian Reservation
IBGC =	Indian Bend (Rio Salado) Golf Course	SRP =	Salt River Project
LAIRD =	Tempe School District No. 3	--- =	No Data
MDWC =	McDowell Water Company		

NOTES:

(1) Extraction well 7EX-1UA went into service in 2008.
(2) Extraction wells 7EX-3MA and 7EX-4MA went into service in September 1999.
(3) Extraction well 7EX-5MA went into service in February 2002.
(4) Extraction well 7EX-6MA went into service in October 13, 2015.
(5) Well MEX-1MA went into service in October 1999.
(6) Well 22.5E,9.3N (PCX-1) went into service in April 1997.

[a] Replacement well for 7EX-5MA
[b] Replacement well for PV-12
[c] Replacement well for COS 71
[d] Replacement well for SRP 21.5E,8N
[e] Replacement well for SRP 23E,10.8N
[f] Replacement well for SRP 23.4E,10.6N

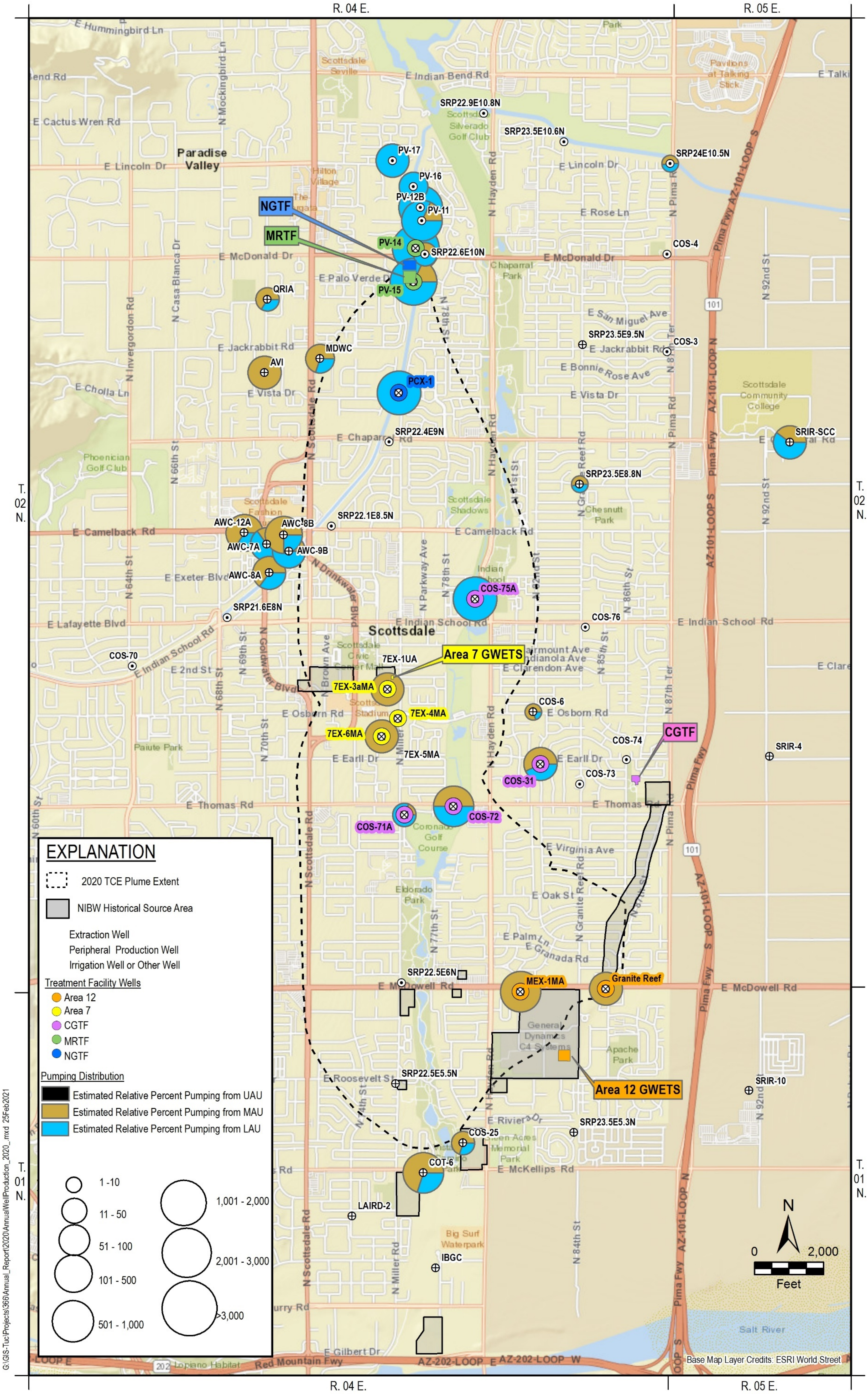

Figure 6. Annual Groundwater Pumping in the NIBW Superfund Site Vicinity

7.2 Groundwater Water Levels

Water level measurements obtained and reported by Montgomery & Associates in May and October are summarized in **Tables B-1 and B-2**, respectively. Due to the COVID-19 pandemic, and with approval from EPA, water levels were measured in May instead of during the usual April monitoring period. Water level monitoring for the UAU has been discontinued for April (as approved by EPA and ADEQ in 2013) and is now conducted annually in October at the remaining network of 28 UAU monitoring wells. May 2020 water level contour maps for the MAU and LAU are shown on **Figure 7**. October 2020 water level contour maps for the UAU, MAU, and LAU are shown on **Figure 8**.

Hydrographs showing continuous water level data for wells in the Northern LAU monitoring program are provided in **Appendix B**. Additional non-compliance continuous water level data were obtained during 2020 at selected MAU and LAU monitoring wells.

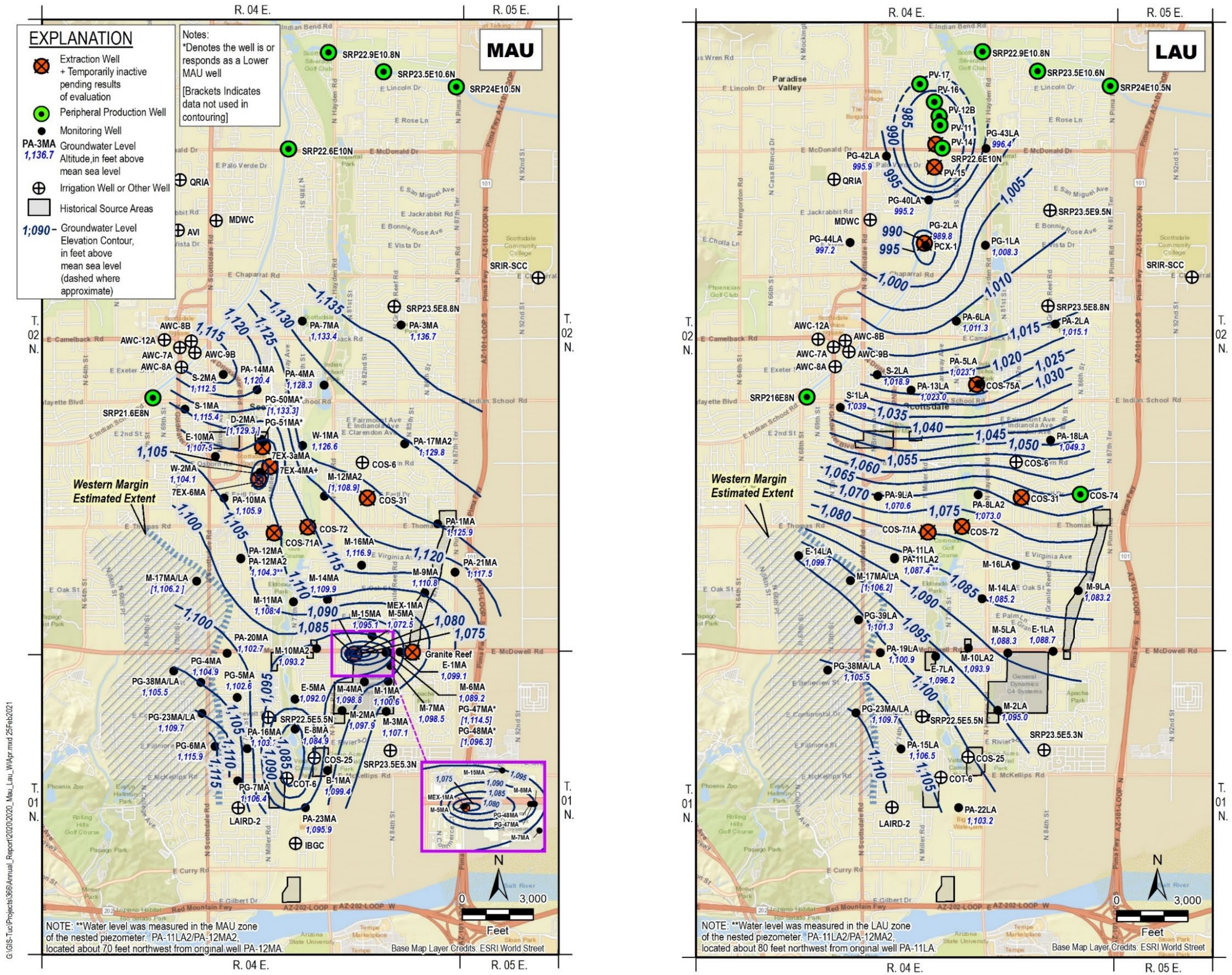

Figure 7. Groundwater Level Contours for the MAU and LAU from May 2020

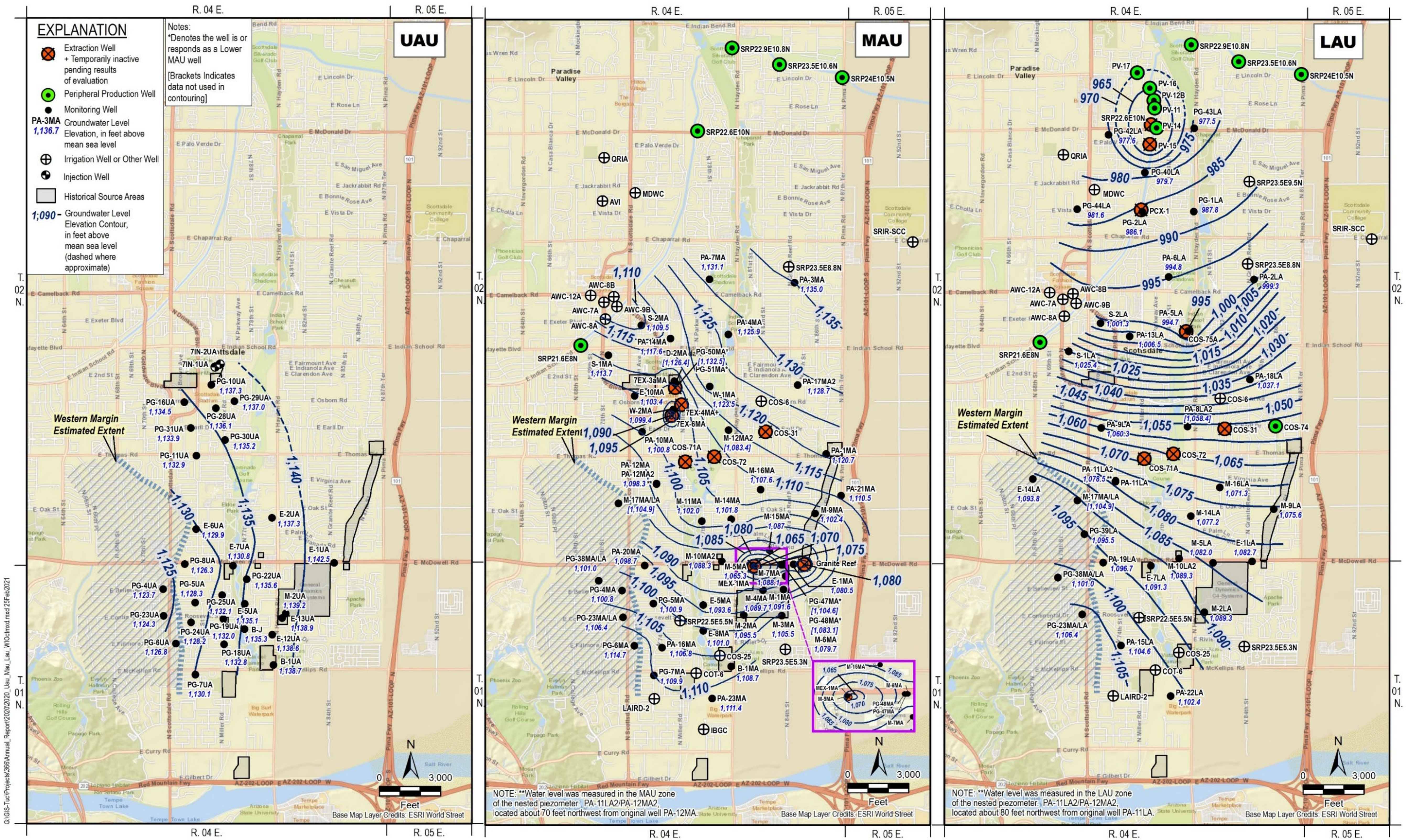

Figure 8. Groundwater Level Contours for the UAU, MAU, and LAU from October 2020

Pumping, chiefly in the MAU and LAU, influences water levels and patterns of groundwater movement in the three alluvial units. The principal pumping centers are discussed in **Section 7.1**. **Table 7** summarizes monthly pumping, and **Figure 6** shows annual pumping for wells in the vicinity of the NIBW Site. As in previous years, the PCs coordinated closely with water providers in an attempt to ensure that, to the extent possible based on demand and operational constraints, key extraction wells were pumping during the May and October compliance water level monitoring events in 2020. Where appropriate, the pumping status of wells within or close to the Site during the May and/or October 2020 water level rounds is noted below in relation to patterns of groundwater movement in each of the alluvial units.

Based on the October 2020 water level contour map (**Figure 8**), direction of groundwater movement in the UAU is from east to west in the area south of McDowell Road and from northeast to southwest in the area north of McDowell Road. Little to no pumping occurs directly from the UAU within or in the immediate vicinity of the Site. UAU groundwater migrates toward the Western Margin of the Site, where it moves vertically into the LAU, either directly or through the MAU. Horizontal hydraulic gradients in the UAU generally increase from northeast to southwest, toward the Western Margin. Downward vertical hydraulic gradients are known to exist across the Site and the conceptual model for the Site acknowledges vertical migration of groundwater from the UAU and the MAU to LAU in response to these gradients.

The complex pattern of groundwater movement observed in the MAU is the result of competing influences between the various pumping centers and the Western Margin, where vertical movement of groundwater into the LAU occurs. During the May 2020 water level monitoring round, pumping was occurring at the following wells located within or adjacent to the Site that extract part or all of their water from the MAU: 1) Area 12 GWETS well MEX-1MA pumped continuously and the Granite Reef well operated for 5 days during the middle of the monitoring event; 2) CGTF well COS-75A had been operating for a month prior to, but went down for 2 days during the water level monitoring event; 3) Area 7 GWETS wells 7EX-3aMA and 7EX-6MA also went down for a few days during the monitoring event; 4) the AWC wells were pumping; and 5) nearby City of Tempe well COT-6 had been pumping continuously for several weeks, but stopped pumping the day after monitoring began. Based on May 2020 conditions (**Figure 7**), cones of depression are apparent in the MAU in the vicinity of these pumping wells. However, continuous water level data for monitoring wells near the AWC wells indicate that the impact of pumping at AWC wells on water levels in the MAU is much smaller than indicated by the discrete value for S-2MA, as shown on **Figure 7 and Figure 8**.

Note that Area 12 GWETS Granite Reef well was not pumping for months prior to the May 2020 water level monitoring round but began pumping the day monitoring began and continued throughout the water level monitoring period. Therefore, the May 2020 cone of depression associated with Area 12 is smaller than usual and centered on well MEX-1MA. In May

(**Figure 7**), horizontal hydraulic gradients in the MAU increased in all directions toward the Area 7 GWETS, Area 12 GWETS, and COT-6 pumping centers. Horizontal hydraulic gradients decrease significantly in the areas between and outside of these pumping centers.

October 2020 MAU water level data displayed in **Figure 8** show that patterns of groundwater movement were generally similar to those observed in May, except for the following: 1) in the south, the impact of cessation of pumping at COT-6 has resulted recovery of the cone of depression that was depicted extending north from COT-6 in May; and 2) in the south, the impact of pumping resuming at the Area 12 Granite Reef extraction well, after a period of inactivity, resulted in additional drawdown and enhanced hydraulic capture in this area in October compared with May.

Note that CGTF extraction well COS-31 was not pumping, and COS-72 was pumping continuously during the October 2020 water level monitoring round. In the south part of the Site, Area 12 extraction wells MEX-1MA and the Granite Reef well were both pumping continuously in October, but only MEX-1MA was pumping during the May water level monitoring round. Based on October 2020 water level contours (**Figure 8**), horizontal hydraulic gradients in the MAU increase in the immediate vicinity of the Area 7 GWETS and Area 12 GWETS extraction wells. Horizontal hydraulic gradients decrease significantly in the areas between and outside of these pumping centers.

Groundwater movement in the LAU is generally from recharge areas in the south and southwest parts of the Site to points of discharge at extraction and production wells to the north, as shown for May and October 2020 on **Figure 7 and Figure 8**, respectively. For the May 2020 water level monitoring round, CGTF extraction well COS-75A, one of the upgradient LAU extraction wells for the remedy, was not-operating during the dates of water level measurement but was operating during the period immediately before and immediately after the measurement period. Well COS-75A was operating during the October 2020 monitoring round.

Key LAU extraction wells PV-15 and PV-14 were pumping during both the May and October water level rounds. NGTF extraction well PCX-1 was pumping during the May water level round, but shut down for about a half a day during the water level measurement period. Extraction well PCX-1 was undergoing repairs from September to December for pump failure and replacement activities and did not pump during the October 2020 monitoring round. Other wells pumping from the LAU during the two monitoring rounds include selected AWC wells and Paradise Valley wells PV-11 and PV-12B.

As shown on **Figure 7 and Figure 8**, pumping at MRTF extraction wells PV-14 and PV-15 and NGTF extraction well PCX-1, combined with pumping at nearby SRP and PV production wells, results in a regional sink for LAU groundwater to the north. The lack of drawdown effects in May, when extraction well COS-75A was not pumping, and in October, when extraction well

PCX-1 was not pumping are apparent (**Figure 7 and Figure 8**). Based on May 2020 water level data (**Figure 7)**, horizontal hydraulic gradients in the LAU increase from south to north toward extraction well COS-75A, and then decrease sharply in the area downgradient from COS-75A to PCX-1. Gradients increase from PCX-1 north to the EPCOR wellfield. Localized gradient increases usually observed near COS-75A were dampened due to the brief shutdown period at the pumping well during the water level measurement period. October 2020 contours (**Figure 8)** show that horizontal hydraulic gradients in the LAU increase from south to north toward extraction well COS-75A, and then decrease sharply in the area downgradient from COS-75A to about PCX-1. Gradients increase from PCX-1 north to the EPCOR wellfield. Localized gradient increases usually observed near PCX-1 were absent due to the extended shutdown period at this extraction well prior to the October 2020 water level monitoring round.

Groundwater level trends over time are evaluated by comparing short term and long-term changes in water levels at UAU, MAU, and LAU monitoring wells. **Table B-3** summarizes the difference in water level between October 2019 and October 2020 for all monitoring wells included in the water level monitoring programs for both years. Water level change is shown on maps and illustrated on associated inset bar graphs on **Figure 9, Figure 10, and Figure 11** for the UAU, MAU, and LAU, respectively. Wells are generally arranged based on location (north to south) on the inset bar graphs. Water level differences computed at individual wells using October 2019 and October 2020 data are representative of changes between 2-point measurements, which may not be reflective of long-term trends. In addition, water level changes on the order of 10 feet or more observed in monitoring wells adjacent to extraction wells are usually attributed to cycling of pumping at extraction well rather than to regional water level conditions in the aquifer. Water level data trends are more accurately tracked by reviewing a larger set of water level data obtained over a longer time period. Hydrographs showing water level data for wells included in the monitoring program are provided in **Appendix D**. Hydrographs for specific wells show only water level data or only TCE data, while others display both, depending on monitoring requirements.

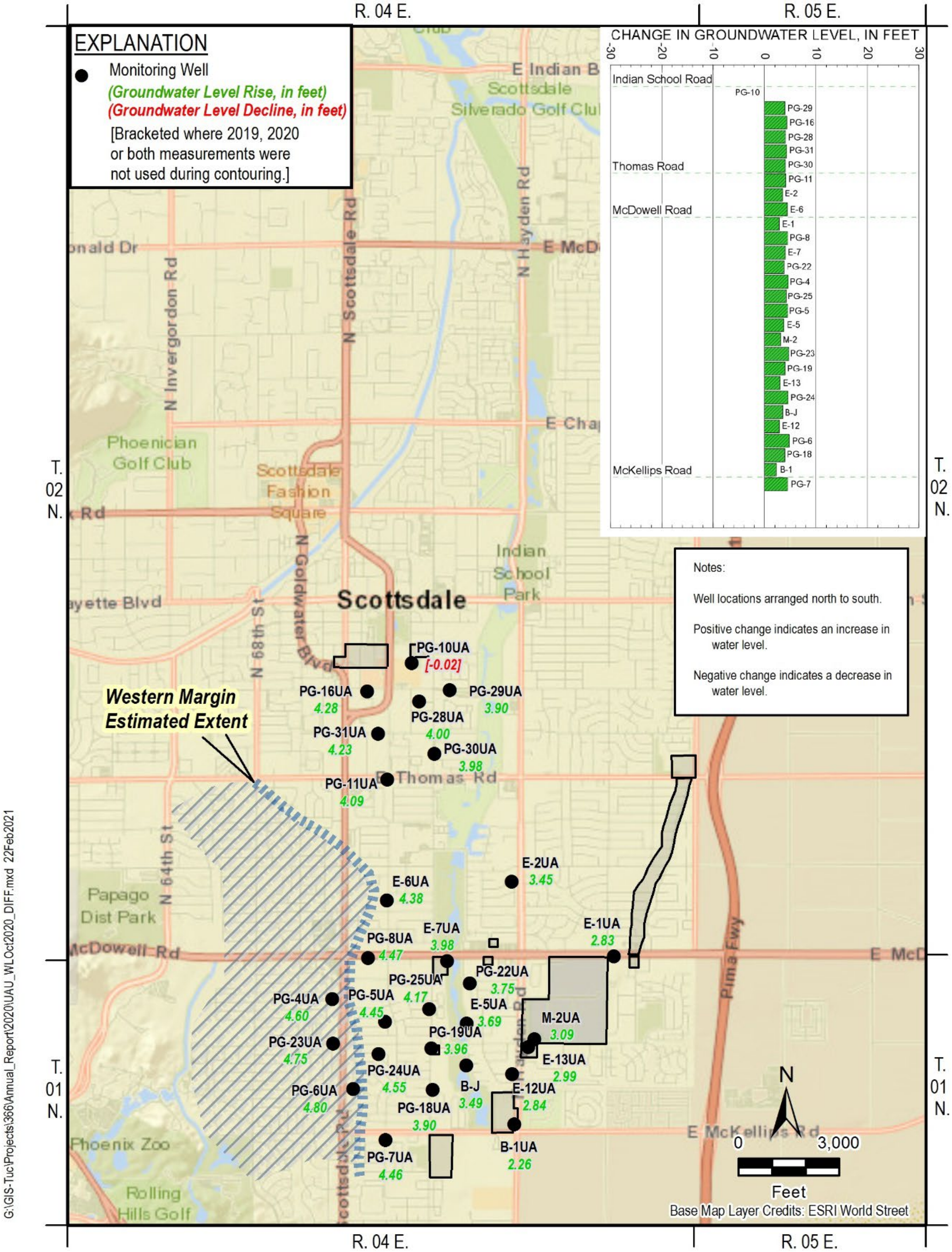

Figure 9. Change in UAU Groundwater Level from October 2019 to October 2020

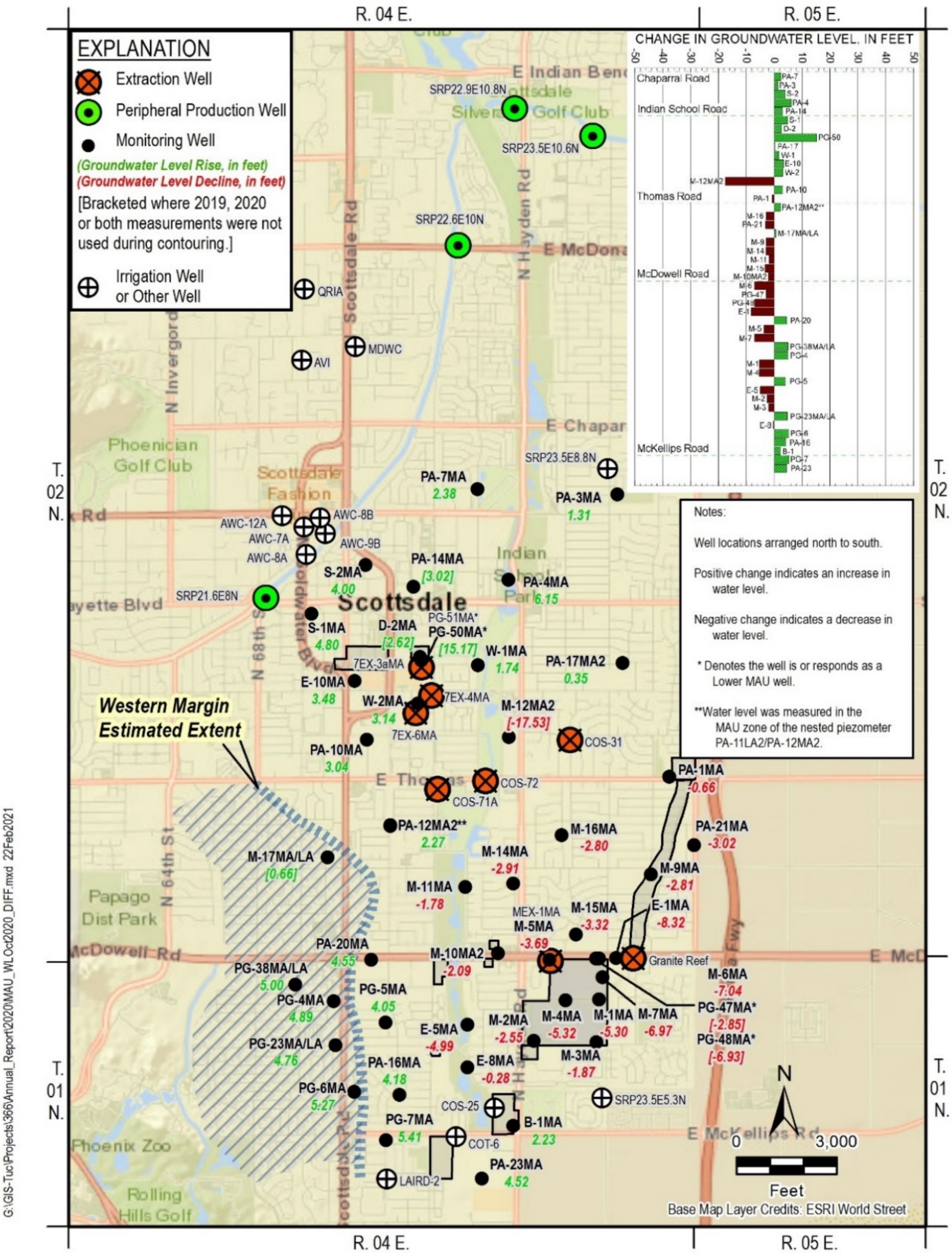

Figure 10. Change in MAU Groundwater Level from October 2019 to October 2020

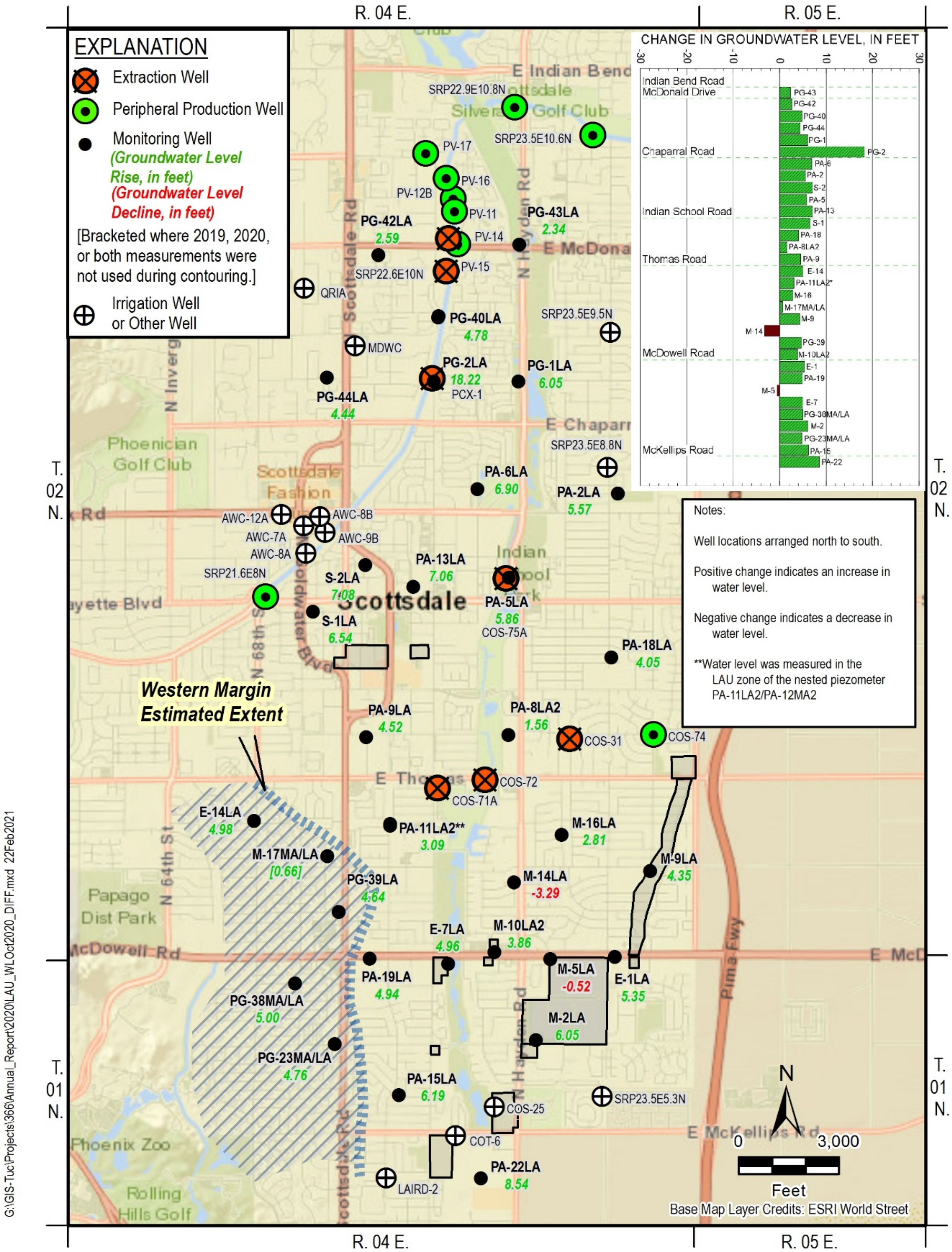

Figure 11. Change in LAU Groundwater Level from October 2019 to October 2020

Water levels rose in all UAU monitoring wells, except PG-10UA, which showed a slight decline. Comparing data from October 2019 and October 2020, observed water level changes in the UAU were all less than 5 feet (**Figure 9**). With the exception of the slight decline at PG-10UA on the north end of the monitoring network, no significant north-south trends in magnitude of rise were observed. The magnitude of rise in the UAU along and to the east of Hayden Road was generally smaller than to the west, ranging from 2.26 to 3.45 feet, while the magnitude of rise in the UAU west of Hayden Road ranged from 3.49 to 4.80 feet. The decline of 0.02 foot at PG-10UA, shown on **Figure 9**, is based on an anomalous 2019 data point, and therefore is not considered representative.

Water level change in the MAU between October 2019 and October 2020 was variable (**Figure 10**). Water levels generally declined between October 2019 and October 2020 in wells between Thomas Road and McKellips Road nearest to the Area 12 remedial extraction wells MEX-1MA and the Granite Reef well. Water level decline is attributed to increased pumping of the Granite Reef well in the time leading up to the October 2020 monitoring round relative to the lead up to the October 2019 round. The magnitude of decline ranged from -0.28 to -8.32 feet in this area.

MAU water levels south of Thomas Road rose for all other wells to the west and south of this large area of decline surrounding the Area 12 pumping impacts, and the magnitude of rise south of Thomas Road ranged from 2.23 to 5.41 feet. The rise of 0.66 foot at M-17MA/LA, shown on **Figure 10,** is based on anomalous 2019 and 2020 data points, and therefore this value is not considered representative.

MAU water levels north of Thomas Road generally rose between October 2019 and October 2020 except at well M-12MA. The apparent larger-scale decline (>17 feet) at M-12MA2 is based on an anomalous measurement obtained in October 2020. In general, water levels at M-12MA2 are not believed to be representative of conditions in the upper MAU. The apparent larger-scale rise (>15 feet) observed at PG-50MA is based on an anomalous measurement obtained in October 2020. Well PG-50MA is a Lower MAU well and water level measurements are not representative of the Upper MAU. Excluding the anomalous rise values of M-12MA2 and PG-50MA, the overall magnitude of rise north of Thomas Road ranged from 0.35 to 6.15 feet.

Water levels in the LAU rose in most LAU monitoring wells between October 2019 and October 2020 (**Figure 11**) with the exception of wells M-5LA and M-14LA, which declined. The magnitude of rise in the LAU north of about Indian School Road was generally larger than to the south, ranging from 2.34 to 18.22 feet. The magnitude of rise in the LAU south of about Indian School Road ranged from 1.56 to 8.54 feet. The rise of 0.66 foot at M-17MA/LA, shown on **Figure 11,** is based on anomalous 2019 and 2020 data points; therefore, this value is not considered representative. The overall trend of rising LAU water levels is likely regional in nature and is further enhanced by shutdown of extraction well PCX-1 in the weeks prior to the October 2020 monitoring event. The change at M-5MA occurred because the Granite Reef well was not operating during the 2019 event but was operating during the 2020 event. Cause for the rise in water level at well M-14LA has not been determined but will be evaluated during future monitoring events.

7.3 Water Quality

During 2020, Montgomery & Associates coordinated activities by both the analytical laboratory, Test America, Inc., and the groundwater monitoring contractor, Verdad Group LLC.

7.3.1 2020 COC Concentrations

A summary of laboratory results of COCs for NIBW monitoring wells for 2020 is provided in **Table C-1**. Extraction well COC results are summarized in **Table C-2**. TCE is the principal COC at the Site and is, therefore, depicted in plume maps and time-series graphs. To analyze change in TCE concentrations, the 2020 plume contours are compared to 2001 plume contours, and a statistical analysis of trends is conducted for individual wells for the period of the last 10 years and last 5 years.

7.3.1.1 2020 TCE Magnitude & Extent

TCE concentration contours for October 2020 for the UAU, MAU, and LAU are shown on **Figure 12**. Hydrographs showing TCE concentrations and water levels for the 10-year period from 2011 through 2020 are shown for all monitoring wells included in the monitoring program in **Appendix D**.

The occurrence of TCE concentrations in UAU groundwater at or in excess of the Cleanup Standard of 5 µg/L is now limited to one monitoring well, PG-31UA. The maximum TCE concentration detected was 20 µg/L at monitoring well PG-31UA in October 2020.

TCE concentrations in MAU groundwater are generally higher than in the other two units, with a 2020 maximum concentration of 1,500 µg/L detected in January and October 2020 at monitoring well W-2MA, located down-gradient from Area 7. The maximum concentration of TCE detected in October 2020 in a monitoring well in the vicinity of Area 12 was 46 µg/L at M-4MA, located down-gradient from Area 12. Samples collected from Area 12 Granite Reef extraction well [SRP23.6E,6N] had a maximum TCE concentration of 100 µg/L (duplicate result of 130 µg/L) in October 2020 and Area 12 extraction well MEX-1MA had a maximum TCE concentration of 54 µg/L in August 2020. The third area of elevated TCE concentrations in MAU groundwater coincides with a localized region associated with monitoring well PG-6MA, located in the southern portion of the Western Margin. The presence of elevated PCE and TCE concentrations at this well point to an alternate VOC source unrelated to the NIBW Site. The agencies have concurred with this interpretation and since 2018 the PCs have modified MAU plume maps to distinguish the plume in the PG-6MA area as being attributed to an alternate source (**Figure 12**). TCE concentration at PG-6MA was 100 µg/L in October 2020.

TCE concentrations in LAU groundwater are generally intermediate between the UAU and the MAU, with a maximum concentration of 150 µg/L detected in July 2020 at monitoring well PA-6LA. The highest concentrations of TCE in LAU groundwater occur in the north-central part of the Site (PA-6LA and PA-13LA), as shown on **Figure 12**.

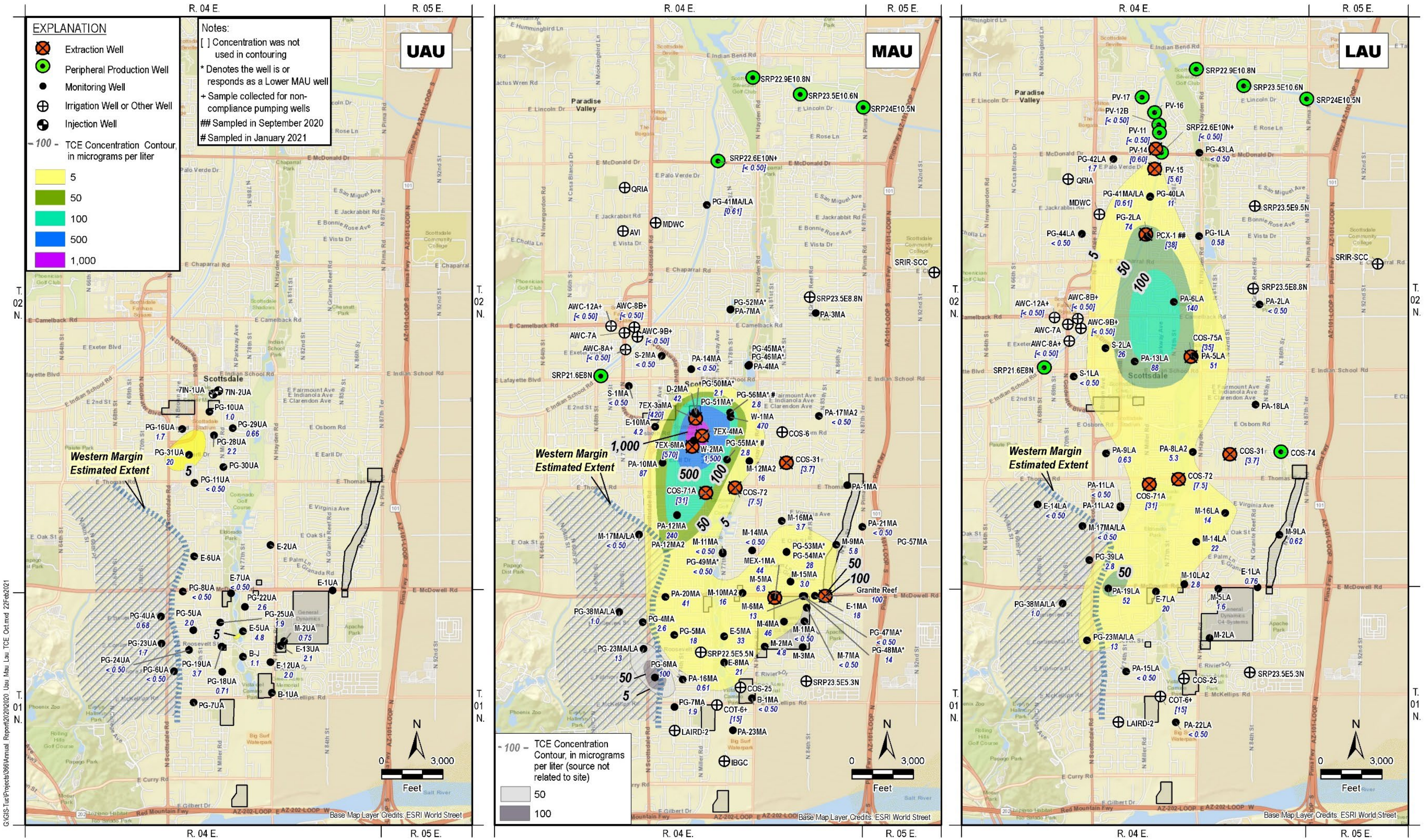

Figure 12. Concentrations of TCE in the UAU, MAU, and LAU from October 2020

7.3.1.2 TCE Concentration Change

Changes in the magnitude and extent of TCE concentrations between the baseline data set, which is defined as October 2001 and coincides with the release of the Amended ROD, and October 2020, the current monitoring period, are shown for the UAU, MAU, and LAU on **Figure 13**.

The extent of the UAU plumes has decreased significantly over time, as depicted on **Figure 13**. In fact, the area of the TCE plume in the UAU has decreased by about 92% from October 2001 to October 2020. For the MAU and LAU, **Figure 13** illustrates that generally very little change in the overall area of the 5 µg/L TCE plumes between October 2001 and October 2020 is apparent. The exception is the predictable migration of the LAU plume to the north in response to regional hydraulic gradients (**Figure 8**) and LAU groundwater remedy extraction at CGTF, NGTF, and MRTF wells. Changes in the extent of the northern portion of the LAU TCE plume between October 2001 and October 2020 are generally small and attributable to northward migration of the plume toward remedial extraction wells (**Figure 13**). Review of inner contours on the MAU and LAU plumes demonstrates that the magnitude and extent of higher concentration areas has been reduced over time through groundwater extraction and treatment. The extent of the west flank of the MAU and LAU plumes is more accurately represented in maps generated after the October 2001 baseline period, due to the availability of data at monitoring well M-17MA/LA following its installation in 2002, and maps have been modified accordingly.

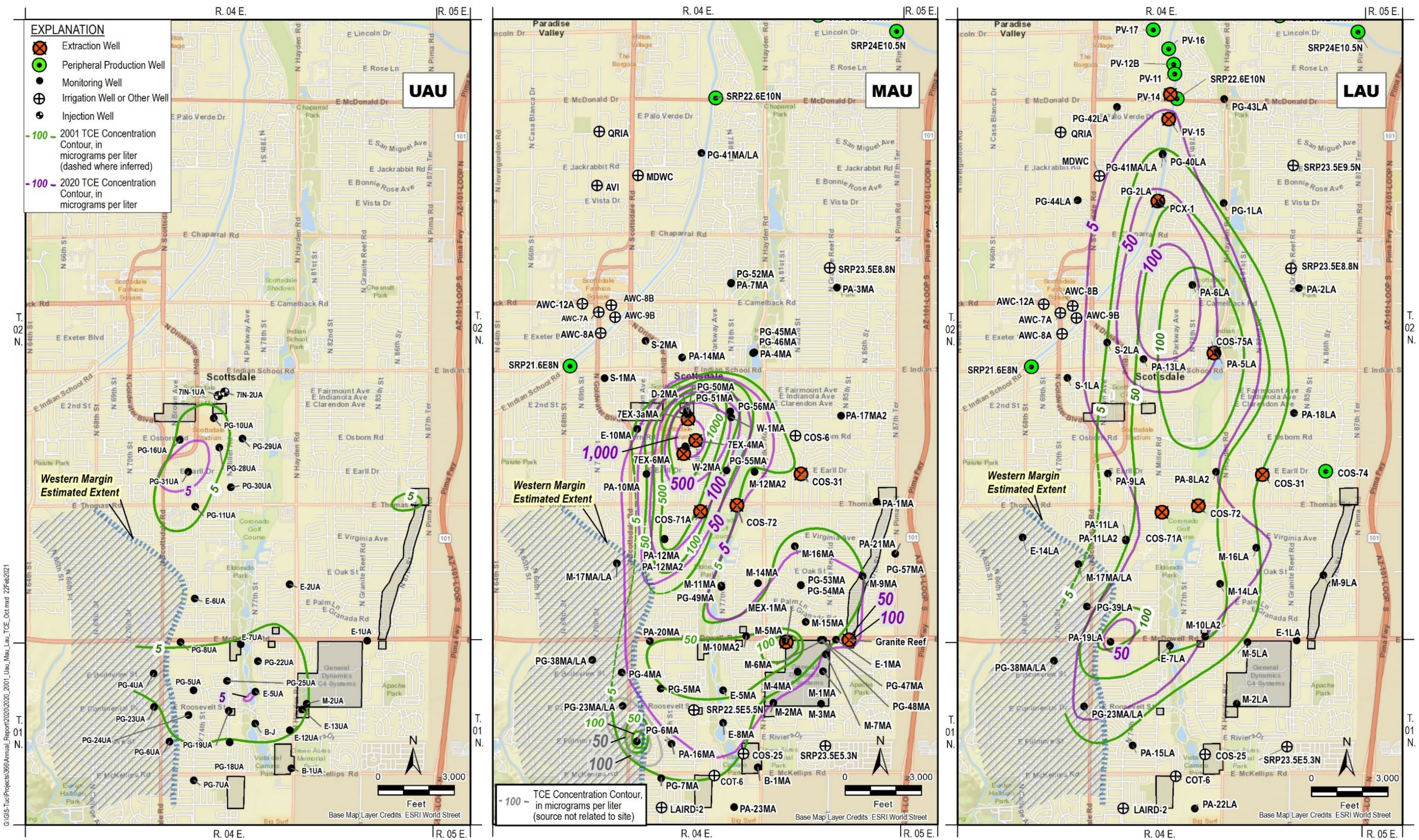

Figure 13. Concentrations of TCE in the UAU, MAU, and LAU for October 2001 and October 2020

7.3.1.3 Mann-Kendall TCE Concentration Trends

To support the interpretation of changes in TCE concentration over time for the SMR, the PCs voluntarily conduct a trend analysis of TCE concentrations in monitoring wells in the UAU, MAU, and LAU as part of the SMR. The Mann-Kendall trend test is performed using EPA's ProUCL software to determine if there is a statistically significant trend in TCE concentrations over time. This method is being considered for potential use in evaluating remedy performance in the GM&EP update.

Mann-Kendall is a non-parametric trend test that relies on computing an "S" statistic. The Mann-Kendall S statistic is calculated by scoring each pair of data points to determine if a significant slope exists in the data set. If the earlier concentration in a pair is lower than the later concentration, the pair is assigned a value of 1. Conversely, if the earlier concentration is higher than the later concentration, the pair is assigned a value of -1. If the two concentrations are equal, the pair is assigned a value of zero. The S statistic is computed by summing the values for each pair in the series. Assessing the S statistic, along with the number of statistically independent samples, provides the probability of rejecting the null hypothesis (no trend) for a given level of significance, or confidence. The trend test for the 2020 SMR is conducted at the 99% confidence level. The Mann-Kendall method assumes that non-detect values are always less than the lowest detected value; as such, the reporting limit is used. If the dataset has greater than 50% non-detect values, then use of the Mann-Kendall test is not recommended. For the 2020 SMR, TCE data from 2016 through 2020 (5 years) were used to determine if a statistically significant trend existed in monitoring wells for recent time; TCE data from 2011 through 2020 (10 years) were used to analyze longer-term trends. Field duplicate results were averaged with original sample results to ensure statistically independent values. Trends, or lack of trends, in TCE concentrations discussed in this SMR refer to statistically significant trends identified using the Mann-Kendall trend test method described herein. Mann-Kendall statistical trend tests results are shown spatially for the past 10-year and 5-year periods on **Figure 14** and **Figure 15**, respectively; trend results are also tabulated in **Table 9**.

TCE concentrations in UAU monitoring wells are generally low and show decreasing or no trends. An increasing trend is observed in one UAU monitoring well (PG-31UA) over the 10-year period and two UAU monitoring wells over the 5-year period (PG-16UA and PG-19UA). Increasing concentrations at PG-31UA and PG-16UA in the UAU down-gradient from Area 7 and at PG-19UA down-gradient from Area 12 are interpreted to indicate the migration of remaining UAU mass toward the Western Margin in accordance with the OU-2 remedy. While increasing TCE concentration trends have been observed at these three UAU wells in recent years (5 years), TCE concentrations in the UAU overall are generally relatively low (only one well above the MCL of 5 µg/L) and longer-term declines in UAU wells are otherwise fairly ubiquitous (10 years) (**Figure 14**). The magnitude of TCE concentrations in UAU groundwater has decreased significantly with time, as reflected in **Appendix D** hydrographs.

In the past 10 years, TCE concentrations in MAU monitoring wells generally show decreasing or no trends (**Figure 14**). An increasing 10-year and 5-year trend was observed in MAU monitoring well PA-10MA. Over the past 5 years, increasing trends in TCE concentrations in the MAU have also been observed at monitoring wells E-10MA, M-6MA and E-1MA. The increasing trends at MAU monitoring wells are believed to be due to a shift in Area 7 pumping from well 7EX-4MA and 7EX-5MA to well 7EX-6MA and downtime that occurred between the time that 7EX-5MA failed and replacement well 7EX-6MA was installed (**Table 8**). The increasing trends at MAU monitoring wells M-6MA and E-1MA are believed to be due to downtime of the Area 12 GWET Granite Reef extraction well in 2019 and 2020 **(Table 7 and Table 8)**. Significant longer-term declines in TCE concentrations have been observed at many MAU monitoring wells (**Appendix D**).

All of the Lower MAU monitoring wells show decreasing trends or no trend for the past 10 years and 5 years, as shown on **Figure 14** and **Figure 15** and in **Table 9.**

For the LAU, most wells show a decreasing trend or no trend. Monitoring well PG-2LA is the only monitoring well to show an increasing trend in TCE concentration over both the past 10 years and 5 years. Monitoring well E-7LA has an increasing trend over the last 5 years but no trend over the last 10 years. TCE concentrations in monitoring wells PG-42LA and S-2LA show an increasing trend over the past 10 years but decreasing trends over the last 5 years. Increasing TCE concentrations in the Northern LAU are anticipated, as LAU mass migrates toward PCX-1 and the MRTF extraction wells; however, as observed, these trends level off and eventually decrease as the plume is captured. Decreasing 10- and 5-year trends are observed across much of the northern half of the LAU plume (PA-6LA, PA-5LA, PG-42LA, S-2LA, and PG-40LA), and 10-year decreasing trends can be seen across many portions of the LAU. Wells that have no TCE concentration trends in the southern half of the LAU are attributed to less mass entering the LAU at the Western Margin over time. Hydrographs for LAU monitoring wells can be found in **Appendix D.**

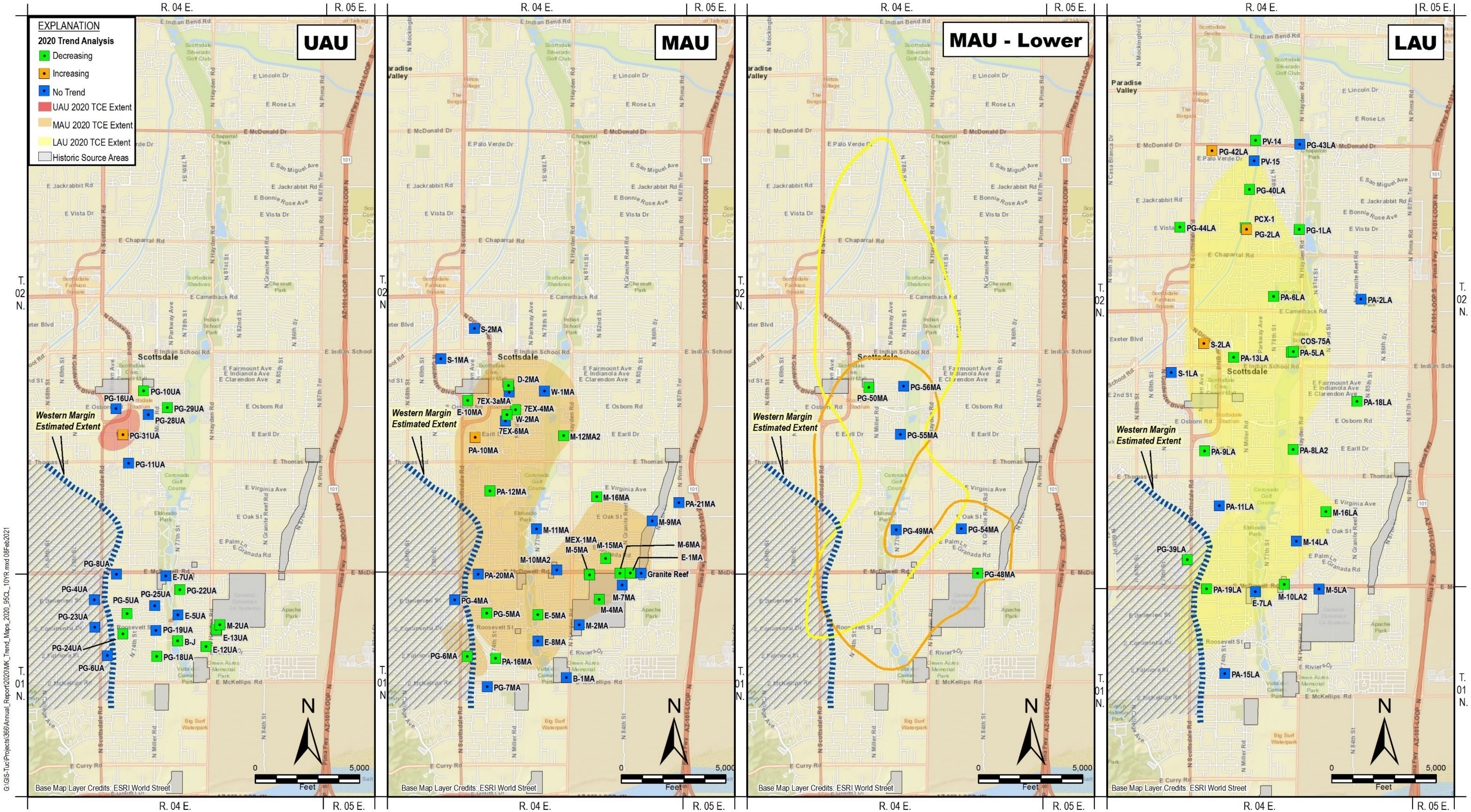

Figure 14. 10-Year Mann-Kendall TCE Trend Results for the UAU, MAU, MAU-Lower, and LAU

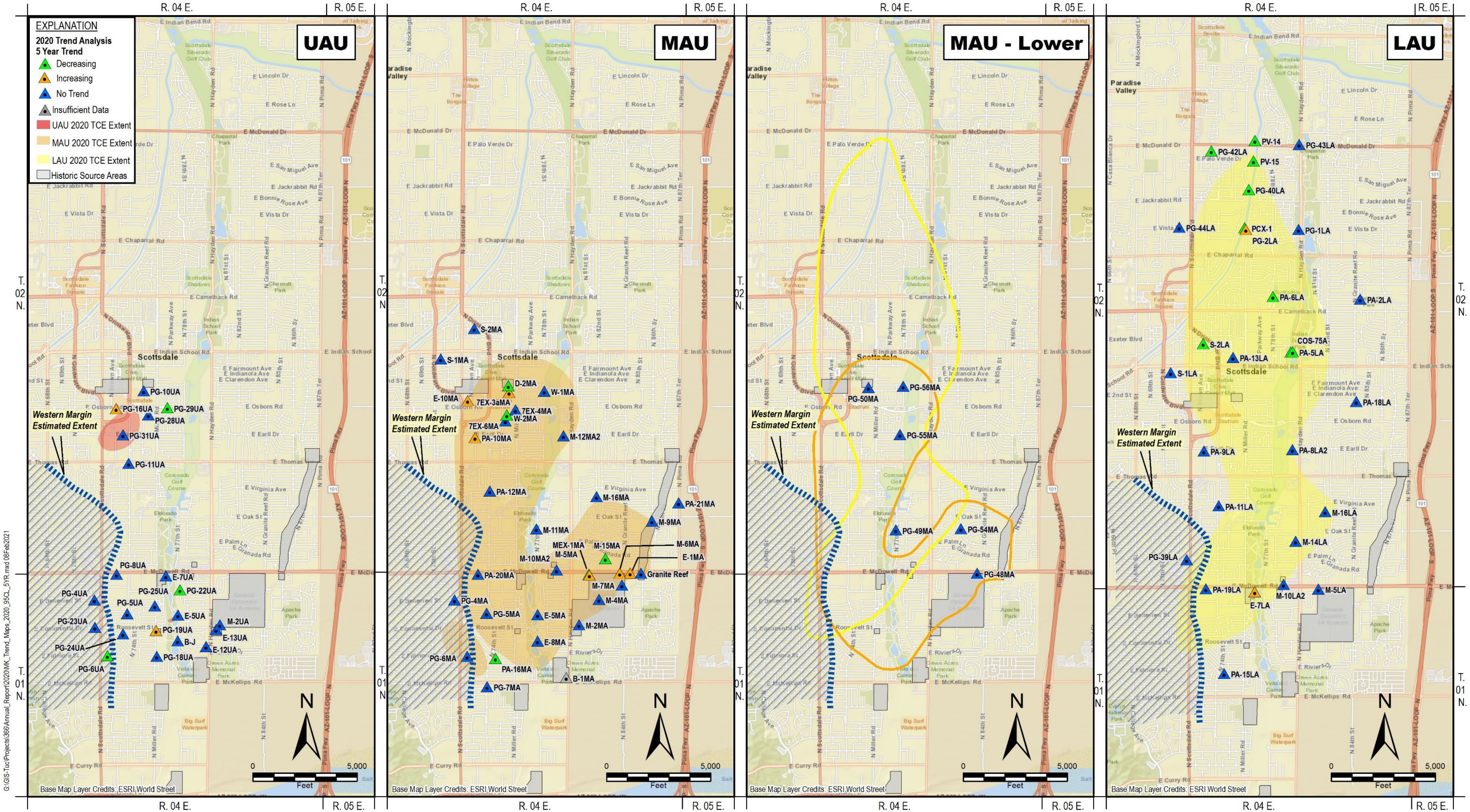

Figure 15. 5-Year Mann-Kendall TCE Trend Results for the UAU, MAU, MAU-Lower, and LAU

Table 9. Mann-Kendall Trend Analysis Results for TCE Concentrations in NIBW Superfund Site Monitoring and Extraction Wells

Well Identifier	Alluvium Unit	Well Type	10-Year Trend	5-Year Trend	TCE (µg/L) 10-Year Minimum Concentration	TCE (µg/L) 10-Year Maximum Concentration
7EX-3aMA	MAU	Extraction	No	Increasing	270	720
7EX-4MA	MAU	Extraction	Decreasing	No	0.95	1,800
7EX-6MA	MAU	Extraction	No	No	540	700
COS-31	MAU/LAU	Extraction	Decreasing	Decreasing	3.4	19
COS-71A	MAU/LAU	Extraction	No	No	17	72
COS-72	MAU/LAU	Extraction	Decreasing	No	5.8	24
COS-75A	LAU	Extraction	Decreasing	Decreasing	35.5	110
Granite Reef	MAU	Extraction	No	No	30	170
MEX-1MA	MAU	Extraction	Decreasing	Increasing	12	120
PCX-1	LAU	Extraction	Decreasing	Decreasing	11	81
PV-14	LAU	Extraction	Decreasing	Decreasing	0.5	3.3
PV-15	LAU	Extraction	No	Decreasing	1.9	8.3
B-1MA	MAU	Monitoring	No	Insufficient Data	0.5	0.5
B-J	UAU	Monitoring	Decreasing	No	0.66	4.1
D-2MA	MAU	Monitoring	Decreasing	Decreasing	8.4	2,100
E-1MA	MAU	Monitoring	Decreasing	Increasing	1.5	110
E-5MA	MAU	Monitoring	Decreasing	No	1.8	54
E-5UA	UAU	Monitoring	No	No	2.5	7.7
E-7LA	LAU	Monitoring	No	Increasing	10	39
E-7UA	UAU	Monitoring	No	No	0.5	2.6
E-8MA	MAU	Monitoring	No	No	18	39
E-10MA	MAU	Monitoring	Decreasing	Increasing	2.8	8.4
E-12UA	UAU	Monitoring	Decreasing	No	1.6	7
E-13UA	UAU	Monitoring	Decreasing	No	0.93	6.1
M-2MA	MAU	Monitoring	No	No	1.6	30
M-2UA	UAU	Monitoring	Decreasing	No	0.58	1.95
M-4MA	MAU	Monitoring	Decreasing	No	3.3	46
M-5LA	LAU	Monitoring	No	No	0.5	1.6
M-5MA	MAU	Monitoring	Decreasing	Decreasing	3.8	65
M-6MA	MAU	Monitoring	Decreasing	Increasing	4.3	105
M-7MA	MAU	Monitoring	No	No	0.5	0.95
M-9MA	MAU	Monitoring	No	No	2.4	5.8
M-10LA2	LAU	Monitoring	Decreasing	No	2.8	24
M-10MA2	MAU	Monitoring	No	No	14.5	55
M-11MA	MAU	Monitoring	No	No	0.5	0.5
M-12MA2	MAU	Monitoring	Decreasing	No	12	25
M-14LA	LAU	Monitoring	No	No	15	37
M-15MA	MAU	Monitoring	Decreasing	Decreasing	2.6	11
M-16LA	LAU	Monitoring	Decreasing	No	11	53
M-16MA	MAU	Monitoring	Decreasing	No	4.15	18
M-17MA/LA	MAU/LAU	Monitoring	Decreasing	Decreasing	0.5	8.4
PA-2LA	LAU	Monitoring	No	No	0.5	0.5
PA-5LA	LAU	Monitoring	Decreasing	Decreasing	46	150
PA-6LA	LAU	Monitoring	Decreasing	Decreasing	120	290
PA-8LA2	LAU	Monitoring	Decreasing	No	3.8	36
PA-9LA	LAU	Monitoring	Decreasing	No	0.63	21
PA-10MA	MAU	Monitoring	Increasing	Increasing	13	87
PA-11LA	LAU	Monitoring	No	No	0.5	0.84
PA-12MA	MAU	Monitoring	Decreasing	No	19	370
PA-13LA	LAU	Monitoring	Decreasing	No	17	190
PA-15LA	LAU	Monitoring	No	No	0.5	0.5
PA-16MA	MAU	Monitoring	Decreasing	Decreasing	0.61	24
PA-18LA	LAU	Monitoring	Decreasing	No	0.88	1.7
PA-19LA	LAU	Monitoring	Decreasing	No	52	110
PA-20MA	MAU	Monitoring	No	No	34.5	81
PA-21MA	MAU	Monitoring	No	No	0.5	0.5
PG-1LA	LAU	Monitoring	Decreasing	No	0.5	2.5
PG-2LA	LAU	Monitoring	Increasing	Increasing	41	75
PG-4MA	MAU	Monitoring	No	No	1.5	5.9
PG-4UA	UAU	Monitoring	No	No	0.51	3
PG-5MA	MAU	Monitoring	Decreasing	No	16	38
PG-5UA	UAU	Monitoring	Decreasing	No	1.6	5
PG-6MA	MAU	Monitoring	Decreasing	No	82	165
PG-6UA	UAU	Monitoring	No	Decreasing	0.5	2.3
PG-7MA	MAU	Monitoring	No	No	0.5	6.1
PG-8UA	UAU	Monitoring	No	No	0.5	0.81
PG-10UA	UAU	Monitoring	Decreasing	No	0.69	1.8
PG-11UA	UAU	Monitoring	No	No	0.5	0.5
PG-16UA	UAU	Monitoring	No	Increasing	0.5	3.5
PG-18UA	UAU	Monitoring	Decreasing	No	0.71	3.5
PG-19UA	UAU	Monitoring	No	Increasing	1.9	3.8
PG-22UA	UAU	Monitoring	Decreasing	Decreasing	2.7	13
PG-23MA/LA	MAU/LAU	Monitoring	Decreasing	No	10	22
PG-23UA	UAU	Monitoring	No	No	1.2	4.3
PG-24UA	UAU	Monitoring	Decreasing	No	0.5	8.9
PG-25UA	UAU	Monitoring	No	No	1.6	3.3
PG-28UA	UAU	Monitoring	No	No	1.2	5.1
PG-29UA	UAU	Monitoring	Decreasing	Decreasing	0.5	2.9
PG-31UA	UAU	Monitoring	Increasing	No	2.7	36
PG-38MA/LA	MAU/LAU	Monitoring	No	Increasing	0.5	3.2
PG-39LA	LAU	Monitoring	Decreasing	No	2.8	13
PG-40LA	LAU	Monitoring	Decreasing	Decreasing	7.4	28
PG-42LA	LAU	Monitoring	Increasing	Decreasing	0.5	3.7
PG-43LA	LAU	Monitoring	No	No	0.5	0.5
PG-44LA	LAU	Monitoring	Decreasing	No	0.5	4.3
PG-48MA	MAU - Lower	Monitoring	Decreasing	No	14	120
PG-49MA	MAU - Lower	Monitoring	No	No	0.5	0.5
PG-50MA	MAU - Lower	Monitoring	Decreasing	No	2.1	11.5
PG-54MA	MAU - Lower	Monitoring	No	No	1.95	31
PG-55MA	MAU - Lower	Monitoring	No	No	1.1	6.9
PG-56MA	MAU - Lower	Monitoring	No	No	1.3	4.8
S-1LA	LAU	Monitoring	No	No	0.5	0.5
S-1MA	MAU	Monitoring	No	No	0.5	0.5
S-2LA	LAU	Monitoring	Increasing	Decreasing	2.3	40.5
S-2MA	MAU	Monitoring	No	No	0.5	0.5
W-1MA	MAU	Monitoring	No	No	51	690
W-2MA	MAU	Monitoring	Decreasing	Decreasing	1,000	4,800

ABBREVIATIONS:
TCE = trichloroethene
µg/L = micrograms per liter
MAU = Middle Alluvium Unit
LAU = Lower Alluvium Unit
UAU = Upper Alluvium Unit
MAU - Lower = Lower Middle Alluvium Unit

8 ANNUAL OPERATION OF TREATMENT FACILITIES

A monthly summary of groundwater pumping and estimated TCE mass removed from each NIBW extraction well is presented on **Table 10**. Concentrations for NIBW COCs in samples obtained at NIBW extraction wells in 2020 are summarized in **Table C-2** and treatment system sample results are shown in **Table C-3**. Historical groundwater extraction is summarized in **Table 8** and is graphed over the last 10-year period along with TCE concentrations in **Appendix E**. Fourth quarter compliance reporting for the treatment facilities, other than the CGTF and NGTF, is provided in **Appendix I**.

Mass removal estimates for individual extraction wells are computed by using a single (or an average) TCE concentration value for each month in which a given well operated, and the total reported pumping from that well during the month. **Table 10** also provides computed monthly and annual percent operating time for each of the extraction wells tied in to treatment. Percent operation time for extraction wells is computed using higher frequency daily or hourly pumping data sets provided by well operators. Time when the associated treatment facilities were available for operation in 2020 is summarized in the Site Inspection Report (**Appendix H**). Results of samples obtained by the NIBW PCs are used where available; however, samples obtained by other parties, such as COS, are used when no PCs' data are available. The PCs have no sample results when extraction wells are not operational during their monthly monitoring round. If no TCE concentrations are available for a particular well for a particular month, values from previous or subsequent months are used in mass removal estimates.

Table 10. Groundwater Extraction and Estimated TCE Mass Removed During 2020 at the NIBW Superfund Site

			UNITS	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTALS	ANNUAL PUMPAGE (in acre-feet)	ANNUAL PUMPAGE (in gpm)
CGTF	COS-31	pumpage	x 1,000 gal	-	-	-	-	893.8	-	1,854.3	2,958.8	-	6,972.3	2,416.1	59,057.7	74,153	228	141
		Operating time	%	0%	0%	0%	0%	1%	0%	2%	3%	0%	6%	3%	52%	6%		
		[TCE conc.]	µg/L					4.2		4.2	4.2		3.7	3.4	3.8	4		
		Est. TCE mass	pounds	-	-	-	-	0.	-	0.1	0.1	-	0.2	0.1	1.9	2		
	COS-71A	pumpage	x 1,000 gal	-	-	-	-	-	-	-	-	-	6,075.3	-	-	6,075	19	12
		Operating time	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	1%		
		[TCE conc.]	µg/L										48.2			48		
		Est. TCE mass	pounds	-	-	-	-	-	-	-	-	-	2.4	-	-	2		
	COS-72	pumpage	x 1,000 gal	-	-	-	579.5	989.6	96,627.4	71,784.1	68,607.	55,264.8	33,425.4	443.1	79,527.1	407,248	1,250	775
		Operating time	%	0%	0%	0%	1%	1%	98%	70%	67%	56%	33%	0%	80%	34%		
		[TCE conc.]	µg/L				7.6	7.6	7.6	8.3	8.	6.4	7.5	8.1	8.7	8		
		Est. TCE mass	pounds	-	-	-	0.	0.1	6.1	5.	4.6	3.	2.1	0.	5.8	27		
	COS-75A	pumpage	x 1,000 gal	-	-	-	48,631.	95,279.3	97,961.3	100,475.2	99,210.4	96,417.5	46,225.1	38,127.6	92,750.3	715,078	2,194	1,360
		Operating time	%	0%	0%	0%	49%	92%	100%	100%	100%	100%	46%	38%	91%	60%		
		[TCE conc.]	µg/L				45.	40.	40.	37.	41.	36.	35.	48.	39.5	40		
		Est. TCE mass	pounds	-	-	-	18.3	31.8	32.7	31.	33.9	29.	13.5	15.3	30.6	236		
	TOTAL	pumpage	x 1,000 gal	-	-	-	49,210.5	97,162.7	194,588.6	174,113.7	170,776.2	151,682.3	92,698.1	40,986.7	231,335.1	**1,202,554**	**3,690**	**2,288**
		Est. TCE mass	pounds	-	-	-	18.3	31.9	38.8	36.1	38.6	31.9	18.3	15.4	38.2	**267**		
MRTF	PV-14	pumpage	x 1,000 gal	88,840.	84,817.	73,638.	68,540.	95,626.	91,451.	97,332.	97,256.	93,474.	99,168.	93,506.	-	983,648	3,019	1,871
		Operating time	%	100%	100%	87%	77%	100%	100%	100%	100%	100%	100%	97%	0%	88%		
		[TCE conc.]	µg/L	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.6	0.7		1		
		Est. TCE mass	pounds	0.4	0.4	0.3	0.3	0.4	0.4	0.6	0.6	0.6	0.5	0.5	-	5		
	PV-15	pumpage	x 1,000 gal	92,987.	59,287.	64,026.	93,803.	92,600.	87,380.	92,613.	93,983.	93,853.	96,333.	69,456.	97,095.	1,033,416	3,171	1,966
		Operating time	%	100%	66%	68%	100%	100%	100%	100%	100%	100%	100%	77%	100%	93%		
		[TCE conc.]	µg/L	4.2	4.4	4.6	4.7	3.8	6.	6.2	6.2	6.3	5.6	5.7	5.2	5		
		Est. TCE mass	pounds	3.3	2.2	2.4	3.7	2.9	4.4	4.8	4.9	4.9	4.5	3.3	4.2	45		
	TOTAL	pumpage	x 1,000 gal	181,827.	144,104.	137,664.	162,343.	188,226.	178,831.	189,945.	191,239.	187,327.	195,501.	162,962.	97,095.	**2,017,064**	**6,190**	**3,838**
		Est. TCE mass	pounds	3.6	2.5	2.7	4.	3.3	4.8	5.4	5.4	5.5	5.	3.8	4.2	**50**		
NGTF	PCX-1	pumpage	x 1,000 gal	113,468.	77,697.3	114,846.7	108,527.2	113,249.2	110,985.9	110,612.6	107,484.	53,119.4	-	-	93.6	**910,084**	2,793	1,732
		Operating time	%	100%	72%	98%	96%	97%	100%	100%	100%	51%	0%	0%	0%	68%		
		Discharge Canal	x 1,000 gal	270.8	42,454.3	114,397.1	107,956.	112,939.9	110,378.9	49,568.3	249.3	232.7	-	-	-	538,447	1,652	1,024
		Discharge CWTP	x 1,000 gal	112,842.4	34,961.9	-	69.1	-	180.4	60,745.8	106,619.4	52,680.6	-	-	-	368,099	1,130	700
		[TCE conc.]	µg/L	67.	56.	48.	55.	49.	51.	45.	44.	38.			38.	51		
		Est. TCE mass	pounds	63.4	36.3	46.	49.8	46.3	47.2	41.5	39.5	16.8	-	-	0.03	**387**		
AREA 7 GWETS	7EX-3aMA	pumpage	x 1,000 gal	6,649.6	6,403.1	6,013.4	6,329.9	5,698.4	4,986.8	5,810.5	5,796.8	6,618.3	6,994.	5,796.8	6,618.3	73,716	226	140
		Operating time	%	100%	100%	87%	88%	80%	77%	87%	81%	95%	100%	90%	78%	88%		
		[TCE conc.]	µg/L	600.	600.	600.	670.	670.	670.	460.	460.	460.	445.	445.	445.	541		
		Est. TCE mass	pounds	33.3	32.1	30.1	35.4	31.9	27.9	22.3	22.3	25.4	26.	21.5	24.6	333		
	7EX-4MA	pumpage	x 1,000 gal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Operating time	%	-	-	-	-	-	-	-	-	-	-	-	-	0%		
		[TCE conc.]	µg/L															
		Est. TCE mass	pounds	-	-	-	-	-	-	-	-	-	-	-	-	-		
	7EX-6MA	pumpage	x 1,000 gal	10,906.	10,499.7	9,742.9	9,394.8	9,427.6	8,041.8	9,277.9	8,566.	8,215.7	9,054.8	8,438.1	7,132.4	108,698	334	207
		Operating time	%	100%	100%	87%	88%	88%	78%	87%	82%	83%	91%	90%	78%	88%		
		[TCE conc.]	µg/L	650.	650.	650.	630.	630.	630.	570.	570.	570.	555.	555.	555.	605		
		Est. TCE mass	pounds	59.2	57.	52.8	49.4	49.6	42.3	44.1	40.7	39.1	41.9	39.1	33.	548		
	TOTAL	pumpage	x 1,000 gal	17,555.6	16,902.8	15,756.4	15,724.7	15,126.	13,028.6	15,088.4	14,362.9	14,834.	16,048.8	14,234.9	13,750.7	**182,414**	**560**	**347**
		Est. TCE mass	pounds	92.5	89.	83.	84.8	81.4	70.2	66.4	63.	64.5	67.9	60.6	57.6	**881**		

			UNITS	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	TOTALS	ANNUAL PUMPAGE (in acre-feet)	ANNUAL PUMPAGE (in gpm)
AREA 12 GWETS	MEX-1MA (SRP 23.1E6N)	Pumpage	x 1,000 gal	-	27,790.6	44,596.8	28,574.7	43,662.8	42,128.5	42,953.6	28,629.2	40,439.6	42,526.7	40,820.5	41,748.7	423,872	1,301	806
		Operating time	%	0%	0%	0%	0%	0%	0%	0%	0%	64%	100%	100%	99%	30%		
		[TCE conc.]	µg/L		60.	49.	55.	49.	53.	49.	54.	50.	44.	49.	50.	51		
		Est. TCE mass	pounds	-	13.9	18.2	13.1	17.9	18.6	17.6	12.9	16.9	15.6	16.7	17.4	179		
	Granite Reef (SRP 23.6E6N)	pumpage	x 1,000 gal	-	-	-	32.1	4,531.2	-	-	-	24,422.8	38,277.6	36,427.8	37,052.6	140,744	432	268
		Operating time	%	0%	67%	100%	67%	99%	100%	99%	66%	97%	100%	100%	99%	83%		
		[TCE conc.]	µg/L				34.	34.				52.	84.5	96.	98.	84		
		Est. TCE mass	pounds	-	-	-	0.	1.3	-	-	-	10.6	27.	29.2	30.3	98		
	TOTAL	pumpage	x 1,000 gal	-	27,790.6	44,596.8	28,606.8	48,194.	42,128.5	42,953.6	28,629.2	64,862.3	80,804.4	77,248.3	78,801.3	**564,616**	**1,733**	**1,074**
		Est. TCE mass	pounds	-	13.9	18.2	13.1	19.1	18.6	17.6	12.9	27.5	42.6	45.9	47.7	**277**		

Total Pumping (in million gallons):	**4,877**	--	--
TCE Mass Removal (in pounds):	**1,863**	--	--
Total Pumping (in gpm):	--	--	**9,278**

EXPLANATION:
1) [TCE] = Concentration of trichloroethene, in micrograms per liter (µg/L).
2) Most TCE results listed are as reported from TestAmerica; where PCs samples(s) not available, City of Scottsdale (COS) sample results may be used. Where multiple samples were collected during the same month, the value shown is the average of those results. Where samples were not able to be collected (e.g., extraction well was offline during scheduled sampling date), but a well operated during the month, TCE value used comprises the results (or average results) of samples obtained during previous or subsequent months.
3) Estimated TCE mass reported is in pounds.
4) Pumpage values reported is in thousands of gallons (x1000).
5) gpm = gallons per minute
6) CWTP = Chaparral Water Treatment Plant
7) Area 12 was not operating in January due to annual SRP canal dry-up. Beginning in second quarter 2019, flow values used are from SRP data transmittals.

8.1 CGTF

COS reported that approximately 3,690 AF (or 1,203 MG) of groundwater was pumped and treated at the CGTF in 2020. The CGTF operated fairly consistently during 2020. Down time was primarily attributed to column cleaning, routine maintenance, and an air stripper rehabilitation project that commenced on November 4, 2019. The CGTF was restarted on April 16, 2020. Of the total, 74 MG were extracted from well COS-31, 407 MG from well COS-72, 6 MG from well COS-71A, and 715 MG from well COS-75A (**Table 10**). Based on extraction well data presented in **Table 10**, an estimated 267 pounds of TCE were removed by the CGTF during 2020. TCE concentrations at COS-75A and COS-31 show a decreasing trend for both recent time (5 years) and longer term (10 years). Well COS-72 TCE concentrations show a decreasing trend over the longer term and well COS-71A does not have a statistically significant trend in TCE concentrations for either recent or longer-term data sets (**Table 9**). As demonstrated in operations reports and CMRs provided by COS, NIBW COCs were not detected in groundwater treated at the CGTF during 2020.

COS reports results of laboratory testing and plant operations directly to EPA and ADEQ. A summary of the key operational results follows. Detailed reporting of the 2020 operational status, laboratory data, and system performance was provided by COS in CGTF Compliance Monitoring Reports (CMRs) submitted on May 27, August 6, October 29, 2020, and February 23, 2021. Routine operation, maintenance, and monitoring at the CGTF are anticipated to continue by COS throughout 2021.

8.2 MRTF

Approximately 6,190 AF (or 2,017 MG) of groundwater were pumped and treated at MRTF in 2020, including 984 MG of groundwater extracted at PV-14 and 1,033 MG extracted at PV-15 (**Table 10**). Well PV-15 is the highest priority EPCOR well for the MRTF and operates whenever available. Well PV-15 was available for use most of the year, except in late February and early March when the well was offline for pump removal and casing evaluation, and from November 6 through 13 for repairs. Well PV-14 is the second highest priority well for the MRTF and was available for use most of the year, except after November 4 when the pump was out of service for conversion from a vertical turbine to line-shaft pump. During low demand periods (generally, December through March), well PV-14 is used on demand and cycles off when water is not needed by EPCOR. Based on groundwater pumping totals and reported TCE concentrations, an estimated 50 pounds of TCE were removed from groundwater at MRTF during 2020. TCE concentrations at well PV-14 show a decreasing trend for recent time (5 years) as well as over the longer term (10 years); well PV-15 has a decreasing trend for recent time, but no trend over the longer term (**Table 9**).

MRTF reported that no treated water from MRTF was delivered to the SRP Arizona Canal in 2020. Discharges to the Arizona Canal are regulated by an AZPDES permit. EPCOR is responsible for monitoring and reporting associated with the AZPDES permit for the MRTF. Routine operation, maintenance, and monitoring at the MRTF are anticipated to continue by EPCOR throughout 2021.

8.3 NGTF

Well PCX-1 was available for use except for two periods: between February 10 through 18, when operations were intermittent due to preventative maintenance on the electrical systems at NGTF and installation of upgraded radio communication systems for PCX-1 and NGTF, and after September 16, when the pump failed. Outside of this timeframe, well PCX-1 operated on a fairly consistent basis in 2020 (**Table 10**). TCE concentrations at well PCX-1 are fairly stable, ranging between 38 and 67 µg/L in 2020 (**Table C-2**).

In 2020, most of the treated water from NGTF was discharged to the CWTP for municipal use by COS before February 10, and again from July 14 to September 16 (**Table 10**). The CWTP was not available between Feb 10 and July 14. Treated water from NGTF that was not discharged to CWTP was discharged to the SRP Arizona Canal under the NGTF AZPDES permit. Treated water discharged to the Arizona Canal is monitored as required by the AZPDES permit. The results of sample analyses were summarized in monthly DMRs and submitted directly to the EPA and ADEQ under separate cover.

The total volume of groundwater extracted and treated at NGTF during 2020 was 2,793 AF (910 MG), with approximately 59% of the total volume discharged to the Arizona Canal and 41% to the CWTP (see **Table 10**). An estimated 387 pounds of TCE were removed from the groundwater treated at NGTF in 2020. TCE concentrations at well PCX-1 show a decreasing trend for both recent time (5 years) and over the longer term (10 years) (**Table 9**). Routine operation, maintenance, and monitoring are anticipated to continue at NGTF throughout 2021.

8.4 Area 7 GWETS

A total of approximately 560 AF (or 182 MG) of groundwater were pumped and treated at the Area 7 GWETS in 2020 (**Table 10**). Of the total, approximately 73.5 MG was pumped from well 7EX-3aMA and approximately 108.5 MG was pumped from well 7EX-6MA (**Table 10**). Treatment system performance data are provided by the Area 7 operator on a monthly basis. Mass removal estimates derived from quarterly monitoring of extraction wells indicate approximately 881 pounds of TCE mass were removed by the Area 7 GWETS in 2020 (**Table 10**). TCE concentrations at Area 7 extraction well 7EX-3aMA show an increasing trend for recent time (5 years) and no trend over the longer term (10 years); no statistically significant trend is observed in 7EX-6MA TCE concentrations (**Table 9**).

As part of Site QA procedures, PE samples (designated with sample identifier SP-104) were submitted to TestAmerica during March and August 2020, and process water split samples were submitted to Trans West Analytical. A summary of the PE sample results and laboratory reports is included with other GWETS data and quality control reporting submitted under separate cover as a supplemental data report (issued concurrently with this SMR). Routine operations and monitoring are anticipated to continue at the Area 7 GWETS throughout 2021.

8.5 Area 12 GWETS

A total of 1,733 AF (or 565 MG) of groundwater was pumped and treated at the Area 12 GWETS in 2020 (**Table 10**). Annual canal dry-up and annual treatment system maintenance were conducted in January and February. Well issues resulted in lower treatment capacity and downtime of the Area 12 GWETS in 2020. These include well rehabilitation, modification, testing, and re-equipping activities at the Granite Reef well during February through September. The Granite Reef well was removed from service in mid-November 2019 and remained offline until September 2020. SRP installed a 16-inch diameter high strength, low alloy (HSLA) liner to total depth and installed new electric submersible pumping equipment in the well in 2020. Of the total, 424 MG were extracted from well MEX-1MA and 141 MG from the Granite Reef well. Treatment system performance data provided by the Area 12 GWETS operator based on monthly sampling of extraction wells (when operating) indicates an estimated 277 pounds of TCE were removed from groundwater during 2020 (**Table 10**).

In 2020, process samples, including influent and treated groundwater, were collected monthly by the Area 12 GWETS operator and submitted to TestAmerica for analysis of NIBW COCs. Samples from the Area 12 extraction wells were generally collected during the first week of the month by the operator (when the treatment system was operational). The Granite Reef extraction well showed no statistically significant trend in TCE concentrations for either recent time (last 5 years) or over the longer term (10 years) (**Table 9**). TCE concentrations at MEX-1MA show a decreasing trend over the longer term, but an increasing term in recent time. To the extent feasible, pumping will be conducted at both the Granite Reef well and MEX-1MA in 2021, especially when well COT-6 is pumping, in accordance with recommendations in the M-2MA contingency response memorandum. Routine operations and monitoring are anticipated to continue at the Area 12 GWETS throughout 2021.

In 2020, process samples, including influent and treated groundwater, were collected monthly by the Area 12 GWETS operator and submitted to TestAmerica for analysis of NIBW COCs. Samples from the Area 12 extraction wells were generally collected during the first week of the

month by the operator (when the treatment system was operational). The Granite Reef extraction well showed no statistically significant trend in TCE concentrations for either recent time (last 5 years) or over the longer term (10 years) (**Table 9**). TCE concentrations at MEX-1MA show a decreasing trend over the longer term, but an increasing term in recent time. Although the Area 12 GWETS presently provides treated water for irrigation use, the treatment system is consistently operated to ensure the TCE level in the treated water is below the Cleanup Standard.

8.6 Laboratory Audit and Treatment Facility Inspections

To assure data quality and consistency associated with collection of compliance monitoring data at the treatment facilities, the NIBW PCs and COS have contracted with TestAmerica (designated as primary analytical laboratory) and Trans West Analytical Services, LLC (dba XENCO Laboratories and designated as backup to TestAmerica), both located in Phoenix, Arizona. TestAmerica and Trans West Analytical are licensed by the Arizona Department of Health Services (ADHS) under analytical laboratory license numbers AZ0728 and AZ0757, respectively. In 2020, XENCO laboratories and TestAmerica were both acquired by Eurofins Scientific and consolidated into one laboratory facility in Phoenix, Arizona, operating as Eurofins TestAmerica, Phoenix. In 2021, the NIBW PCs will contract with Pace Analytical National Center for Testing & Innovation (ADHS license number AZ0612) as the backup laboratory to Eurofins TestAmerica, Phoenix.

To help assure laboratory performance and data quality, COS and the NIBW PCs conducted an annual audit of TestAmerica on December 3, 2020. Results of the laboratory audit are submitted under separate cover as a supplemental data report (issued concurrently with this SMR).

The NIBW PCs coordinated inspections of the CGTF and NGTF on September 23, 2020, and the inspections for MRTF, Area 7 GWETS, and Area 12 GWETS, on October 6, 2020, in accordance with Section VI.B.4.d of the SOW. Representatives of EPA and ADEQ participated virtually while the NIBW PCs and the operators participated locally for the annual inspections at each of the treatment facilities. Video and photographs were made available to EPA and ADEQ for the facility inspections. The groundwater treatment and extraction systems were inspected for malfunctions, deterioration, issues with operator practices and protocols, and discharges that could result in a release of untreated groundwater. At each facility, the major system components were identified and examined for operability, condition of operating equipment, and management of untreated groundwater and residual materials. Additionally, data related to routine operation, system startup and shutdown, routine and non-routine maintenance, and sampling were made available for review during the inspections. No hazards, significant deterioration, or procedural issues were noted in the course of the inspections at the CGTF, MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS that would affect groundwater treatment performance standards or compliance with the Amended CD/SOW. Additional details of the NIBW Site inspections are described in the Inspection Report provided in **Appendix H**.

9 REMEDY PERFORMANCE EVALUATION

Remedy performance is evaluated with regard to the Amended CD SOW Performance Standards and the GM&EP performance criteria and contingency initiation criteria. The Amended CD SOW Performance Standards for containment of COCs in the MAU/LAU and capture of relatively higher concentrations in the MAU (Area 7 and Area 12) are described in **Section 5.1**. GM&EP performance criteria and contingency initiation criteria for the UAU, MAU/LAU, Northern LAU, and Source Control Programs are summarized in **Table 4** in **Section 5.2**. Evaluation of remedy performance for 2020 is discussed below.

9.1 Evaluation of UAU Program

The assessment of remedy performance for the UAU plumes involves monitoring both VOC mass reduction over time and progress toward aquifer restoration. For the 2020 VOC mass flux analysis, total mass of VOCs present in UAU groundwater was computed using data for saturated thickness from the October 2020 water level monitoring round and VOC concentration data from the October 2020 water quality monitoring round. VOC mass in the UAU is computed annually both with and with mass attributable to a non-Site related source in the vicinity of PG-4UA. This source is dominated by PCE. **Table 11** summarizes VOC mass estimates for UAU groundwater for 2020. VOC mass is computed annually both with and without mass attributed to the vicinity of PG-4UA, which has historically show elevated PCE VOC mass for the UAU is calculated annually both with and without mass attributed to the vicinity of PG-4UA, where a source of PCE unrelated to the Site has been acknowledged by EPA and ADEQ. **Table 11** summarizes VOC mass estimates for UAU groundwater for 2020. Based on 2020 data, a total of about 14 gallons, or 168 pounds, of VOCs are estimated to remain in the saturated portion of the UAU (**Table 11**). **Figure 16** illustrates the decline in total VOC mass in UAU groundwater over time. Estimated total mass of VOCs present in the saturated portion of the UAU has decreased substantially over the past 27 years, declining from a high of over 11,000 pounds in 1993 to the current estimate of 168 pounds. In recent years, the VOC mass reduction with time has become fairly asymptotic.

The inset table on **Figure 16** summarizes the calculated 5-year running average of VOC mass in UAU groundwater since annual mass estimates were initiated in 1996. The most recent 5-year running average of 212 pounds represents a decrease relative to the previous 5-year average of 224 pounds, indicating the performance measure for UAU mass reduction has been achieved for 2020.

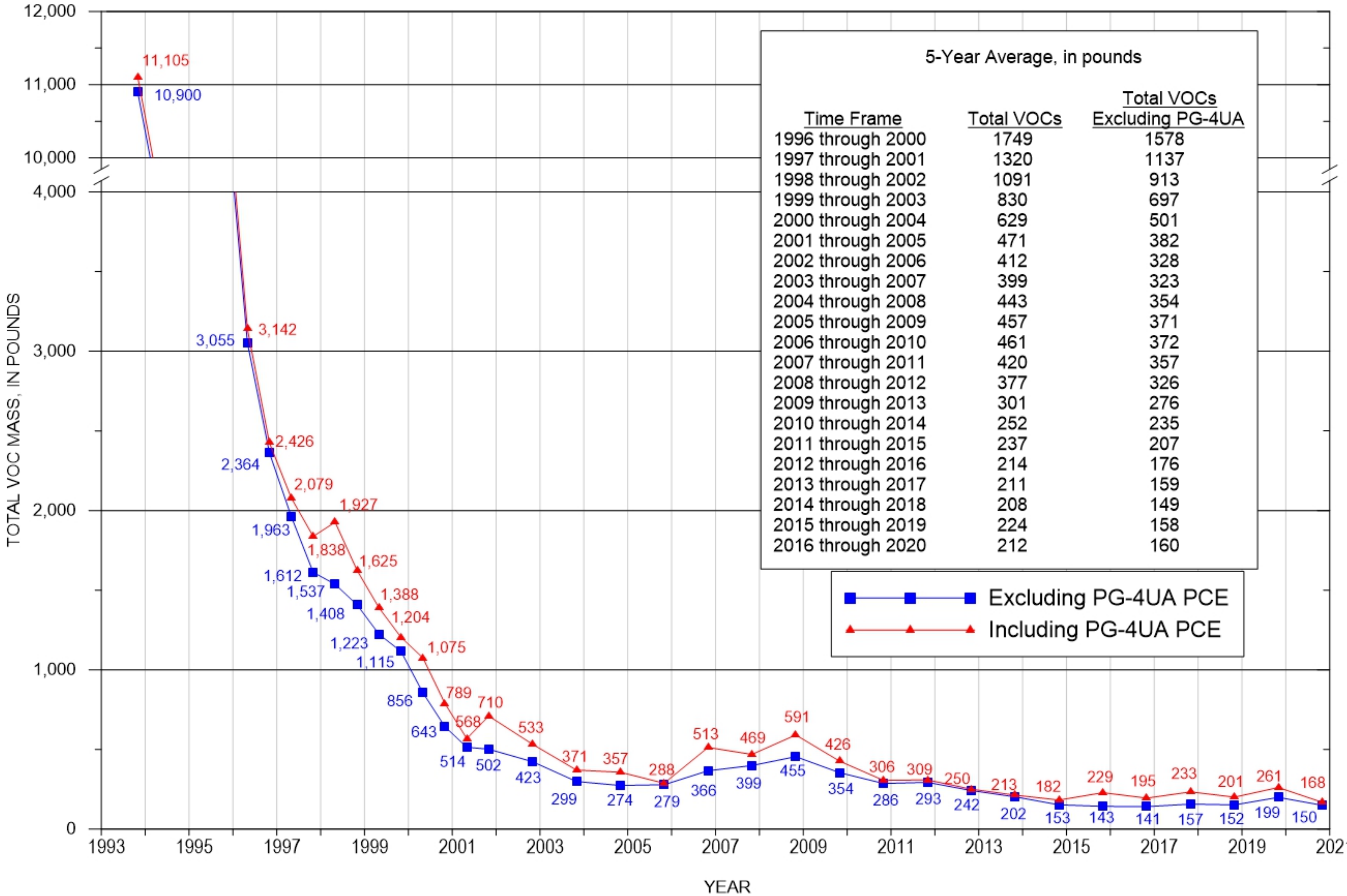

Figure 16. Total Mass of VOCs in Saturated Portion of UAU

Table 11. Summary of VOC Mass Estimates in UAU Groundwater

POLYGON (WELL NAME)	TOTAL VOCs (micrograms per liter)[a]	ELEVATION BASE OF UAU (feet, amsl)	ELEVATION UAU WATER TABLE (feet, amsl)	SATURATED THICKNESS (feet)	POLYGON AREA (square feet)	SATURATED POLYGON VOLUME (cubic feet)	SATURATED PORE VOLUME (liters)	VOC VOLUME (gallons)	VOC MASS (pounds)[b]
B-J	1.94	1,065	1,135.29	70	1,312,017	92,220,363	783,476,537	0.28	3.35
E-5UA	4.8	1,067	1,135.14	68	1,563,483	106,535,732	905,095,615	0.80	9.58
E-7UA	0	1,079	1,130.82	52	2,135,156	110,643,784	939,996,395	0.00	0.00
E-12UA	2.6	1,075	1,138.60	64	1,868,432	118,822,933	1,009,483,992	0.48	5.79
E-13UA	2.86	1,080	1,138.91	59	851,113	50,136,513	425,944,778	0.22	2.69
M-2UA	1.75	1,081	1,139.16	58	1,081,841	62,919,873	534,548,361	0.17	2.06
PG-4UA	6.78	1,055	1,123.73	69	2,867,709	197,097,640	1,674,482,416	2.09	25.03
PG-5UA	2.66	1,036	1,128.34	92	1,729,659	159,716,712	1,356,905,271	0.66	7.96
PG-6UA	0	1,043	1,126.79	84	2,363,199	198,012,444	1,682,254,322	0.00	0.00
PG-8UA	0.66	1,060	1,126.29	66	1,631,115	108,126,613	918,611,269	0.11	1.34
PG-10UA	1.77	1,089	1,137.28	48	693,947	33,503,761	284,637,904	0.09	1.11
PG-11UA	0.84	1,076	1,132.87	57	2,167,731	123,278,862	1,047,340,228	0.16	1.94
PG-16UA	1.7	1,079	1,134.46	55	1,327,719	73,635,296	625,583,382	0.20	2.34
PG-18UA	1.48	1,045	1,132.82	88	1,953,438	171,550,925	1,457,445,195	0.40	4.76
PG-19UA	4.55	1,049	1,131.96	83	1,407,810	116,791,918	992,229,094	0.83	9.95
PG-22UA	2.60	1,067	1,135.59	69	1,764,305	121,013,680	1,028,095,921	0.49	5.89
PG-23UA	2.52	1,055	1,124.28	69	1,753,035	121,450,265	1,031,805,015	0.48	5.73
PG-24UA	0	1,054	1,128.15	74	1,535,896	113,886,688	967,547,139	0.00	0.00
PG-25UA	2.63	1,056	1,132.08	76	1,538,241	117,029,375	994,246,464	0.48	5.77
PG-28UA	4.6	1,061	1,136.06	75	1,669,714	125,328,733	1,064,755,316	0.90	10.80
PG-29UA	1.19	1,080	1,136.97	57	1,345,997	76,681,449	651,462,587	0.14	1.71
PG-31UA	22.6	1,081	1,133.93	53	2,706,853	143,273,729	1,217,210,622	5.06	60.66
TOTALS							**21,593,157,822**	**14.05**	**168.46**

ABBREVIATIONS:
feet, amsl = feet, above mean seal level

NOTES:
[a] Includes total concentration of TCE, PCE, 1,1,1-TCA, DCE, and Chloroform from October 2020 water quality data set. "0" indicates either that concentrations of all VOCs were below the detection limit, the well was dry, or the well is no longer included in the NIBW Monitoring Program due to long-term ND levels of VOCs.
[b] Formula for calculation of VOC mass in pounds: (Total VOCs [micrograms per liter] * Saturated Pore Volume [liters] * 0.000000002205 [conversion from micrograms to pounds]

9.2 Evaluation of MAU/LAU Program

Overall, Amended CD SOW Performance Standards for MAU/LAU containment are being met at the Site. MAU/LAU extraction provides sufficient hydraulic control to prevent groundwater in the MAU/LAU with VOC contamination above the Cleanup Standards from migrating toward and ultimately impacting production wells that have not contained NIBW COCs exceeding MCLs prior to the Effective Date of the Amended CD and which are not currently connected to an existing treatment facility. In addition, TCE mass in the MAU outside the source areas (i.e., Area 7 and Area 12) is being reduced. Remedy performance metrics for the MAU/LAU Program, as outlined in the GM&EP, are summarized in **Table 4**. Compliance with most of the GM&EP achievement measures was attained, as discussed below.

Containment of the MAU and LAU plumes is based on direction of groundwater movement along the periphery of all areas with TCE concentrations in excess of 5 µg/L toward extraction wells tied in to treatment (MAU and LAU) and/or toward the Western Margin (MAU outside of source areas). Water level and TCE concentration data for October 2020, with arrows indicating direction of groundwater movement, are shown for the MAU and LAU on **Figure 17**. Where arrows are not present, direction of groundwater movement is inferred as perpendicular to water level contours. Further information regarding hydraulic capture for the MAU and LAU is provided on **Figure 17** through estimated capture zones. For the MAU, water level data for October 2020 were used to estimate the extent of hydraulic capture for the Area 7 and Area 12 Source Control Programs. For the LAU, the extent of the hydraulic capture zone associated with the northernmost LAU extraction well, PV-14, was projected using the NIBW groundwater flow model. Based on water level patterns shown on **Figure 17**, the inferred direction of groundwater movement along the periphery of the MAU and LAU plumes is toward extraction wells or the Western Margin.

For the MAU, October 2020 data demonstrate that direction of groundwater movement within and along the periphery of the plume is toward the two remedial pumping centers associated with groundwater extraction (Area 7: wells 7EX-3aMA and 7EX-6MA; Area 12: wells MEX-1MA and the Granite Reef well) or the Western Margin. Demonstrating that MAU mass outside of source area capture zones flows toward the Western Margin is consistent with Amended CD containment performance standards, since this mass moves vertically into the LAU where it is directed toward and captured at LAU extraction wells. For the LAU, flow patterns interpreted from October 2020 water level data (**Figure 17**) show that direction of groundwater movement within and along the periphery of the plume is toward LAU extraction wells associated with the NIBW remedy, principally CGTF extraction well COS-75A, NGTF extraction well PCX-1, and MRTF extraction wells PV-15 and PV-14. As such, the PCs conclude that pumping of remedial action wells in 2020 resulted in groundwater flow patterns across the MAU and LAU plumes that meet GM&EP performance criteria.

It should be noted that there is uncertainty with respect to flow patterns in the LAU in the immediate vicinity of the AWC irrigation wellfield, particularly during periods when the wellfield is operated on a more consistent basis in the spring and summer months. While the AWC wells are interpreted to be completed across both the MAU and LAU, water level responses to pumping are principally noted in the LAU. As described in **Section 10.1.2** below, the PCs worked with EPA and AWC to gain access to sample the AWC wells during the October 2020 monitoring round. All but one of the AWC irrigation supply wells were sampled and the concentration of TCE, the principal Site COC, was below the detection limit in all of these wells, as shown on **Figure 12**. Unfortunately, AWC 2020 pumping data was not provided to the PCs in time to allow for further evaluation of groundwater flow patterns in the vicinity of the AWC wellfield for the 2020 SMR using the NIBW groundwater flow model, which is currently being updated and recalibrated. This evaluation will be conducted when AWC pumping data, which were supplied to the PCs late in the SMR preparation process, have been incorporated into the model and calibration is deemed complete.

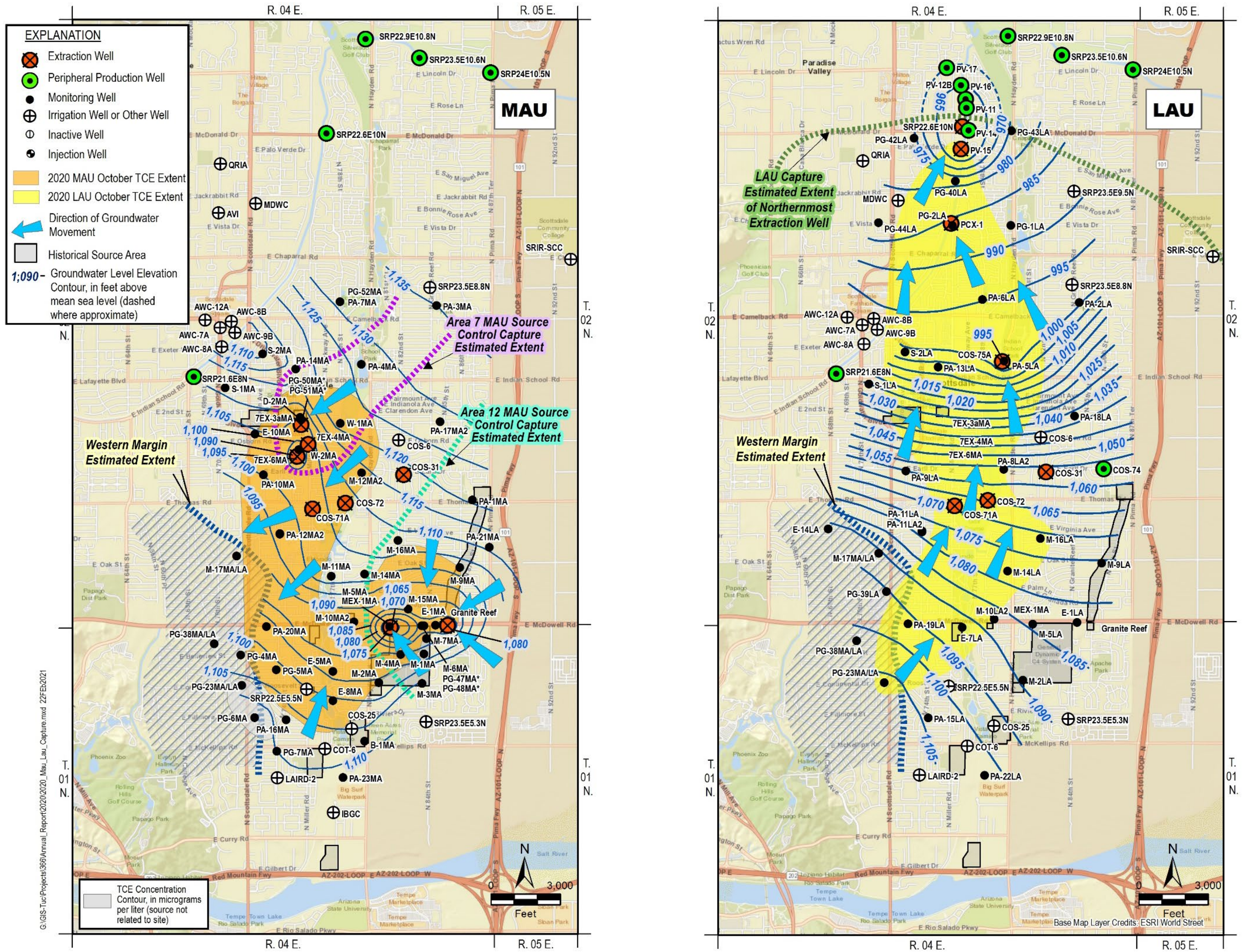

Figure 17. Estimated Hydraulic Capture of TCE Plume by MAU Source Control and Northernmost LAU Extraction Well for October 2020

With respect to the performance measure regarding shifts in the plume extent relative to baseline (2001) conditions, outward shifts in the location of the 5 µg/L TCE contour in both the MAU and LAU between 2001 and 2020 are less than the 1,000-foot performance measure (**Figure 13**). The noted and anticipated exception is the Northern LAU, where the plume is migrating toward extraction wells tied in to treatment. Shifts of the 5 µg/L TCE concentration contour ranging from about 1,000 to 1,600 feet are observed between 2001 and 2020 along the northern and northwestern edge of the LAU plume due to anticipated northern migration of the LAU plume for capture by the NGTF and MRTF extraction wells. In fact, over the last 5 years, TCE concentrations in wells in the northern part of the LAU generally show either statistically significant decreasing TCE concentration trends (S-2LA, PA-5LA, PA-6LA, PG-40LA, PG-42LA, PV-15, and PV-14) or show no statistically significant trend (PA-13LA. PG-44LA, PG-1LA, and PG-43LA) (**Figure 15**). These positive trends demonstrate that coordinated pumping of LAU extraction wells is reducing concentrations in the LAU plume to the north and protecting peripheral production wells serving drinking water end uses.

TCE concentration metrics specified in the GM&EP for selected MAU and LAU peripheral monitoring wells, along with concentrations reported for the October 2020 sampling round, are summarized in **Table 12**. With the exception of S-2LA, TCE concentrations are all less than or equal to achievement measures for the specified monitoring wells. Well S-2LA exceeded the GM&EP TCE achievement measure of 15 µg/L during all sampling rounds conducted in 2020 (**Table C-1**); contingency response actions are discussed in **Section 9.5.** Note that well PA-18LA could not be sampled in 2020, because the pump failed and access to make the necessary repairs was not immediately granted by the property owner. Sampling is anticipated to be possible in 2021.

Table 12. GM&EP Achievement Measures and Observed TCE Concentrations in Selected NIBW Monitoring Wells

Well Name	TCE Concentration (in µg/L)	
	Achievement Measure	October 2020 Sampling Round Results
MAU Monitoring Wells		
0.01	10	4.8/5.0*
M-7MA	10	<0.50/<0.50*
S-1MA	2	<0.50
S-2MA	3	<0.50
LAU Monitoring Wells		
M-5LA	10	1.6
PA-2LA	3	<0.50
PA-15LA	10	<0.50/<0.50*
PA-18LA	10	NS
PG-1LA	15	0.58
PG-44LA	5	<0.50
S-1LA	3	<0.50/<0.50*
S-2LA	15	**26/23***

NS = Not sampled; access to replace a failed pump is in progress
*Duplicate sample
< = Non-Detected at concentration listed

9.3 Evaluation of Northern LAU Program

Remedy performance metrics for the Northern LAU Program, as outlined in the GM&EP, are summarized in **Table 4**. For 2020, compliance with most of these achievement measures was attained, as discussed below.

Based on interpretation of flow directions using October 2020 water level data, the direction of groundwater movement along the Northern LAU plume is toward northern LAU extraction wells, consistent with the GM&EP metric. The outline of the October 2020 LAU TCE plume is shown with October 2020 LAU water level contours on **Figure 17**. Arrows are provided to infer direction of groundwater movement along the periphery of and within the plume. Water level contours indicate that groundwater flow from the Western Margin to the north is controlled by regional pumping, with the northernmost extent of the LAU plume being captured by the broad cone of depression that occurs as a result of focused LAU pumping at the MRTF (PV-15 and PV-14) and NGTF (PCX-1) extraction wells. Additional capture is also provided by LAU pumping at CGTF extraction wells, particularly COS-75A. As mentioned above, water level data indicate that the AWC wellfield also has a localized impact on LAU flow patterns, particularly when fully operational during the spring and summer months.

The extent of capture for the northernmost LAU extraction well, PV-14, simulated for 2020 pumping rates using the NIBW groundwater flow model, is shown with the entire LAU plume on **Figure 17** and for the northern LAU on **Figure 18**. These projections show broad capture by the LAU extraction well network that extends beyond the LAU plume footprint. However, as previously noted, projections do not include updated 2020 pumping from the AWC wells, which have a noted influence on water levels along the western edge of the LAU plume when operating. Pumping impacts from the AWC wellfield will be evaluated once pumping data supplied by AWC late in the SMR preparation process can be incorporated into the model and calibration has been completed.

TCE concentration achievement measures specified in the GM&EP are compared to 2020 values for specified Northern LAU monitoring wells in **Table 13**.

Table 13. GM&EP Achievement Measures and Observed TCE Concentrations in Selected NIBW Northern LAU Program Wells

Well Name	TCE Concentration (in µg/L)	
	Achievement Measure	October 2020 Sampling Round Results
Northern LAU Program Wells		
PG-42LA	2	1.7*
PG-43LA	2	<0.50
PV-14	2	0.60

* October 2020 sample for PG-42LA was below the achievement measure but samples obtained in January and July exceeded and sample for May was equal to GM&EP achievement measure.
< = Not detected at concentration listed

As indicated in **Table 13** and in **Appendix D**, TCE concentrations in 2020 were at or above the 2 µg/L performance metric at monitoring well PG-42LA for all quarterly samples except the sample obtained in October; contingency response for PG-42LA is discussed in **Section 9.5** below. Interpretation of water level contour maps and results of groundwater flow modeling clearly indicate that water passing well PG-42LA is captured by well PV-14, which is tied to treatment at the MRTF. TCE concentrations in all samples obtained at wells PG-43LA (**Table 4**) and
PV-14 (**Table 5**), the other two Northern LAU indicator wells, were below the 2 µg/L performance metric. Changes in the northwestern part of the LAU plume will continue to be closely monitored in relation to GM&EP performance measures.

TCE concentration trends in the Northern LAU are encouraging and indicate that extraction and treatment are effectively reducing concentrations over time. Low-level TCE concentrations at well PV-14, which in 2020 ranged from <0.50 to 0.73 µg/L, continue to be relatively predictable and display a statically significant decreasing trend over both the short (5 years) and longer term (10 years) (**Appendix D**). Further, TCE concentration trends at PV-15, which were increasing through 2014, now show no trend over the last 10 years and a declining trend over the last 5 years (**Appendix D**). These positive responses are attributable to operation of the MRTF extraction wells and other PV production wells consistent with the optimized pumping strategy, along with consistent pumping of NGTF extraction well PCX-1.

Figure 19 is a stacked bar chart showing total annual pumping volume for PV wells and PCX-1 for the time period 1990 through 2020. Wells are stacked in order of their position from south to north in the wellfield, such that annual pumpage for well PCX-1, the southernmost well, is on the bottom and annual pumpage for well PV-17, the northernmost well, is near the top of each bar. Pumping from SRP well 22.6E,10.0N, which is located southeast from well PV-14, has been added at the very top of each bar. Although this well is completed across both the MAU and LAU, it contributes to LAU pumping in this region when operated by SRP. Pumping volumes contributed by well PCX-1 and the MRTF extraction wells are shown in shades of red. Pumping volumes for wells without treatment are shown in shades of blue, green, and yellow. A dashed line is provided to group the three southern wells that are tied in to treatment (PCX-1, PV-15, and PV-14). RP well 22.6E,10.0N is shown in pink.

Data displayed on **Figure 19** show that focused pumping of extraction wells PCX-1, PV-15, and PV-14 began in 1998 and continued over the subsequent 10 years. This pumping pattern effectively contained the Northern LAU plume and limited impacts to peripheral production wells (including the more northerly PV wells and SRP 22.6E,10.0N). However, beginning in 2007, a decrease in the amount of pumping by MRTF extraction wells occurred and resulted in the first instance where TCE concentrations exceeded performance metrics at Northern LAU indicator monitoring well PG-42LA and then later at extraction well PV-14. Focused pumping of

MRTF extraction wells was restored midway through 2010 and since that time EPCOR has, to the extent practicable, maintained a south to north pumping strategy. This pumping approach has been shown through model projections to optimize plume containment.

Comparison of TCE mass removed over time at MRTF extraction wells PV-14 and PV-15 and NGTF extraction well PCX-1 shows that groundwater extraction from well PCX-1 has been responsible for the overwhelming majority of TCE mass captured in the Northern LAU over time, preventing much of the LAU plume from reaching the PV wellfield. In 2020, extraction from well PCX-1 was responsible for about 90 of the combined mass removed at MRTF and NGTF extraction wells (**Table 10**).

Based on all available data, even taking into account the performance measure issue at well PG-42LA, the Northern LAU remedy is deemed to be operating effectively through implementation of a coordinated extraction and treatment strategy that focuses on the Amended CD Performance Standard of protection of peripheral production wells for drinking water end use.

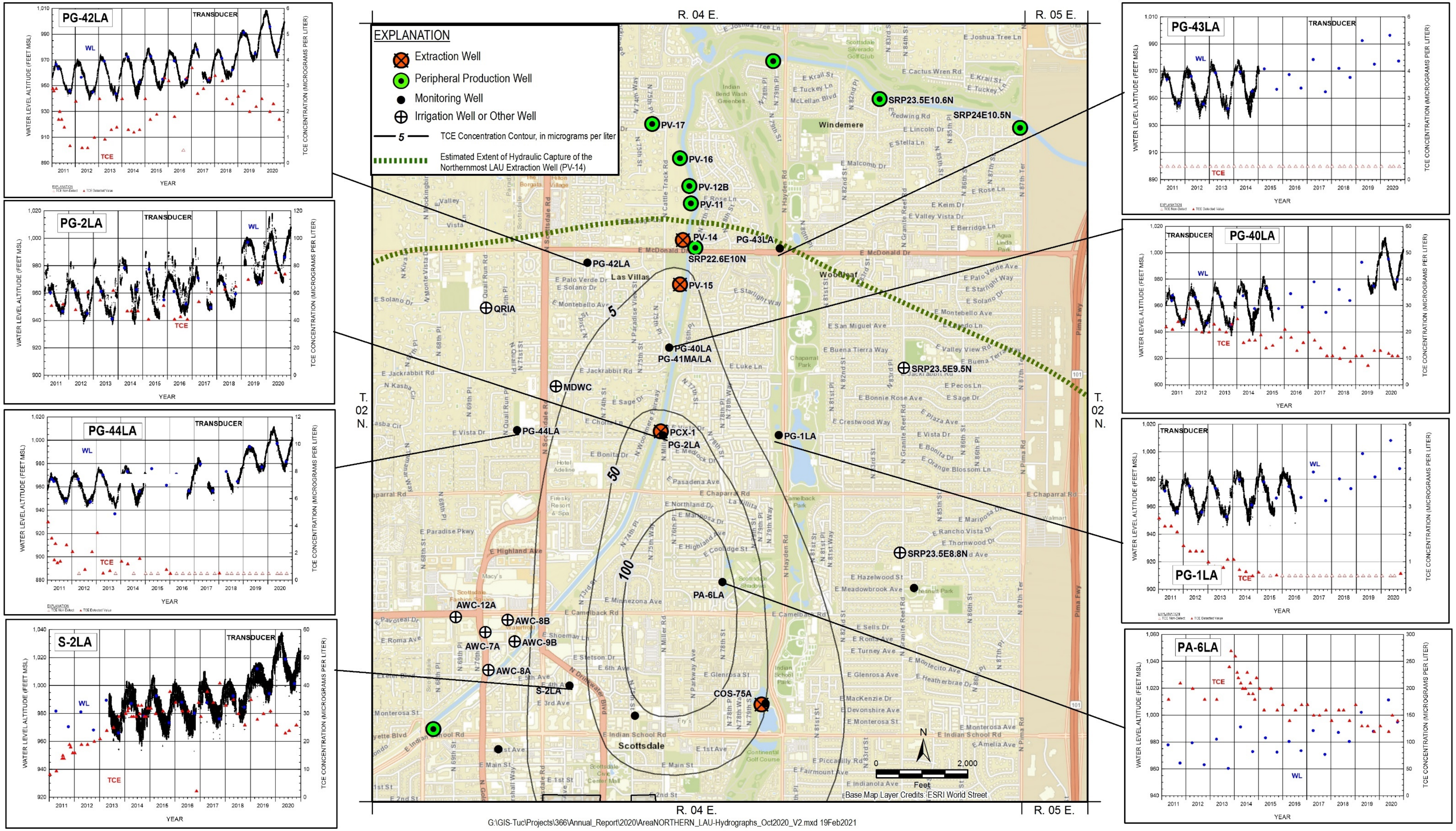

Figure 18. Water Levels, TCE Concentrations, and Estimated Hydraulic Capture for the Northernmost LAU Extraction Well - Northern LAU

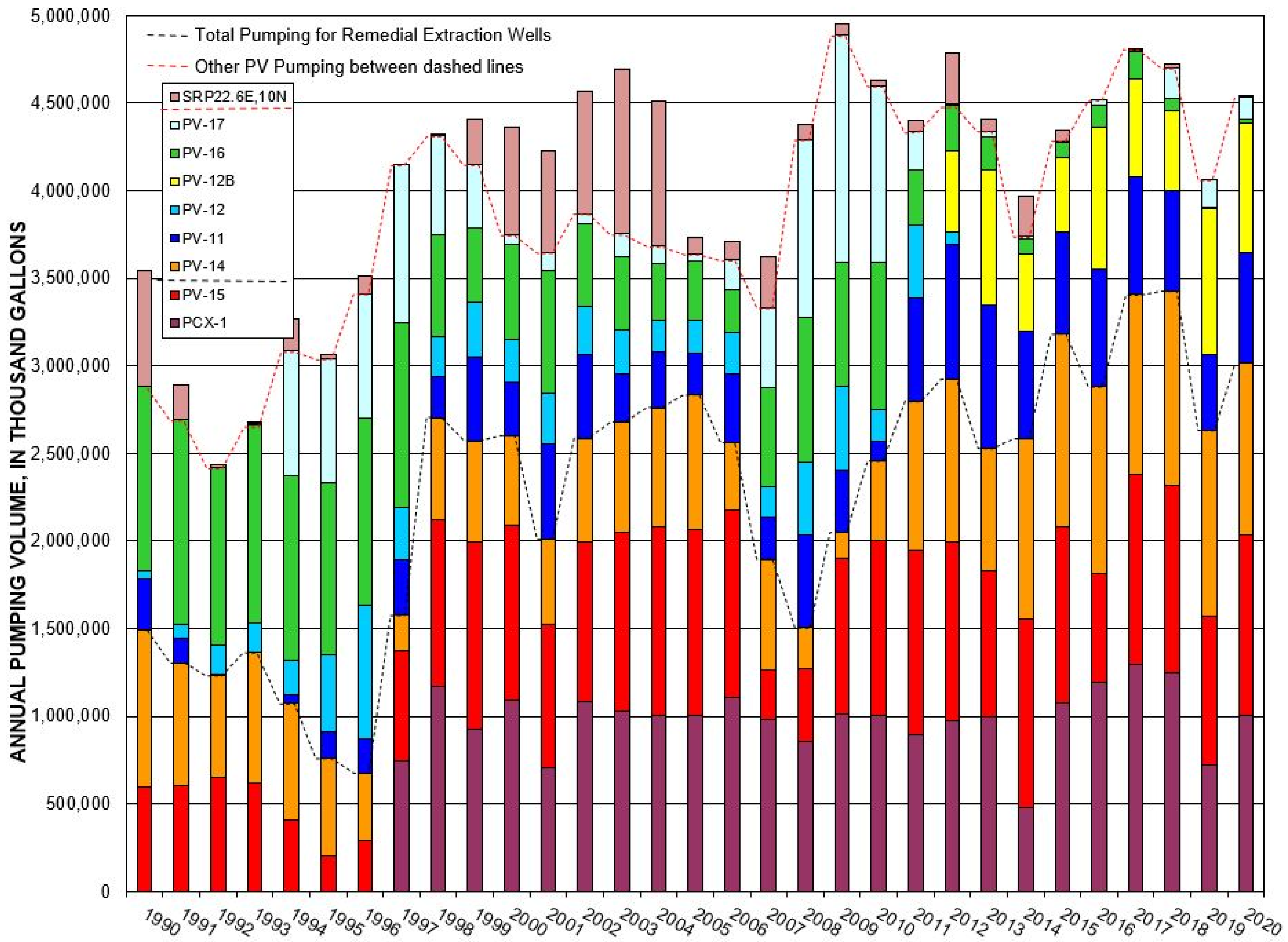

Figure 19. Distribution of Pumping in PV Wellfied

9.4 Evaluation of MAU Source Control Programs

Overall, Area 7 and Area 12 Source Control Program Amended CD containment performance standards are being met. The two systems are reducing the mass of COCs and providing sufficient hydraulic control to prevent MAU groundwater in the vicinity of Area 7 and Area 12 with TCE concentrations higher relative to the surrounding vicinity from migrating away from the source areas. Hydraulic control in these areas is minimizing the total mass of NIBW COCs that is allowed to migrate toward the Western Margin. As described below, extraction at wells tied in to the Area 7 GWETS did not meet the GM&EP metric of extent of capture to the vicinity of PA-12MA in 2020. The PCs have discussed this issue with EPA and ADEQ and continue to conclude that Area 7 containment is consistent with the Amended CD Performance Standard of localized containment of higher concentration groundwater. As discussed with EPA and ADEQ, GM&EP performance criteria related to Source Control Programs, such as demonstration of capture extending down-gradient to a specified location and/or documentation of declining average TCE concentrations in wells in the immediate vicinity of the source areas have been found, in practice, to be unsuitable as measures of remedy performance relative to either the Amended ROD remedial action objectives or the Amended CD SOW Performance Standards. The PCs have presented preliminary proposals for alternative GM&EP metrics and look forward to continued discussions with the Technical Committee.

9.4.1 Area 7 Source Control

Remedy performance metrics for the Area 7 Source Control Program, as outlined in the GM&EP, are summarized in **Table 4**. For 2020, compliance with most of these achievement measures was attained, as discussed below.

Figure 20 includes graphs of water level and TCE concentration data for indicator wells in the vicinity of Area 7. Data from these indicator wells are used to evaluate long-term trends and overall effectiveness of the Area 7 GWETS. Water levels in the vicinity of Area 7 display some seasonal patterns in response to pumping but are otherwise fairly consistent with regional trends, increasing slightly through 2011 and then showing stable to declining trends. TCE concentrations in the MAU indicator wells in the vicinity of Area 7 are generally stable or declining. Four of the six Area 7 indicator wells show declining 10-year trends and two show declining 5-year trends (**Appendix D**). Other indicator wells show no statistically significant trend over these two time periods, with the exception of PA-10MA for both the last 5 and 10 years and E-10MA for the last 5 years. TCE concentrations trends at PA-10MA and E-10MA are attributed to changes in local patterns of groundwater movement resulting from changes in pumping at Area 7 GWETS and CGTF extraction wells.

Figure 20 also shows the estimated extent of hydraulic capture associated with MAU extraction in the vicinity of Area 7. MAU remedial extraction wells 7EX-3aMA and 7EX-6MA were both operational during most of the period when water level data were obtained in May and October 2020. Review of the interpreted hydraulic capture for the Area 7 MAU GWETS indicates that the program is achieving the Amended CD SOW performance standard of providing sufficient hydraulic control to prevent migration away from the source area of MAU groundwater with COC concentrations that are higher relative to the surrounding vicinity. In addition, hydraulic capture data indicate that the MAU Source Control system is also fulfilling the Area 7 GWETS EPA-approved design objective of capturing and removing groundwater with higher concentrations of COCs in the upper MAU near the Area 7 source. The GM&EP specifies an achievement measure that the hydraulic capture zone from Area 7 pumping extend south to the vicinity of well PA-12MA. This achievement measure was not met in 2020 and may not be achievable using available MAU extraction wells tied in to treatment at the Area 7 GWETS and the CGTF.

COS is unable to prioritize use of well COS-71A for extraction and treatment at the CGTF due to elevated concentrations of inorganic COCs unrelated to the Site. While the PCs are working with COS and the other Technical Committee members to develop an approach to bring COS-71A back on line, particularly in the MAU, the current pumping configuration continues to provide sufficient capture to prevent migration of relatively higher COC concentrations associated with Area 7 from migrating to the Western Margin, achieving the performance standard of the Amended CD SOW. Support for this interpretation is evidenced by a long-term (10-year) declining TCE concentration trend in down-gradient monitoring well PA-12MA. Increasing concentration trends at down-gradient well PA-10MA are not inconsistent with this interpretation, as the trends at that well are believed to be related to mass that escaped capture during the time period between when 7EX-5MA went off line and replacement well 7EX-6MA was installed (2012 to 2015). This mass is now heading to the Western Margin for capture in the LAU. Trends at PA-10MA are anticipated to stabilize as a new equilibrium is established at Area 7.

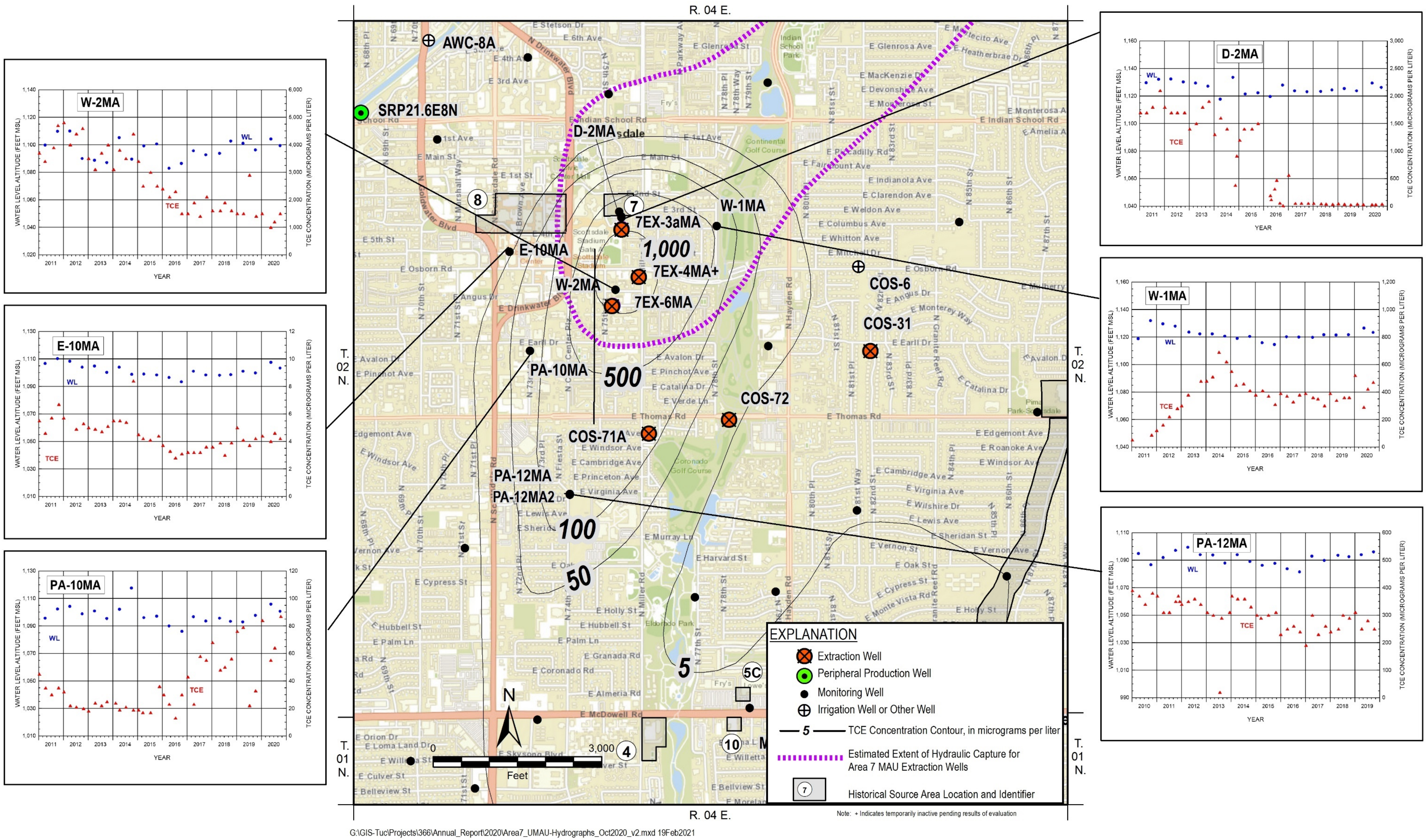

Figure 20. Water levels, TCE Concentrations, and Estimated Hydraulic Capture from Area 7 MAU Extraction Wells

The second evaluation metric for the Area 7 MAU Source Control Program is demonstration of a decline in the 5-year running average of TCE concentrations for the designated index wells (D-2MA, E-10MA, PA-10MA, PA-12MA, W-1MA, and W-2MA) for the period following full implementation of the Area 7 groundwater remedy. **Table 14** summarizes annual average TCE concentrations for the period 1995 through 2020 at the six Area 7 MAU indicator monitoring wells specified in the GM&EP for Area 7. Annual average TCE concentrations at each of the specified Area 7 MAU indicator wells were computed for each year during the period 1995 through 2020; and then a total combined annual TCE average (for all wells) was determined for each year. For the running average calculation, as a conservative measure, the 2015 average TCE concentration was used for well D-2MA for 2016 through 2020 because analytical results for these years have not been representative of historical values. The cause for anomalously low TCE concentrations at D-2MA over the past 5 years has not been determined, and the PCs are considering options to either rehabilitate D-2MA or utilize another MAU well in the area as a replacement. As shown in **Table 14**, the overall 2020 average TCE concentration for the six Area 7 indicator wells of 574 µg/L was lower than the annual average of 648 µg/L for 2019. In addition, the 5-year average TCE concentration that was calculated for the period 2016 through 2020 of 630 µg/L was lower than the average for the previous 5-year period of 663 µg/L. Accordingly, compliance with the mass reduction component of the Area 7 remedy performance was achieved in 2020.

Figure 21 depicts the computed 5-year running average TCE concentration for Area 7 indicator wells. These data indicate that, except for the 5-year periods ending in 2011 and 2012, a declining trend has been observed since this performance measure went into effect in 2004. Increases in the 5-year running averages for these two periods are directly correlated to variations in TCE concentrations reported at monitoring well W-2MA. Since TCE concentrations at well W-2MA are significantly higher than other Area 7 indicator wells, slight variations in TCE concentrations can have a substantial effect on the combined annual averages. TCE concentrations at W-2MA have varied considerably over time; however, data currently show both statistically significant short term (5-year) and long-term (10-year) declining trends (**Figure 20** and **Appendix D**).

In conclusion, the performance measure involving a decline in 5-year running average TCE concentrations was achieved at Area 7 in 2020. However, demonstration of hydraulic capture, such that the direction of groundwater movement from the vicinity of monitoring well PA-12MA is toward the cone of depression associated with Area 7 pumping was not achieved. See Section 9.5 for further discussion.

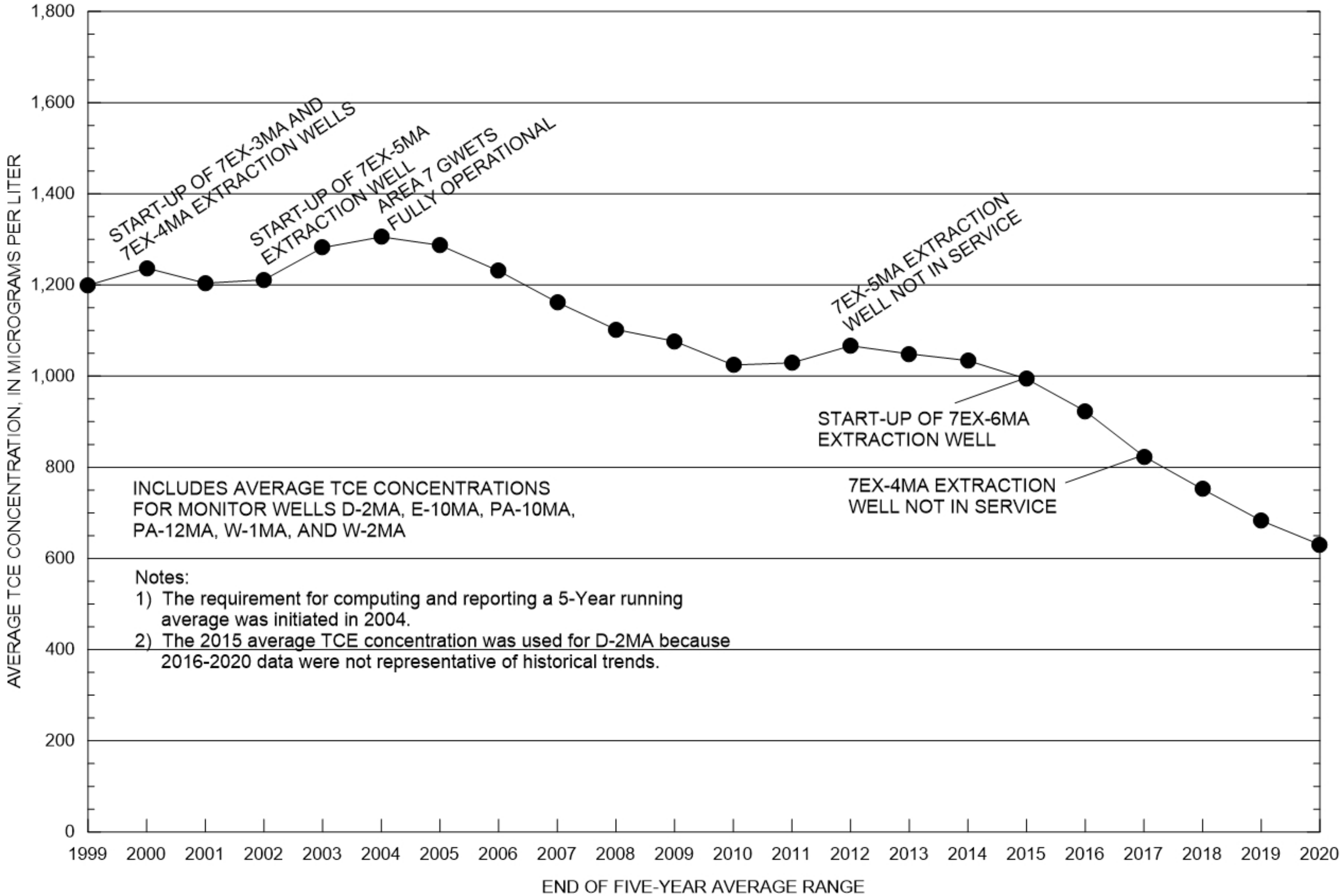

Figure 21. Five-year Running Average of TCE Concentrations in the MAU - Vicinity of Area 7

Table 14. Average TCE Concentrations for MAU Monitoring Wells - Vicinity of Area 7

	AVERAGE TCE CONCENTRATIONS (micrograms per liter)																									
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
D-2MA	---	5,600	4,650	3,500	2,200	2,369	2,533	2,180	2,200	1,650	1,650	1,145	828	1,015	1,550	1,675	1,825	1,725	1,650	1,303	1,375	1,375	1,375	1,375	1,375	1,375
E-10MA	6	6	6	11	15	15	15	14	10	8	7	6	5	6	5	5	6	5	5	6	4	3	3	4	4	4
PA-10MA	12	15	26	68	96	68	39	39	46	39	41	36	35	41	34	31	36	24	22	21	22	24	45	56	53	73
PA-12MA	190	135	175	360	760	608	586	581	580	483	483	400	407	360	400	370	343	348	303	355	300	245	245	270	273	265
W-1MA	2,800	1,045	560	200	497	1,432	707	389	495	270	335	151	129	95	88	44	70	195	387	575	468	368	368	350	363	425
W-2MA	3,000	1,950	2,050	1,950	2,900	3,844	3,875	4,490	4,875	4,725	5,275	4,325	4,225	4,900	4,325	4,100	3,925	4,450	3,575	3,700	2,850	2,075	1,725	1,675	1,825	1,300
ANNUAL AVERAGE	**1,202**	**1,458**	**1,245**	**1,015**	**1,078**	**1,390**	**1,292**	**1,282**	**1,368**	**1,196**	**1,298**	**1,010**	**938**	**1,069**	**1,067**	**1,038**	**1,034**	**1,124**	**990**	**993**	**837**	**682**	**627**	**622**	**649**	**574**

NOTES:

1) Duplicates were not used in the calculation of 5-Year Average TCE Concentrations.
2) 2015 average TCE concentration was used for D-2MA because 2016-2020 data were not representative of historical trends.

Five-Year Average TCE Concentrations (micrograms per liter)

1995-1999	1,199	Start-Up of 7EX-3MA and 7EX-4MA Extraction Wells
1996-2000	1,237	
1997-2001	1,204	
1998-2002	1,211	Start-Up of 7EX-5MA Extraction Well
1999-2003	1,282	Area 7 GWETS Fully Operational
2000-2004	1,305	Performance Measure Became Effective
2001-2005	1,287	
2002-2006	1,231	
2003-2007	1,162	
2004-2008	1,102	
2005-2009	1,077	
2006-2010	1,024	
2007-2011	1,029	
2008-2012	1,066	Beginning in 2012 7EX-5MA Extraction Well Not in Service
2009-2013	1,051	
2010-2014	1,036	
2011-2015	996	Start-Up of 7EX-6MA Extraction Well
2012-2016	925	
2013-2017	826	Beginning in 2017 7EX-4MA Extraction Well Not in Service
2014-2018	752	
2015-2019	683	
2016-2020	630	

9.4.2 Area 12 Source Control

Remedy performance metrics for the Area 12 Source Control Program, as outlined in the GM&EP, are summarized in **Table 4**. For 2020, compliance with most of these achievement measures was attained, as discussed below.

Figure 22 includes graphs showing 10 years of water level and TCE concentration data for indicator wells in the vicinity of Area 12. Data from these indicator wells help to evaluate long-term trends and confirm overall effectiveness of the Area 12 groundwater extraction and treatment system. Water levels in the vicinity of Area 12 display seasonal patterns in response to pumping. Water level trends at the Area 12 indicator wells were generally increasing through 2011, declining in 2012 and 2013, and then stable to increasing from 2014 through 2020, as shown on **Figure 22**. Although TCE concentration trends at all Area 12 MAU indicator wells are stable or declining over the long term (10 years), two wells (E-1MA and M-6MA) exhibit short term (5 years) increasing TCE concentration trends. The increasing trends are linked to variability groundwater pumping patterns at the Area 12 GWETS extraction wells - MEX-1MA and the Granite Reef well. Specifically, while MEX-1MA was pumped consistently over the last 5 years, maintenance issues have resulted in a curtailed pumping schedule for the Granite Reef well for 3 of the last 5 years (2017, 2019, and 2020). SRP replaced the pump at the Granite Reef well in 2020, and the PCs are encouraged that more consistent pumping will occur in 2021.

Figure 22 also shows MAU TCE concentration contours for October 2020 and the estimated extent of hydraulic capture associated with Area 12 MAU extraction. MAU water level contours and the associated interpretation of MAU hydraulic capture for the Area 12 GWETS for October 2020 are also shown on **Figure 17**. Review of patterns of groundwater movement and the extent of hydraulic capture for the vicinity of Area 12 indicates that a cone of depression occurs as a result of MAU pumping at Area 12 extraction wells (MEX-1MA and the Granite Reef well). Consistent with the achievement measure, direction of groundwater movement from the general vicinity of Hayden Road is to the east toward this cone of depression. Accordingly, compliance with the hydraulic capture component of the Area 12 remedy performance was achieved in 2020.

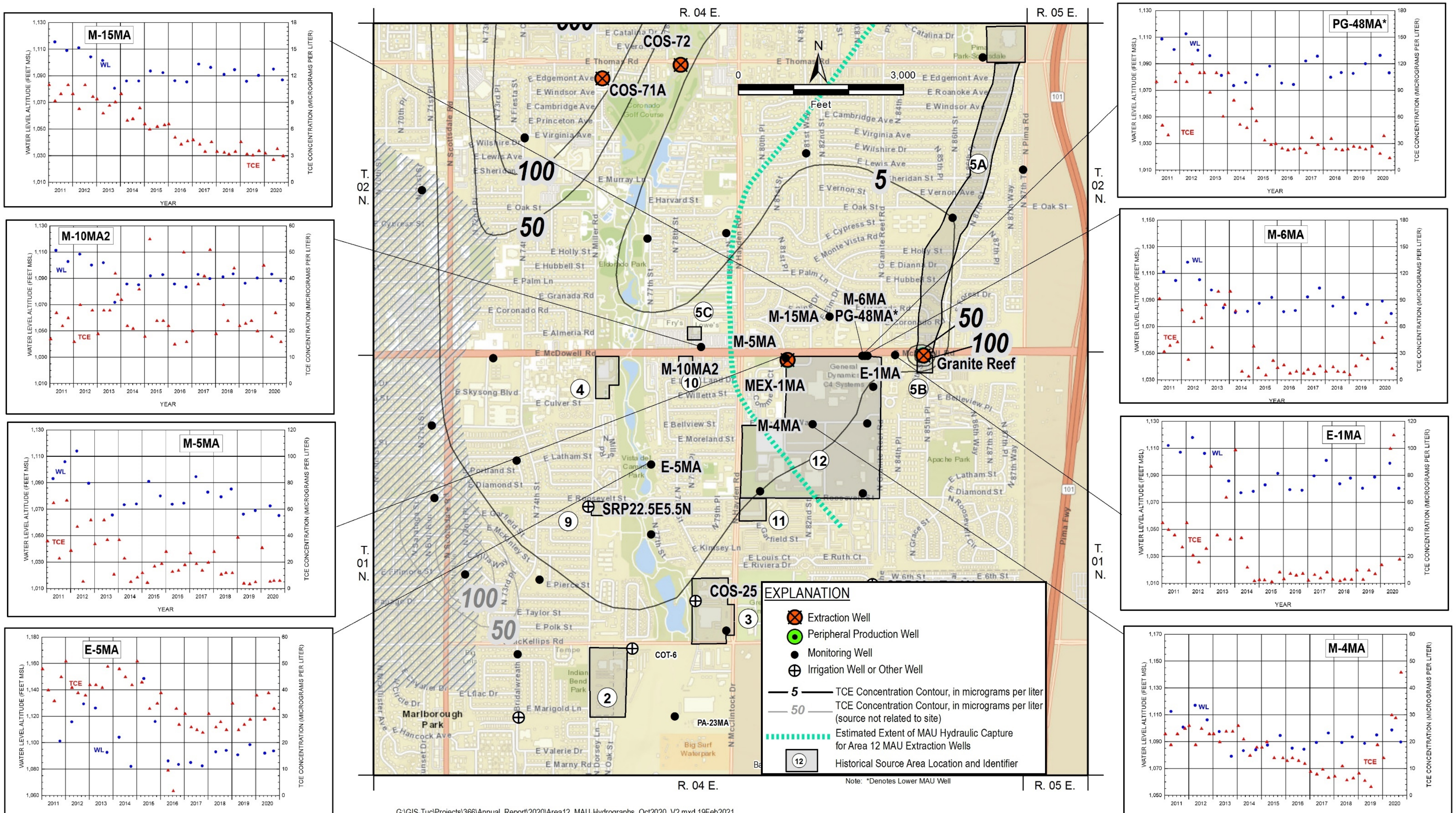

Figure 22. Water Levels, TCE Concentrations, and Estimated Hydraulic Capture from Area 12 MAU Extraction Wells

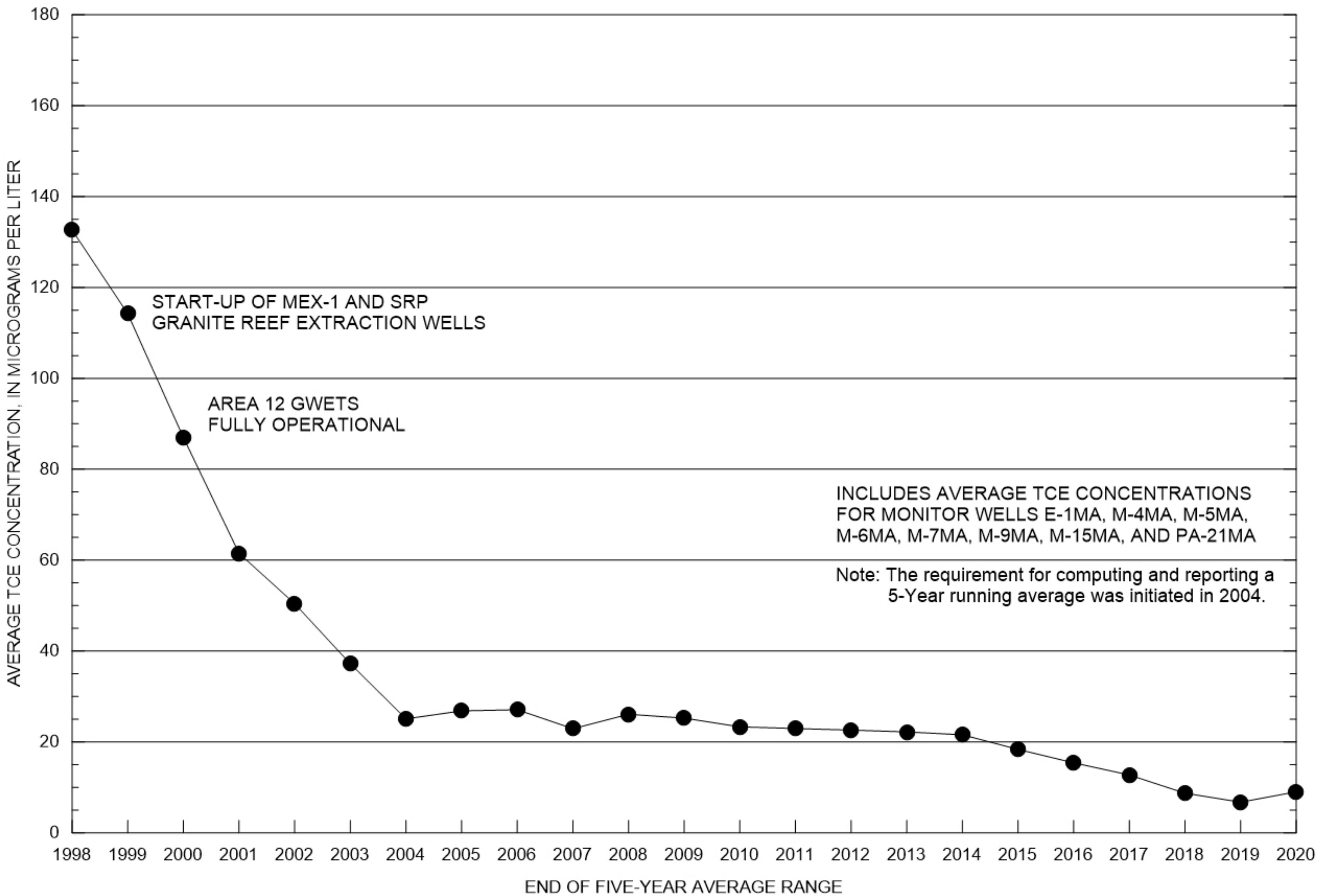

Figure 23. Five-year Running Average of TCE Concentrations in the MAU - Vicinity of Area 12

The second evaluation metric for the Area 12 MAU Source Control Program is demonstration of a decline in the 5-year running average of TCE concentrations for the designated index wells (E-1MA, M-4MA, M-5MA, M-6MA, M-7MA, M-9MA, M-15MA, and PA-21MA) for the period following full implementation of the Area 12 groundwater remedy. **Table 15** summarizes annual average TCE concentrations for 1994 through 2020 for the eight Area 7 MAU indicator monitoring wells specified in the GM&EP for Area 7. Annual average TCE concentrations at each of the specified Area 12 MAU indicator wells were computed for each year and then the individual monitoring well annual average TCE concentrations were averaged to arrive at a combined Area 12 average for each year. The combined average TCE concentration for the Area 12 MAU indicator wells for 2020 was 19 µg/L, which is higher than the annual average of 7 µg/L for 2019. Using the 2020 combined annual average TCE value, the 5-year average was calculated to be 9 µg/L for the period 2016 through 2020. This value is slightly higher than the average of 7 µg/L that was computed for the previous 5-year period. As such, compliance with the mass reduction component of the Area 12 remedy performance was not achieved in 2020. Contingency responses are discussed in **Section 9.5** below.

Figure 23 depicts the computed 5-year running average TCE concentrations for Area 12 indicator wells. These data indicate that, except for the 5-year periods ending in 2008 and 2020, a stable or declining trend in the running average TCE concentrations at Area 12 has been observed since this performance measure came into effect in 2004. The increase in the 5-year running average for the period ending in 2008 was small and appears to be attributable to a sequence of lower pumping years for the Granite Reef well (**Table 8**). As discussed above, this was also the case for the most recent 5-year period.

In conclusion, demonstration of hydraulic capture, such that the direction of groundwater movement from the vicinity of Hayden Road is toward the cone of depression associated with Area 12 pumping was achieved in 2020. However, the performance measure involving a decline in 5-year running average TCE concentrations was not achieved at Area 12 in 2020. See **Section 9.5** for further discussion.

Table 15. Average TCE Concentrations for MAU Monitoring Wells - Vicinity of Area 12

	AVERAGE TCE CONCENTRATIONS (micrograms per liter)																										
	1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
E-1MA	367	440	490	370	350	370	18	3	130	3	56	73	42	22	63	21	34	37	27	55	37	4	6	5	3	8	61
M-4MA	29	20	32	31	32	28	27	20	24	21	25	26	20	21	20	19	20	23	23	23	20	17	13	8	8	9	30
M-5MA	377	365	295	120	43	65	79	115	105	45	53	54	68	65	50	65	58	48	33	34	19	13	18	20	16	13	12
M-6MA	333	315	180	113	120	125	22	7	55	2	40	69	43	49	68	38	63	52	60	77	48	20	12	11	11	19	42
M-7MA	11	7	6	8	9	3	0	1	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
M-9MA	150	113	72	52	24	15	10	8	5	6	7	7	4	4	5	5	4	4	5	5	4	3	3	4	2	4	6
M-15MA	105	14	115	83	40	75	40	25	19	14	13	11	12	12	12	12	11	10	10	9	8	6	5	4	3	4	3
PA-21MA	44	14	8	7	3	2	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANNUAL AVERAGE	**177**	**161**	**150**	**98**	**78**	**85**	**24**	**22**	**42**	**12**	**24**	**30**	**24**	**22**	**27**	**20**	**24**	**22**	**20**	**25**	**17**	**8**	**7**	**7**	**5**	**7**	**19**

NOTES:

Duplicates were not used in the calculation of 5-Year Average TCE Concentrations.

Five-Year Average TCE Concentrations (micrograms per liter)

1994-1998	**133**	
1995-1999	**114**	**Start-Up of MEX-1 and SRP Granite Reef Extraction**
1996-2000	**87**	**Area 12 GWETS Fully Operational**
1997-2001	**62**	
1998-2002	**50**	
1999-2003	**37**	
2000-2004	**25**	**Performance Measure Became Effective**
2001-2005	**26**	
2002-2006	**26**	
2003-2007	**22**	
2004-2008	**25**	
2005-2009	**25**	
2006-2010	**23**	
2007-2011	**23**	
2008-2012	**23**	
2009-2013	**22**	
2010-2014	**22**	
2011-2015	**18**	
2012-2016	**15**	
2013-2017	**13**	
2014-2018	**9**	
2015-2019	**7**	
2016-2020	**9**	

9.5 GM&EP Contingency Responses

9.5.1 LAU Wells with TCE Concentrations above GM&EP Achievement Measures

Two LAU wells did not achieve their respective TCE concentration achievement measures in 2020: S-2LA and PG-42LA. Increasing TCE concentrations in the Northern LAU were anticipated as LAU mass migrated toward northern extraction wells, and these two wells have displayed concentration increases that are directly attributable to plume migration. A general shift of the west has been observed over time as the LAU plume has migrated to the north toward capture wells, and the western flank of the LAU plume in the vicinity of S-2LA and PG-42LA has been being closely monitored for several years, as described below.

Well S-2LA has consistently exceeded the achievement measure of 15 µg/L since 2011. The PCs have conducted significant investigation work to characterize LAU groundwater conditions in the vicinity of well S-2LA and update the assessment of plume containment. Results of initial contingency evaluations were summarized in the 2011 SMR. Findings of the 2011 evaluation indicated that the increase in TCE concentrations at well S-2LA may be attributable to migration of TCE mass from an upgradient portion of the LAU plume that is located within the combined hydraulic capture zone created by pumping of CGTF, NGTF, and MRTF extraction wells. After contingency response actions were initiated at well S-2LA in 2011, TCE concentrations at this well continued to increase at a similar rate until 2014, then appeared to stabilize (**Figure 18 and Appendix D**). In fact, while Mann-Kendall trend analyses show that there is still a long-term (10-year) increasing trend in TCE concentrations at well S-2LA, a declining trend exists in the more recent data set (5 years). These results indicated that TCE concentrations at S-2LA have leveled off and are beginning to decline, as mass migrates north for capture at northern extraction wells. The PCs anticipate this trend to continue in 2021.

TCE concentrations were first reported to exceed the GM&EP metric of 2 µg/L at well PG-42LA in 2011, and contingency response actions included data acquisition and analyses to further characterize LAU groundwater conditions. The overall findings from this nearly year-long effort indicated that the NIBW remedy was performing effectively to contain the Northern LAU plume. Containment and capture of the leading edge of the Northern LAU plume are demonstrated by multiple lines of evidence, including evaluation of water quality data, water level data, and groundwater modeling analyses. Recent TCE concentration trends at PG-42LA, like S-2LA, are encouraging. While there is a longer-term (10-year) increasing concentration trend at PG-42LA, the trend of the last 5 years is actually decreasing. These trends suggest that the northern edge of the LAU plume is being effectively captured and that mass in the area is being reduced over time.

Encouraging trends at S-2LA and PG-42LA are attributed to consistent pumping at PCX-1, PV-14, and PV-15. Coordinated pumping of other PV wells north of the MRTF, in accordance with the optimal plume containment strategy, which prioritizes pumping from south to north, is also critical (**Figure 18**). While the NIBW PCs continue to closely monitor water quality at specific LAU wells where metric exceedances have occurred, along with overall containment of the LAU plume using water level data and modeling, EPA in 2012 approved suspension of formal contingency actions associated with Northern LAU containment. In conjunction with ongoing data evaluation, the NIBW PCs will continue to work with the Technical Committee to consider potential revised GM&EP performance measures and, as appropriate, updated metrics for the LAU.

9.5.2 Area 7 Capture to PA-12MA

Capture zones interpreted from water level data show that the current pumping configuration provides sufficient capture to prevent migration of relatively higher COC concentrations associated with Area 7 from migrating to the Western Margin and into the LAU, consistent with the Amended CD SOW performance standard. However, the GM&EP achievement measure that the hydraulic capture zone from Area 7 pumping extend south to the vicinity of well PA-12MA was not met in 2020. In fact, as discussed with the Technical Committee, this metric is not likely to be achievable using currently available MAU extraction wells tied in to treatment at the Area 7 GWETS or the CGTF. The PCs are working with COS and the other Technical Committee members to develop an approach to resume pumping at well COS-71A, particularly from the MAU part of the perforated interval, which would significantly increase capture of the MAU plume downgradient from Area 7. Investigations are planned for 2021 to evaluate both the feasibility and potential benefits of this remedy enhancement.

9.5.3 Area 12 Five-Year Running Average

In 2020, Area 12 did not meet the GM&EP metric of a decline in the 5-year running average of annual average TCE concentrations for the group of eight Area 12 indicator wells specified in the GM&EP. While the increase was relatively small (from 7 µg/L to 9 µg/L for the 5-year running average), the cause for the shift is understandable. While MEX-1MA was pumped consistently over the last 5 years, maintenance issues have resulted in a curtailed pumping schedule for the Granite Reef well for 3 of the last 5 years (2017, 2019, and 2020). This pumping reduction, while not preventable, caused two wells in the immediate vicinity of the Granite Reef well (E-1MA and M-6MA) to exhibit short term (5-year) increasing TCE concentration trends. While all of these wells are within the Area 12 MAU Source Control capture zone, SRP replaced the pump at the Granite Reef well in 2020 and the PCs are encouraged that more consistent pumping will occur in 2021.

9.6 Evaluation of Groundwater Treatment Performance Standard

Performance of the NIBW groundwater treatment systems is evaluated based on criteria established in the SOW and compliance with groundwater Cleanup Standards specified in the Amended ROD and shown in **Table 2**. The following sections summarize monitoring data from treatment system effluent samples obtained during 2020 with respect to groundwater treatment performance standards at the five treatment facilities. A summary of all treatment facility sample points and frequency is provided in **Table 5,** for reference. Laboratory results for VOCs in treatment system samples are included for MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS in **Table C-3**. Quarterly results for treatment system performance sampling conducted by COS at the CGTF are reported to EPA and ADEQ under separate cover.

9.6.1 CGTF Evaluation

Throughout 2020, samples of treated groundwater were collected from the common sump at the CGTF and analyzed for the NIBW COCs on a weekly basis when the treatment facility was in operation. The NIBW COC concentrations in all treated water samples from the common sump samples were below the Method Reporting Limit (MRL) of 0.50 µg/L and consistently achieved the Cleanup Standards presented in **Table 2**. Although COS submits results under separate cover, Level 4 data analytical reports are included as part of the supplemental data reports submitted with the SMR.

9.6.2 MRTF Evaluation

Throughout 2020, samples of treated groundwater were collected from the MRTF treatment trains (Tower 1 Effluent, Tower 2 Effluent, Tower 3 Effluent) and analyzed for the NIBW COCs on a monthly basis when the treatment facility was in operation. The results of sampling and analysis are included in **Table C-3**. As evidenced from the data, the NIBW COC concentrations in all treated water samples from the MRTF treatment trains were below the MRL of 0.50 µg/L and consistently achieved the Cleanup Standards presented in **Table 2**.

9.6.3 NGTF Evaluation

Throughout 2020, samples of treated groundwater were collected from the treatment plant discharges to both the CWTP (NGTF-CP) and to the SRP Arizona Canal (referred to as AZCO for COS samples) and analyzed for the NIBW COCs on a weekly basis when the treatment facility was in operation. The results of sampling and analysis are included in **Table C-3**. As evidenced from the data, the NIBW COC concentrations in all treated water samples from the treatment plant discharges were below the MRL of 0.50 µg/L for TCE, PCE, 1,1-DCE, and TCA and consistently achieved the Cleanup Standards presented in **Table 2**; therefore, discharges from NGTF met the requirements of the AZPDES permit. Additional sampling and analysis for physical and inorganic water quality parameters is reported in monthly DMRs submitted to ADEQ and EPA.

9.6.4 Area 7 GWETS Evaluation

Throughout 2020, samples of treated groundwater were collected from air stripper effluent (SP-105) at the Area 7 GWETS and analyzed for the NIBW COCs on a monthly basis when the treatment facility was in operation. The results of sampling and analysis are included in **Table C-3**. As evidenced from the data, the NIBW COC concentrations in all treated water samples from the Area 7 GWETS (SP-105) were below the MRL of 0.50 µg/L and consistently achieved the Cleanup Standards presented in **Table 2**; therefore, the discharge meets Arizona AWQS for these parameters.

9.6.5 Area 12 GWETS Evaluation

Throughout 2020, samples of treated groundwater were collected from air stripper effluent (WSP-2) at the Area 12 GWETS and analyzed for NIBW COCs on a monthly basis when the treatment system was in operation. The results of sampling and analysis are included in **Table C-3**. As evidenced from the data, the NIBW COC concentrations in all treated water samples from the Area 12 GWETS (WSP-2) were below the MRL of 0.50 µg/L and consistently achieved the Cleanup Standards presented in **Table 2**. Therefore, discharges from Area 12 GWETS met the requirements of the AZPDES permit. Additional sampling and analysis for physical and inorganic water quality parameters is reported in monthly DMRs submitted to ADEQ and EPA.

9.7 Progress Toward Achievement of Remedial Action Objectives

EPA established seven RAOs for the NIBW Site (A through G) in the September 2001 Amended ROD (**Section 3.1.2**). The following is a qualitative discussion of the progress achieved in satisfying RAOs, based on review of data through 2020. Details regarding data that provide a more quantitative basis to support the following qualitative statements regarding specific aspects of the remedy are provided in earlier sections of the SMR.

Remedial Action Objective A - Restoration:

Significant progress has been made toward the removal and restoration of groundwater to drinking water quality with respect to the Site COCs. In 2020, the NIBW remedial actions resulted in the extraction and treatment of about 4.9 billion gallons of groundwater and removal of about 1,860 pounds of TCE, as shown in **Table 10**. From the inception of the NIBW groundwater remedy in 1994, about 135 billion gallons of groundwater have been extracted to remove an estimated 96,300 pounds of TCE. Furthermore, soil remedial actions (as discussed in RAO F) have eliminated the threat to groundwater from historical sources of TCE at EPA-identified source areas. As a consequence, TCE concentrations have dramatically decreased in the UAU and significantly decreased across large portions of the MAU and LAU.

The most significant declines observed in TCE concentrations are in UAU groundwater. According to UAU mass flux calculations, the estimated VOC mass in the UAU has declined from about 11,100 pounds in 1993 to approximately 168 pounds in 2020, representing a decrease of more than 98% in the past 27 years (**Figure 16**). In 2020, the Cleanup Standard for TCE was exceeded at only one monitoring well, with a TCE concentration of 20 µg/L at well PG-31UA. Historically, TCE concentrations in UAU groundwater were two to three orders of magnitude higher than at present. The extent of VOC impact in the UAU has also been greatly reduced, as evident in **Figure 10**, where only small, localized TCE plumes remain down-gradient from Area 7 and Area 12. While there are two wells with increasing 5-year TCE concentration trends (PG-16UA and PG-19UA) and one well with a 10-year increasing trend (PG-31UA), overall reductions have been significant and widespread across the UAU. Based on this observation, EPA approved and the NIBW PCs have conducted formal abandonment of a total of 43 UAU monitoring wells.

Evidence of progress toward restoration in the MAU and LAU is also significant (**Figure 14 and Figure 15**). Based on the last 5 years of data, stable to declining TCE concentrations are evident in all but five MAU monitoring wells and in all but one MAU extraction well. These wells are all located in the vicinity of either Area 7 or Area 12. Longer-term (10-year) increasing trends are only observed in one MAU monitoring well. These data point to the impact of significant mass removal that has occurred since initiation of the MAU Source Control Programs. Within the LAU, no trend or decreasing trends are observed over the 5-year period at all but two monitoring wells and all extraction wells. Longer-term (10-year) TCE concentration increases are limited to three LAU monitoring wells. These data demonstrate that coordinated and consistent operation of key LAU extraction wells—particularly COS-75A and PCX-1—is effectively reducing mass in LAU, while MAU Source Control Programs are significantly reducing the amount of new TCE mass entering the LAU via the Western Margin.

Restoration of the aquifer for drinking water end use is the overriding goal of the NIBW remediation program. While restoration of UAU groundwater has progressed significantly, the process in the MAU and LAU—which are less permeable, thicker, and more aerially extensive than the UAU—will take significantly longer. However, information presented in the 2020 SMR demonstrates that significant progress is being made.

Remedial Action Objective B - Eliminate Exposure:

As presented in **Section 8**, groundwater that is extracted as part of the NIBW Site remedy was treated in 2020 to meet the groundwater Cleanup Standards specified in the Amended ROD, which results in protection of human health and the environment.

Remedial Action Objective C- Provide COS with Potable Water Source:

The CGTF was constructed to provide treatment of TCE-impacted groundwater for COS beneficial use. Since the CGTF began operation under COS in 1994, the CGTF has treated about 68 billion gallons of groundwater to levels safely below drinking water MCLs for the NIBW COCs. The treated groundwater is blended with other potable sources and used as a supply to the COS municipal water system.

Although not Site COCs, increasing concentrations of inorganic constituents have impacted COS's ability to pump, treat, and serve water from certain key remedial extraction wells through its municipal system. A post-treatment acid feed system at the CGTF was brought online in 2017 to adjust the pH of the treated water from CGTF to address calcium carbonate scale in COS's system. Since 2017, the PCs have collaborated with COS to develop solutions that enabled COS to manage its inorganic challenges, while continuing to support extraction and treatment to provide for TCE plume containment. By prioritizing pumping at extraction well COS-75A, and bringing other wells online only as needed in response to demand, COS has been able to maintain a balance between the VOC remedy and concentrations of inorganic COCs in its system. A reverse osmosis treatment facility, which will be capable of removing inorganic COC from about 2,000 gpm of VOC-treated water from the CGTF, is anticipated to come on line in 2021. The PCs will continue to work with COS in 2021 to find ways to enhance the VOC remedy plume containment and mass removal objectives in a manner that supports municipal supply needs. Concepts that have been previewed with the Technical Committee, such as bringing COS-71A back online to pump only from the MAU and tying monitoring well PG-41MA/LA in to treatment at the NGTF, are promising and will continue to be explored.

Remedial Action Objective D - Plume Containment:

Water level data continue to support the interpretation that the direction of groundwater movement within the MAU/LAU plume is generally toward NIBW extraction wells or the Western Margin. While drawdown impacts of pumping by AWC irrigation supply wells are being evaluated, particularly in the LAU, groundwater samples obtained from these wells in October 2020 all showed TCE concentrations were below the detection limit. Monitoring wells located near the edge or along the periphery of the MAU/LAU plume show decreasing trends in many parts of the Site and peripheral production wells are being protected for drinking water end use. In cases where increasing trends at specific wells have been noted (such as PA-10MA, S-

2LA, and PG-42LA), the NIBW PCs continue to evaluate and report trends to the Technical Committee to ensure that the overall objectives of the MAU/LAU remedy are maintained.

Remedial Action Objective E - Consistency with Arizona's Groundwater Management Act:

Treated water produced by all five NIBW groundwater treatment facilities is beneficially used. The CGTF and NGTF provide treated groundwater as a supply to the COS potable water system or may alternately deliver treated water to SRP. The MRTF treats groundwater for use by EPCOR. At Area 7, treated groundwater is delivered to shallow injection wells that recharge the UAU aquifer and enhance UAU plume migration to the Western Margin. Treated water from the Area 7 system has elevated concentrations of inorganic COCs and is not suitable for direct potable use. At Area 12, treated groundwater is provided to the SRP water system for irrigation use. SRP reports that the canal system that receives discharge from the Area 12 GWETS will be migrated to drinking water end use in the future. All NIBW end-uses are consistent with beneficial use designations of ADWR and in accordance with the Groundwater Management Act. Furthermore, the NIBW remedy has incorporated COS, SRP, and EPCOR as end users of treated groundwater in lieu of groundwater pumping they have historically conducted and would have otherwise relied upon within and near the Site.

Remedial Action Objective F - Mitigate Soil Impacts to Groundwater:

As described in **Section 3.4**, the NIBW PCs have implemented soil remediation at four EPA-identified source areas - Areas 6, 7, 8, and 12. The collective soil remediation has resulted in the removal of over 10,000 pounds of TCE from the unsaturated zone and eliminated these sources as an ongoing threat for groundwater impacts. All vadose zone remedies at the Site were closed out with EPA approval.

Remedial Action Objective G - Improve Aquifer Suitability for Potable Use:

The NIBW PCs have closely coordinated the planning and implementation of NIBW remedial actions with the key water providers, including COS, SRP, and EPCOR. The efforts have strongly focused on defining mutually beneficial objectives for all parties involved in the remedy. For example, the NIBW remedy requires consistent and reliable groundwater extraction in the areas most favorable for capture and containment of the MAU/LAU plumes. The water providers have considerable, but variable, water demands in the NIBW Site area and a system of existing wells and infrastructure available for groundwater pumping.

Through technical discussions and cooperation, the parties have taken a number of steps to focus groundwater extraction and end uses for optimum water resource management. For example, the NIBW PCs have installed, modified, and replaced, as needed, a number of the water provider wells to improve groundwater plume capture and mass removal. To assure that the water providers can utilize the treated groundwater, the NIBW PCs have upgraded treatment systems and enhanced infrastructure and control systems for the water providers. The water providers have cooperated by prioritizing pumping to meet water demands using those wells most beneficial to the remedy.

In 2020, the PCs continued to work with COS to help balance inorganic loading to their municipal system. Although not Site COCs, increasing concentrations of inorganic constituents have impacted COS's ability to accept water from certain key remedial extraction wells. Through discussions with the Technical Committee, solutions were developed and are being implemented that enable COS to manage inorganic challenges, while continuing to support extraction and treatment to provide for TCE plume containment. Remedy enhancements are also being discussed (bringing COS-71A back online to pump from the MAU only and tying well PG-41MA/LA in to treatment at the NGTF) that have the potential to benefit both the NIBW remedy and COS's ability to control inorganic COCs in its system.

9.8 Monitoring Network Evaluation

The GM&EP requires an annual assessment of the scope and frequency of monitoring activities to optimize program effectiveness over time. In the first Five-Year Review of the NIBW Superfund Site (2011), EPA comprehensively reviewed groundwater monitoring data obtained pursuant to the GM&EP and concluded significant progress has been achieved toward restoration of the UAU. Based on this finding, EPA and the NIBW PCs agreed to reassess and revise the UAU groundwater monitoring program as part of an optimized approach to be adopted in an updated GM&EP. With EPA approval, the NIBW PCs have conducted formal abandonment of a total of 43 UAU monitoring wells to date. Concentrations of COCs in the remaining 28 UAU monitoring wells are generally declining over time. The PCs will continue to collect data from the remaining UAU monitoring wells.

The scope and frequency of the MAU and LAU groundwater monitoring program is evaluated in an ongoing manner relative to GM&EP performance evaluation requirements. In response to input received from EPA in 2020 regarding the potential need for additional monitoring wells, the PCs evaluated the monitoring network in relation to compliance with the GM&EP. Results of this evaluation were discussed with EPA in Technical Committee meetings and supplemental data collection tasks in support of the monitoring network evaluation were completed during 2020 that are summarized in **Section 10**.

The current compliance monitoring network consists of 121 wells, 110 of which are monitoring wells (28 UAU wells, 49 MAU wells, 3 MAU/LAU wells, and 30 LAU wells) and 11 of which are extraction wells.

9.9 Evaluation of Need for Modeling Analyses

The remedy for the NIBW Site established in the Amended ROD includes periodic use of modeling analyses to "assess the accuracy over time of projections in the Feasibility Study Addendum." The GM&EP presented an approach to determine when modeling analyses would be considered, what the scope of modeling analyses would comprise, and how results of modeling analyses would be used.

The NIBW model has been a useful tool for specific analyses over time, such as predicting patterns of groundwater movement and hydraulic capture associated with groundwater pumping occurring at the Site or changes to the pumping regime. In addition to use to project capture for the annual SMR, some of the applications for the NIBW groundwater flow model have included:

- 2011 Five-Year Review estimates of restoration time frame for the LAU
- 2012 evaluation of pumping changes associated with COS end-use of water extracted from well PCX-1 and replacement of existing CGTF extraction well COS-71 with new extraction well COS-71A
- 2013 to 2014 evaluation of alternate locations for installation of replacement extraction well 7EX-6MA to enhance the Area 7 MAU Source Control Program
- 2016 evaluation of hydraulic capture for the MAU and LAU remedial systems to provide information to evaluate remedy performance for the second Five-Year Review
- 2019 updates to model boundaries to reflect water level trends and to improve model calibration
- 2020 to 2021 comprehensive model update, including:
    - Migrating the model to an updated and more robust code
    - Expanding the model domain to explicitly include regional features as they are simulated in a public domain model developed by ADWR (Salt River Valley [SRV] Regional Model)
    - Incorporating data and information collected since the FSA model
    - Developing a more representative characterization of the Western Margin
    - Using the parameter estimation routine PEST (a software package and suite of utility programs) as an automated calibration tool

Throughout the current model update process, the PCs have been working collaboratively with technical representatives from EPA and the entire NIBW Technical Committee. The PCs are also providing updates and seeking input at critical junctures. The groundwater flow model update is anticipated to be completed in the first half of 2021 and will be available for ongoing uses at the Site.

9.10 CSM Evaluation

Interpretation of data from 2020 indicates that there are no substantial changes to the overall understanding of the CSM, or the remedy which has been built around the CSM. The PCs will continue to evaluate consistency of data collected during 2021 with the CSM and discuss any observations regarding anomalies or changes with the Technical Committee.

Recognizing that significant data collection and analysis had occurred since the CSM presented in the 1999 FSA, the NIBW PCs prepared a CSM Update in 2020, a draft of which was delivered to EPA, ADEQ, and other members of the Technical Committee for review on February 1, 2021. This report relies largely on data for the 20-year period between 2000 and 2019 to describe and depict the PCs' most current understanding of Site conditions and the associated hydrogeologic and hydrochemical framework. Once finalized, the 2020 CSM Update will become an agreed upon basis for evaluating new data and making sound technical decisions regarding the remedy.

10 SUPPLEMENTAL ACTIVITIES

10.1 Supplemental Data Collection

EPA provided the PCs with "Recommendations on Groundwater Monitoring Well Network Improvements" on October 19, 2019. The PCs reviewed the recommendations provided in this document and evaluated them against the Site requirements for the monitoring network. This evaluation was presented to the NIBW Technical Committee during the July and August 2020 NIBW Technical Committee meetings.

The recommendations from the EPA included installing 45 new monitoring wells. The recommended locations were generally along the periphery of the MAU/LAU TCE plume, adjacent to existing extraction wells, or between the plume and existing production wells. The objectives of the monitoring network as stated in the GM&EP are summarized in **Section 6**.

To support the continued evaluation of the monitoring network and the effectiveness of the network to meet the requirements of the GM&EP, the PCs proposed to complete the following tasks:

- Conduct supplemental water quality monitoring at wells on the periphery of the Site that are no longer sampled due to consistently low or not detected concentrations of COCs and lower MAU wells that are no longer part of the compliance monitoring program.
- Work with owners/operators of key extraction and production wells to ensure the wells were operational during the annual monitoring event so water quality samples could be collected.
- Complete vertical fluid movement investigations at wells that are already equipped with access tubes to evaluate vertical plume characteristics.

Information on these programs is summarized below.

10.1.1 Monitoring Well Sampling

During the 2020 annual groundwater monitoring event, the PCs attempted to collect water quality data at MAU (Upper and Lower MAU) and LAU monitoring wells that had been previously eliminated from the compliance monitoring program. The pumps in most of these wells had not been operated in many years, and functionality of the pumps was not known.

In the Upper MAU, sampling was attempted at wells B-1MA, M-14MA, M-1MA, M-3MA, PA-4MA, PA-14MA, PA-17MA2, and PA-23MA during the annual 2020 monitoring event. Due to inoperable equipment, samples could not be obtained at M-3MA, PA-4MA, and PA-23MA.

Results for the wells that were sampled for water quality are summarized in **Table C-1** and shown on **Figure 12**. Monitoring wells B-1MA, M-14MA, M-1MA, PA-14MA, and PA-17MA2 were sampled using HydraSleeves and concentrations for all COCs were below the detection limit with the exception of TCM at PA-14MA, which was reported at 0.96 mg/L, well below the Cleanup Standard of 6 mg/L.

In the Lower MAU, sampling was attempted at wells PG-45MA, PG-46MA, PG-47MA, PG-51MA, PG-52MA, and PG-53MA during the annual 2020 monitoring event. Due to inoperable equipment, only PG-47MA could be sampled. Results for PG-47MA are summarized in **Table C-1** and shown on **Figure 12**. All COC concentrations at PG-47MA were below the detection limit.

In the LAU, sampling was attempted at wells E-1LA, M-2LA, M-9LA, PA-22LA, and E-14LA during the 2020 annual monitoring event. All wells except M-2LA were successfully sampled. E-14LA and PA-22LA were sampled using HydraSleeves; E-1LA and M-9LA were sampled using dedicated pumping equipment. The results of the water quality sampling for these wells are summarized in **Table C-1** and included on **Figure 12**. All COCs were below Cleanup Standards for the supplemental LAU wells sampled. The results of the supplemental groundwater monitoring well sampling during the October 2020 groundwater monitoring event indicate that all wells sampled remain peripheral to the plume and future sampling is not warranted.

10.1.2 Extraction, Production, & Irrigation Well Sampling

The PCs requested permission from well owners to sample key production, extraction, and irrigation wells in or near the Site during the October 2020 annual groundwater monitoring event to augment the annual monitoring data set in support of the CSM Update, Five-Year Review, and ongoing remedy performance evaluation. Wells sampled during this effort are owned by COS, SRP, and AWC. For previous groundwater monitoring events, the CGTF extraction wells were only sampled if they were operational during the scheduled monitoring event, but during the October 2020 event, COS provided access to CGTF wells typically not operated during that time period. Wells were pumped for a minimum of 2 days before sampling. Water quality sampling results for the CGTF extraction wells are summarized in **Table C-2** and shown on **Figure 12**. This effort will continue to ensure that, when feasible, water quality data is collected from all CGTF extraction wells during regular monitoring events.

To reduce permitting efforts, SRP obtained samples from well 22.6E10N and provided the samples to the PCs for analysis at the EPA-approved project laboratory. The well was pumped for 2 days before sampling. TCE concentrations for SRP well 22.6E10N are shown on **Figure 12**.

The PCs worked closely with EPA to gain access to the AWC irrigation wells, located near the northwest edge of the LAU plume, to further evaluate the extent of the plume in that portion of the Site. In October 2020, AWC granted access for the PCs and EPA and four of the five AWC irrigation wells were sampled. AWC has communicated that it will not allow regular access to their irrigation wells; however, the PCs will continue to work with EPA and AWC to collect data when warranted and authorized by AWC. TCE concentrations for the wells sampled are shown on **Figure 12**; TCE was non-detect at all AWC wells sampled. Results for PCs and EPA samples were transmitted to AWC and EPA on December 2, 2020. Note that AWC has not been consistent in labeling their replacement wells; therefore, results provided in the December 2 transmittal for well AWC-9A refer to well AWC-9B, as shown on **Figure 12**.

The City of Tempe sampled well COT-6 twice in 2020. Results for TCE concentrations include: 21.5 µg/L on August 3 and 14.7 µg/L on November 12. The result for the November sampling is shown on **Figure 12**.

10.1.3 Vertical Fluid Movement Investigations

The PCs are conducting supplemental vertical fluid movement investigations at key extraction wells to further evaluate the vertical extent of impacted groundwater at the Site. This work includes spinner-flowmeter surveys to evaluate the vertical flow profile within the perforated interval(s) of the well and depth-specific sampling to evaluate changes in concentrations of COCs with depth. In 2020, a vertical fluid movement investigation was completed at the Granite Reef well at Area 12. In 2021, similar investigations are planned at NGTF extraction well PCX-1, Area 12 extraction well MEX-1MA, and CGTF extraction well COS-71A. All of these extraction wells are equipped with access tubes which allow the investigations to be completed without taking the wells offline. Fluid movement investigations will be completed at other extraction wells, where feasible, as wells are re-equipped and access tubes can be installed.

Results and interpretation of the vertical fluid movement investigations will be provided to EPA and other parties during monthly Technical Committee meetings and will be summarized in technical memoranda.

10.2 Optimization Evaluation

The PCs work in a collaborative, active, and ongoing manner with the NIBW Technical Committee to evaluate ways to improve the NIBW remedy. In 2020, this process became more formal as the PCs met with COS and SRP to evaluate approaches to support remedy operation considering water provider concerns regarding increasing concentrations of inorganic constituents - specifically arsenic and nitrate. Although these inorganic constituents are unrelated to the Site, they impact the ability of water providers to effectively integrate the remedy water treated for VOCs into their potable water supplies, resulting in reduced pumping of key extraction wells. The principal impact to date has been reduced pumping from wells tied in to the CGTF; however, additional reductions could occur in the future if inorganic water quality trends continue.

Late in 2020, the PCs presented information to EPA regarding potential remedy enhancements discussed with COS and SRP. These enhancements were identified as ways to balance the needs of water providers regarding inorganic constituents with current and future VOC remedy operation. Enhancements being considered focus on areas of the Site where benefits would be most tangible. These include: 1) increasing capture of MAU mass down-gradient from Area 7 that would otherwise be captured in the LAU, and 2) providing redundancy in Northern LAU containment to increase protection of peripheral production wells. The first step in the process was to compile and evaluate historical COC and inorganic water quality data. Based on historical data, potential approaches to balance inorganics and COCs in a manner that meets water provider needs and addresses remedy priorities were then developed and shared with the Technical Committee. These include: 1) modifying COS-71A to extract only from the MAU and then balancing pumping between the two most critical CGTF wells - COS-71A and COS-75A; and 2) testing and potentially equipping and tying monitoring well PG-41MA/LA, located north of PCX-1, into treatment at the NGTF. The next step will be to conduct updated data acquisition programs in early 2021 to determine the feasibility and benefits of proposed actions (see **Section 8.1.3**). The PCs will then review the information with the Technical Committee and develop plans to implement the highest value remedy enhancements that match water provider needs.

On a parallel track, EPA has initiated a Remedy Optimization Evaluation utilizing EPA resources supported by Tetra Tech as part of the Five-Year Review process. The PCs are supporting the process by: 1) providing the Optimization Team with a complete digital set of applicable Site documents, 2) presenting information on the Site status and CSM, and 3) sharing perspectives on optimization concepts previously identified and being evaluated by the PCs. The interactive process between the PCs and the EPA Optimization Team will complement and support both the Five-Year Review and evaluations that are already in progress regarding potential remedy enhancements.

10.3 Area 7 Vapor Intrusion Investigations

In its second Five-Year Review for the NIBW Superfund Site, published in September 2016, EPA deferred making a formal protectiveness determination at the Site pending vapor intrusion assessments in the vicinity of historical source areas and updated emission exposure assessments for groundwater treatment facilities (USACE on behalf of EPA, 2016).

To evaluate the potential risk of vapor intrusion from shallow soil gas, the PCs initiated efforts during the last quarter of 2016 to compile soil gas data for the historical source areas, evaluate these data relative to EPA soil vapor intrusion screening levels, and propose locations for installing shallow soil gas sampling (SGS) points. In 2017, a total of about 50 shallow SGS points were installed at seven of the historical source areas (**Figure 1**: Area 3, Area 5C, Area 7, Area 8, Area 9, Area 11, and Area 12). With the exception of a few SGS points at Area 7, TCE soil gas concentrations were all below land-use-specific EPA screening levels. Results were reviewed with EPA as they were received and following approval by EPA, all SGS points at Area 3, Area 5C, Area 8, Area 9, Area 11, and Area 12 were abandoned in 2017. At Area 7, 16 of the 21 SGS points installed were abandoned in 2018. A report summarizing SGS point sampling, installation methods, procedures, results, and abandonment status was submitted to EPA on September 27, 2018 (NIBW PCs, 2018).

In addition to shallow soil gas sampling, indoor air was sampled at Area 7 to further evaluate the potential for vapor intrusion. A report summarizing results from the indoor air sampling was submitted to EPA on June 8, 2018 (NIBW PCs, 2018). Follow-up actions, including collection of additional shallow soil gas and indoor air samples, were conducted in 2018 and 2019 and results were shared with the Technical Committee. Tasks conducted in 2019 included additional sampling of indoor air along with annual monitoring of the subslab vapor mitigation system which was proactively installed below three of the apartment units in a complex located southeast of Area 7. The PCs conducted a Human Health Risk Assessment, submitted to EPA on December 19, 2019 (NIBW PCs, 2019), which confirmed that all calculated risks at Area 7 were less than the noncarcinogenic threshold and less than the most conservative end of EPA's acceptable range for carcinogenic risks under conservative exposure scenarios. The Human Health Risk Assessment indicated there were no current vapor intrusion risks at Area 7 that exceed EPA thresholds.

The PCs participated in meetings with EPA and other members of the Technical Committee during 2019 and 2020 to discuss vapor intrusion risks at Area 7 and evaluate the potential need for additional mitigation and/or remedial measures. The potential need for remedial actions to address remaining VOC mass in the vadose zone at Area 7 was suggested by EPA. Relying on results of the Human Health Risk Assessment, the PCs continue to believe that current exposure levels are low and do not pose an unacceptable risk and has requested that EPA establish remedial action objectives to enable evaluation of any potential remedial actions. EPA is in the process of reviewing information and assessing regulatory drivers for further action at Area 7, in consultation with ADEQ. During 2021, the PCs will continue to support required Area 7 vapor intrusion investigations and mitigation actions, pending EPA's evaluation of any remaining risk.

11 CONCLUSIONS AND RECOMMENDATIONS

Data collected and evaluated through 2020 indicate that the mass of COCs is continuing to be removed by the NIBW treatment facilities, with extracted groundwater being put to beneficial use. Additionally, the plume area continues to be reduced over time, with TCE concentrations generally showing no trend or decreasing trends at the majority of wells in all three alluvial units. UAU groundwater is approaching restoration. Containment as required by performance standards in the Amended CD SOW is being achieved both for the MAU/LAU and the Source Control Programs. In 2020, all GM&EP metrics were achieved in the UAU Program, as were most of the metrics associated with the MAU/LAU Program, the Northern LAU Program, and the Source Area Programs. Exceptions are discussed in **Section 9.5** and are being tracked carefully. As data collection and reporting at the Site continue, the CSM will continue to be critically evaluated and updated as appropriate. Areas where increasing concentrations are observed will continue to be monitored and evaluated for consistency with the CSM and with the Site containment performance standards.

In addition to regular compliance monitoring and reporting, recommendations for 2021 include:

- Finalize the CSM Update Report.
- Complete calibration of the updated groundwater flow model and conduct associated particle tracking to evaluate plume capture.
- Support EPA Optimization and Five-Year Review Teams with requested data and analyses.
- Complete data collection programs aimed at evaluating the feasibility and benefits of proposed remedy enhancements - pumping from the MAU at COS-71A and tying PG-41MA/LA in to treatment at the NGTF.

12 REFERENCES

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13 ACRONYMS & ABBREVIATIONS

µg/L ....micrograms per liter
ADEQ ....Arizona Department of Environmental Quality
ADHS.............Arizona Department of Health Services
ADWR ....Arizona Department of Water Resources
AF ....acre-feet
APP ....Aquifer Protection Permit
AWC ....Arcadia Water Company
AWQS............Aquifer Water Quality Standard
AZCO.............Arizona Canal Outfall
AZPDES ....Arizona Pollutant Discharge Elimination System
CD ....Consent Decree
CGTF ....Central Groundwater Treatment Facility
CMR...............Compliance Monitoring Report
COC ....Constituent of Concern
COS................City of Scottsdale
COT................City of Tempe
CSM ....Conceptual Site Model
CWTP ....Chaparral Water Treatment Plant
DCE................1,1- Dichloroethene
DMR ....Discharge Monitoring Report
EPA ................U.S. Environmental Protection Agency
EPCOR...........EPCOR Water USA
ESD ....Explanation of Significant Differences
FSA ....Feasibility Study Addendum
FSP ....field sampling plan
GAC ....Granular Activated Carbon
gpm ....gallons per minute
GM&EP ....Groundwater Monitoring and Evaluation Plan
GWETS..........Groundwater Extraction and Treatment System
LAU ....Lower Alluvium Unit
MAU ....Middle Alluvium Unit
MCL...............Maximum Contaminant Level
MG ....Million Gallons
MRL...............Method Reporting Limit
MRTF.............Miller Road Treatment Facility
NGTF ....NIBW Granular Activated Carbon Treatment Facility
NGTF-CP.......NGTF Effluent Chaparral Compliance Point Sample Identifier

NIBW.............North Indian Bend Wash
O&M..............Operation and Maintenance
OU..................Operable Unit
PCE ......Tetrachloroethene
PCs ....Participating Companies
PE ....Performance Evaluation
PV ......Paradise Valley
PVARF ......Paradise Valley Arsenic Removal Facility
QA..................quality assurance
QAPP ....quality assurance project plan
RAO ....Remedial Action Objective
RD/RA ....Remedial Design / Remedial Action
ROD ....Record of Decision
SAP ....Sampling and Analysis Plan
SGS ....Soil Gas Sampling
SMR ....Site Monitoring Report
SOW...............Statement of Work
SRP ....Salt River Project
SRPMIC.........Salt River Pima Maricopa Indian Community
SRV................Salt River Valley
SVE................Soil Vapor Extraction
TCA................1,1,1-Trichloroethane
TCE................Trichloroethene
TCM...............chloroform
TDS................Total Dissolved Solids
UAU...............Upper Alluvium Unit
UIC.................Underground Injection Control
UV..................Ultraviolet
UV/OX...........Ultraviolet Oxidation
VOC...............Volatile Organic Compound

APPENDIX A
WELL INFORMATION AND SAMPLING FREQUENCY

Table A-1. Summary of Compliance Groundwater Monitoring Frequency
North Indian Bend Wash Area, Scottsdale, Arizona

Well Identifier	Well Type	Aquifer Unit	Water Quality Monitoring Frequency	Water Level Monitoring Frequency
7EX-3aMA	Extraction[1]	MAU	Quarterly	---
7EX-4MA	Extraction[1]	MAU	Quarterly	---
7EX-6MA	Extraction[1]	MAU	Quarterly	---
COS-31	Extraction[1]	MAU/LAU	Monthly	---
COS-71A	Extraction[1]	MAU/LAU	Monthly	---
COS-72	Extraction[1]	MAU/LAU	Monthly	---
COS-75A	Extraction[1]	LAU	Monthly	---
Granite Reef	Extraction[1]	MAU	Quarterly	---
MEX-1MA	Extraction[1]	MAU	Quarterly	---
PCX-1	Extraction[1]	LAU	Monthly	---
PV-11	Production	LAU	---	Continuous
PV-14	Extraction[1]	LAU	Monthly	Continuous
PV-15	Extraction[1]	MAU/LAU	Monthly	Continuous
PV-17	Production	LAU	---	Continuous
B-1MA	Monitor	MAU	---	Semi-Annually
B-1UA	Monitor	UAU	---	Annually
B-J	Monitor	UAU	Annually	Annually
D-2MA	Monitor	MAU	Quarterly	Semi-Annually
E-1LA	Monitor	LAU	---	Semi-Annually
E-1MA	Monitor	MAU	Quarterly	Semi-Annually
E-1UA	Monitor	UAU	---	Annually
E-2UA	Monitor	UAU	---	Annually
E-5MA	Monitor	MAU	Quarterly	Semi-Annually
E-5UA	Monitor	UAU	Annually	Annually
E-6UA	Monitor	UAU	---	Annually
E-7LA	Monitor	LAU	Annually	Semi-Annually
E-7UA	Monitor	UAU	Annually	Annually
E-8MA	Monitor	MAU	Annually	Semi-Annually
E-10MA	Monitor	MAU	Quarterly	Semi-Annually
E-12UA	Monitor	UAU	Annually	Annually
E-13UA	Monitor	UAU	Annually	Annually
E-14LA	Monitor	LAU	---	Semi-Annually
M-1MA	Monitor	MAU	---	Semi-Annually
M-2LA	Monitor	LAU	---	Semi-Annually
M-2MA	Monitor	MAU	Annually	Semi-Annually
M-2UA	Monitor	UAU	Annually	Annually
M-3MA	Monitor	MAU	---	Semi-Annually
M-4MA	Monitor	MAU	Quarterly	Semi-Annually
M-5LA	Monitor	LAU	Annually	Semi-Annually
M-5MA	Monitor	MAU	Quarterly	Semi-Annually
M-6MA	Monitor	MAU	Quarterly	Semi-Annually
M-7MA	Monitor	MAU	Annually	Semi-Annually
M-9LA	Monitor	LAU	---	Semi-Annually
M-9MA	Monitor	MAU	Annually	Semi-Annually

Table A-1. Summary of Compliance Groundwater Monitoring Frequency
North Indian Bend Wash Area, Scottsdale, Arizona

Well Identifier	Well Type	Aquifer Unit	Water Quality Monitoring Frequency	Water Level Monitoring Frequency
M-10LA2	Monitor	LAU	Annually	Semi-Annually
M-10MA2	Monitor	MAU	Quarterly	Semi-Annually
M-11MA	Monitor	MAU	Annually	Semi-Annually
M-12MA2	Monitor	MAU	Annually	Semi-Annually
M-14LA	Monitor	LAU	Annually	Semi-Annually
M-14MA	Monitor	MAU	---	Semi-Annually
M-15MA	Monitor	MAU	Quarterly	Semi-Annually
M-16LA	Monitor	LAU	Annually	Semi-Annually
M-16MA	Monitor	MAU	Annually	Semi-Annually
M-17MA/LA	Monitor	MAU/LAU	Quarterly	Semi-Annually
PA-1MA	Monitor	MAU	---	Semi-Annually
PA-2LA	Monitor	LAU	Annually	Semi-Annually
PA-3MA	Monitor	MAU	---	Semi-Annually
PA-4MA	Monitor	MAU	---	Semi-Annually
PA-5LA	Monitor	LAU	Quarterly	Semi-Annually
PA-6LA	Monitor	LAU	Quarterly	Semi-Annually
PA-7MA	Monitor	MAU	---	Semi-Annually
PA-8LA2	Monitor	LAU	Annually	Semi-Annually
PA-9LA	Monitor	LAU	Annually	Semi-Annually
PA-10MA	Monitor	MAU	Quarterly	Semi-Annually
PA-11LA	Monitor	LAU	Annually	---
PA-11LA2	Monitor	LAU	---	Semi-Annually
PA-12MA	Monitor	MAU	Quarterly	---
PA-12MA2	Monitor	MAU	---	Semi-Annually
PA-13LA	Monitor	LAU	Quarterly	Continuous
PA-14MA	Monitor	MAU	---	Semi-Annually
PA-15LA	Monitor	LAU	Annually	Semi-Annually
PA-16MA	Monitor	MAU	Annually	Semi-Annually
PA-17MA2	Monitor	MAU	---	Semi-Annually
PA-18LA	Monitor	LAU	Annually	Semi-Annually
PA-19LA	Monitor	LAU	Annually	Semi-Annually
PA-20MA	Monitor	MAU	Annually	Semi-Annually
PA-21MA	Monitor	MAU	Annually	Semi-Annually
PA-22LA	Monitor	LAU	---	Semi-Annually
PA-23MA	Monitor	MAU	---	Semi-Annually
PG-1LA	Monitor	LAU	Quarterly	Semi-Annually
PG-2LA	Monitor	LAU	Semi-Annually	Continuous
PG-4MA	Monitor	MAU	Annually	Semi-Annually
PG-4UA	Monitor	UAU	Annually	Annually
PG-5MA	Monitor	MAU	Annually	Semi-Annually
PG-5UA	Monitor	UAU	Annually	Annually
PG-6MA	Monitor	MAU	Annually	Semi-Annually
PG-6UA	Monitor	UAU	Annually	Annually
PG-7MA	Monitor	MAU	Annually	Semi-Annually
PG-7UA	Monitor	UAU	---	Annually
PG-8UA	Monitor	UAU	Annually	Annually

Table A-1. Summary of Compliance Groundwater Monitoring Frequency
North Indian Bend Wash Area, Scottsdale, Arizona

Well Identifier	Well Type	Aquifer Unit	Water Quality Monitoring Frequency	Water Level Monitoring Frequency
PG-10UA	Monitor	UAU	Annually	Annually
PG-11UA	Monitor	UAU	Annually	Annually
PG-16UA	Monitor	UAU	Annually	Annually
PG-18UA	Monitor	UAU	Annually	Annually
PG-19UA	Monitor	UAU	Annually	Annually
PG-22UA	Monitor	UAU	Annually	Annually
PG-23MA/LA	Monitor	MAU/LAU	Annually	Semi-Annually
PG-23UA	Monitor	UAU	Annually	Annually
PG-24UA	Monitor	UAU	Annually	Annually
PG-25UA	Monitor	UAU	Annually	Annually
PG-28UA	Monitor	UAU	Annually	Annually
PG-29UA	Monitor	UAU	Annually	Annually
PG-30UA	Monitor	UAU	---	Annually
PG-31UA	Monitor	UAU	Annually	Annually
PG-38MA/LA	Monitor	MAU/LAU	Annually	Semi-Annually
PG-39LA	Monitor	LAU	Annually	Semi-Annually
PG-40LA	Monitor	LAU	Quarterly	Semi-Annually
PG-41MA/LA	Monitor	MAU/LAU	---	Continuous
PG-42LA	Monitor	LAU	Quarterly	Continuous
PG-43LA	Monitor	LAU	Quarterly	Semi-Annually
PG-44LA	Monitor	LAU	Quarterly	Continuous
PG-47MA	Monitor	MAU-Lower	---	Semi-Annually
PG-48MA	Monitor	MAU-Lower	Quarterly	Semi-Annually
PG-49MA	Monitor	MAU-Lower	Annually	---
PG-50MA	Monitor	MAU-Lower	Annually	Semi-Annually
PG-51MA	Monitor	MAU-Lower	---	Semi-Annually
PG-54MA	Monitor	MAU-Lower	Annually	---
PG-55MA	Monitor	MAU-Lower	Annually	---
PG-56MA	Monitor	MAU-Lower	Annually	---
S-1LA	Monitor	LAU	Annually	Semi-Annually
S-1MA	Monitor	MAU	Annually	Semi-Annually
S-2LA	Monitor	LAU	Quarterly	Continuous
S-2MA	Monitor	MAU	Annually	Semi-Annually
W-1MA	Monitor	MAU	Quarterly	Semi-Annually
W-2MA	Monitor	MAU	Quarterly	Semi-Annually

1 - Extraction wells are only sampled when operating during sampling event

EXPLANATION:

UAU = Upper Alluvium Unit
MAU = Middle Alluvium Unit
LAU = Lower Alluvium Unit

Table A-2. Summary Well Construction Details for NIBW Monitor and Extraction Wells
North Indian Bend Wash Area, Maricopa County, Arizona

					Casing							
Well Name	Cadastral Location	ADWR Registration Number	Completion Date	Depth Drilled (ft, bls)	Diameter (inches)	Type	Depth Interval (ft, bls)	Perforated Interval (ft, bls)	Sampling Method	Pump Intake (ft, bls)	Latitude[1]	Longitude[1]
MONITOR WELLS:												
B-1MA	(A-1-4) 2ddd1	55-510690	04/19/85	305	14 8 5	steel	0-20 +1-250 +1.2-300	--- --- 250-300	Not Sampled	---	33.451897	-111.909709
B-1UA	(A-1-4) 2ddd2	55-510691	05/01/85	122	6 4	steel	0-21 0-122	--- 72-122	Not Sampled	Unknown	33.451900	-111.909567
B-J	(A-1-4) 2dbd1	55-510693	05/20/85	113	8 4	steel	0-20 0-114	--- 64-114	Pump	Unknown	33.456741	-111.914229
D-2MA	(A-2-4) 26bda1	55-529966	11/30/90	260	6 4	steel	+1-20 0-248	--- 195-248	Pump	220	33.490414	-111.918838
E-1LA	(A-1-4) 1abb1	55-510220	05/14/85	749	10 6 4	steel	+1-20 0-695 0-749	--- --- 689-749*	Not Sampled	280	33.465686	-111.899727
E-1MA	(A-1-4) 1abb2	55-510221	05/23/85	300	10 6 4	steel	+1-20 0-250 0-300	--- --- 250-300	Pump	Unknown	33.465689	-111.899631
E-1UA	(A-1-4) 1abb3	55-510222	05/24/85	150	6 4	steel	+1-20 0-128	--- 78-128	Not Sampled	117	33.465689	-111.899799
E-2UA	(A-2-4) 35daa1	55-510208	05/29/85	161	6 4	steel	+1-20 0-150	--- 97-150	Not Sampled	136	33.471792	-111.909791
E-5MA	(A-1-4) 2acd2	55-520077	09/30/88	305	10 6 4	steel	+11-21 +1-250 +0.5-300	--- --- 250-300	Pump	Unknown	33.460212	-111.914192
E-5UA	(A-1-4) 2acd1	55-510210	06/02/85	132	6 4	steel	0-20 0-132	--- 78-132	HydraSleeve	---	33.460180	-111.914195
E-6UA	(A-2-4) 35cbd	55-520079	09/02/88	167	10 4	steel	+1-21 +0.5-160	--- 120-160	Not Sampled	147	33.470253	-111.922033
E-7LA	(A-1-4) 2abb2	55-520076	09/23/88	632	10 6 4	steel	+1-21 +1-530 +0.5-600	--- --- 550-600	Pump	Unknown	33.465112	-111.916059
E-7UA	(A-1-4) 2abb3	55-520078	10/18/88	143	10 4	steel	+1-21 +0.5-130	--- 100-130	HydraSleeve	---	33.465297	-111.916109
E-8MA	(A-1-4) 2dbd2	55-520075	10/24/88	315	10 6 4	steel	+1-21 +1-250 +1-300	--- --- 250-300	Pump	Unknown	33.456716	-111.914187
E-10MA	(A-2-4) 26bcc	55-521791	07/23/88	369	10 4	steel	0-20 0-300	--- 250-300	HydraSleeve	---	33.488454	-111.925249
E-12UA	(A-1-4) 2dad	55-523247	01/26/89	125	6 4	steel	0-20 0-125	--- 90-120	HydraSleeve	---	33.456015	-111.909780
E-13UA	(A-1-4) 1cbb	55-523302	03/15/89	121	6 4	steel	0-20 20-121	--- 91-121	Pump	115	33.458239	-111.908174
E-14LA	(A-2-4) 34bad	55-521514	06/26/88	310	4	steel	0-310	290-310	Not Sampled	---	33.476826	-111.935063
M-1MA	(A-1-4) 1bad2	55-507300	04/03/84	302	10 6 4	steel	+1-20 0-252 0-302	--- --- 252-302	Not Sampled	Unknown	33.462270	-111.901285
M-2LA	(A-1-4) 1bcc3	55-518239	09/29/87	710	10 6 4	steel	+1-20 0-659 0-710	--- --- 659-710	Not Sampled	Unknown	33.458837	-111.907445
M-2MA	(A-1-4) 1bcc1	55-507296	04/09/84	303	10 6 4	steel	+1-21 0-251 0-303	--- --- 251-303	HydraSleeve	---	33.458873	-111.907681
M-2UA	(A-1-4) 1bcc2	55-507303	04/12/84	125	6 4	steel	+1.5-21 0-121	--- 79-121	Pump	Unknown	33.458864	-111.907596
M-3MA	(A-1-4) 1bdd1	55-507294	04/19/84	303	10 6 4	steel	+1.5-21 0-250 0-303	--- --- 250-303	Not Sampled	Unknown	33.458762	-111.901552
M-4MA	(A-1-4) 1bdb2	55-507295	04/26/84	302	10 6 4	steel	+1.5-19 0-251 0-302	--- --- 251-302	HydraSleeve	---	33.462226	-111.904554
M-5LA	(A-1-4) 1bba3	55-518240	10/07/87	750	10 6 4	steel	+1-20 0-702 0-748	--- --- 697-748	Pump	Unknown	33.465492	-111.906038
M-5MA	(A-1-4) 1bba1	55-507304	04/30/84	302	10 6 4	steel	+1.5-19 0-251 0-302	--- --- 251-302	Pump	Unknown	33.465528	-111.906146
M-6MA	(A-1-4) 1baa1	55-507298	05/09/84	302	10 6 4	steel	+1.5-19 0-251 0-302	--- --- 249-302*	Pump	Unknown	33.465651	-111.901275
M-7MA	(A-1-4) 1bad3	55-507299	05/18/84	300	10 6 4	steel	+1-10 0-250 0-300	--- --- 258-300	Pump	Unknown	33.464102	-111.900938
M-9LA	(A-2-4) 36dba3	55-518243	08/27/87	835	10 6 4	steel	+1-20 0-777 0-835	--- --- 777-835	Not Sampled	Unknown	33.472741	-111.896258
M-9MA	(A-2-4) 36dba1	55-509772	03/27/85	302	10 4	steel	0-20 0-302	--- 249-302	Pump	Unknown	33.472553	-111.896187
M-10LA2	(A-2-4) 35ddc5	55-905027	10/23/06	720	5	steel	0.5-700	650-700	HydraSleeve	---	33.466086	-111.911519
M-10MA2	(A-2-4) 35ddc4	55-905026	10/23/06	310	5	steel	0.5-300	250-300	Pump	240	33.466088	-111.911211
M-11MA	(A-2-4) 35dba	55-509773	04/11/85	300	10 4	steel	0-18 0-300	--- 245-300	Pump	Unknown	33.471516	-111.914409
M-12MA2	(A-2-4) 26dda4	55-906269	02/07/07	301	5	steel	0-299	250-299	Pump	285	33.483832	-111.910129
M-14LA	(A-2-4) 35daa2	55-518241	10/19/87	721	10 6 4	steel	+1-20 0-670 0-721	--- --- 670-721	Pump	Unknown	33.471794	-111.909596

Table A-2. Summary Well Construction Details for NIBW Monitor and Extraction Wells
North Indian Bend Wash Area, Maricopa County, Arizona

					Casing							
Well Name	Cadastral Location	ADWR Registration Number	Completion Date	Depth Drilled (ft, bls)	Diameter (inches)	Type	Depth Interval (ft, bls)	Perforated Interval (ft, bls)	Sampling Method	Pump Intake (ft, bls)	Latitude[1]	Longitude[1]
M-14MA	(A-2-4) 35daa3	55-518242	10/22/87	302	10 6 4	steel	+1-20 0-251 0-302	--- --- 251-302	Not Sampled	Unknown	33.471793	-111.909696
M-15MA	(A-2-4) 36cdc1	55-518802	10/28/87	300	10 6 4	steel	+1-20 0-251 0-300	--- --- 251-300	Pump	Unknown	33.467612	-111.903534
M-16LA	(A-2-4) 36bca1	55-518799	11/11/87	779	10 6 4	steel	+1-20 0-729 0-779	--- --- 729-779	Pump	294	33.475689	-111.904934
M-16MA	(A-2-4) 36bca2	55-518800	11/19/87	300	10 6 4	steel	+1-20 0-250 0-300	--- --- 250-300	Pump	Unknown	33.475782	-111.904940
M-17MA/LA	(A-2-4) 34aca	55-594864	10/31/02	300	4	steel	0-300	250-300	HydraSleeve	---	33.473933	-111.927866
PA-1MA	(A-2-4) 25ddc1	55-526966	03/23/90	301	10 6 4	steel	0-20 0-251 0-301	--- --- 241-301*	Not Sampled	Unknown	33.480586	-111.894394
PA-2LA	(A-2-4) 24acb1	55-526957	04/04/90	898	10 6 4	steel	0-20 0-845 0-898	--- --- 835-898*	Pump	Unknown	33.503743	-111.899419
PA-3MA	(A-2-4) 24acb2	55-526956	04/10/90	300	10 6 4	steel	0-20 0-250 0-300	--- --- 240-300*	Not Sampled	Unknown	33.503743	-111.899489
PA-4MA	(A-2-4) 23ddd3	55-526954	04/13/90	300	10 6 4	steel	0-20 0-250 0-300	--- --- 240-300*	Not Sampled	252	33.496748	-111.910162
PA-5LA	(A-2-4) 23ddd4	55-526955	04/25/90	802	10 6 4	steel	0-20 0-750 0-802	--- --- 740-802*	Pump	441	33.496804	-111.910083
PA-6LA	(A-2-4) 23adb1	55-526949	05/07/90	770	10 6 4	steel	0-20 0-730 0-770	--- --- 720-770*	Pump	462	33.504101	-111.913175
PA-7MA	(A-2-4) 23adb2	55-526948	05/11/90	302	10 6 4	steel	0-20 0-252 0-302	--- --- 242-302*	Not Sampled	Unknown	33.504191	-111.913175
PA-8LA2	(A-2-4) 26dda5	55-906270	02/12/07	754	5	steel	0-751	700-751	Pump	365	33.483905	-111.910128
PA-9LA	(A-2-4) 26ccb1	55-526951	06/01/90	681	10 6 4	steel	0-20 0-630 0-681	--- --- 620-681	HydraSleeve	---	33.483704	-111.924057
PA-10MA	(A-2-4) 26ccb2	55-526950	06/06/90	300	10 6 4	steel	0-20 0-250 0-300	--- --- 240-300*	HydraSleeve	---	33.483601	-111.924053
PA-11LA	(A-2-4) 35bdb1	55-526961	06/15/90	585	10 6 4	steel	0-20 0-535 0-585	--- --- 525-585*	Pump	273	33.476466	-111.921734
PA-11LA2	(A-2-4) 35bdb3	55-906271	05/01/07	590	2	PVC	585	525-585	Not Sampled	---	33.476586	-111.921734
PA-12MA	(A-2-4) 35bdb2	55-526960	06/21/90	300	10 6 4	PVC	0-20 0-250 0-300	--- --- 240-300*	Pump	231	33.476540	-111.921733
PA-12MA2	(A-2-4) 35bdb3	55-906271	05/01/07	590	2	steel	301	240-301	Not Sampled	---	33.476586	-111.921734
PA-13LA	(A-2-4) 23cdd1	55-526953	07/23/90	710	6 4	steel	0-660 0-710	--- 650-710*	Pump	462	33.496065	-111.919461
PA-14MA	(A-2-4) 23cdd2	55-526952	07/27/90	306	10 6 4	steel	+0.5-20 0-255 0-305	--- --- 245-305*	Not Sampled	---	33.496181	-111.919460
PA-15LA	(A-1-4) 2cdb2	55-526965	08/03/90	525	10 6 4	steel	+1-20 0-475 0-525	--- --- 465-525*	Pump	Unknown	33.454336	-111.920851
PA-16MA	(A-1-4) 2cdb3	55-526964	08/10/90	302	10 6 4	steel	+1-20 0-250 0-302	--- --- 240-302*	HydraSleeve	---	33.454439	-111.920845
PA-17MA2	(A-2-4) 25acc1	55-223679	07/10/14	305	2.375	PVC	0-303	243-303	Not Sampled	---	33.489903	-111.898958
PA-18LA	(A-2-4) 25acc2	55-526963	08/28/90	845	10 6 4	steel	+0.5-20 0-795 0-845	--- --- 785-845*	Pump	357	33.490250	-111.900068
PA-19LA	(A-1-4) 2bba3	55-526959	09/13/90	405	10 6 4	steel	+1-20 0-355 0-405	--- --- 345-405*	Pump	252	33.465528	-111.923724
PA-20MA	(A-1-4) 2bba2	55-526958	09/19/90	260	10 6 4	steel	+1-20 0-210 0-260	--- --- 200-260*	Pump	Unknown	33.465528	-111.923618
PA-21MA	(A-2-4) 36add	55-526967	09/28/90	302	10 6 4	steel	+1-20 0-250 0-302	--- --- 240-302*	HydraSleeve	---	33.474963	-111.891986
PA-22LA	(A-1-4) 11adb1	55-526969	10/01/90	635	6 4	steel	0-584 0-635	--- 574-635*	Not Sampled	---	33.447509	-111.912847
PA-23MA	(A-1-4) 11adb2	55-526968	10/19/90	300	10 6 4	steel	+1-20 0-250 0-300	--- --- 240-300*	Not Sampled	Unknown	33.447595	-111.912772
PG-1LA	(A-2-4) 14dda	55-533846	12/30/91	810	10 6 4	steel	0-20 0-757 0-809	--- --- 754-809*	Pump	483	33.512941	-111.909137
PG-2LA	(A-2-4) 14cda1	55-533845	01/14/92	763	10 6 4	steel	0-20 0-710 0-762	--- --- 710-762	Pump	483	33.512932	-111.917459

Table A-2. Summary Well Construction Details for NIBW Monitor and Extraction Wells
North Indian Bend Wash Area, Maricopa County, Arizona

					Casing							
Well Name	**Cadastral Location**	**ADWR Registration Number**	**Completion Date**	**Depth Drilled (ft, bls)**	**Diameter (inches)**	**Type**	**Depth Interval (ft, bls)**	**Perforated Interval (ft, bls)**	**Sampling Method**	**Pump Intake (ft, bls)**	**Latitude[1]**	**Longitude[1]**
PG-4UA	(A-1-4) 3aad2	55-534408	03/10/92	172	6 4	steel	0-20 0-172	--- 140-172	HydraSleeve	---	33.462154	-111.927351
PG-5MA	(A-1-4) 2bca1	55-534411	03/18/92	500	10 6 4	steel	0-20 0-250 0-300	--- --- 249-300*	Pump	Unknown	33.460405	-111.922224
PG-5UA	(A-1-4) 2bca2	55-534412	03/20/92	178	6 4	steel	0-20 0-178	--- 115-178	Pump	Unknown	33.460321	-111.922194
PG-6MA	(A-1-4) 2ccb2	55-534410	03/25/92	400	10 6 4	steel	0-20 0-195 0-245	--- --- 185-245*	Pump	Unknown	33.454703	-111.925289
PG-6UA	(A-1-4) 2ccb1	55-534409	04/02/92	170	6 4	steel	+1-20 0-170	--- 107-170	Pump	Unknown	33.454793	-111.925289
PG-7MA	(A-1-4) 11bab	55-534413	04/08/92	435	10 6 4	steel	0-20 0-250 0-300	--- --- 237-300*	Pump	Unknown	33.450711	-111.922152
PG-7UA	(A-1-4) 11bba	55-534414	04/16/92	156	6 4	steel	+1-20 0-156	--- 72-156	Not Sampled	136	33.450591	-111.922153
PG-8UA	(A-1-4) 2bba1	55-534415	04/24/92	162	6 4	steel	+1-20 0-162	--- 122-162	Pump	Unknown	33.465526	-111.923863
PG-10UA	(A-2-4) 26bdb	55-535829	06/25/92	154	8 6	steel	+1-20 +1-154	--- 130-152	Pump	144	33.489743	-111.919585
PG-11UA	(A-2-4) 35bba2	55-535459	06/25/92	157	8 6	steel	+1-20 0-157	--- 124-154	HydraSleeve	---	33.480162	-111.921979
PG-16UA	(A-2-4) 26cbb	55-535458	07/18/92	166	8 6	steel	+1-20 0-166	--- 130-163	Pump	Unknown	33.487392	-111.923954
PG-18UA	(A-1-4) 2dcb	55-535470	07/28/92	160	8 6	steel	+1-20 0-160	--- 75-157	Pump	Unknown	33.454715	-111.917537
PG-19UA	(A-1-4) 2dbb2	55-535474	07/30/92	158	8 6	steel	+1-20 0-158	--- 82-155	Pump	146	33.458113	-111.917641
PG-22UA	(A-1-4) 2abd	55-535467	08/07/92	147	8 6	steel	+1-20 0-147	--- 83-143	HydraSleeve	---	33.463474	-111.913899
PG-23MA/LA	(A-1-4) 3add2	NA	10/15/93	300	11 4	steel	0-20 0-300	--- 250-300	Pump	Unknown	33.458535	-111.927121
PG-23UA	(A-1-4) 3add1	55-535473	08/12/92	174	8 6	steel	+1-20 0-174	--- 118-168	HydraSleeve	---	33.458535	-111.927269
PG-24UA	(A-1-4) 2cba	55-535471	08/13/92	163	8 6	steel	+1-20 0-163	--- 96-158	HydraSleeve	---	33.457657	-111.922843
PG-25UA	(A-1-4) 2bda	55-535468	08/18/92	153	8 6	steel	+1-20 0-153	--- 87-150	HydraSleeve	---	33.461354	-111.917861
PG-28UA	(A-2-4) 26caa2	55-539541	08/ /93	176	4	steel	0-173	113-173	Pump	163	33.486571	-111.918858
PG-29UA	(A-2-4) 26acc	55-539540	07/16/93	155	8 4	steel	0-20 0-152	--- 92-152	Pump	135	33.487523	-111.915867
PG-30UA	(A-2-4) 26dcb	55-539542	08/01/93	157	4	steel	0-152	107-152	Not Sampled	144	33.482279	-111.917370
PG-31UA	(A-2-4) 26ccb3	55-539539	08/01/93	156	8 4	steel	0-20 0-154	--- 114-154	HydraSleeve	---	33.483932	-111.922877
PG-38MA/LA	(A-1-4) 3abd2	55-540382	10/01/93	250	10 6 4	steel	0-20 0-200 0-250	--- --- 200-250	HydraSleeve	---	33.463494	-111.931033
PG-39LA	(A-2-4) 34dad1	55-540380	11/07/93	300	8 4	steel	0-20 0-300	--- 250-300	Pump	252	33.469351	-111.926777
PG-40LA	(A-2-4) 14acb3	55-544386	08/01/94	1,400	12 8 6	steel	0-20 0-900 856-1,400	--- --- 900-1,400	Pump	Unknown	33.518203	-111.917000
PG-41MA/LA	(A-2-4) 14acb4	55-550401	08/01/95	900	10 6	steel	0-503 492-900	--- 503-890	Pump	Unknown	33.518283	-111.916985
PG-42LA	(A-2-4) 11ccd	55-557440	06/21/96	830	8 4	steel	0-20 0-759	--- 597-759	Pump	567	33.523318	-111.922877
PG-43LA	(A-2-4) 11ddd	55-557441	07/15/96	907	8 4	steel	0-22 0-900	--- 720-900	Pump	483	33.524172	-111.909065
PG-44LA	(A-2-4) 15dad	55-558952	08/01/96	869	8 4	steel	0-20 0-759	--- 633-759	Pump	525	33.513244	-111.927936
PG-47MA	(A-1-4) 1baa4	55-566511	07/02/96	690	4	steel	0-560	510-560	Not Sampled	232	33.465645	-111.901429
PG-48MA	(A-1-4) 1baa5	55-566512	07/12/96	450	4	steel	0-430	380-430	Pump	232	33.465649	-111.901578
PG-49MA	(A-2-4) 35dba3	55-566513	07/26/96	609	4	steel	0-574	524-574	Pump	295	33.471383	-111.914415
PG-50MA	(A-2-4) 26bda5	55-556193	08/08/96	638	4	steel	0-562	522-562	Pump	274	33.490186	-111.918715
PG-51MA	(A-2-4) 26bda6	55-556194	08/16/96	481	4	steel	0-480	460-480	Not Sampled	463	33.490134	-111.918714
PG-54MA	(A-2-4) 36cab3	55-566515	09/27/96	444	4	steel	0-424	389-424	Pump	232	33.471566	-111.904151
PG-55MA	(A-2-4) 26dca	55-559965	10/10/96	660	4	steel	0-570	520-570	Pump	274	33.483996	-111.913721
PG-56MA	(A-2-4) 26aca2	55-560235	10/29/96	690	4	steel	0-580	530-580	Pump	253	33.490350	-111.913239
S-1LA	(A-2-4) 27aab1	55-525290	08/26/89	662	10 6 4	steel	0-20 0-600 0-658	--- --- 608-658	Pump	Unknown	33.494044	-111.929281
S-1MA	(A-2-4) 27aab2	55-525291	08/31/89	274	10 6 4	steel	+2-20 0-174 0-273	--- --- 223-273	HydraSleeve	---	33.493951	-111.929480
S-2LA	(A-2-4) 23ccb1	55-525292	08/07/89	682	10 6 4	steel	+2-20 0-618 0-668	--- --- 618-668	Pump	Unknown	33.497868	-111.924166
S-2MA	(A-2-4) 23ccb2	55-525293	08/14/89	304	10 4	steel	+2-20 0-280	--- 230-280	HydraSleeve	---	33.497976	-111.924191
W-1MA	(A-2-4) 26aca1	55-530928	03/04/91	291	4	steel	0-290	240-290	Pump	260	33.489720	-111.913139

Table A-2. Summary Well Construction Details for NIBW Monitor and Extraction Wells
North Indian Bend Wash Area, Maricopa County, Arizona

Well Name	Cadastral Location	ADWR Registration Number	Completion Date	Depth Drilled (ft, bls)	Casing Diameter (inches)	Casing Type	Casing Depth Interval (ft, bls)	Casing Perforated Interval (ft, bls)	Sampling Method	Pump Intake (ft, bls)	Latitude[1]	Longitude[1]
W-2MA	(A-2-4) 26caa1	55-530929	03/04/91	290	4	steel	0-290	240-290	Pump	280	33.486586	-111.919062
EXTRACTION WELLS:												
7EX-3aMA	(A-2-4) 26bda7	55-577372	09/24/99	355	6	stainless steel	0-354.5	165-354.5	Pump	275	33.489537	-111.918722
7EX-4MA	(A-2-4) 26caa3	55-400132	10/01/96	370	6	stainless steel	0-304	190-244	Pump	240	33.487221	-111.917712
7EX-6MA	(A-2-4) 26cad	55-224306	07/02/15	381	8	stainless steel	0-362	200-362	Pump		33.485782	-111.919273
COS-31	(A-2-4) 25cdb2	55-608435	08/02/57	1,300	20 16	steel	0-695 695-1,300	300-692 705-1,288	Pump		33.483906	-111.904478
COS-71A	(A-2-4) 35abb	55-222760	03/17/14	1,100	20	steel stainless steel	0-211 211-802	--- 211-402 422-507 552-687 713-792	Pump		33.479533	-111.917114
COS-72	(A-2-4) 35aab2	55-626542	08/21/51	985	20	steel	0-985	200-970	Pump	431	33.480214	-111.912430
COS-75A	(A-2-4) 23ddd5	55-546469	05/01/95	1,413	20	steel	0-1,278	658-1,258	Pump	500	33.496731	-111.910389
Granite Reef	(A-1-4) 01aba1	55-617830	01/01/41	493	24 18 16	steel	0-482 0-199 0-472	199-465 --- 192-472	Pump	312	33.465672	-111.898427
MEX-1MA	(A-2-4) 01bba4	55-566405	01/01/98	666	20	steel	0-656	140-544	Pump	415	33.465437	-111.906054
PCX-1	(A-2-4) 14cda2	55-564426	05/01/95	1,350	20	steel	0-1,245	720-1,151	Pump	562	33.513160	-111.917630
PV-14	(A-2-4) 11dcc3	55-624807	02/22/65	1,743	20 8	steel	0-1,400 1,400-1,730	700-1,400 1,400-1,730	Pump	580	33.524682	-111.916032
PV-15	(A-2-4) 14abc1	55-624808	02/11/69	1,430	20 18 16	steel	0-660 0-1,208 1,193-1,429	505-643 643-1,193 1,193-1,424	Pump	569	33.522000	-111.916250
PRODUCTION WELLS:												
AVI	(A-2-4) 14dab	55-800928	04/01/46	798	16	steel	0-798	165-798	Not Sampled	Unknown	33.513836	-111.931379
AWC-7A	(A-2-4) 22dab5	55-608782	11/23/71	801	14	steel	0-620	300-620	Not Sampled	Unknown	33.501092	-111.930144
AWC-8A	(A-2-4) 22dac	55-536833	02/05/94	630	20 16	steel	0-625 0-610	335-611 340-610	Not Sampled	Unknown	33.498840	-111.929952
AWC-8B	(A-2-4) 22dab	55-585033	04/02/01	785	18	steel	0-774	460-760	Not Sampled	Unknown	33.501781	-111.928658
AWC-9B	(A-2-4) 22daa	55-201729	06/16/04	1,210	18	steel	0-1200	500-1180	Not Sampled	Unknown	33.500603	-111.928328
AWC-12A	(A-2-4) 22dba3	55-540859	02/27/94	696	20	steel	0-650	345-645	Not Sampled	Unknown	33.501991	-111.932343
COS-6	(A-2-4) 25bcd	55-607686	11/09/53	1295	20 16	steel	0-465 465-1295	Unknown	Not Sampled	Unknown	33.487725	-111.904850
COS-25	(A-1-4) 02dda	55-626824	09/15/77	700	16 14	steel	0-500 500-700	Unknown	Not Sampled	Unknown	33.453681	-111.911635
COS-74	(A-2-4) 25ddb	55-626615	03/13/74	1,200	20 16	steel	0-800 800-1,200	--- 800-1,200	Not Sampled	Unknown	33.483686	-111.895762
COT-6	(A-1-4) 11aba	55-628167	12/12/60	1,054	16	steel	0-1,050	300-980	Not Sampled	Unknown	33.450762	-111.914432
IBGC	(A-2-4) 11dba	55-527102	07/16/90	622	16	steel	0-622	300-610	Not Sampled	Unknown	33.443418	-111.914123
Laird 2	(A-1-4) 11bdb	55-603767	11/01/73	492	16	steel	0-445	155-430	Not Sampled	Unknown	33.447134	-111.922291
MDWC	(A-2-4) 14cbb	55-600523	02/23/50	840	20 12	steel	0-500 500-750	Unknown	Not Sampled	Unknown	33.516398	-111.925694
PV-11	(A-2-4) 11dcb	55-624805	07/01/59	1,372	20 16	steel	0-1,020 1,000-1,342	509-1,020 1,000-1,225	Pump	Unknown	33.526793	-111.915422
PV-12B	(A-2-4) 11dcb	55-220510	09/09/11	1,150	20	steel	0-1,130	716-1,130	Pump	Unknown	33.527877	-111.915644
PV-16	(A-2-4) 11dbb	55-624809	03/27/80	1,505	18	steel	0-1,500	650-1,500	Not Sampled	Unknown	33.529599	-111.916200
PV-17	(A-2-4) 11bdd	55-537967	04/20/93	1,590	20 16	steel	0-582 582-1,145	--- 582-1,125	Not Sampled	Unknown	33.531626	-111.918256
SRIR SCC	(A-2-5) 19aba	Not Registered	03/01/58	1,106	20	steel	0-984	450-984	Not Sampled	Unknown	33.508377	-111.879310
QRIA	(A-2-4) 15aa	55-802113	04/09/05	601	16 14	steel	0-450 450-601	Unknown	Not Sampled	Unknown	33.519280	-111.929246
Radisson	(A-2-4) 11abb	55-609565	01/01/76	684	10	steel	0-684	Unknown	Not Sampled	Unknown	33.537541	-111.916236
SRP21.5E,8N	(A-2-4) 22dcc	55-226628	03/15/17	640	20	steel	0-630	300-610	Not Sampled	Unknown	33.494956	-111.933857
SRP22.5E,5.5N	(A-1-4) 02dbb	55-608363	11/16/48	610	20	steel	0-520	Unknown	Not Sampled	Unknown	33.457799	-111.917339
SRP22.6E,10N	(A-2-4) 11dcc1	55-617843	12/01/40	1,003	20	steel	0-996	348-996	Pump	Unknown	33.523920	-111.915105
SRP22.9E,10.8N	(A-2-4) 11aad2	55-202099	09/25/04	1,210	20	steel	0-1,200	400-540 640-760 840-1,180	Not Sampled	Unknown	33.534954	-111.908941
SRP23.5E,5.3N	(A-1-4) 01cda	55-608365	07/06/52	850	20	steel	0-840	Unknown	Not Sampled	Unknown	33.454212	-111.900806
SRP23.5E,8.8N	(A-2-4) 24bad	55-607687	01/28/49	1,300	24 20 16	steel	0-460 460-1,012 1,012-1,300	Unknown	Not Sampled	Unknown	33.505549	-111.900505
SRP23.5E,9.5N	(A-2-4) 13caa	55-607716	04/03/52	1,020	20 16	steel	0-742 742-1,020	Unknown	Not Sampled	Unknown	33.515424	-111.901059
SRP23.5E,10.6N	(A-2-4) 12bdd	55-214647	11/20/07	1,005	20	steel	0-1,000	380-630 730-980	Not Sampled	Unknown	33.532846	-111.902218
SRP24E,10.5N	(A-2-4) 12add2	55-607710	05/06/49	1,200	24 20	steel	0-770 770-1,200	Unknown	Not Sampled	Unknown	33.531248	-111.891981

EXPLANATION:

ft, bls = feet, below land surface

NOTES:

--- Not applicable

1 Coordinates of well locations use datum NAD 1983

* Asterisk indicates that the perforated interval in the production casing extends up into the sealed conductor casing. The effective perforated interval starts at bottom of outer blank casing.

NA Not available

Table A-3 Continuous Water Level Monitoring Locations, Northern Lau
North Indian Bend Wash Superfund Site

Northern LAU Well	Monitoring Location in GM&EP	Current Monitoring Location	Comments
PG-1LA	X		Transducer failed; replacement moved to well S-2LA
S-2LA		X	Replaced PG-1LA to provide better data for hydraulic capture and control
PG-2LA	X	X	
PG-40LA	X		Transducer failed; replacement moved to well PG-41MA/LA
PG-41MA/LA		X	Replaced PG-40LA to provide better data for hydraulic capture and control
PG-42LA	X	X	
PG-43LA	X		Transducer failed; replacement moved to well PA-13LA
PA-13LA		X	Replaced PG-43LA to provide better data for hydraulic capture and control
PG-44LA	X	X	
PV-11	X	X	
PV-12	X		Well abandoned; placed transducer in well PV-17
PV-17		X	Replaced PV-12 to provide better data for hydraulic capture and control
PV-14	X	X	
PV-15	X	X	

EXPLANATION:

LAU = Lower Alluvium Unit

GM&EP = Groundwater Monitoring & Evaluation Plan

APPENDIX B
WATER LEVEL TABLES AND NORTHERN LAU CONTINUOUS

Table B-1. Summary of Groundwater Level Measurements Taken by Montgomery Associates
North Indian Bend Wash Area, Scottsdale, Arizona
May 2020

Monitor Well Identifier	Measurement Date	Depth to Water (ft, bls)	Groundwater Elevation (ft, amsl)
B-1MA	5/18/20 14:02	90.86	1,099.40
B-1UA	Not included in May monitoring event		
B-J	Not included in May monitoring event		
D-2MA	5/17/20 12:33	110.71	1,129.32
E-1LA	5/18/20 9:45	126.33	1,088.67
E-1MA	5/18/20 10:07	115.32	1,099.05
E-1UA	Not included in May monitoring event		
E-2UA	Not included in May monitoring event		
E-5MA	5/17/20 10:54	107.46	1,091.97
E-5UA	Not included in May monitoring event		
E-6UA	Not included in May monitoring event		
E-7LA	5/17/20 11:15	101.55	1,096.24
E-7UA	Not included in May monitoring event		
E-8MA	5/17/20 10:27	107.97	1,084.92
E-10MA	5/17/20 12:11	136.35	1,107.51
E-12UA	Not included in May monitoring event		
E-13UA	Not included in May monitoring event		
E-14LA	5/17/20 13:41	154.29	1,099.66
M-1MA	5/18/20 15:03	110.32	1,100.57
M-2LA	5/20/20 15:45	115.26	1,094.97
M-2MA	5/20/20 16:43	112.18	1,097.88
M-2UA	Not included in May monitoring event		
M-3MA	5/20/20 15:20	98.41	1,107.14
M-4MA	5/18/20 15:33	116.15	1,098.75
M-5LA	5/18/20 16:11	129.2	1,088.26
M-5MA	5/18/20 16:24	144.92	1,072.51
M-6MA	5/18/20 18:31	127.74	1,089.25
M-7MA	5/18/20 14:43	115.38	1,098.49
M-9LA	5/18/20 11:49	137.33	1,083.19
M-9MA	5/18/20 11:35	109.68	1,110.84
M-10LA2	5/19/20 11:07	125.76	1,093.94
M-10MA2	5/19/20 11:23	126.82	1,093.23
M-11MA	5/17/20 14:33	103.23	1,108.36
M-12MA2	5/20/20 11:35	119.04	1,108.88
M-14LA	5/18/20 12:32	139.95	1,085.23
M-14MA	5/18/20 12:20	115.27	1,109.93
M-15MA	5/17/20 15:00	123.85	1,095.06
M-16LA	Obstruction in sounder tube. No water level measurement taken.		
M-16MA	5/17/20 17:51	111.24	1,116.91

Table B-1. Summary of Groundwater Level Measurements Taken by Montgomery Associates
North Indian Bend Wash Area, Scottsdale, Arizona
May 2020

Monitor Well Identifier	Measurement Date	Depth to Water (ft, bls)	Groundwater Elevation (ft, amsl)
M-17MA/LA	5/17/20 13:57	131.46	1,106.24
PA-1MA	5/17/20 18:37	99.59	1,125.91
PA-2LA	5/17/20 19:09	238.69	1,015.07
PA-3MA	5/17/20 19:31	116.76	1,136.68
PA-4MA	5/19/20 19:31	102.59	1,128.33
PA-5LA	5/19/20 19:11	206.35	1,023.10
PA-6LA	5/19/20 16:45	241.66	1,011.27
PA-7MA	5/19/20 16:58	119.68	1,133.38
PA-8LA2	5/20/20 13:09	155.33	1,073.00
PA-9LA	5/17/20 9:32	166.22	1,070.56
PA-10MA	5/17/20 9:46	130.94	1,105.86
PA-11LA2	5/17/20 8:44	137.56	1,087.40
PA-12MA2	5/17/20 8:59	120.63	1,104.33
PA-13LA	5/19/20 15:56	225.96	1,023.03
PA-14MA	5/19/20 16:27	128.65	1,120.44
PA-15LA	5/17/20 10:05	97.76	1,106.52
PA-16MA	5/17/20 9:38	101.32	1,103.16
PA-17MA2	6/16/20 13:52	108.91	1129.79
PA-18LA	5/21/20 10:37	189.52	1,049.34
PA-19LA	5/17/20 11:47	120.52	1,100.94
PA-20MA	5/17/20 11:39	118.63	1,102.65
PA-21MA	5/17/20 18:12	107.72	1,117.47
PA-22LA	5/17/20 8:09	80.78	1,103.22
PA-23MA	5/17/20 8:38	88.52	1,095.90
PG-1LA	5/20/20 8:56	241.39	1,008.27
PG-2LA	5/19/20 18:35	281.23	989.83
PG-4MA	5/17/20 12:10	122.64	1,104.90
PG-4UA	Not included in May monitoring event		
PG-5MA	5/17/20 12:43	111.69	1,102.58
PG-5UA	Not included in May monitoring event		
PG-6MA	5/17/20 9:22	96.78	1,115.92
PG-6UA	Not included in May monitoring event		
PG-7MA	5/17/20 9:07	91.48	1,106.38
PG-7UA	Not included in May monitoring event		
PG-8UA	Not included in May monitoring event		
PG-10UA	Not included in May monitoring event		
PG-11UA	Not included in May monitoring event		
PG-16UA	Not included in May monitoring event		
PG-18UA	Not included in May monitoring event		

Table B-1. Summary of Groundwater Level Measurements Taken by Montgomery Associates
North Indian Bend Wash Area, Scottsdale, Arizona
May 2020

Monitor Well Identifier	Measurement Date	Depth to Water (ft, bls)	Groundwater Elevation (ft, amsl)
PG-19UA	Not included in May monitoring event		
PG-22UA	Not included in May monitoring event		
PG-23MA/LA	5/17/20 12:56	112.85	1,109.68
PG-23UA	Not included in May monitoring event		
PG-24UA	Not included in May monitoring event		
PG-25UA	Not included in May monitoring event		
PG-28UA	Not included in May monitoring event		
PG-29UA	Not included in May monitoring event		
PG-30UA	Not included in May monitoring event		
PG-31UA	Not included in May monitoring event		
PG-38MA/LA	5/17/20 12:22	131.71	1,105.53
PG-39LA	5/17/20 14:12	131.28	1,101.30
PG-40LA	5/19/20 17:51	280.09	995.24
PG-42LA	5/19/20 18:41	296.44	995.87
PG-43LA	5/20/20 8:33	268.56	996.45
PG-44LA	5/19/20 17:15	300.36	997.23
PG-47MA	5/18/20 17:04	102.15	1,114.54
PG-48MA	5/18/20 17:21	120.57	1,096.27
PG-50MA	5/17/20 12:59	107.67	1,133.29
PG-51MA	Obstruction in sounder tube. No water level measurement taken.		
S-1LA	5/19/20 16:52	221.42	1,039.03
S-1MA	5/19/20 16:46	144.97	1,115.37
S-2LA	5/19/20 18:01	241.08	1,018.89
S-2MA	5/19/20 15:37	148.02	1,112.47
W-1MA	5/17/20 16:56	103.78	1,126.60
W-2MA	5/17/20 10:49	130.94	1,104.14

ABBREVIATIONS:

ft, bls = feet below land surface

ft, amsl = feet above mean sea level

NOTES:

* = collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA

** = collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA

Table B-2. Summary of Groundwater Level Measurements Taken by Montgomery Associates
North Indian Bend Wash Area, Scottsdale, Arizona
October 2020

Monitor Well Identifier	Measurement Date & Time	Depth to Water (ft, bls)	Groundwater Elevation (ft, amsl)
B-1MA	10/02/2020 08:42	81.61	1,108.65
B-1UA	10/02/2020 08:53	51.66	1,138.66
B-J	10/03/2020 08:01	56.95	1,135.29
D-2MA	10/3/2020 11:44	113.63	1,126.40
E-1LA	10/01/2020 15:34	132.34	1,082.66
E-1MA	10/01/2020 16:06	133.83	1,080.54
E-1UA	10/01/2020 15:54	72.89	1,142.47
E-2UA	10/01/2020 13:58	87.68	1,137.35
E-5MA	10/02/2020 16:00	105.8	1,093.63
E-5UA	10/02/2020 15:53	64.42	1,135.14
E-6UA	10/01/2020 18:35	92.41	1,129.89
E-7LA	10/02/2020 15:10	106.46	1,091.33
E-7UA	10/02/2020 15:19	66.59	1,130.82
E-8MA	10/03/2020 08:10	91.87	1,101.02
E-10MA	10/01/2020 11:20	140.5	1,103.36
E-12UA	10/06/2020 12:31	65.03	1,138.60
E-13UA	10/03/2020 08:27	69.72	1,138.91
E-14LA	10/02/2020 14:19	160.15	1,093.80
M-1MA	10/02/2020 14:17	119.28	1,091.61
M-2LA	10/03/2020 10:26	120.9	1,089.33
M-2MA	10/02/2020 17:55	114.54	1,095.52
M-2UA	10/02/2020 17:43	71.01	1,139.16
M-3MA	10/02/2020 14:56	100.075	1,105.48
M-4MA	10/02/2020 14:33	125.205	1,089.70
M-5LA	10/02/2020 10:53	135.43	1,082.03
M-5MA	10/02/2020 11:17	152.18	1,065.25
M-6MA	10/02/2020 13:29	137.25	1,079.73
M-7MA	10/02/2020 13:52	125.75	1,088.12
M-9LA	10/01/2020 12:06	144.95	1,075.57
M-9MA	10/01/2020 11:49	118.13	1,102.39
M-10LA2	10/02/2020 16:38	130.4	1,089.30
M-10MA2	10/02/2020 16:35	131.8	1,088.25
M-11MA	10/01/2020 18:00	109.59	1,102.00
M-12MA2	10/03/2020 11:48	144.55	1,083.37
M-14LA	10/01/2020 13:31	148.02	1,077.16
M-14MA	10/01/2020 13:43	123.36	1,101.84
M-15MA	10/01/2020 16:54	131.93	1,086.98
M-16LA	10/01/2020 11:33	156.73	1,071.35
M-16MA	10/01/2020 11:40	120.54	1,107.61

Table B-2. Summary of Groundwater Level Measurements Taken by Montgomery Associates
North Indian Bend Wash Area, Scottsdale, Arizona
October 2020

Monitor Well Identifier	Measurement Date & Time	Depth to Water (ft, bls)	Groundwater Elevation (ft, amsl)
M-17MA/LA	10/02/2020 13:30	132.82	1,104.88
PA-1MA	10/01/2020 11:01	104.77	1,120.73
PA-2LA	10/01/2020 14:25	254.46	999.30
PA-3MA	10/01/2020 14:35	118.46	1,134.98
PA-4MA	10/01/2020 13:39	105.01	1,125.91
PA-5LA	10/01/2020 13:33	234.78	994.67
PA-6LA	10/01/2020 10:04	258.15	994.78
PA-7MA	10/01/2020 10:12	121.97	1,131.09
PA-8LA2	10/03/2020 11:33	169.94	1,058.39
PA-9LA	10/03/2020 10:16	176.46	1,060.32
PA-10MA	10/03/2020 10:08	136.02	1,100.78
PA-11LA2	10/03/2020 09:02	146.48	1,078.48
PA-12MA2	10/03/2020 08:55	126.64	1,098.32
PA-13LA	10/01/2020 09:01	242.52	1,006.48
PA-14MA	10/01/2020 08:52	131.52	1,117.57
PA-15LA	10/02/2020 10:04	99.71	1,104.57
PA-16MA	10/02/2020 09:57	97.63	1,106.85
PA-17MA2	10/03/2020 13:51	110.02	1,128.68
PA-18LA	10/03/2020 13:15	201.74	1,037.12
PA-19LA	10/02/2020 12:41	124.74	1,096.72
PA-20MA	10/02/2020 12:53	122.56	1,098.72
PA-21MA	10/01/2020 11:16	114.64	1,110.55
PA-22LA	10/02/2020 07:56	81.61	1,102.39
PA-23MA	10/02/2020 08:13	73.03	1,111.39
PG-1LA	10/01/2020 15:05	261.83	987.83
PG-2LA	10/01/2020 17:09	284.93	986.13
PG-4MA	10/02/2020 11:49	126.76	1,100.78
PG-4UA	10/02/2020 11:55	104.1	1,123.73
PG-5MA	10/02/2020 11:12	113.39	1,100.88
PG-5UA	10/02/2020 11:17	85.86	1,128.34
PG-6MA	10/02/2020 10:54	98.01	1,114.69
PG-6UA	10/02/2020 11:00	86.3	1,126.79
PG-7MA	10/02/2020 09:22	87.93	1,109.93
PG-7UA	10/02/2020 09:17	67.42	1,130.14
PG-8UA	10/02/2020 12:34	95.72	1,126.29
PG-10UA	10/03/2020 12:43	103.56	1,137.28
PG-11UA	10/01/2020 09:37	97.53	1,132.87
PG-16UA	10/01/2020 11:34	107.43	1,134.46

Table B-2. Summary of Groundwater Level Measurements Taken by Montgomery Associates
North Indian Bend Wash Area, Scottsdale, Arizona
October 2020

Monitor Well Identifier	Measurement Date & Time	Depth to Water (ft, bls)	Groundwater Elevation (ft, amsl)
PG-18UA	10/02/2020 10:28	69.31	1,132.82
PG-19UA	10/01/2020 09:50	72.34	1,131.96
PG-22UA	10/02/2020 15:31	74.7	1,135.59
PG-23MA/LA	10/02/2020 11:31	116.09	1,106.44
PG-23UA	10/02/2020 11:36	98.68	1,124.28
PG-24UA	10/02/2020 10:40	84.07	1,128.15
PG-25UA	10/02/2020 14:44	74.46	1,132.08
PG-28UA	10/03/2020 11:01	98.89	1,136.06
PG-29UA	10/03/2020 13:11	96.06	1,136.97
PG-30UA	10/03/2020 09:27	91.17	1,135.19
PG-31UA	10/03/2020 17:41	101.52	1,133.93
PG-38MA/LA	10/02/2020 12:18	136.2	1,101.04
PG-39LA	10/02/2020 13:15	137.09	1,095.49
PG-40LA	10/01/2020 15:55	295.67	979.66
PG-42LA	10/01/2020 16:20	314.69	977.62
PG-43LA	10/01/2020 15:18	287.52	977.49
PG-44LA	10/01/2020 16:47	316	981.59
PG-47MA	10/02/2020 13:04	112.09	1,104.60
PG-48MA	10/02/2020 12:38	133.7	1,083.14
PG-50MA	10/03/2020 11:58	108.47	1,132.49
PG-51MA	Obstruction in sounder tube. No water level measurement taken.		
S-1LA	10/01/2020 10:59	235.07	1,025.38
S-1MA	10/01/2020 10:53	146.66	1,113.68
S-2LA	10/01/2020 09:28	258.7	1,001.27
S-2MA	10/01/2020 08:38	150.98	1,109.51
W-1MA	10/03/2020 16:18	106.93	1,123.45
W-2MA	10/03/2020 11:09	135.67	1,099.41

ABBREVIATIONS:

ft, bls = feet below land surface

ft, amsl = feet above mean sea level

NOTES:

* = collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA

** = collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA

Table B-3. Summary of Groundwater Level Difference Between October 2019 and October 2020
North Indian Bend Wash Area, Scottsdale, Arizona

Monitor Well Identifier[1]	Alluvium Unit	October 2019 Depth to Groundwater Level (ft, bls)	October 2020 Depth to Groundwater Level (ft, bls)	Change in Depth to Groundwater Level (feet)
B-1	U	53.92	51.66	2.26
B-1	M	83.84	81.61	2.23
B-J	U	60.44	56.95	3.49
D-2	M	116.25	113.63	2.62
E-1	U	75.72	72.89	2.83
E-1	M	125.51	133.83	-8.32
E-1	L	137.69	132.34	5.35
E-2	U	91.13	87.68	3.45
E-5	U	68.11	64.42	3.69
E-5	M	100.81	105.80	-4.99
E-6	U	96.79	92.41	4.38
E-7	U	70.57	66.59	3.98
E-7	L	111.42	106.46	4.96
E-8	M	91.59	91.87	-0.28
E-10	M	143.98	140.50	3.48
E-12	U	67.87	65.03	2.84
E-13	U	72.71	69.72	2.99
E-14	L	165.13	160.15	4.98
M-1	M	113.98	119.28	-5.30
M-2	U	74.10	71.01	3.09
M-2	M	111.99	114.54	-2.55
M-2	L	126.95	120.90	6.05
M-3	M	98.21	100.08	-1.87
M-4	M	119.89	125.21	-5.32
M-5	M	148.50	152.18	-3.69
M-5	L	134.91	135.43	-0.52
M-6	M	130.21	137.25	-7.04
M-7	M	118.78	125.75	-6.97
M-9	M	115.32	118.13	-2.81
M-9	L	149.30	144.95	4.35
M-10MA2	M	129.71	131.80	-2.09
M-10LA2	L	134.26	130.40	3.86
M-11	M	107.81	109.59	-1.78
M-12MA2	M	127.02	144.55	-17.53
M-14	M	120.45	123.36	-2.91
M-14	L	144.73	148.02	-3.29
M-15	M	128.61	131.93	-3.32
M-16	M	117.74	120.54	-2.80
M-16	L	159.54	156.73	2.81
M-17MA/LA	M	133.48	132.82	0.66
PA-1	M	104.11	104.77	-0.66
PA-2	L	260.03	254.46	5.57
PA-3	M	119.77	118.46	1.31
PA-4	M	111.16	105.01	6.15
PA-5	L	240.64	234.78	5.86
PA-6	L	265.05	258.15	6.90
PA-7	M	124.35	121.97	2.38
PA-8LA2	L	171.50	169.94	1.56
PA-9	L	180.98	176.46	4.52
PA-10	M	139.06	136.02	3.04

Table B-3. Summary of Groundwater Level Difference Between October 2019 and October 2020
North Indian Bend Wash Area, Scottsdale, Arizona

Monitor Well Identifier[1]	Alluvium Unit	October 2019 Depth to Groundwater Level (ft, bls)	October 2020 Depth to Groundwater Level (ft, bls)	Change in Depth to Groundwater Level (feet)
PA-11LA2*	L	149.57	146.48	3.09
PA-12MA2**	M	128.91	126.64	2.27
PA-13	L	249.58	242.52	7.06
PA-14	M	134.54	131.52	3.02
PA-15	L	105.90	99.71	6.19
PA-16	M	101.81	97.63	4.18
PA-17MA2	M	110.37	110.02	0.35
PA-18	L	205.79	201.74	4.05
PA-19	L	129.68	124.74	4.94
PA-20	M	127.11	122.56	4.55
PA-21	M	111.62	114.64	-3.02
PA-22	L	90.15	81.61	8.54
PA-23	M	77.55	73.03	4.52
PG-1	L	267.88	261.83	6.05
PG-2	L	303.15	284.93	18.22
PG-4	U	108.70	104.10	4.60
PG-4	M	131.65	126.76	4.89
PG-5	U	90.31	85.86	4.45
PG-5	M	117.44	113.39	4.05
PG-6	U	91.10	86.30	4.80
PG-6	M	103.28	98.01	5.27
PG-7	U	71.88	67.42	4.46
PG-7	M	93.34	87.93	5.41
PG-8	U	100.19	95.72	4.47
PG-10	U	103.54	103.56	-0.02
PG-11	U	101.62	97.53	4.09
PG-16	U	111.71	107.43	4.28
PG-18	U	73.21	69.31	3.90
PG-19	U	76.30	72.34	3.96
PG-22	U	78.45	74.70	3.75
PG-23	U	103.43	98.68	4.75
PG-23MA/LA	M	120.85	116.09	4.76
PG-24	U	88.62	84.07	4.55
PG-25	U	78.63	74.46	4.17
PG-28	U	102.89	98.89	4.00
PG-29	U	99.96	96.06	3.90
PG-30	U	95.15	91.17	3.98
PG-31	U	105.75	101.52	4.23
PG-38MA/LA	M	141.20	136.20	5.00
PG-39	L	141.73	137.09	4.64
PG-40	L	300.45	295.67	4.78
PG-42	L	317.28	314.69	2.59
PG-43	L	289.86	287.52	2.34
PG-44	L	320.44	316.00	4.44
PG-47	M	109.24	112.09	-2.85
PG-48	M	126.77	133.70	-6.93
PG-50	M	123.64	108.47	15.17
PG-51	M	144.78	Obstruction	---

Table B-3. Summary of Groundwater Level Difference Between October 2019 and October 2020
North Indian Bend Wash Area, Scottsdale, Arizona

Monitor Well Identifier[1]	Alluvium Unit	October 2019 Depth to Groundwater Level (ft, bls)	October 2020 Depth to Groundwater Level (ft, bls)	Change in Depth to Groundwater Level (feet)
S-1	M	151.46	146.66	4.80
S-1	L	241.61	235.07	6.54
S-2	M	154.98	150.98	4.00
S-2	L	265.78	258.70	7.08
W-1	M	108.67	106.93	1.74
W-2	M	138.81	135.67	3.14

ABBREVIATIONS:

ft, bls = feet below land surface
U = Upper Alluvium Unit monitor well
M = Middle Alluvium Unit monitor well
L = Lower Alluvium Unit monitor well

NOTES:

[1] Wells arranged alphabetically, then by unit.
* = collected from LAU completed well at piezometer PA-11LA2/12MA2 located approximately 80 feet northwest of original well PA-11LA
** = collected from MAU completed well at piezometer PA-11LA2/12MA2 located approximately 70 feet northwest of original well PA-12MA

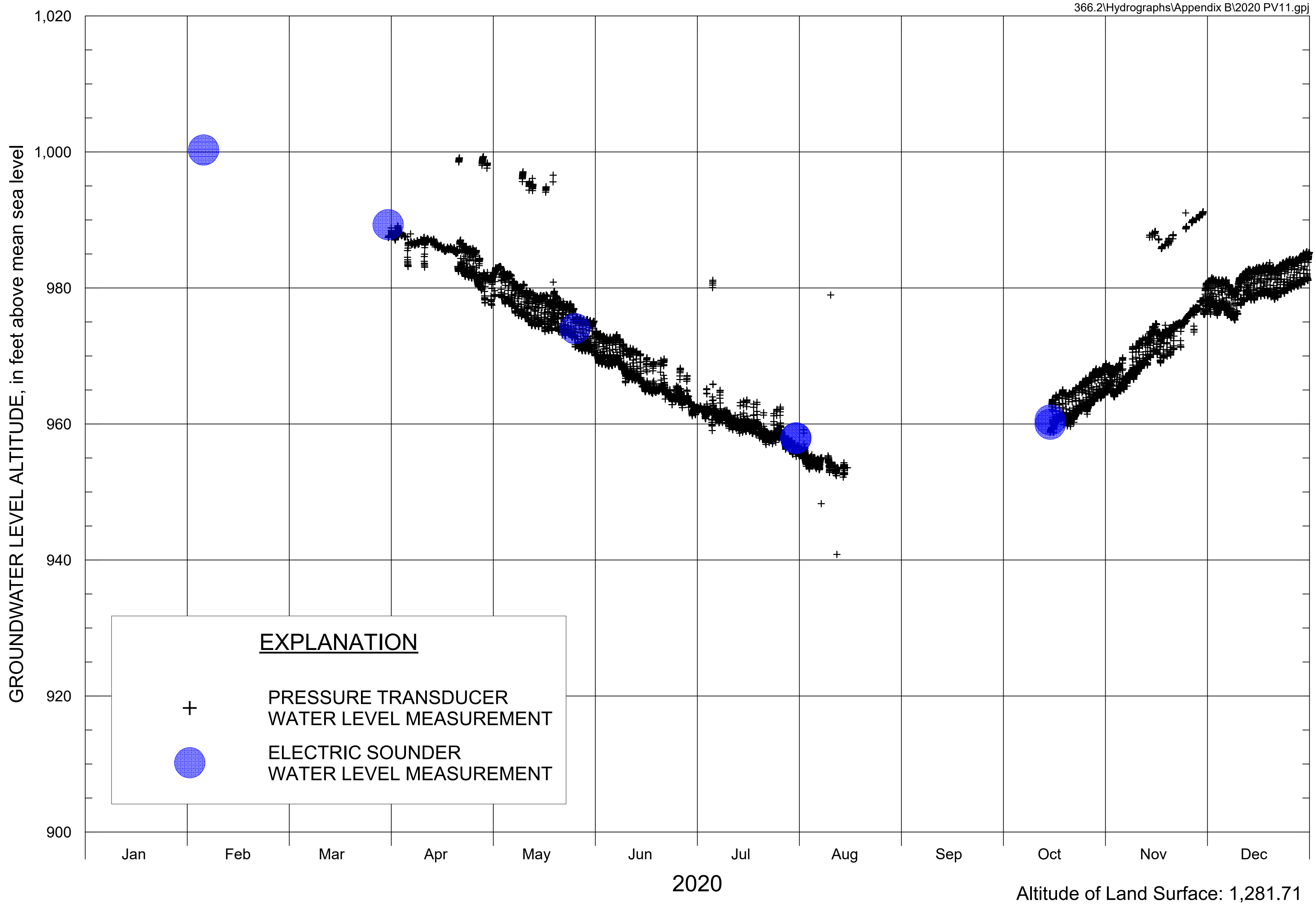
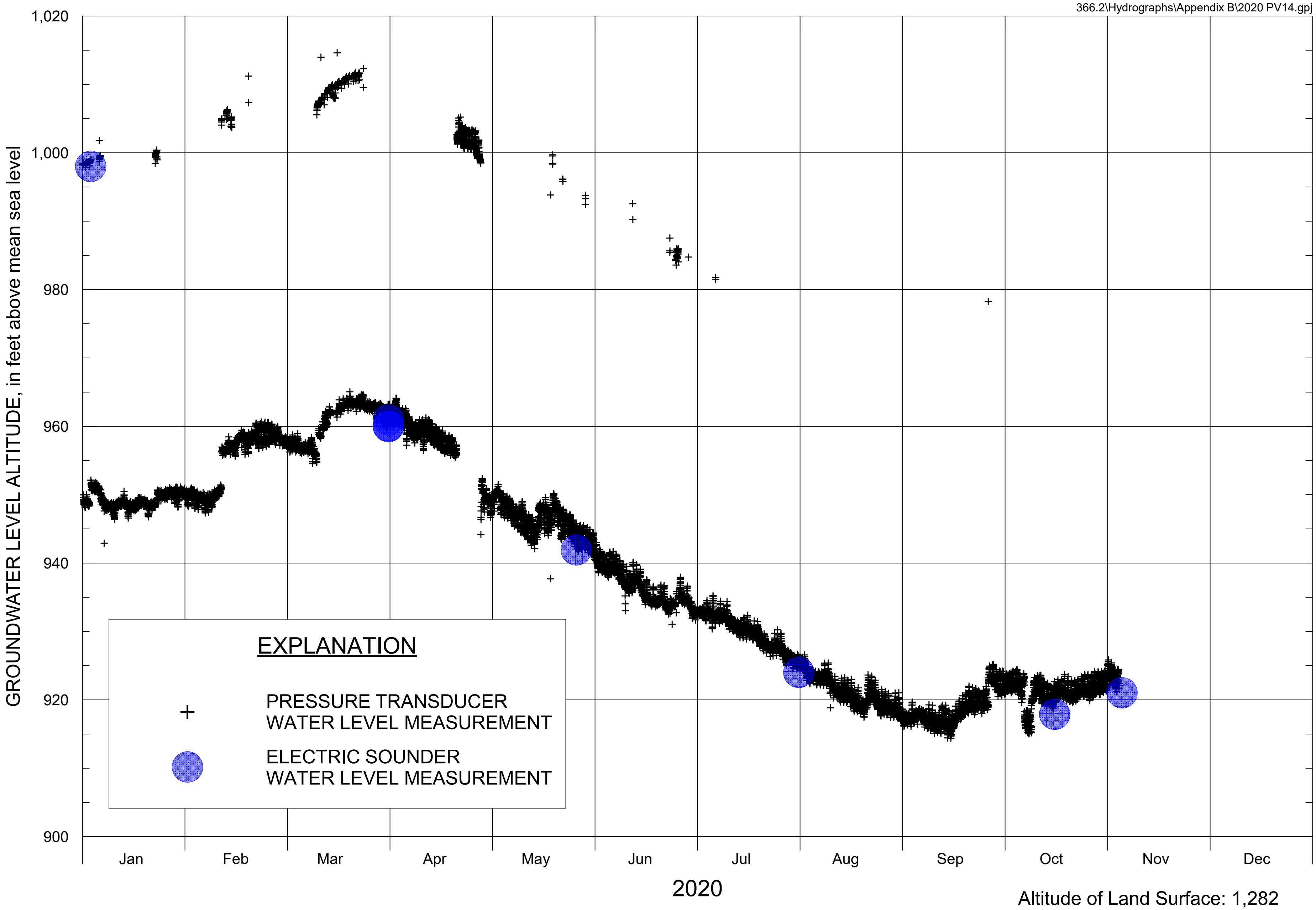


FIGURE B-1. GROUNDWATER LEVEL HYDROGRAPH FOR EXTRACTION WELL PV-11

Note: 1) Higher water levels are representative of non-pumping conditions; lower water levels are representative of pumping conditions.

North Indian Bend Wash Superfund Site

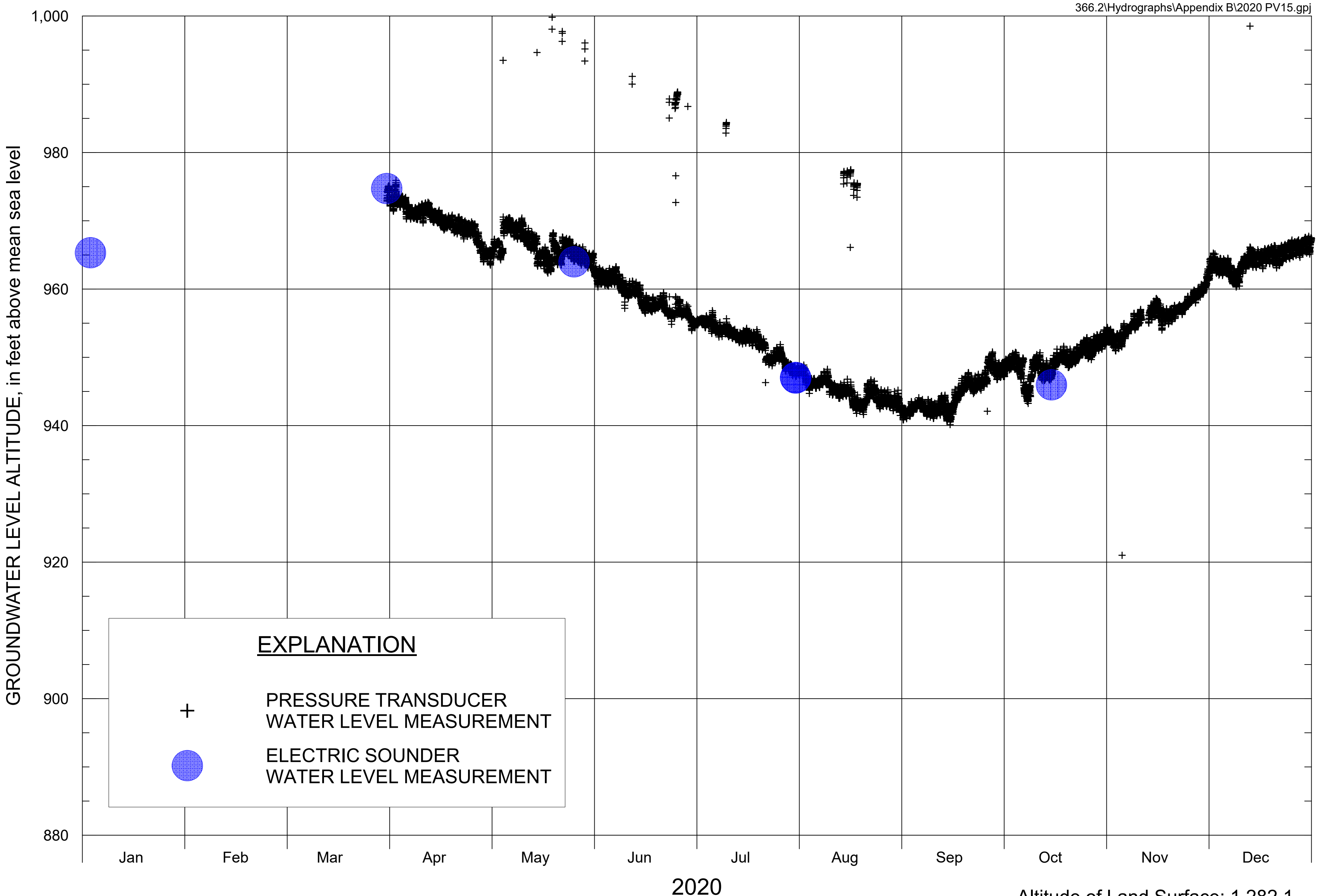


Altitude of Land Surface: 1,282

FIGURE B-2. GROUNDWATER LEVEL HYDROGRAPH FOR EXTRACTION WELL PV-14

Note: 1) Higher water levels are representative of non-pumping conditions;
lower water levels are representative of pumping conditions.

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,282.1

FIGURE B-3. GROUNDWATER LEVEL HYDROGRAPH FOR EXTRACTION WELL PV-15

Note: 1) Higher water levels are representative of non-pumping conditions; lower water levels are representative of pumping conditions.

North Indian Bend Wash Superfund Site

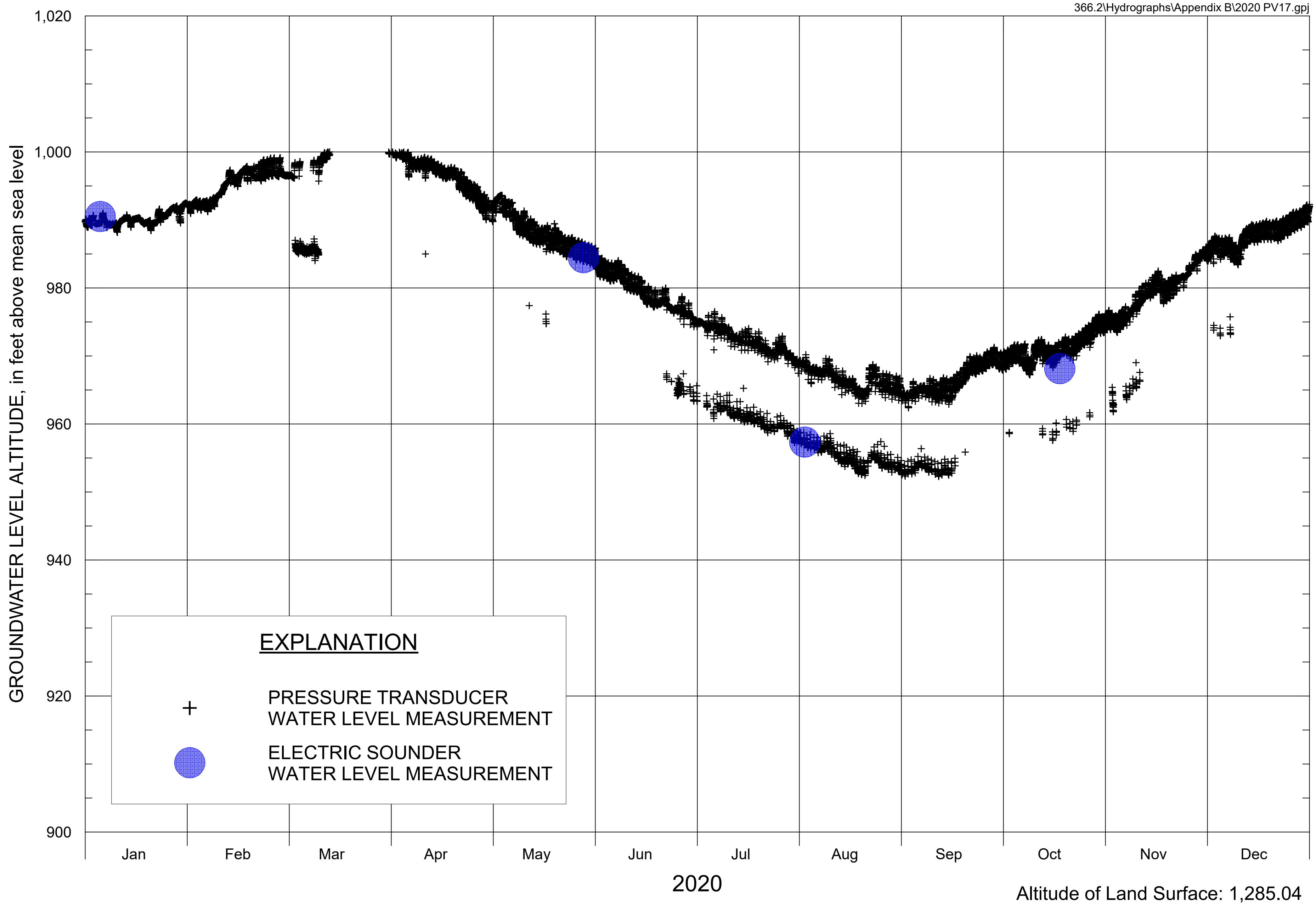


FIGURE B-4. GROUNDWATER LEVEL HYDROGRAPH FOR EXTRACTION WELL PV-17

Note: 1) Higher water levels are representative of non-pumping conditions; lower water levels are representative of pumping conditions.

North Indian Bend Wash Superfund Site

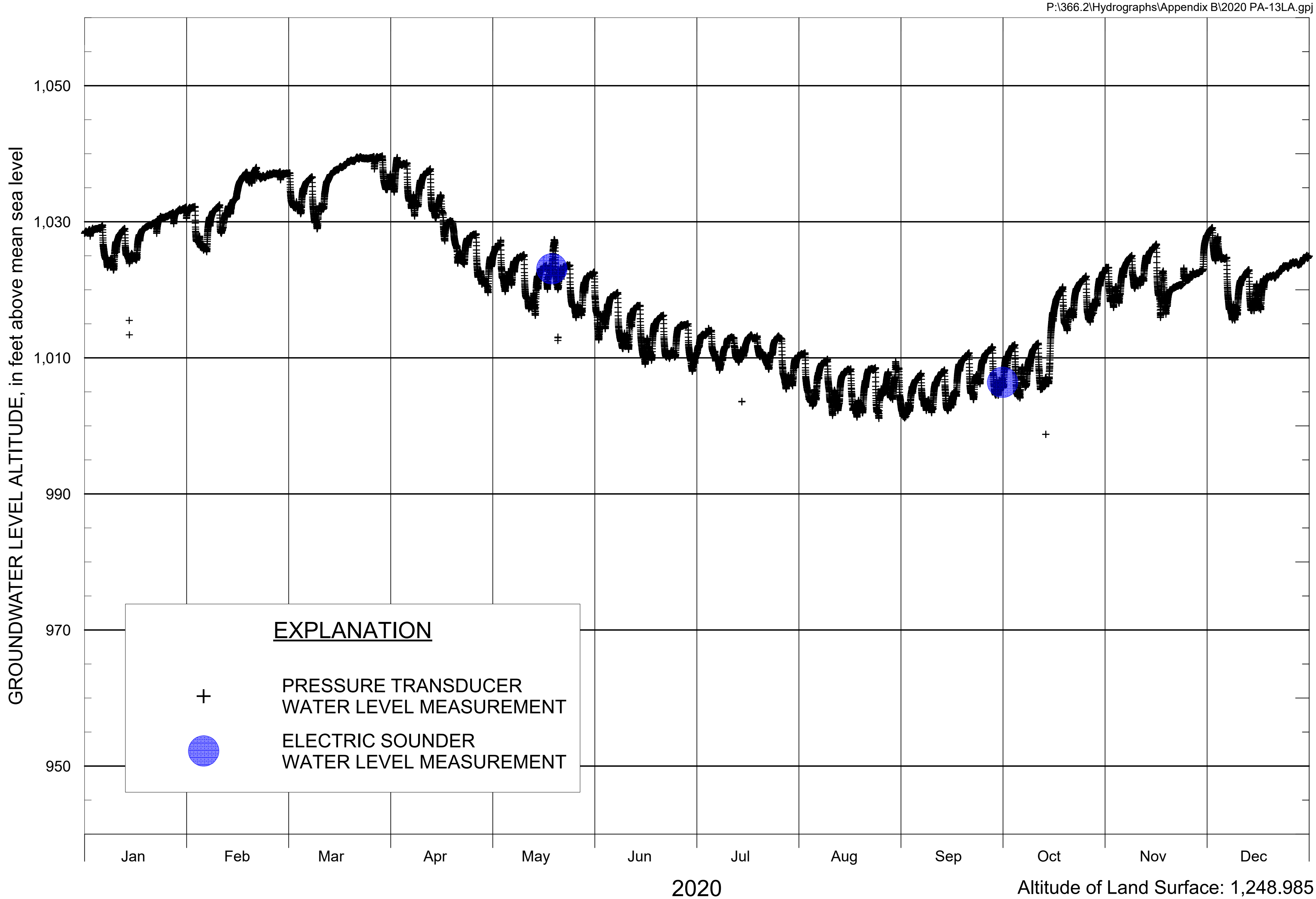


FIGURE B-5. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-13LA

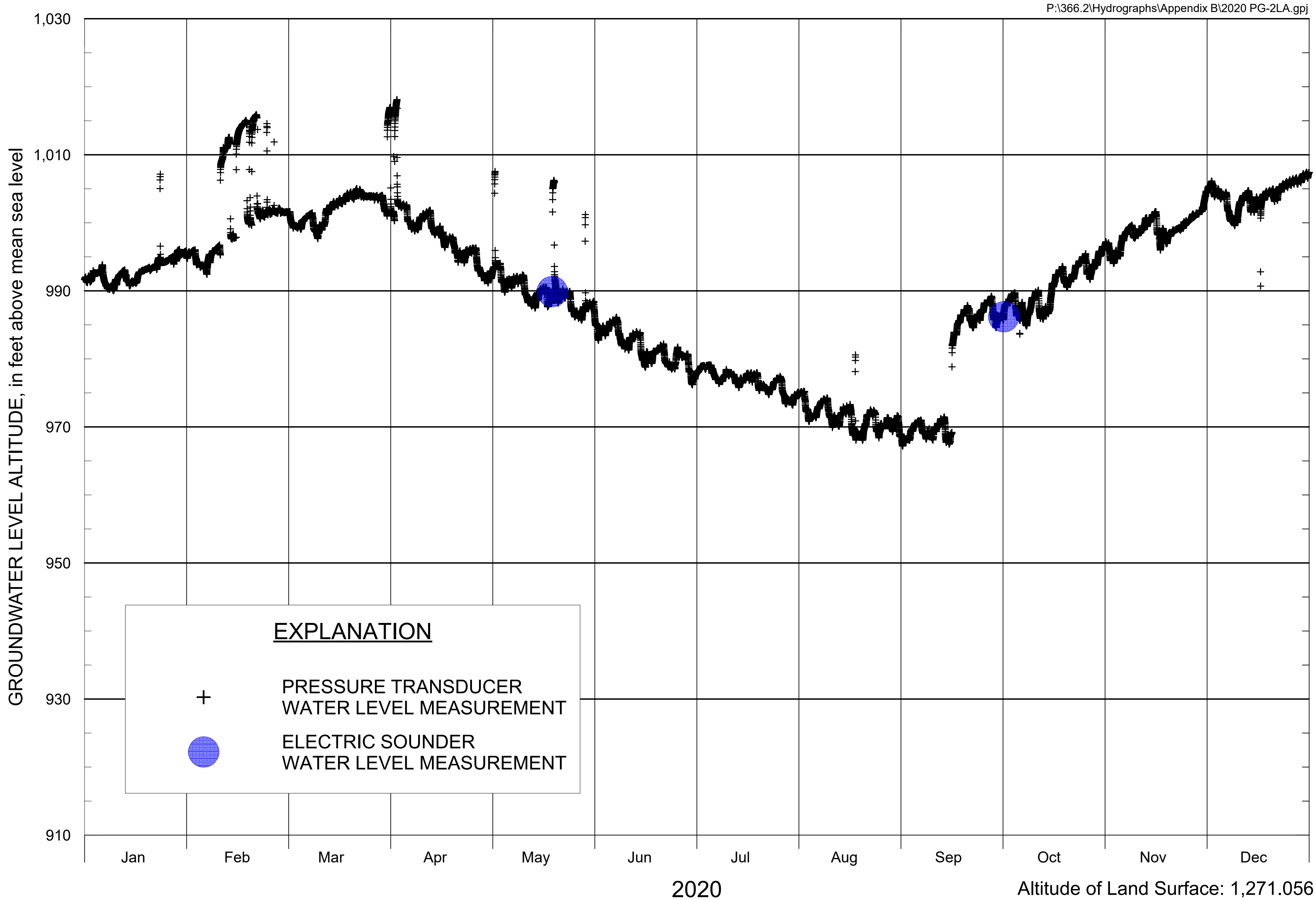


FIGURE B-6. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-2LA

North Indian Bend Wash Superfund Site

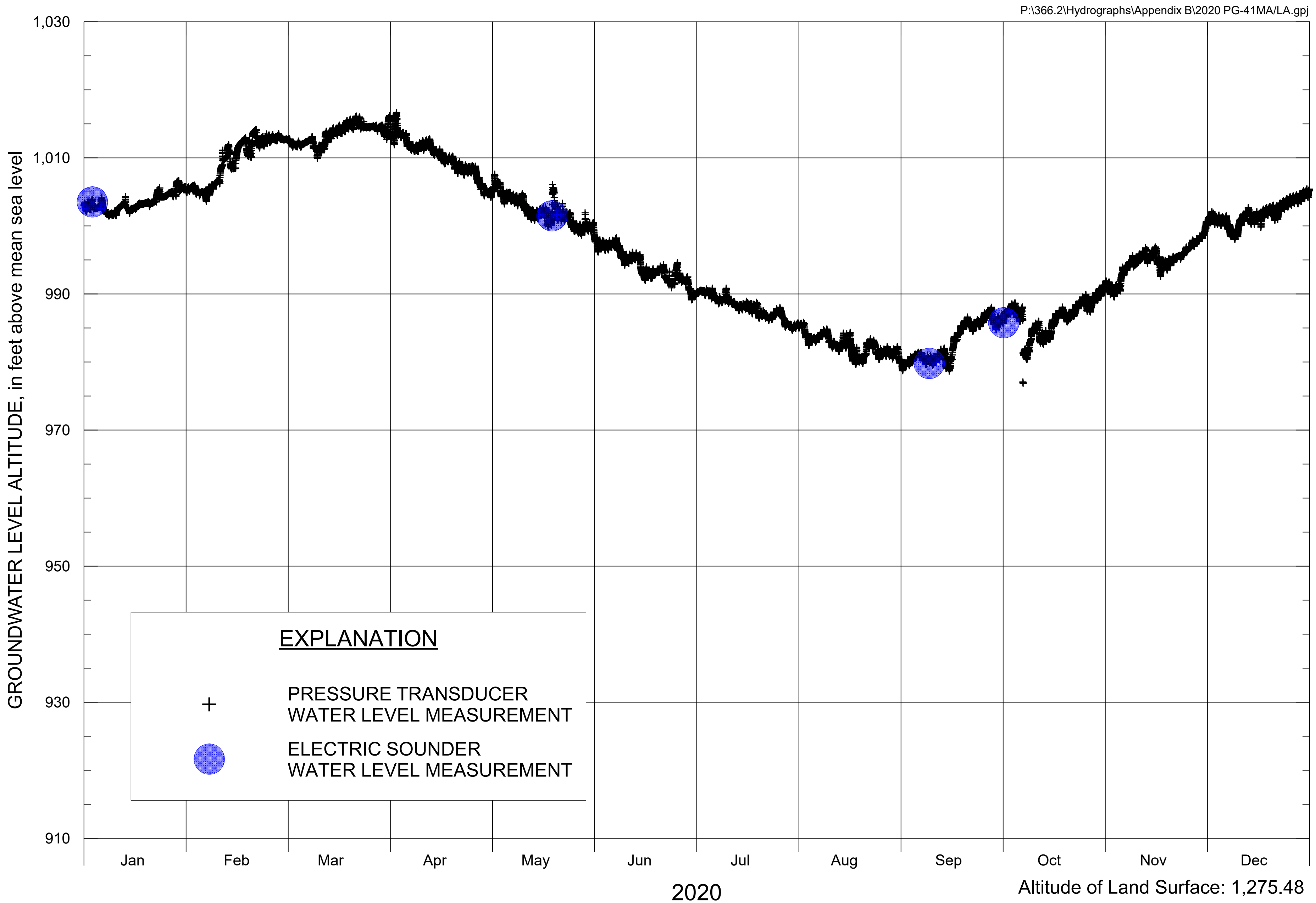


FIGURE B-7. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-41MA/LA

North Indian Bend Wash Superfund Site

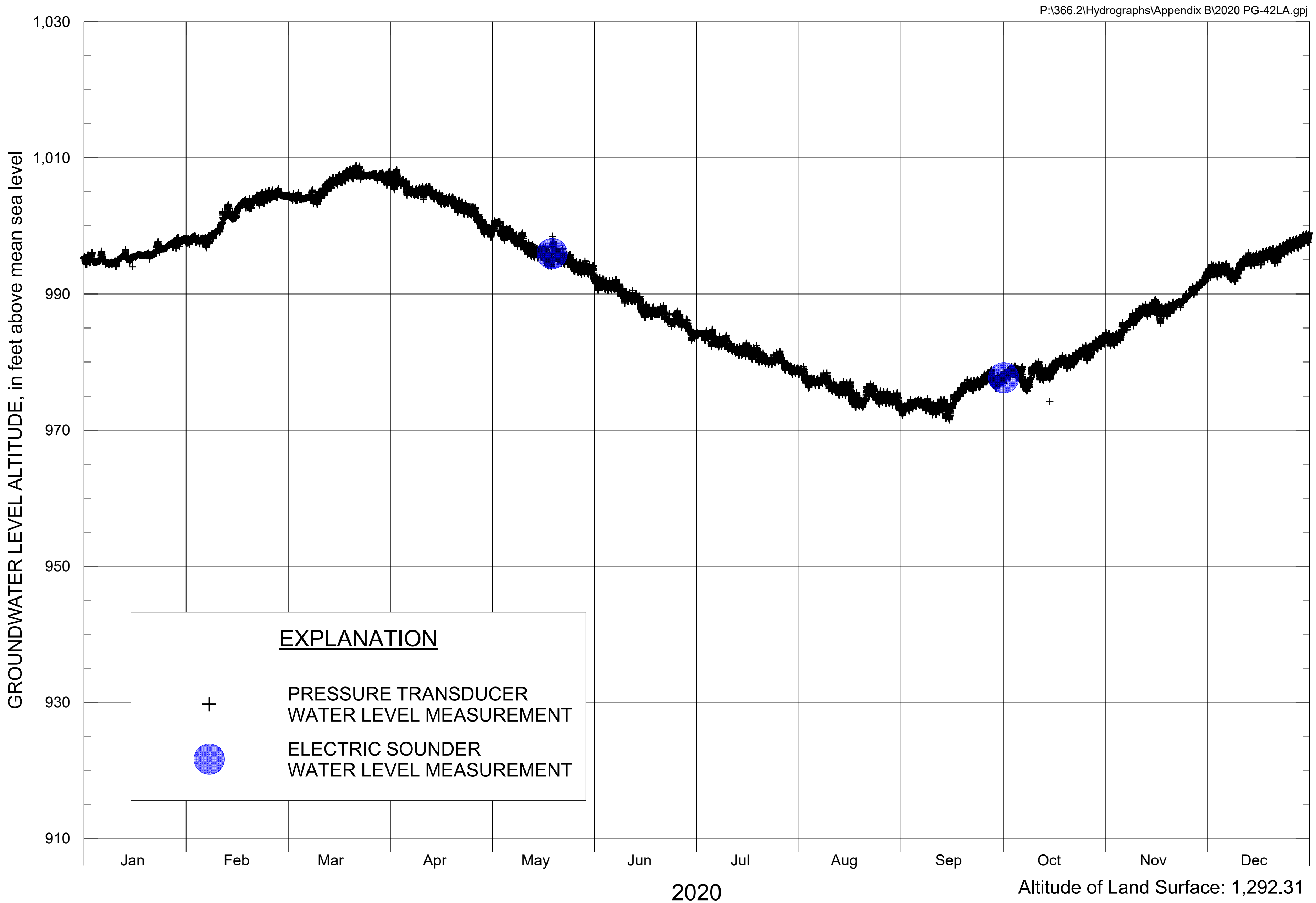


FIGURE B-8. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-42LA

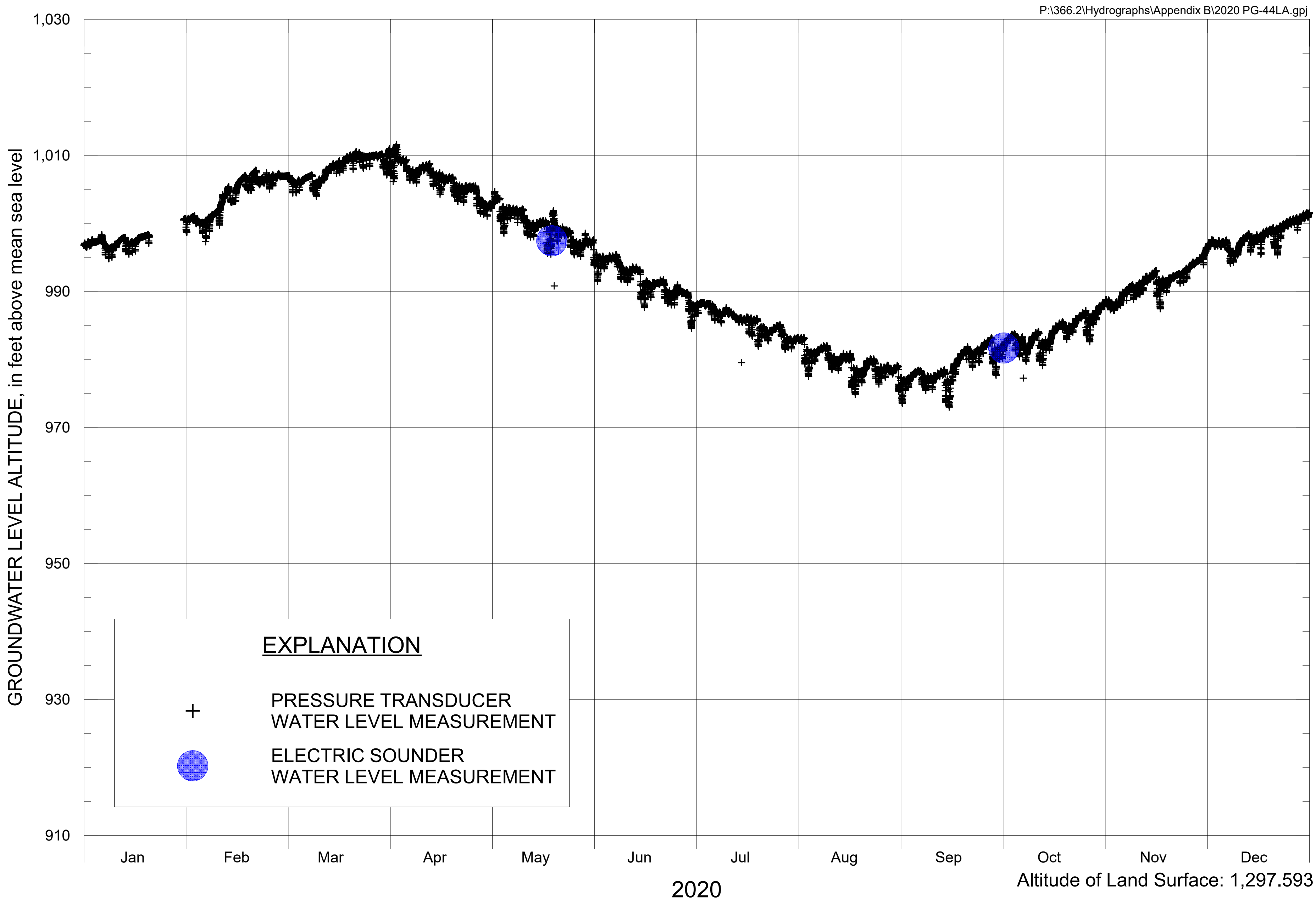


FIGURE B-9. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-44LA

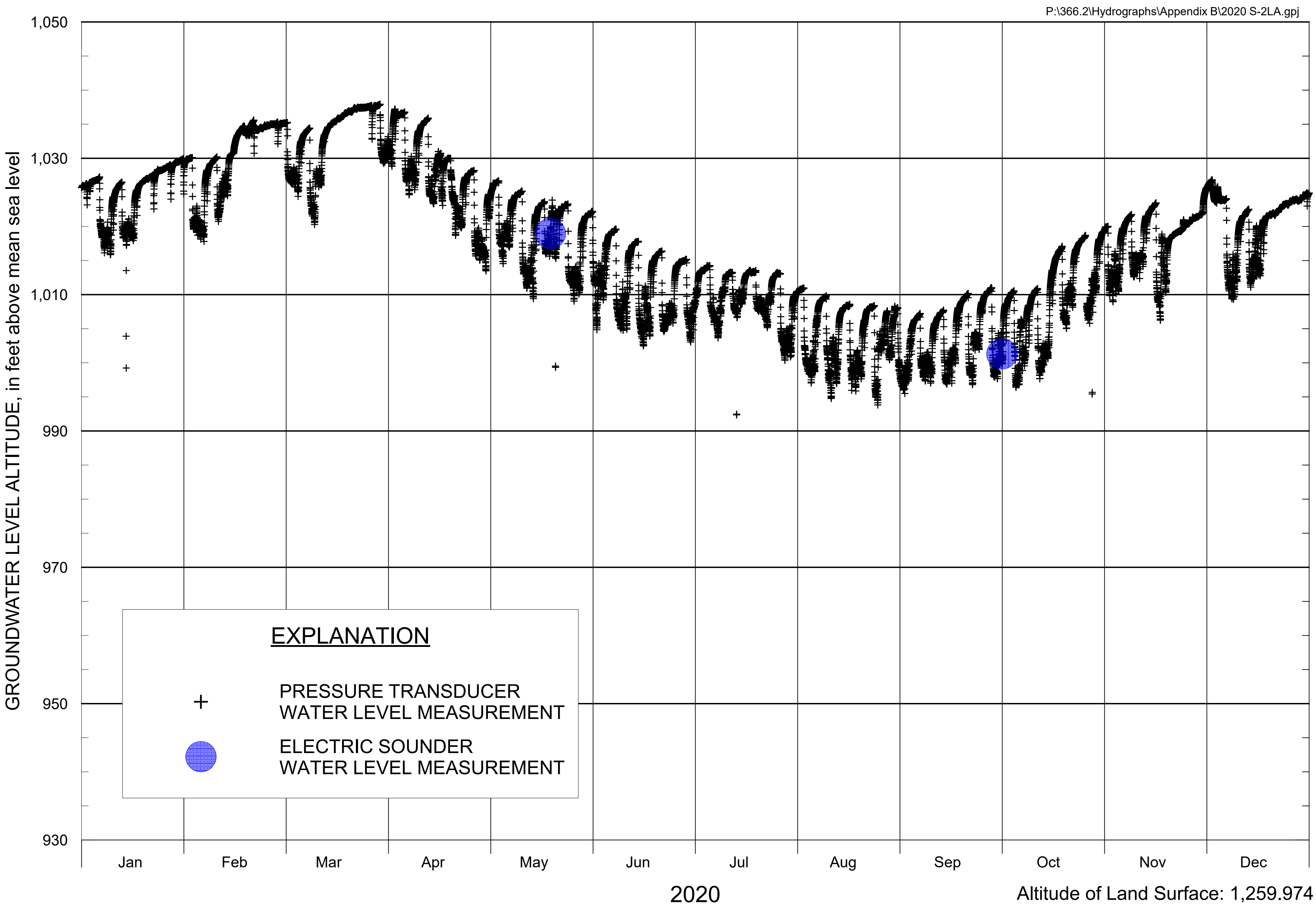


FIGURE B-10. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL S-2LA

North Indian Bend Wash Superfund Site

APPENDIX C
LABORATORY RESULTS FOR VOLATILE ORGANIC COMPOUNDS, 2020

Table C-1. 2020 Laboratory Results for VOCs in Groundwater Monitoring Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	Lab	TCA	DCE	TCM	PCE	TCE	Report
						200	*6*	*6*	*5*	*5*	
Monitoring	B-J	B-J	10/8/2020	Original	TA	<0.50	<0.50	0.84	<0.50	1.1	550-150572
Monitoring	B-1MA (A)	B-1MA HS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150453
Monitoring	D-2MA	D-2MA	1/13/2020	Original	TA	<0.50	<0.50	1.0	<0.50	**29**	550-136115
Monitoring	D-2MA	D-2MA	5/18/2020	Original	TA	<0.50	<0.50	0.58	<0.50	**28**	550-142270
Monitoring	D-2MA	F	5/18/2020	Duplicate	TA	<0.50	<0.50	0.55	<0.50	**25**	550-142270
Monitoring	D-2MA	D-2MA	7/13/2020	Original	TA	<0.50	<0.50	0.67	<0.50	**32**	550-145019
Monitoring	D-2MA	D-2MA	10/15/2020	Original	TA	<0.50	<0.50	0.59	<0.50	**42**	550-151098
Monitoring	E-1LA (A)	E-1LA	10/15/2020	Original	TA	<0.50	<0.50	1.9	<0.50	0.76	550-151096
Monitoring	E-1LA (A)	Z	10/15/2020	Duplicate	TA	<0.50	<0.50	1.9	<0.50	0.79	550-151096
Monitoring	E-1MA	E-1MA	1/16/2020	Original	TA	<0.50	<0.50	0.64	<0.50	**14**	550-136381
Monitoring	E-1MA	D	1/16/2020	Duplicate	TA	<0.50	<0.50	0.59	<0.50	**13**	550-136381
Monitoring	E-1MA	E-1MA	5/28/2020	Original	TA	<0.50	0.91	5.2	2.6	**100**	550-142693
Monitoring	E-1MA	K	5/28/2020	Duplicate	TA	<0.50	0.94	5.2	2.7	**94**	550-142693
Monitoring	E-1MA	E-1MA	7/16/2020	Original	TA	<0.50	0.76	5.3	3.1	**110**	550-145367
Monitoring	E-1MA	O	7/16/2020	Duplicate	TA	<0.50	0.86	5.7	2.9	**110**	550-145367
Monitoring	E-1MA (B)	E-1MA	10/13/2020	Original	TA	<0.50$_{REJ}$	<0.50$_{REJ}$	<0.50$_{REJ}$	1.3$_{REJ}$	**12**$_{REJ}$	550-150906
				Lab dup	TA	<0.50 (1)(B)	<0.50 (1)(B)	0.96 (1)(B)	0.57 (1)(B)	**18** (1)(B)	
				Lab dup		<0.50 (1)	<0.50 (1)	0.80 (1)	<0.50 (1)	**12** (1)	
Monitoring	E-1MA	X	10/13/2020	Duplicate	TA	<0.50	<0.50	1.0	0.56	**19**	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	0.88 (1)	0.61 (1)	**18** (1)	
Monitoring	E-5MA	E-5MA	1/16/2020	Original	TA	<0.50	<0.50	1.4	0.83	**38**	550-136381
Monitoring	E-5MA	E-5MA	5/19/2020	Original	TA	<0.50	<0.50	1.2	1.1	**29**	550-142324
Monitoring	E-5MA	E-5MA	7/16/2020	Original	TA	<0.50	<0.50	1.7	1.1	**39**	550-145367
Monitoring	E-5MA	E-5MA	10/9/2020	Original	TA	<0.50	<0.50	1.5	0.74	**33**	550-150667
Monitoring	E-5UA	E-5UAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	4.8	550-150466-1
Monitoring	E-7LA	E-7LA	10/8/2020	Original	TA	<0.50	<0.50	1.1	1.4	**20**	550-150572
Monitoring	E-7UA	E-7UAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150466-1
Monitoring	E-8MA	E-8MA	10/9/2020	Original	TA	<0.50	<0.50	0.93	<0.50	**21**	550-150667
Monitoring	E-10MA	E-10MAHS	1/15/2020	Original	TA	<0.50	<0.50	0.67	2.7	4.4	550-136275
Monitoring	E-10MA	E-10MA HS	5/20/2020	Original	TA	<0.50	<0.50	0.52	2.7	4.0	550-142393
Monitoring	E-10MA	E-10MAHS	7/15/2020	Original	TA	<0.50	<0.50	0.69	2.5	4.6	550-145228
Monitoring	E-10MA	E-10MAHS	10/7/2020	Original	TA	<0.50	<0.50	0.68	2.8	4.2	550-150466-1
Monitoring	E-12UA	E-12UAHS	10/7/2020	Original	TA	<0.50	<0.50	0.60	<0.50	2.0	550-150466-1
Monitoring	E-12UA	S	10/7/2020	Duplicate	TA	<0.50	<0.50	0.53	<0.50	2.0	550-150466-1
Monitoring	E-13UA	E-13UA	10/9/2020	Original	TA	<0.50	<0.50	0.76	<0.50	2.1	550-150667
Monitoring	E-14LA (A)	E-14LAHS	10/8/2020	Original	TA	<0.50	<0.50	1.0	<0.50	<0.50	550-150571-1
Monitoring	M-1MA (A)	M-1MAHS	10/16/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151258
Monitoring	M-2MA	M-2MAHS	10/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	4.8	550-150438-1
Monitoring	M-2MA	Q	10/6/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	5.0	550-150438-1

Table C-1. 2020 Laboratory Results for VOCs in Groundwater Monitoring Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	Lab	TCA	DCE	TCM	PCE	TCE	Report
						200	6	6	5	5	
Monitoring	M-2UA	M-2UA	10/8/2020	Original	TA	<0.50	<0.50	1.0	<0.50	0.75	550-150572
Monitoring	M-4MA	M-4MAHS	1/15/2020	Original	TA	<0.50	<0.50	0.60	<0.50	**14**	550-136275
Monitoring	M-4MA	M-4MA HS	5/20/2020	Original	TA	<0.50	<0.50	1.0	1.7	**30**	550-142393
Monitoring	M-4MA	M-4MAHS	7/15/2020	Original	TA	<0.50	<0.50	1.3	1.2	**29**	550-145228
Monitoring	M-4MA	M-4MAHS	10/7/2020	Original	TA	<0.50	0.95	1.0	2.0	**46**	550-150466-1
Monitoring	M-5LA	M-5LA	10/14/2020	Original	TA	<0.50	<0.50	1.8	<0.50	1.6	550-151002
Monitoring	M-5MA	M-5MA	1/16/2020	Original	TA	<0.50	1.2	1.1	3.1	**31**	550-136381
Monitoring	M-5MA	M-5MA	5/19/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.5**	550-142324
Monitoring	M-5MA	M-5MA	7/16/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.2**	550-145367
Monitoring	M-5MA	M-5MA	10/13/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.3**	550-150906
Monitoring	M-6MA	M-6MA	1/16/2020	Original	TA	<0.50	<0.50	1.8	1.1	**42**	550-136381
Monitoring	M-6MA	M-6MA	5/19/2020	Original	TA	<0.50	<0.50	2.2	1.1	**48**	550-142324
Monitoring	M-6MA	G	5/19/2020	Duplicate	TA	<0.50	0.51	2.3	2.0	**51**	550-142324
Monitoring	M-6MA	M-6MA	7/16/2020	Original	TA	<0.50	0.63	3.1	2.1	**65**	550-145367
Monitoring	M-6MA	M-6MA	10/13/2020	Original	TA	<0.50	<0.50	0.68	<0.50	**13**	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	1.1 (1)	<0.50 (1)	**18** (1)	
Monitoring	M-7MA	M-7MA	10/27/2020	Original	TA	<0.50	<0.50	1.5	<0.50	<0.50	550-151827
Monitoring	M-7MA	AB	10/27/2020	Duplicate	TA	<0.50	<0.50	1.5	<0.50	<0.50	550-151827
Monitoring	M-9LA (A)	M-9LA	10/15/2020	Original	TA	<0.50	<0.50	1.2	<0.50	0.62	550-151096
Monitoring	M-9MA	M-9MA	10/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.8**	550-151098
Monitoring	M-10LA2	M-10LA2HS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	2.8	550-150438-1
Monitoring	M-10MA2	M-10MA2	1/15/2020	Original	TA	<0.50	0.56	0.88	0.63	**45**	550-136275
Monitoring	M-10MA2	M-10MA2	5/19/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**18**	550-142324
Monitoring	M-10MA2	M-10MA2	7/16/2020	Original	TA	<0.50	<0.50	0.67	<0.50	**27**	550-145367
Monitoring	M-10MA2	M-10MA2	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**16**	550-150572
Monitoring	M-11MA	M-11MA	10/13/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	<0.50 (1)	<0.50 (1)	<0.50 (1)	
Monitoring	M-12MA2	M-12MA2	10/14/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**16**	550-151002
Monitoring	M-14LA	M-14LA	10/9/2020	Original	TA	<0.50	<0.50	1.1	4.9	**22**	550-150667
Monitoring	M-14LA	V	10/9/2020	Duplicate	TA	<0.50	<0.50	1.2	4.7	**21**	550-150667
Monitoring	M-14MA (A)	M-14MA	10/9/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150668
Monitoring	M-15MA	M-15MA	1/16/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.3	550-136381
Monitoring	M-15MA	M-15MA	5/19/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	2.6	550-142324
Monitoring	M-15MA	M-15MA	7/16/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.8	550-145367
Monitoring	M-15MA	M-15MA	10/14/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.0	550-151002
Monitoring	M-16LA	M-16LAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	1.1	**14**	550-150572
Monitoring	M-16MA	M-16MA	10/12/2020	Original	TA	<0.50 (1)	<0.50 (1)	<0.50 (1)	<0.50 (1)	3.7 (1)	550-150825
Monitoring	M-16MA	W	10/12/2020	Duplicate	TA	<2.5	<2.5	<2.5	<2.5	4.6	550-150825
Monitoring	M-17MA/LA	M-17MA/LA HS	1/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136275

Table C-1. 2020 Laboratory Results for VOCs in Groundwater Monitoring Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	Lab	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
Monitoring	M-17MA/LA	M-17MA/LA HS	5/20/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142393
Monitoring	M-17MA/LA	M-17MA/LAHS	7/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145228
Monitoring	M-17MA/LA	M-17MA/LAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150466-1
Monitoring	PA-2LA	PA-2LA	10/15/2020	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-151097
Monitoring	PA-5LA	PA-5LA	1/14/2020	Original	TA	<0.50	<0.50	2.5	2.3	**57**	550-136194
Monitoring	PA-5LA	PA-5LA	5/21/2020	Original	TA	<0.50	<0.50	2.4	3.7	**54**	550-142442
Monitoring	PA-5LA	PA-5LA	7/14/2020	Original	TA	<0.50	<0.50	2.7	2.6	**46**	550-145091
Monitoring	PA-5LA	PA-5LA	10/6/2020	Original	TA	<0.50	0.50	3.0	2.5	**51**	550-150321
Monitoring	PA-5LA	P	10/6/2020	Duplicate	TA	<0.50	0.53	3.0	2.5	**52**	550-150321
Monitoring	PA-6LA	PA-6LA	1/14/2020	Original	TA	<0.50	2.5	2.8	**17**	**130**	550-136194
Monitoring	PA-6LA	PA-6LA	5/21/2020	Original	TA	<0.50	2.7	2.5	**20**	**120**	550-142442
Monitoring	PA-6LA	PA-6LA	7/14/2020	Original	TA	<0.50	2.9	3.0	**17**	**150**	550-145091
Monitoring	PA-6LA	PA-6LA	10/6/2020	Original	TA	<0.50	3.4	3.1	**17**	**140** (2)	550-150321
Monitoring	PA-8LA2	PA-8LA2	10/14/2020	Original	TA	<0.50 (3)	<0.50 (3)	0.80 (3)	1.1 (3)	**5.3** (3)	550-151002
Monitoring	PA-9LA	PA-9LAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.63	550-150466-1
Monitoring	PA-10MA	PA-10MAHS	1/15/2020	Original	TA	<0.50	<0.50	<0.50	1.2	**84**	550-136275
Monitoring	PA-10MA	C	1/15/2020	Duplicate	TA	<0.50	<0.50	<0.50	0.98	**67**	550-136275
Monitoring	PA-10MA	PA-10MA HS	5/20/2020	Original	TA	<0.50	<0.50	<0.50	1.3	**55**	550-142393
Monitoring	PA-10MA	PA-10MAHS	7/15/2020	Original	TA	<0.50	<0.50	<0.50	1.3	**64**	550-145228
Monitoring	PA-10MA	PA-10MAHS	10/15/2020	Original	TA	<0.50	<0.50	<0.50	1.6	**87**	550-151098
Monitoring	PA-11LA	PA-11LA	10/14/2020	Original	TA	<0.50	<0.50	1.6	0.76	<0.50	550-151002
Monitoring	PA-12MA	PA-12MA	1/16/2020	Original	TA	<0.50	<0.50	0.57	2.7	**270**	550-136381
Monitoring	PA-12MA	PA-12MA	5/20/2020	Original	TA	<0.50	<0.50	0.55	3.9	**230**	550-142393
Monitoring	PA-12MA	I	5/20/2020	Duplicate	TA	<0.50	<0.50	0.52	3.7	**220**	550-142393
Monitoring	PA-12MA	PA-12MA	7/15/2020	Original	TA	<0.50	<0.50	0.64	3.3	**320**	550-145228
Monitoring	PA-12MA	PA-12MA	10/14/2020	Original	TA	<0.50 (4)	<0.50 (4)	0.71 (4)	2.8 (4)	**240**	550-151002
Monitoring	PA-13LA	PA-13LA	1/14/2020	Original	TA	<0.50	<0.50	1.3	0.61	**70**	550-136194
Monitoring	PA-13LA	PA-13LA	5/21/2020	Original	TA	<0.50	<0.50	1.3	1.2	**69**	550-142442
Monitoring	PA-13LA	PA-13LA	7/15/2020	Original	TA	<0.50	<0.50	1.5	0.85	**66**	550-145227
Monitoring	PA-13LA	PA-13LA	10/14/2020	Original	TA	<0.50	<0.50	1.9	1.1	**88**	550-151003
Monitoring	PA-13LA	Y	10/14/2020	Duplicate	TA	<0.50	<0.50	2.4	1.3	**51** (5) REJ	550-151003
				Lab dup		---	---	---	---	**47** (5)(6) REJ	
Monitoring	PA-14MA (A)	PA-14MAHS	10/7/2020	Original	TA	<0.50	<0.50	0.96	<0.50	<0.50	550-150466-2
Monitoring	PA-15LA	PA-15LAHS	10/29/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986
Monitoring	PA-15LA	AD	10/29/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986
Monitoring	PA-16MA	PA-16MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.61	550-150572
Monitoring	PA-17MA2 (A)	PA-17MA2HS	10/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150438-4
Monitoring	PA-19LA	PA-19LA	10/8/2020	Original	TA	<0.50	0.81	1.8	2.5	**52**	550-150572
Monitoring	PA-20MA	PA-20MA	10/8/2020	Original	TA	<0.50	<0.50	1.1	2.0	**41**	550-150572

Table C-1. 2020 Laboratory Results for VOCs in Groundwater Monitoring Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	Lab	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
Monitoring	PA-21MA	PA-21MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150571-2
Monitoring	PA-22LA (A)	PA-22LAHS	10/7/2020	Original	TA	<0.50 (7)	<0.50 (7)	1.1 (7)	<0.50 (7)	<0.50 (7)	550-150466-2
Monitoring	PG-1LA	PG-1LA	1/15/2020	Original	TA	<0.50	<0.50	0.82	<0.50	<0.50	550-136273
Monitoring	PG-1LA	PG-1LA	5/20/2020	Original	TA	<0.50	<0.50	0.83	<0.50	<0.50	550-142394
Monitoring	PG-1LA	PG-1LA	7/14/2020	Original	TA	<0.50	<0.50	0.97	<0.50	<0.50	550-145091
Monitoring	PG-1LA	PG-1LA	10/15/2020	Original	TA	<0.50	<0.50	1.2	<0.50	0.58	550-151097
Monitoring	PG-2LA	PG-2LA	5/20/2020	Original	TA	<0.50	<0.50	0.92	2.0	**75**	550-142394
Monitoring	PG-2LA	PG-2LA	10/6/2020	Original	TA	<0.50	<0.50	1.1	1.3	**74**	550-150321
Monitoring	PG-4MA	PG-4MA	10/14/2020	Original	TA	<0.50	<0.50	0.84	0.54	2.6	550-151002
Monitoring	PG-4UA	PG-4UAHS	10/8/2020	Original	TA	<0.50	<0.50	1.0	**5.1**	0.68	550-150572
Monitoring	PG-5MA	PG-5MA	10/13/2020	Original	TA	<0.50	<0.50	1.1	0.69	**18**	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	1.0 (1)	0.62 (1)	**18** (1)	
Monitoring	PG-5UA	PG-5UA	10/13/2020	Original	TA	<0.50	<0.50	0.66	<0.50	2.0	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	0.68 (1)	<0.50 (1)	2.5 (1)	
Monitoring	PG-6MA	PG-6MA	10/12/2020	Original	TA	<0.50 (1)	1.2 (1)	3.1 (1)	3.6 (1)	**100** (1)	550-150825
Monitoring	PG-6UA	PG-6UA	10/12/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150825
Monitoring	PG-7MA	PG-7MA	10/9/2020	Original	TA	<0.50	<0.50	0.86	<0.50	1.9	550-150667
Monitoring	PG-8UA	PG-8UA	10/12/2020	Original	TA	<0.50	<0.50	0.66	<0.50	<0.50	550-150825
Monitoring	PG-10UA	PG-10UA	10/16/2020	Original	TA	<0.50	<0.50	0.77	<0.50	1.0	550-151232
Monitoring	PG-11UA	PG-11UAHS	10/13/2020	Original	TA	<0.50	<0.50	0.84	<0.50	<0.50	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	0.93 (1)	<0.50 (1)	<0.50 (1)	
Monitoring	PG-16UA	PG-16UA	10/16/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	1.7	550-151232
Monitoring	PG-18UA	PG-18UA	10/12/2020	Original	TA	<0.50	<0.50	0.77	<0.50	0.71	550-150825
Monitoring	PG-19UA	PG-19UA	10/12/2020	Original	TA	<0.50	<0.50	0.85	<0.50	3.7	550-150825
Monitoring	PG-22UA	PG-22UAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	2.6	550-150572
Monitoring	PG-22UA	U	10/8/2020	Duplicate	TA	<0.50	<0.50	<0.50	0.71	2.8	550-150572
Monitoring	PG-23MA/LA	PG-23MA/LA	10/14/2020	Original	TA	<0.50	<0.50	1.4	1.1	**13**	550-151002
Monitoring	PG-23UA	PG-23UAHS	10/8/2020	Original	TA	<0.50	<0.50	0.82	<0.50	1.7	550-150572
Monitoring	PG-24UA	PG-24UAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150572
Monitoring	PG-25UA	PG-25UAHS	10/8/2020	Original	TA	<0.50	<0.50	0.73	<0.50	1.9	550-150572
Monitoring	PG-28UA	PG-28UA	10/15/2020	Original	TA	<0.50	<0.50	2.4	<0.50	2.2	550-151101
Monitoring	PG-29UA (C)	PG-29UA	1/27/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136843
Monitoring	PG-29UA (C)	E	1/27/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136843
Monitoring	PG-29UA	PG-29UA	10/16/2020	Original	TA	<0.50	<0.50	0.53	<0.50	0.66	550-151232
Monitoring	PG-29UA	AA	10/16/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	0.62	550-151232
Monitoring	PG-31UA	PG-31UAHS	10/6/2020	Original	TA	<0.50	<0.50	2.6	<0.50	**20**	550-150438-1
Monitoring	PG-38MA/LA	PG-38MA/LAHS	10/8/2020	Original	TA	<0.50	<0.50	0.67	4.1	1.0	550-150572
Monitoring	PG-39LA	PG-39LA	10/8/2020	Original	TA	<0.50	<0.50	1.0	1.9	2.8	550-150572
Monitoring	PG-40LA	PG-40LA	1/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**13**	550-136273

Table C-1. 2020 Laboratory Results for VOCs in Groundwater Monitoring Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	Lab	TCA *200*	DCE *6*	TCM *6*	PCE *5*	TCE *5*	Report
Monitoring	PG-40LA	PG-40LA	5/20/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**12**	550-142394
Monitoring	PG-40LA	H	5/20/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**12**	550-142394
Monitoring	PG-40LA	PG-40LA	7/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**11**	550-145227
Monitoring	PG-40LA	N	7/15/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**11**	550-145227
Monitoring	PG-40LA	PG-40LA	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**11**	550-150464
Monitoring	PG-40LA	R	10/7/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**12**	550-150464
Monitoring	PG-41MA/LA [A]	PG-41 MA/LA	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.61	550-150453
Monitoring	PG-42LA	PG-42LA	1/15/2020	Original	TA	<0.50	<0.50	1.0	<0.50	2.5	550-136273
Monitoring	PG-42LA	PG-42LA	5/20/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	2.0	550-142394
Monitoring	PG-42LA	PG-42LA	7/16/2020	Original	TA	<0.50	<0.50	0.61	<0.50	2.3	550-145370
Monitoring	PG-42LA	PG-42LA	10/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	1.7	550-151097
Monitoring	PG-43LA	PG-43LA	1/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136273
Monitoring	PG-43LA	PG-43LA	5/20/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142394
Monitoring	PG-43LA	PG-43LA	7/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145227
Monitoring	PG-43LA	PG-43LA	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150464
Monitoring	PG-44LA	PG-44LA	1/15/2020	Original	TA	<0.50	<0.50	3.6	<0.50	<0.50	550-136273
Monitoring	PG-44LA	PG- 44LA	5/20/2020	Original	TA	<0.50	<0.50	3.5	<0.50	<0.50	550-142394
Monitoring	PG-44LA	PG-44LA	7/15/2020	Original	TA	<0.50	<0.50	4.2	<0.50	<0.50	550-145227
Monitoring	PG-44LA	PG-44LA	10/7/2020	Original	TA	<0.50	<0.50	4.0	<0.50	<0.50	550-150464
Monitoring	PG-47MA [A]	PG-47MA	10/13/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150908
Monitoring	PG-48MA	PG-48MA	1/16/2020	Original	TA	<0.50	<0.50	1.1	0.60	**27**	550-136381
Monitoring	PG-48MA	PG-48MA	5/19/2020	Original	TA	<0.50	<0.50	0.79	0.69	**19**	550-142324
Monitoring	PG-48MA	PG-48MA	7/16/2020	Original	TA	<0.50	<0.50	1.8	1.1	**39**	550-145367
Monitoring	PG-48MA	PG-48MA	10/13/2020	Original	TA	<0.50	<0.50	0.78	<0.50	**14**	550-150906
				Lab dup		<0.50 [1][8]	<0.50 [1]	0.82 [1][8]	<0.50 [1]	**12** [1]	
Monitoring	PG-49MA	PG-49MAHS	10/29/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986
Monitoring	PG-50MA	PG-50MAHS	10/29/2020	Original	TA	<0.50	<0.50	0.90	<0.50	2.1	550-151986
Monitoring	PG-54MA	PG-54MA	10/12/2020	Original	TA	<0.50	<0.50	1.3	0.80	**28**	550-150825
Monitoring	S-1LA	S-1LA	10/8/2020	Original	TA	<0.50	<0.50	1.4	**46**	<0.50	550-150572
Monitoring	S-1LA	T	10/8/2020	Duplicate	TA	<0.50	<0.50	1.4	**44**	<0.50	550-150572
Monitoring	S-1MA	S-1MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	**5.9**	<0.50	550-150572
Monitoring	S-2LA	S-2LA	1/14/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**26**	550-136194
Monitoring	S-2LA	B	1/14/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**26**	550-136194
Monitoring	S-2LA	S-2LA	5/21/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**23**	550-142442
Monitoring	S-2LA	J	5/21/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**24**	550-142442
Monitoring	S-2LA	S-2LA	7/14/2020	Original	TA	<0.50	<0.50	0.50	<0.50	**24**	550-145091
Monitoring	S-2LA	M	7/14/2020	Duplicate	TA	<0.50	<0.50	0.53	<0.50	**27**	550-145091
Monitoring	S-2LA	S-2LA	10/28/2020	Original	TA	<0.50	<0.50	0.53	<0.50	**26**	550-151907
Monitoring	S-2LA	AC	10/28/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**23**	550-151907

Table C-1. 2020 Laboratory Results for VOCs in Groundwater Monitoring Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	Lab	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
Monitoring	S-2MA	S-2MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150572
Monitoring	W-1MA	W-1MA	1/14/2020	Original	TA	<0.50	<0.50	0.85	1.4	**520**	550-136193
				Lab dup		<0.50	<0.50	0.80	1.1	**460** (9)	
Monitoring	W-1MA	W-1MA	5/18/2020	Original	TA	<0.50	<0.50	0.71	1.2	**290**	550-142270
Monitoring	W-1MA	W-1MA	7/15/2020	Original	TA	<0.50	<0.50	0.86	1.6	**420**	550-145228
Monitoring	W-1MA	W-1MA	10/7/2020	Original	TA	<0.50	<0.50	1.1	1.7	**470**	550-150466-1
Monitoring	W-2MA	W-2MA	1/13/2020	Original	TA	<0.50	<0.50	0.52	3.6	**1500**	550-136115
Monitoring	W-2MA	A	1/13/2020	Duplicate	TA	<0.50	<0.50	<0.50	2.9	**1300**	550-136115
Monitoring	W-2MA	W-2MA	5/18/2020	Original	TA	<0.50	<0.50	<0.50	3.0	**1000**	550-142270
Monitoring	W-2MA	W-2MA	7/13/2020	Original	TA	<0.50	<0.50	0.56	4.2	**1200**	550-145019
Monitoring	W-2MA	L	7/13/2020	Duplicate	TA	<0.50	<0.50	0.61	4.5	**1200**	550-145019
Monitoring	W-2MA	W-2 MA	10/6/2020	Original	TA	<0.50	<0.50	0.51	3.1	**1500** (2)	550-150320
--	QC	FRB (Trip)	1/13/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136115
--	QC	FRB (Trip)	1/14/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136194
--	QC	FRB (Trip)	1/15/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136275
--	QC	FRB (Trip)	1/16/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136381
--	QC (C)	FRB (Trip)	1/27/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136843
--	QC	FRB (Trip)	5/18/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142270
--	QC	FRB (Trip)	5/19/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142324
--	QC	FRB (Trip)	5/20/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142393
--	QC	FRB (Trip)	5/21/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142442
--	QC	FRB (Trip)	5/28/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142693
--	QC	FRB (Trip)	7/13/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145019
--	QC	FRB (Trip)	7/14/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145091
--	QC	FRB (Trip)	7/15/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145227
--	QC	FRB (Trip)	7/16/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145367
--	QC	FRB (Trip)	10/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150320
--	QC	Trip Blank	10/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150438-1
--	QC	FRB (Trip)	10/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150464
--	QC	FRB (Trip)	10/8/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150572
--	QC	FRB (Trip)	10/9/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150667
--	QC	FRB (Trip)	10/12/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150825
--	QC	FRB (Trip)	10/13/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150906
--	QC	FRB (Trip)	10/14/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151002
--	QC	FRB (Trip)	10/15/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151098
--	QC	FRB (Trip)	10/16/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151232
--	QC	FRB (Trip)	10/27/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151827
--	QC	FRB (Trip)	10/28/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151907
--	QC	FRB (Trip)	10/29/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986

Table C-1. 2020 Laboratory Results for VOCs in Groundwater Monitoring Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

PG-55MA and PG-56-MA samples were obtained in 2021-Q1, rather than 2020-Q4 due to pump failure; results will be in 2021 SMR.

<0.50=	Non-Detect
5	Cleanup Standards for Treated Water (µg/L)
5.1	Sample result exceeds Cleanup Standard for Treated Water

EXPLANATION:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene

ID = Identifier
TA = TestAmerica, Inc.
< = Analytical result is less than laboratory detection limit
QC = Quality Control
TB = Trip Blank
FRB = Field Reagent Blank

REJ Analysis result rejected due to relative percent difference (RPD) exceeding acceptable limit and re-analyses results not confirming initial value. Lab could not rectify discrepancies in data.

(A) Sample at this location was part of a supplemental sampling program to verify plume boundaries, and is not a compliance sample.

(B) Original sample data was rejected due to lab issues and inconsistency with duplicate sample. Lab re-analysis is used to represent water quality for the original sample at this well.

(C) Samplers were unable to collect PG-29UA sample in Q4 of 2019. Sample was collected on 1/27/2020.

(1) H1 Flag: Sample analysis performed past holding time.

(2) N1 Flag: Sample was re-analyzed with headspace in the sample vial due to required dilution.

(3) N1 Flag: Reanalysis was performed outside of the analytical holding time due to the failure of Internal standard in the initial run. Reanalysis results for sample PA-8LA2 confirmed original results. Original results reported with N1 qualifier.

(4) N1 Flag: Sample reanalyzed due to TCE requiring dilution. Reanalysis confirmed original results. Original results reported with N1 qualifier.

(5) N1 Flag: Sample was re-analyzed with headspace in the sample vial. Results may be biased low. Reanalysis was performed outside of the analytical holding time due to a required dilution for Trichloroethene confirmation.

(6) H2 Flag: Initial analysis within holding time. Reanalysis for the required dilution was past holding time.

(7) N1 Flag: Sample was collected in a properly preserved vial; however, the pH(5) was outside the required criteria when verified by the laboratory. The sample was analyzed outside the 7-day holding time specified for unpreserved samples, but within the 14-day holding time specified for preserved samples.

(8) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(9) E2 Flag: Concentration estimated. Analyte exceeded calibration range. Reanalysis not performed due to sample matrix.

Table C-2. 2020 Laboratory Results for VOCs in Groundwater Extraction Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
						200	*6*	*6*	*5*	*5*	
AREA 7 GWETS											
Extraction	7EX-3aMA	7EX-3MA	1/21/2020	Original	TA	<0.50	<0.50	0.91	3.3	**600**	550-136554
Extraction	7EX-3aMA	7EX-3MA	4/6/2020	Original	TA	<0.50	<0.50	0.97	4.2	**670**	550-140368
Extraction	7EX-3aMA	7EX-3aMA	7/20/2020	Original	TA	<0.50	<0.50	0.91	3.5	**460**	550-145531
Extraction	7EX-3aMA	7EX-3aMA	10/1/2020	Original	TA	<0.50	<0.50	0.76	2.5	**420**	550-150111
Extraction	7EX-3aMA	7EX-3aMA	10/20/2020	Original	TA	<0.50	<0.50	0.85	2.6	**470**	550-151402
Extraction	7EX-6MA	7EX-6MA	1/21/2020	Original	TA	<0.50	<0.50	0.71	2.7	**650**	550-136554
Extraction	7EX-6MA	7EX-6MA	4/6/2020	Original	TA	<0.50	<0.50	0.76	3.2	**630**	550-140368
Extraction	7EX-6MA	7EX-6MA	7/20/2020	Original	TA	<0.50	<0.50	0.97	4.1	**570**	550-145531
Extraction	7EX-6MA	7EX-6MA	10/1/2020	Original	TA	<0.50	<0.50	0.81	3.3	**570** (1)(A)	550-150111
Extraction	7EX-6MA	7EX-6MA	10/20/2020	Original	TA	<0.50	<0.50	0.97	3.6	**540**	550-151402
Extraction	7EX-6MA	EXT-1A-102020	10/20/2020	Duplicate	TA	<0.50	<0.50	0.95	3.7	**580**	550-151402
CGTF											
Extraction	COS-31	COS-31	10/9/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.7	550-150625
Extraction	COS-31	COS-31	11/25/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.4	550-153638
Extraction	COS-31	COS-31	12/1/2020	Original	TA	<0.50 (2)	<0.50	<0.50 (2)	<0.50	3.8	550-153818
Extraction	COS-31	EXT-1A-12012020	12/1/2020	Duplicate	TA	<0.50 (2)	<0.50	<0.50 (2)	<0.50	3.8	550-153818
Extraction	COS-71A	COS-71 A	10/7/2020	Original	TA	<0.50$_{REJ}$	<0.50$_{REJ}$	3.2$_{REJ}$	<0.50$_{REJ}$	<0.50$_{REJ}$	550-150463
				Lab dup	TA	<0.50 (3)(4)$_{REJ}$	<0.50 (3)$_{REJ}$	2.3 (3)(4)$_{REJ}$	<0.50 (3)$_{REJ}$	<0.50 (3)$_{REJ}$	
Extraction	COS-72	COS-72	7/1/2020	Original	TA	<0.50	<0.50	0.75	1.1	**8.3**	550-144362
Extraction	COS-72	COS-72	8/11/2020	Original	TA	<0.50	<0.50	0.75	1.1	**8.0**	550-146962
Extraction	COS-72	COS-72	9/9/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.4**	550-148753
Extraction	COS-72	COS-72	10/1/2020	Original	TA	<0.50	<0.50	0.72	1.0	**7.5**	550-150116
Extraction	COS-75A	COS 75A	4/28/2020	Original	TA	<0.50	0.69	2.1	**6.0**	**45**	550-141395
Extraction	COS-75A	COS-75A	5/1/2020	Original	TA	<0.50	<0.50	1.7	4.5	**40**	550-141574
Extraction	COS-75A	COS-75 A	6/1/2020	Original	TA	<0.50	0.71	2.1	**5.5**	**40**	550-142827
Extraction	COS-75A	EXT-1A-06012020	6/1/2020	Duplicate	TA	<0.50	0.81	2.2	**5.6**	**44**	550-142827
Extraction	COS-75A	COS-75 A	7/1/2020	Original	TA	<0.50	0.51	1.8	**5.7**	**37**	550-144362
Extraction	COS-75A	EXT-1A-07012020	7/1/2020	Duplicate	TA	<0.50	0.56	1.9	**5.8**	**37**	550-144362
Extraction	COS-75A	COS-75 A	8/3/2020	Original	TA	<0.50	0.67	2.1	**6.0**	**41**	550-146295
Extraction	COS-75A	EXT-1A-08032020	8/3/2020	Duplicate	TA	<0.50	0.67	2.1	**6.0**	**41**	550-146295
Extraction	COS-75A	COS-75 A	9/1/2020	Original	TA	<0.50	0.60	1.9	**5.4**	**36**	550-148281
Extraction	COS-75A	EXT-1A-09012020	9/1/2020	Duplicate	TA	<0.50	0.58	1.9	**5.5**	**36**	550-148281
Extraction	COS-75A	COS-75 A	10/1/2020	Original	TA	<0.50	0.59	1.6	5.0	**35**	550-150116
Extraction	COS-75A	EXT-1A-10012020	10/1/2020	Duplicate	TA	<0.50	0.67	1.7	5.0	**36**	550-150116
Extraction	COS-75A	COS-75 A	11/19/2020	Original	TA	<0.50 (4)	0.72	2.1	**6.6**	**48**	550-153357
Extraction	COS-75A	EXT-1A-11192020	11/19/2020	Duplicate	TA	<0.50 (4)	0.84	2.1	**6.3**	**45**	550-153357

Table C-2. 2020 Laboratory Results for VOCs in Groundwater Extraction Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
						200	6	6	5	5	
AREA 12 GWETS											
Extraction	MEX-1MA	MEX-1-1A-2142020	2/14/2020	Original	TA	<0.50	1.5	1.7	3.2	**60**	550-137917
Extraction	MEX-1MA	MEX-1-1A-03022020	3/2/2020	Original	TA	<0.50	1.2	1.6	2.5	**49**	550-138669
Extraction	MEX-1MA	MEX-1-1A-04012020	4/1/2020	Original	TA	<0.50	1.4	1.8	2.3	**55**	550-140142
Extraction	MEX-1MA	MEX-1-1A-05012020	5/1/2020	Original	TA	<0.50	0.98	1.4	2.6	**49**	550-141570
Extraction	MEX-1MA	MEX-1-1A-06012020	6/1/2020	Original	TA	<0.50	2.0	1.9	3.1	**53**	550-142828
Extraction	MEX-1MA	MEX-1-1A-7012020	7/1/2020	Original	TA	<0.50	1.4	1.7	3.0	**49**	550-144364
Extraction	MEX-1MA	MEX-1-1A-8032020	8/3/2020	Original	TA	<0.50	1.6	1.9	3.0	**54**	550-146300
Extraction	MEX-1MA	MEX-1-1A-9012020	9/1/2020	Original	TA	<0.50	1.4	1.8	2.8	**50**	550-148282
Extraction	MEX-1MA	MEX-1-1A-10012020	10/1/2020	Original	TA	<0.50	0.79	1.6	2.3	**44**	550-150113
Extraction	MEX-1MA	MEX-1-1A-11022020	11/2/2020	Original	TA	<0.50	1.1	1.7	2.6	**49**	550-152169
Extraction	MEX-1MA	MEX-1-1A-12012020	12/1/2020	Original	TA	<0.50 (2)	1.4	1.4	2.3	**50**	550-153817
Extraction	Granite Reef	GRWH4	5/21/2020	Original	TA	<0.50 (B)	<0.50 (B)	1.5 (B)	1.1 (B)	**34** (B)	550-142484-2
Extraction	Granite Reef	GRWH4D	5/21/2020	Duplicate	TA	<0.50 (B)	<0.50 (B)	1.5 (B)	1.1 (B)	**35** (B)	550-142484-2
Extraction	Granite Reef	GR-1-1A-09172020	9/17/2020	Original	TA	<0.50	0.63	2.2	1.3	**52**	550-149352
Extraction	Granite Reef	GR-1-1A-10012020	10/1/2020	Original	TA	<0.50	<0.50	0.82	0.92	**69**	550-150113
Extraction	Granite Reef	GR-1-1A-10162020	10/16/2020	Original	TA	<0.50	1.1	4.4	2.3	**100** (5)	550-151257
Extraction	Granite Reef	EXT-1A-10162020	10/16/2020	Duplicate	TA	<0.50	1.1	3.9	2.3	**130**	550-151257
Extraction	Granite Reef	GR-1-1A-11022020	11/2/2020	Original	TA	<0.50	1.1	5.4	2.4	**96** (6)	550-152169
Extraction	Granite Reef	EXT-1A-11022020	11/2/2020	Duplicate	TA	<0.50	1.1	3.9	2.3	**94** (6)	550-152169
Extraction	Granite Reef	GR-1-1A-12012020	12/1/2020	Original	TA	<0.50	1.3	4.2	2.3	**98**	550-153817
NGTF											
Extraction	PCX-1	PCX-1	1/22/2020	Original	TA	<0.50	0.73	1.9	4.3	**67**	550-136604
Extraction	PCX-1	PCX-1	2/4/2020	Original	TA	<0.50	0.66	1.6	3.5	**56**	550-137285
Extraction	PCX-1	PCX-1	3/2/2020	Original	TA	<0.50	0.64	1.6	3.4	**48**	550-138668
Extraction	PCX-1	PCX-1	4/1/2020	Original	TA	<0.50	0.64	1.9	3.4	**55**	550-140155
Extraction	PCX-1	PCX-1	5/1/2020	Original	TA	<0.50	0.58	1.7	3.4	**49**	550-141571
Extraction	PCX-1	PCX-1	6/1/2020	Original	TA	<0.50	0.71	2.1	4.0	**51**	550-142840
Extraction	PCX-1	PCX-1	7/1/2020	Original	TA	<0.50	0.63	1.8	4.0	**45**	550-144361
Extraction	PCX-1	PCX-1	8/11/2020	Original	TA	<0.50	0.56	1.8	3.5	**44**	550-146959
Extraction	PCX-1	PCX-1	9/9/2020	Original	TA	<0.50	<0.50	1.7	3.1	**38**	550-148752

Table C-2. 2020 Laboratory Results for VOCs in Groundwater Extraction Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
						200	*6*	*6*	*5*	*5*	
MRTF											
Extraction	PV-14	PV14	1/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-135594
Extraction	PV-14	PV14	2/4/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137286
Extraction	PV-14	PV14	3/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138670
Extraction	PV-14	PV14	4/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140141
Extraction	PV-14	PV14	5/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141575
Extraction	PV-14	PV 14	6/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.58	550-142830
Extraction	PV-14	PV 14	7/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.69	550-144357
Extraction	PV-14	PV 14	8/3/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.68	550-146301
Extraction	PV-14	PV 14	9/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.73	550-148283
Extraction	PV-14	PV 14	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.60	550-150120
Extraction	PV-14	PV 14	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.68	550-152167
Extraction	PV-15	PV15	1/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	4.2	550-135594
Extraction	PV-15	PV15	2/4/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	4.4	550-137286
Extraction	PV-15	PV15	4/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	4.7	550-140141
Extraction	PV-15	PV15	5/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.8	550-141575
Extraction	PV-15	PV 15	6/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.0**	550-142830
Extraction	PV-15	PV 15	7/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.2**	550-144357
Extraction	PV-15	PV 15	8/3/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.2**	550-146301
Extraction	PV-15	PV 15	9/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.3**	550-148283
Extraction	PV-15	PV 15	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.6**	550-150120
Extraction	PV-15	PV 15	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.7**	550-152167
Extraction	PV-15	PV 15	12/1/2020	Original	TA	<0.50 [(2)]	<0.50	<0.50	<0.50	**5.2**	550-153819

Table C-2. 2020 Laboratory Results for VOCs in Groundwater Extraction Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Well Type	Sample Location	Sample Identifier	Sample Date	Sample Type	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	Report
Trip/Field Blanks											
--	Area 7	Trip Blank	1/21/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136556
--	Area 7	TRIP BLANK	4/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140369
--	CGTF	FRB (Trip)	4/28/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141395
--	CGTF	FRB (Trip)	5/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141574
--	Area12	TB	2/14/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137910
--	Area12	TB	3/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138661
--	Area12	TB	4/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140134
--	Area12	TB	5/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141565
--	NGTF	TB	1/22/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136604
--	NGTF	TB	2/4/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137285
--	NGTF	TB	3/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138668
--	NGTF	TB	4/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140155
--	NGTF	TB	5/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141571
--	MRTF	TB	1/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-135594
--	MRTF	TB	2/4/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137286
--	MRTF	TB	3/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138670
--	MRTF	TB	4/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140141
--	MRTF	TB	5/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141575
--	EX-QC (C)	Trip Blank	5/21/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142484-2
--	EX-QC (C)	FB	6/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142831
--	EX-QC (C)	FRB (TRIP)	6/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142831
--	EX-QC (C)	FRB (TRIP)	7/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144366
--	EX-QC (C)	FRB (TRIP)	8/3/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146297
--	EX-QC (C)	TB-2-1A-08112020	8/11/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146966
--	EX-QC (C)	FRB (TRIP)	9/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148243
--	EX-QC (C)	TB-2-1A-09092020	9/9/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148751
--	EX-QC (C)	TB	9/17/2020	TB	TA	<0.50 (7)	<0.50 (7)	<0.50 (7)	<0.50 (7)	<0.50 (7)	550-149352
--	EX-QC (C)	FB	9/17/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-149352
--	EX-QC (C)	FB	10/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150118
--	EX-QC (C)	FRB (TRIP)	10/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150118
--	EX-QC (C)	FRB (TRIP)	10/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150465
--	EX-QC (C)	FRB (TRIP)	10/9/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150626
--	EX-QC (C)	FRB(TRIP)	10/16/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151257
--	EX-QC (C)	FRB (TRIP)	10/20/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151405
--	EX-QC (C)	FRB (TRIP)	11/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152171
--	EX-QC (C)	FRB (TRIP)	11/19/2020	TB	TA	<0.50 (4)	<0.50	<0.50 (4)	<0.50	<0.50	550-153358
--	EX-QC (C)	FRB(Trip)	11/25/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-153638
--	EX-QC (C)	FRB (TRIP)	12/1/2020	TB	TA	<0.50 (2)	<0.50	<0.50 (2)	<0.50	<0.50	550-153821

Table C-2. 2020 Laboratory Results for VOCs in Groundwater Extraction Wells
North Indian Bend Wash Superfund Site, Scottsdale, Arizona

<0.50=	Non-Detect
5	Cleanup Standards for Treated Water (µg/L)
5.1	Sample result exceeds Cleanup Standard for Treated Water

EXPLANATION:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene

ID = Identifier
TA = TestAmerica, Inc.
<0.50 = Analytical result is less than laboratory detection limit
QC = Quality Control
TB = Trip Blank
FB = Field Blank
FRB = Field Reagent Blank

REJ COS-71A analysis results from Test America are inconsistent with historical values. Lab re-analyses confirmed the ND result and inconsistency could not be reconciled at the lab. City of Scottsdale (COS) collected a sample at COS-71A, 40 minutes prior to this sample, and had a detected TCE value of 31.4 ug/L; the COS result is consistent with historical values. Test America results were rejected based on the contradicting COS data. For analyses purposes, the COS value of 31.4 ug/L was used for statistical calculations and plume delineation.

(A) The TCE value for this sample was preliminarily reported with a dilution error. The value discrepancy was brought to the attention of the lab prior to issuance of a report. The lab re-analyzed the sample as part of the corrective action, but only an estimated result could be reported. The preliminary incorrect value prompted a resample of this location.

(B) Sample was obtained after a long period off line and may not be representative for long-term operating conditions for the well.

(C) EX-QC - Beginning in June 2020, a single field blank is collected for all extraction well samples, regardless of facility, when collected and shipped on the same day.

(1) E2 Flag: Concentration estimated. Analyte exceeded calibration range. Reanalysis not performed due to sample matrix.

(2) L5 Flag: The associated blank spike recovery was above laboratory/method acceptance limit. This analyte was not detected in the sample.

(3) H1 Flag: Sample analysis performed past holding time.

(4) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(5) N1 Flag: Sample was re-analyzed with headspace in the sample vial due to required dilution.

(6) H2 Flag: Initial analysis within holding time. Reanalysis for the required dilution was past holding time.

(7) N1 Flag: The closing continuing calibration verification (CCV) and laboratory control sample duplicate (LCSD) were analyzed out of 4-Bromofluorobenzene Surrogate (BFB) tune time due to an autosampler error. All affected samples reanalyzed except trip blanks. The trip blanks could not be re-analyzed due to insufficient sample volume with only one vial provided.

Table C-3. 2020 Laboratory Results for VOCs in Treatment System Samples
North Indian Bend Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Sample Location	Field Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	*6*	*6*	*5*	*5*	
AREA 7 GWETS										
SP-102 (influent)	SP-102	1/21/2020	Original	TA	<0.50	<0.50	0.78	2.8	**610**	550-136556
SP-102 (influent)	SP-102	2/25/2020	Original	TA	<0.50	<0.50	0.73	2.4	**550**	550-138457
SP-102 (influent)	SP-102	3/9/2020	Original	TA	<0.50	<0.50	0.86	2.6	**600**	550-139118
SP-102 (influent)	SP-102	4/6/2020	Original	TA	<0.50	<0.50	0.87	3.4	**660**	550-140369
SP-102 (influent)	SP-102	5/7/2020	Original	TA	<0.50	<0.50	0.83	3.1	**640**	550-141847
SP-102 (influent)	SP-102	6/4/2020	Original	TA	<0.50	<0.50	0.92	3.5	**530**	550-143085
SP-102 (influent)	TS-2A-06042020	6/4/2020	Duplicate	TA	<0.50	<0.50	0.92	3.2	**530**	550-143085
SP-102 (influent)	SP-102	7/1/2020	Original	TA	<0.50	<0.50	0.86	3.5	**520**	550-144367
SP-102 (influent)	TS-2A-07012020	7/1/2020	Duplicate	TA	<0.50	<0.50	0.90	3.5	**500**	550-144367
SP-102 (influent)	SP-102	8/11/2020	Original	TA	<0.50	<0.50	0.87	3.1	**470**	550-146964
SP-102 (influent)	TS-2A-08112020	8/11/2020	Duplicate	TA	<0.50	<0.50	0.84	3.1	**490**	550-146964
SP-102 (influent)	SP-102	9/1/2020	Original	TA	<0.50	<0.50	0.86	3.2	**540**	550-148315
SP-102 (influent)	TS-2A-09012020	9/1/2020	Duplicate	TA	<0.50	<0.50	0.85	3.3	**550**	550-148315
SP-102 (influent)	SP-102	10/1/2020	Original	TA	<0.50	<0.50	0.79	3.1	**480** (1)	550-150115
SP-102 (influent)	TS-2A-10012020	10/1/2020	Duplicate	TA	<0.50	<0.50	0.78	2.9	**480** (1)	550-150115
SP-102 (influent)	SP-102	10/20/2020	Original	TA	<0.50	<0.50	0.80	2.8	**490**	550-151400
SP-102 (influent)	TS-2A-10202020	10/20/2020	Duplicate	TA	<0.50	<0.50	0.76	2.7	**500**	550-151400
SP-102 (influent)	SP-102	11/2/2020	Original	TA	<0.50	<0.50	0.84	2.8	**490** (2)	550-152170
SP-102 (influent)	TS-2A-11022020	11/2/2020	Duplicate	TA	<0.50	<0.50	0.62	2.9	**510** (2)	550-152170
SP-102 (influent)	SP-102	12/7/2020	Original	TA	<0.50	<0.50	0.74	3.5	**550**	550-154117
			Lab dup		---	---	---	---	**460** (A)	
SP-102 (influent)	TS-2A-12072020	12/7/2020	Duplicate	TA	<0.50	<0.50	0.71	3.5	**350** (A) REJ	550-154117
SP-103 (UV/Ox effluent)	SP-103	1/21/2020	Original	TA	<0.50	<0.50	0.79	0.81	**91**	550-136556
SP-103 (UV/Ox effluent)	SP-103	2/25/2020	Original	TA	<0.50	<0.50	0.68	0.78	**110**	550-138457
SP-103 (UV/Ox effluent)	SP-103	3/9/2020	Original	TA	<0.50	<0.50	0.80	0.90	**88**	550-139118
SP-103 (UV/Ox effluent)	SP-103	4/6/2020	Original	TA	<0.50	<0.50	0.85	1.4	**110**	550-140369
SP-103 (UV/Ox effluent)	SP-103	5/7/2020	Original	TA	<0.50	<0.50	0.85	1.2	**110**	550-141847
SP-103 (UV/Ox effluent)	SP-103	6/4/2020	Original	TA	<0.50	<0.50	0.86	1.0	**84**	550-143085
SP-103 (UV/Ox effluent)	SP-103	7/1/2020	Original	TA	<0.50	<0.50	0.83	1.4	**110**	550-144367
SP-103 (UV/Ox effluent)	SP-103	8/11/2020	Original	TA	<0.50	<0.50	0.77	0.87	**53**	550-146964
SP-103 (UV/Ox effluent)	SP-103	9/1/2020	Original	TA	<0.50	<0.50	0.86	1.0	**77**	550-148315
SP-103 (UV/Ox effluent)	SP-103	10/1/2020	Original	TA	<0.50	<0.50	0.82	2.7	**82**	550-150115
SP-103 (UV/Ox effluent)	SP-103	10/20/2020	Original	TA	<0.50	<0.50	0.76	1.2	**130**	550-151400
SP-103 (UV/Ox effluent)	SP-103	11/2/2020	Original	TA	<0.50	<0.50	0.83	1.7	**94** (2)	550-152170
SP-103 (UV/Ox effluent)	SP-103	12/7/2020	Original	TA	<0.50	<0.50	0.78	1.2	**76**	550-154117
SP-105 (Air Stripper Effluent)	SP-105	1/21/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136556
SP-105 (Air Stripper Effluent)	SP-105	2/25/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138457
SP-105 (Air Stripper Effluent)	SP-105	3/9/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-139118
SP-105 (Air Stripper Effluent)	SP-105	4/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140369
SP-105 (Air Stripper Effluent)	SP-105	5/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141847
SP-105 (Air Stripper Effluent)	SP-105	6/4/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-143085

Table C-3. 2020 Laboratory Results for VOCs in Treatment System Samples
North Indian Bend Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Sample Location	Field Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	*6*	*6*	*5*	*5*	
SP-105 (Air Stripper Effluent)	SP-105	7/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144367
SP-105 (Air Stripper Effluent)	SP-105	8/11/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146964
SP-105 (Air Stripper Effluent)	SP-105	9/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148315
SP-105 (Air Stripper Effluent)	SP-105	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150115
SP-105 (Air Stripper Effluent)	SP-105	10/20/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151400
SP-105 (Air Stripper Effluent)	SP-105	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152164
SP-105 (Air Stripper Effluent)	SP-105	12/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-154114
AREA 12 GWETS										
WSP-1 (Influent)	WSP-1-1A-2142020	2/14/2020	Original	TA	<0.50	1.5	1.7	3.1	**62**	550-137917
WSP-1 (Influent)	WSP-1-1A-03022020	3/2/2020	Original	TA	<0.50	1.1	1.6	2.5	**50**	550-138669
WSP-1 (Influent)	WSP-1-1A 04012020	4/1/2020	Original	TA	<0.50	1.5	1.8	2.6	**57**	550-140142
WSP-1 (Influent)	WSP-1-1A-05012020	5/1/2020	Original	TA	<0.50	1.2	1.5	2.7	**50**	550-141570
WSP-1 (Influent)	WSP-1-1A-06012020	6/1/2020	Original	TA	<0.50	1.6	1.7	2.5	**48**	550-142838
WSP-1 (Influent)	TS-1-1A-06012020	6/1/2020	Duplicate	TA	<0.50	1.6	1.6	2.9	**51**	550-142838
WSP-1 (Influent)	WSP-1-1A-07012020	7/1/2020	Original	TA	<0.50	1.4	1.7	3.2	**50**	550-144358
WSP-1 (Influent)	TS-1-1A-07012020	7/1/2020	Duplicate	TA	<0.50	1.2	1.6	3.2	**49**	550-144358
WSP-1 (Influent)	WSP-1-1A-08032020	8/3/2020	Original	TA	<0.50	1.7	2.0	3.3	**57**	550-146296
WSP-1 (Influent)	TS-1-1A-08032020	8/3/2020	Duplicate	TA	<0.50	1.7	2.0	3.2	**57**	550-146296
WSP-1 (Influent)	WSP-1-1A-09012020	9/1/2020	Original	TA	<0.50	1.5	1.8	2.9	**50**	550-148313
WSP-1 (Influent)	TS-1-1A-09012020	9/1/2020	Duplicate	TA	<0.50	1.6	1.8	3.0	**51**	550-148313
WSP-1 (Influent)	WSP-1-1A-10012020	10/1/2020	Original	TA	<0.50	0.79	2.4	1.8	**60**	550-150127
WSP-1 (Influent)	TS-1-1A-10012020	10/1/2020	Duplicate	TA	<0.50	0.88	2.1	1.9	**59**	550-150127
WSP-1 (Influent)	WSP-1-1A-11022020	11/2/2020	Original	TA	<0.50	0.96	3.0	2.3	**77**	550-152166
WSP-1 (Influent)	TS-1-1A-11022020	11/2/2020	Duplicate	TA	<0.50	1.1	3.2	2.4	**79**	550-152166
WSP-1 (Influent)	WSP-1-1A-12012020 (B)	12/1/2020	Original	TA	<0.50 (3)	1.4	2.7	2.2	**99** (B)	550-153815
WSP-1 (Influent)	TS-1-1A-12012020 (B)	12/1/2020	Duplicate	TA	<0.50 (3)	1.6	3.0	2.3	**69** (B)	550-153815
WSP-2 (Air Stripper Effluent)	WSP-2-1A-021420	2/14/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137910
WSP-2 (Air Stripper Effluent)	WSP-2-1A-03022020	3/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138661
WSP-2 (Air Stripper Effluent)	WSP-2-1A-04012020	4/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140134
WSP-2 (Air Stripper Effluent)	WSP-2-1A- 05012020	5/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141565
WSP-2 (Air Stripper Effluent)	WSP-2-1A-06012020	6/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142825
WSP-2 (Air Stripper Effluent)	WSP-2-1A - 07012020	7/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144372
WSP-2 (Air Stripper Effluent)	WSP-2-1A-08032020	8/3/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146284
WSP-2 (Air Stripper Effluent)	WSP-2-1A-09012020	9/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148242
WSP-2 (Air Stripper Effluent)	WSP-2-1A-10012020	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150093
WSP-2 (Air Stripper Effluent)	WSP-2-1A-11022020	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152155
WSP-2 (Air Stripper Effluent)	WSP-2-1A-11192020	11/19/2020	Original	TA	<0.50 (4)	<0.50	<0.50 (4)	<0.50	<0.50	550-153356
WSP-2 (Air Stripper Effluent)	WSP-2-1A-12012020	12/1/2020	Original	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153811

Table C-3. 2020 Laboratory Results for VOCs in Treatment System Samples
North Indian Bend Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Sample Location	Field Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	6	6	5	5	
MRTF										
Tower 1 Effluent	Tower 1	1/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-135594
Tower 1 Effluent	Tower 1	2/4/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137286
Tower 1 Effluent	Tower 1	4/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140141
Tower 1 Effluent	Tower 1	5/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141575
Tower 1 Effluent	Tower 1	8/3/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146298
Tower 1 Effluent	Tower 1	9/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148288
Tower 1 Effluent	Tower 1	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150112
Tower 1 Effluent	Tower 1	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152163
Tower 1 Effluent	Tower 1	12/1/2020	Original	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153813
Tower 2 Effluent	Tower 2	1/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-135594
Tower 2 Effluent	Tower 2	2/4/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137286
Tower 2 Effluent	Tower 2	3/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138670
Tower 2 Effluent	Tower 2	4/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140141
Tower 2 Effluent	Tower 2	6/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142839
Tower 2 Effluent	Tower 2	7/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144369
Tower 3 Effluent	Tower 3	5/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141575
Tower 3 Effluent	Tower 3	6/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142839
Tower 3 Effluent	Tower 3	7/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144369
Tower 3 Effluent	Tower 3	8/3/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146298
Tower 3 Effluent	Tower 3	9/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148288
Tower 3 Effluent	Tower 3	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150112
Tower 3 Effluent	Tower 3	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152163
NGTF										
Outfall 001 (Effluent)	NGTF-CP	1/6/2020	Original	TA	<0.50	<0.50	0.86	<0.50	<0.50	550-135591
Outfall 001 (Effluent)	NGTF-CP	1/13/2020	Original	TA	<0.50	<0.50	1.0	<0.50	<0.50	550-136093
Outfall 001 (Effluent)	NGTF-CP	1/21/2020	Original	TA	<0.50	<0.50	1.3	<0.50	<0.50	550-136547
Outfall 001 (Effluent)	NGTF-CP	1/27/2020	Original	TA	<0.50	<0.50	0.87	<0.50	<0.50	550-136844
Outfall 001 (Effluent)	NGTF-CP	2/3/2020	Original	TA	<0.50	<0.50	1.3	<0.50	<0.50	550-137233
Outfall 001 (Effluent)	NGTF-CP	2/10/2020	Original	TA	<0.50	<0.50	0.89	<0.50	<0.50	550-137653
Outfall 001 (Effluent)	NGTF-CP	2/21/2020	Original	TA	<0.50	<0.50	0.73	<0.50	<0.50	550-138345
Outfall 001 (Effluent)	NGTF-CP	2/24/2020	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-138378
Outfall 001 (Effluent)	NGTF-CP	3/2/2020	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-138672
Outfall 001 (Effluent)	NGTF-CP	3/9/2020	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-139108
Outfall 001 (Effluent)	NGTF-CP	3/16/2020	Original	TA	<0.50	<0.50	0.52	<0.50	<0.50	550-139408
Outfall 001 (Effluent)	NGTF-CP	3/23/2020	Original	TA	<0.50	<0.50	0.92	<0.50	<0.50	550-139732
Outfall 001 (Effluent)	NGTF-CP	3/30/2020	Original	TA	<0.50	<0.50	0.51	<0.50	<0.50	550-139979
Outfall 001 (Effluent)	NGTF-CP	4/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140367
Outfall 001 (Effluent)	NGTF-CP	4/13/2020	Original	TA	<0.50	<0.50	0.65	<0.50	<0.50	550-140749
Outfall 001 (Effluent)	NGTF-CP	4/20/2020	Original	TA	<0.50	<0.50	0.63	<0.50	<0.50	550-141078
Outfall 001 (Effluent)	NGTF-CP	4/27/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141362
Outfall 001 (Effluent)	NGTF-CP	5/4/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141609

Table C-3. 2020 Laboratory Results for VOCs in Treatment System Samples
North Indian Bend Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Sample Location	Field Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	6	6	5	5	
Outfall 001 (Effluent)	NGTF-CP	5/11/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141967
Outfall 001 (Effluent)	NGTF-CP	5/18/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142259
Outfall 001 (Effluent)	NGTF-CP	5/26/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142583
Outfall 001 (Effluent)	NGTF-CP	6/1/2020	Original	TA	<0.50	<0.50	0.51	<0.50	<0.50	550-142810
Outfall 001 (Effluent)	NGTF-CP	6/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-143193
Outfall 001 (Effluent)	NGTF-CP	6/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50 (4)	<0.50	550-143495
Outfall 001 (Effluent)	NGTF-CP	6/22/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-143821
Outfall 001 (Effluent)	NGTF-CP	6/29/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144144
Outfall 001 (Effluent)	NGTF-CP	7/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144495
Outfall 001 (Effluent)	NGTF-CP	7/13/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145014
Outfall 001 (Effluent)	NGTF-CP	7/20/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145538
Outfall 001 (Effluent)	NGTF-CP	7/27/2020	Original	TA	<0.50	<0.50	0.58	<0.50	<0.50	550-145964
Outfall 001 (Effluent)	NGTF-CP	8/3/2020	Original	TA	<0.50	<0.50	0.87	<0.50	<0.50	550-146292
Outfall 001 (Effluent)	NGTF-CP	8/10/2020	Original	TA	<0.50	<0.50	1.2	<0.50	<0.50	550-146852
Outfall 001 (Effluent)	NGTF-CP	8/17/2020	Original	TA	<0.50	<0.50	0.90	<0.50	<0.50	550-147336
Outfall 001 (Effluent)	NGTF-CP	8/24/2020	Original	TA	<0.50	<0.50	0.64	<0.50	<0.50	550-147790
Outfall 001 (Effluent)	NGTF-CP	8/31/2020	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-148199
Outfall 001 (Effluent)	NGTF-CP	9/8/2020	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-148669
Outfall 001 (Effluent)	NGTF-CP	9/14/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148978
Trip/Field Blanks										
QC - Area 7	Field Blank	1/21/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136556
QC - Area 7	Trip Blank	1/21/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136556
QC - Area 7	Field Blank	2/25/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138457
QC - Area 7	Trip Blank	2/25/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138457
QC - Area 7	Field Blank	3/9/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-139118
QC - Area 7	Trip Blank	3/9/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-139118
QC - Area 7	FIELD BLANK	4/6/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140369
QC - Area 7	TRIP BLANK	4/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140369
QC - Area 7	FIELD BLANK	5/7/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141847
QC - Area 7	TRIP BLANK	5/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141847
QC - Area 12	FB-1-1A-021420	2/14/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137910
QC - Area 12	TB	2/14/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137910
QC - Area 12	FB-1-1A-03022020	3/2/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138661
QC - Area 12	TB	3/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138661
QC - Area 12	FB-1-1A-04012020	4/1/2020	FB	TA	<0.50	<0.50	3.7	<0.50	<0.50	550-140134
QC - Area 12	TB	4/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140134
QC - Area 12	FB-1-1A- 05012020	5/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141565
QC - Area 12	TB	5/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141565
QC - Area 12	FB-1-1A-06012020	6/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142825
QC - Area 12	TB-1-1A-06012020	6/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142825
QC - Area 12	FB-1-1A-07012020	7/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144359
QC - Area 12	TB-1-1A-07012020	7/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144359

Table C-3. 2020 Laboratory Results for VOCs in Treatment System Samples
North Indian Bend Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Sample Location	Field Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	6	6	5	5	
QC - Area 12	FB-1-1A-08032020	8/3/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146284
QC - Area 12	TB-1-1A-08032020	8/3/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146284
QC - Area 12	FB-1-1A-09012020	9/1/2020	FB	TA	<0.50	<0.50	2.9 (C)	<0.50	<0.50	550-148244
QC - Area 12	TB-1-1A-09012020	9/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148244
QC - Area 12	FB-1-1A-10012020	10/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150124
QC - Area 12	TB-1-1A-10012020	10/1/2020	TB	TA	<0.50 (5)	<0.50 (5)	1.7 (5)	<0.50 (5)	<0.50 (5)	550-150124
QC - Area 12	FB-1-1A-11022020	11/2/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152162
QC - Area 12	TB-1-1A-11022020	11/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152162
QC - Area 12	FB-1-1A 11192020	11/19/2020	FB	TA	<0.50 (4)	<0.50	<0.50 (4)	<0.50	<0.50	550-153356
QC - Area 12	TB-1-1A 11192020	11/19/2020	TB	TA	<0.50 (4)	<0.50	<0.50 (4)	<0.50	<0.50	550-153356
QC - Area 12	FB-1-1A-12012020	12/1/2020	FB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153812
QC - Area 12	TB-1-1A-12012020	12/1/2020	TB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153812
QC -MRTF	TB	1/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-135594
QC -MRTF	TB	2/4/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137286
QC -MRTF	TB	3/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138670
QC -MRTF	TB	4/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140141
QC -MRTF	TB	5/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141575
QC - NGTF	TB	1/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-135591
QC - NGTF	TB	1/13/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136093
QC - NGTF	TB	1/21/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136547
QC - NGTF	TB	1/27/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-136844
QC - NGTF	TB	2/3/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137233
QC - NGTF	TB	2/10/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-137653
QC - NGTF	TB	2/21/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138345
QC - NGTF	TB	2/24/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138378
QC - NGTF	TB	3/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-138672
QC - NGTF	TB	3/9/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-139108
QC - NGTF	TB	3/16/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-139408
QC - NGTF	TB	3/23/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-139732
QC - NGTF	TB	3/30/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-139979
QC - NGTF	TB	4/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140367
QC - NGTF	TB	4/13/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-140749
QC - NGTF	TB	4/20/2020	TB	TA	<0.50 (3,6)	<0.50 (3,6)	<0.50 (3,6)	<0.50	<0.50	550-141078
QC - NGTF	TB	4/27/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141362
QC - NGTF	TB	5/4/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141609
QC - NGTF	TB	5/11/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-141967
QC - NGTF	TB	5/18/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142259
QC - NGTF	TB	5/26/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142583
QC - NGTF	TB	6/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142810
QC - NGTF	TB	6/8/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-143193
QC - NGTF	TB	6/15/2020	TB	TA	<0.50	<0.50	<0.50	<0.50 (4)	<0.50	550-143495
QC - NGTF	TB	6/22/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-143821

Table C-3. 2020 Laboratory Results for VOCs in Treatment System Samples
North Indian Bend Superfund Site, Scottsdale, Arizona

(Results presented in micrograms per liter, µg/L)

Sample Location	Field Sample Identifier	Sample Date	Sample Type	LAB	TCA	DCE	TCM	PCE	TCE	Report
					200	*6*	*6*	*5*	*5*	
QC - NGTF	TB	6/29/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144144
QC - NGTF	TB	7/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144495
QC - NGTF	TB	7/13/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145014
QC - NGTF	TB	7/20/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-145538
QC - NGTF	TB	7/27/2020	TB	TA	<0.50	<0.50	0.58	<0.50	<0.50	550-145964
QC - NGTF	TB	8/3/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146292
QC - NGTF	TB	8/10/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146852
QC - NGTF	TB	8/17/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-147336
QC - NGTF	TB	8/24/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-147790
QC - NGTF	TB	8/31/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148199
QC - NGTF	TB	9/8/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148669
QC - NGTF	TB	9/14/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148978
QC-TS (E)	FB-2-1A-06012020	6/1/2020	FB	TA	<0.50	<0.50	4.2 (D)	<0.50	<0.50	550-142837
QC-TS (E)	TB-2-1A-06012020	6/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-142837
QC-TS (E)	FB-2-1A-06042020	6/4/2020	FB	TA	<0.50	<0.50	4.7 (D)	<0.50	<0.50	550-143085
			Lab dup		<0.50	<0.50	4.0 (D)	<0.50	<0.50	
QC-TS (E)	TB-2-1A-06042020	6/4/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-143085
QC-TS (E)	FB-2-1A-07012020	7/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144365
QC-TS (E)	TB-2-1A-07012020	7/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-144365
QC-TS (E)	FB-2-1A-08032020	8/3/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146299
QC-TS (E)	TB-2-1A-08032020	8/3/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146299
QC-TS (E)	FB-2-1A-08112020	8/11/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146966
QC-TS (E)	TB-2-1A-08112020	8/11/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-146966
QC-TS (E)	FB-2-1A-09012020	9/1/2020	FB	TA	<0.50	<0.50	2.9 (C)	<0.50	<0.50	550-148285
QC-TS (E)	TB-2-1A-09012020	9/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-148285
QC-TS (E)	FB-2-1A-10012020	10/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150122
QC-TS (E)	TB-2-1A-10012020	10/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150122
QC-TS (E)	FB-2-1A-10202020	10/20/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151403
QC-TS (E)	TB-2-1A-10202020	10/20/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151403
QC-TS (E)	FB-2-1A-11022020	11/2/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152165
QC-TS (E)	TB-2-1A-11022020	11/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152165
QC-TS (E)	FB-2-1A-12012020	12/1/2020	FB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153814
QC-TS (E)	TB-2-1A-12012020	12/1/2020	TB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153814
QC-TS (E)	FB-2-1A-12072020	12/7/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-154116
QC-TS (E)	TB-2-1A-12072020	12/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-154116

<0.50 =	Non-Detect
5	Cleanup Standards for Treated Water (µg/L)
5.1	Sample result exceeds Cleanup Standard for Treated Water

Table C-3. 2020 Laboratory Results for VOCs in Treatment System Samples
North Indian Bend Superfund Site, Scottsdale, Arizona

EXPLANATION:

TCA =	1,1,1-Trichloroethane	TA =	TestAmerica, Inc.
DCE =	1,1-Dichloroethene	<0.50 =	Analytical result is less than laboratory detection limit
TCM =	Chloroform	QC =	Quality Control
PCE =	Tetrachloroethene	TB =	Trip Blank
TCE =	Trichloroethene	FB =	Field Blank
ID =	Identifier		

REJ SP-102 duplicate sample analysis result for TCE of 350 ug/L is inconsistent with recent values, and with the original sample results. Re-analyses of this sample yielded higher values of 420 and 480 ug/L, but the higher concentration data was not within calibration and therefore not reported by the lab. Since the lab could not achieve consistent or reliable results on this sample, we are rejecting the duplicate value of 350 ug/L.

(A) High Relative Percent Difference for TCE values between the original and duplicate sample could not be reconciled by the lab. Each sample was fully used by the lab, and no additional sample was available for re-analysis. For the original sample (SP-102) the lower 10x dilution value of 460 ug/L was reported, however it had a low surrogate recovery. The lab indicated that the 100x dilution of 550 ug/L is therefore more reliable. Both values are reported here, due to additional issues with the field duplicate, which was rejected.

(B) High Relative Percent Difference for TCE values between the original and duplicate sample could not be reconciled by the lab. Each sample was fully used by the lab while attempting to fix surrogate recovery issues on chloroform, and no additional sample was available for re-analysis of TCE. For the original sample (WSP-1-1A), the 1x dilution value of 99 ug/L was within calibration and therefore reported. Lab re-analyses of this sample yielded values of 87 ug/L and 65 ug/L with issues that prevented reporting. For the field duplicate sample (TS-1-1A-12012020), the original 1x dilution result of 100 ug/L failed calibration and was therefore not reported by the lab because the value was estimated. The second 1x dilution that was run as part of the surrogate recovery issue resolution passed calibration with a value of 69 ug/L, and was therefore reported by the lab. An additional re-analysis of this sample was run at a 2x dilution and yielded a result of 32 ug/L. The lab internally rejected this result for reporting.

(C) Field blank samples for 9/1/2020 were obtained from the same bottle of distilled water. All had high chloroform detections. Corresponding treatment system samples and trip blanks did not have chloroform detections of the same magnitude, so the high concentration of chloroform corresponds to the field blank water source.

(D) Field blank samples were obtained from the same bottle of distilled water for samples on 6/1/2020 and 6/4/2020. All had high chloroform detections. Corresponding treatment system samples and trip blanks did not have chloroform detections of the same magnitude, so the high concentration of chloroform corresponds to the field blank water source. The remaining source water was disposed of after the initial lab detection.

(E) QC-TS - Beginning in June 2020, a single trip blank is collected for Area 7, MRTF, and NGTF samples, when collected and shipped on the same day.

(1) H1 Flag: Sample analysis performed past holding time.

(2) H2 Flag: Initial analysis within holding time. Reanalysis for the required dilution was past holding time.

(3) L5 Flag: The associated blank spike recovery was above laboratory/method acceptance limit. This analyte was not detected in the sample.

(4) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(5) N1 Flag: The sample (trip blank) was re-analyzed due to out of 4-Bromofluorobenzene Surrogate (BFB) tune time in the original analysis and Internal Standard (ISTD) response was outside of acceptance limits, low in this run. The trip blanks could not be re-analyzed due insufficient sample volume.

(6) V1 Flag: CCV recovery was above method acceptance limits. This target analyte was not detected in the sample.

APPENDIX D
WATER LEVEL/TCE TIME-SERIES HYDROGRAPHS FOR NIBW WELLS

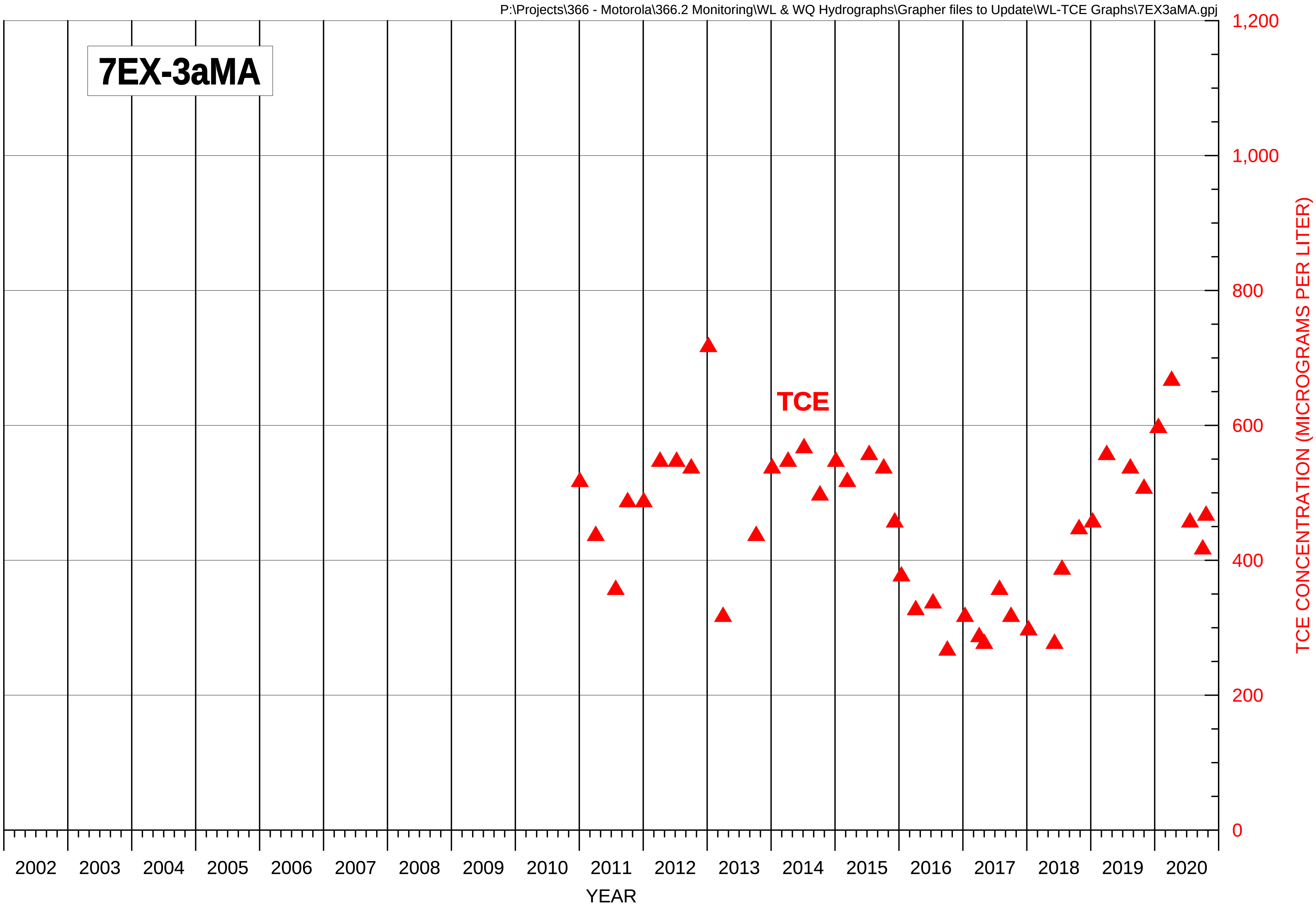


FIGURE D-1. TCE CONCENTRATIONS FOR EXTRACTION WELL 7EX-3aMA

North Indian Bend Wash Superfund Site

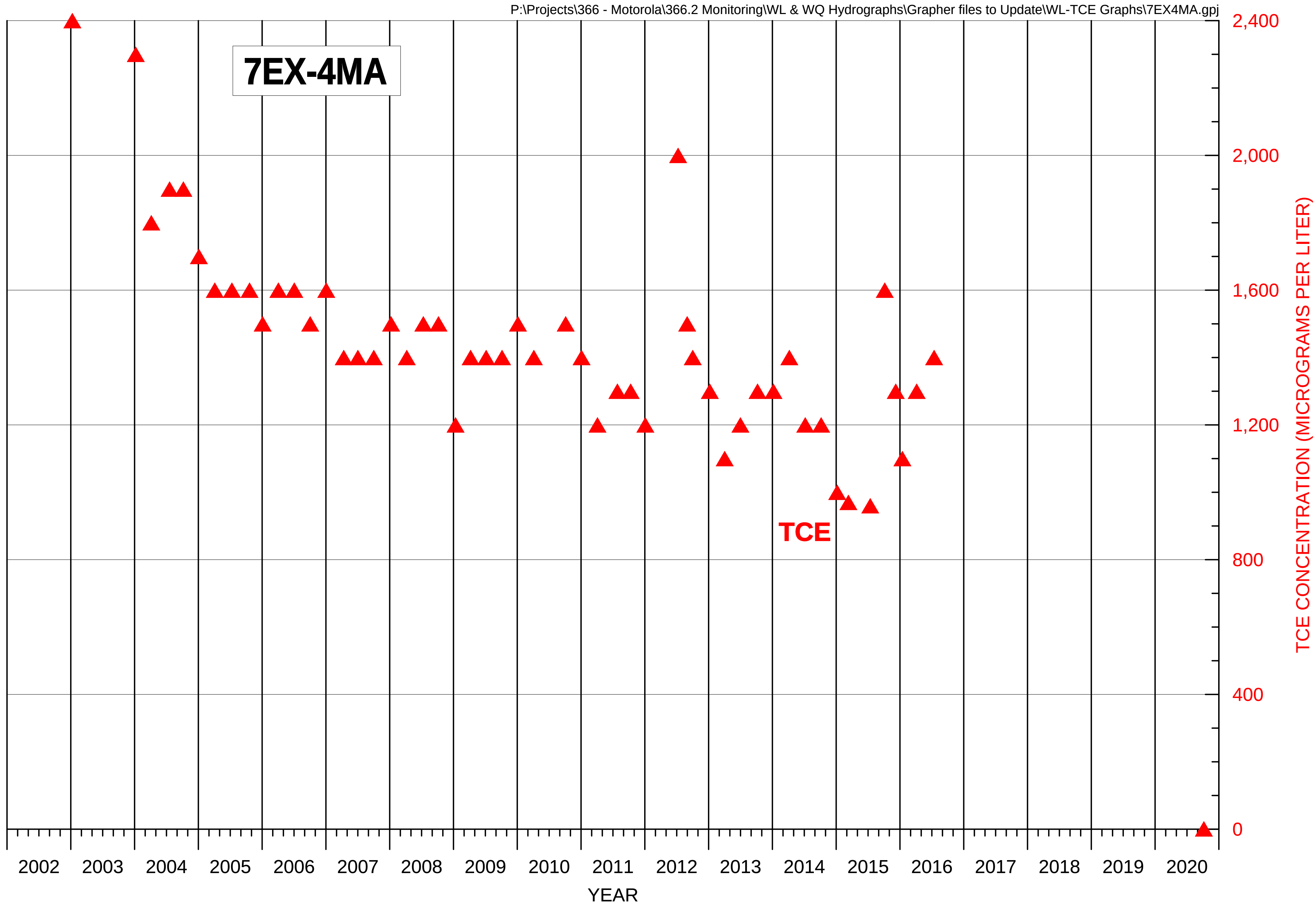


FIGURE D-2. TCE CONCENTRATIONS FOR EXTRACTION WELL 7EX-4MA

North Indian Bend Wash Superfund Site

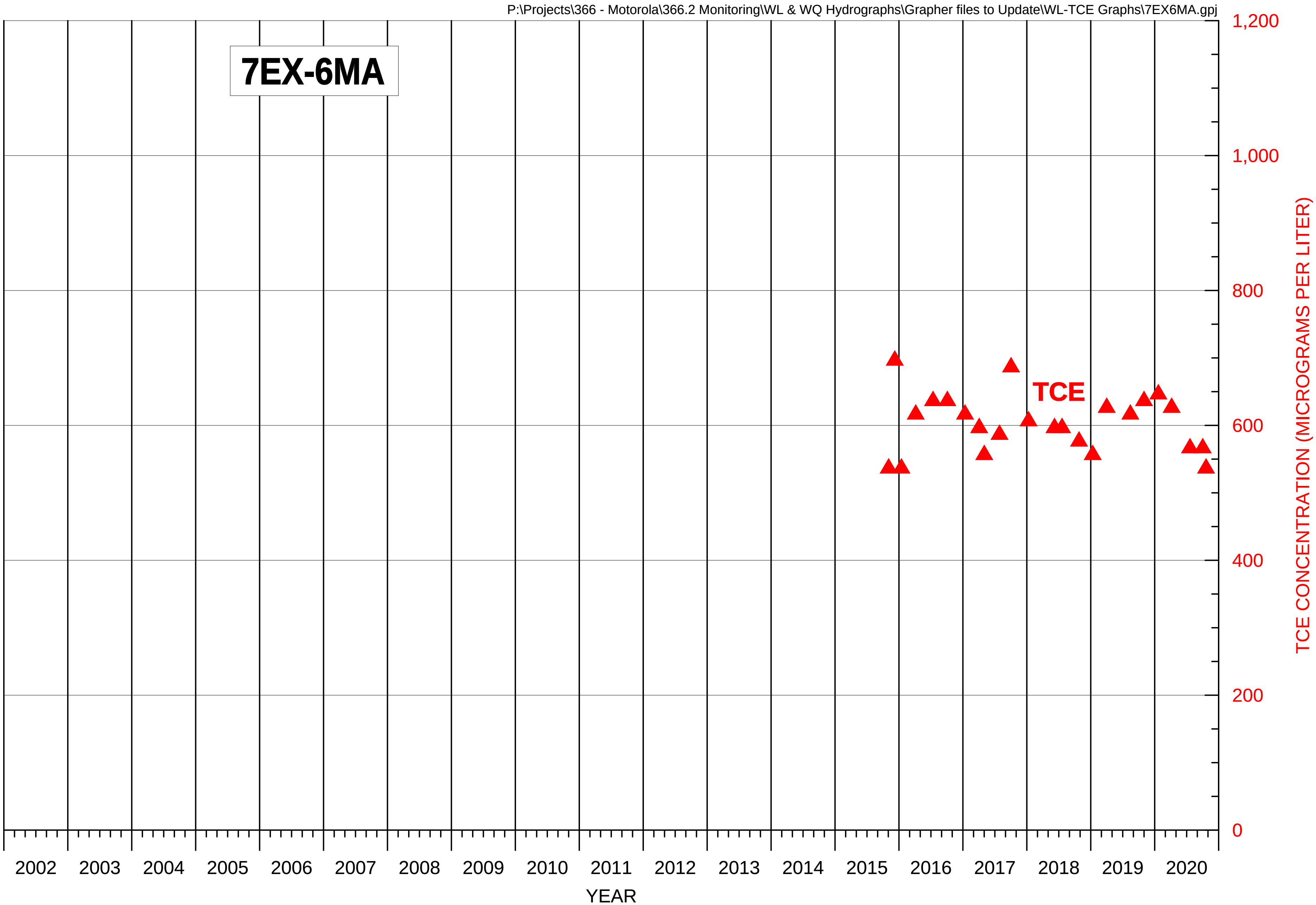


FIGURE D-3. TCE CONCENTRATIONS FOR EXTRACTION WELL 7EX-6MA

North Indian Bend Wash Superfund Site

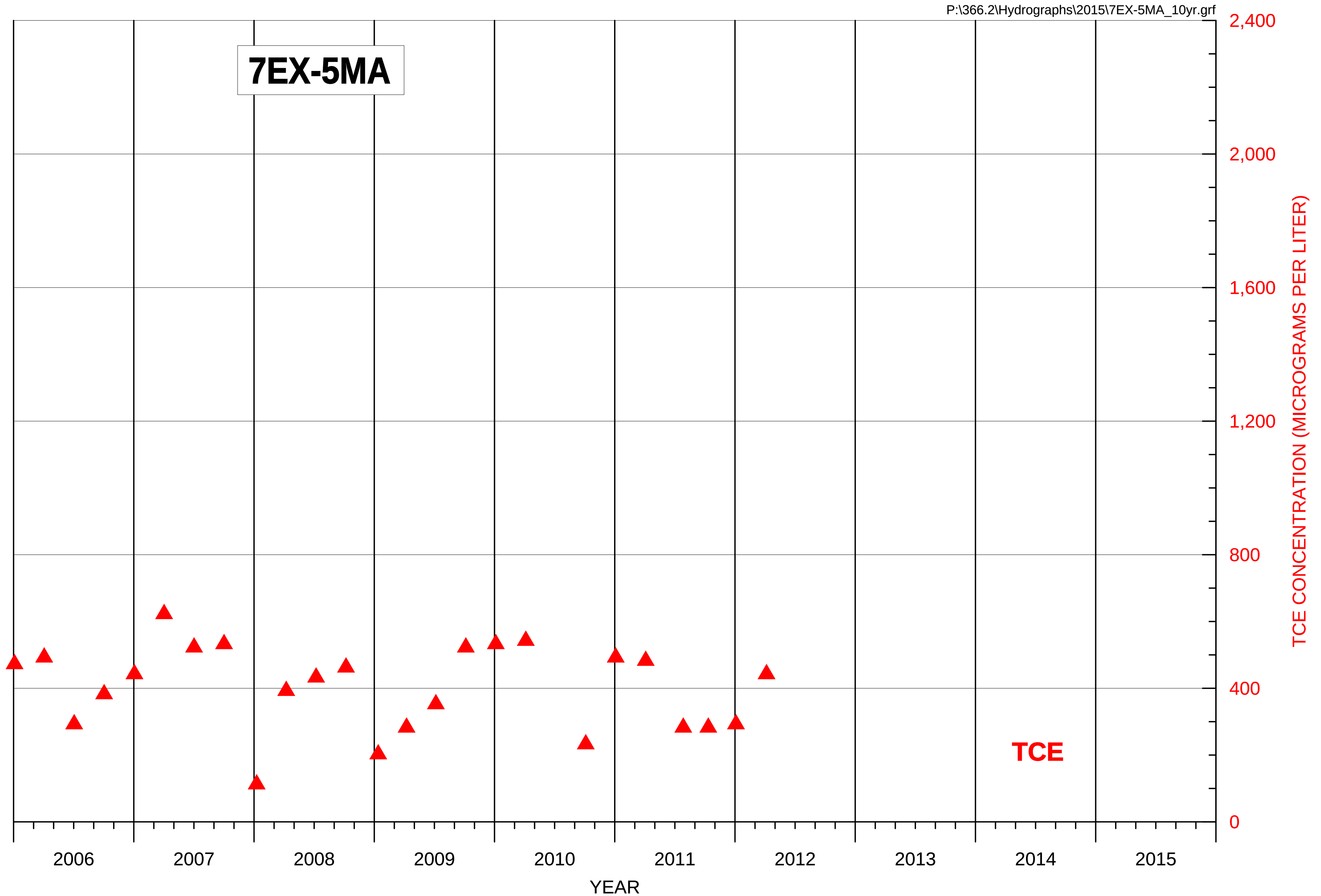


FIGURE D-4. TCE CONCENTRATIONS FOR EXTRACTION WELL 7EX-5MA

North Indian Bend Wash Superfund Site

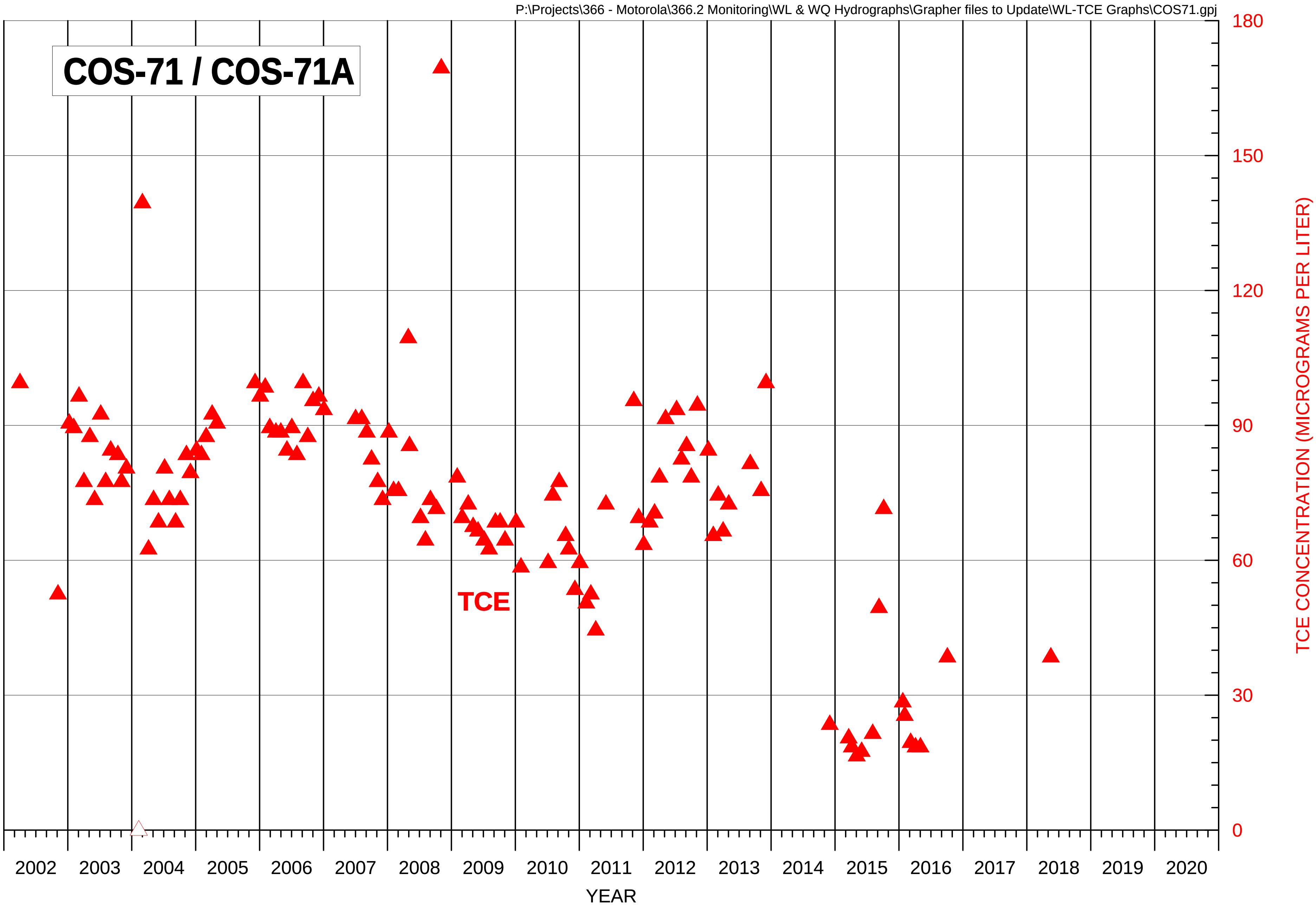


FIGURE D-5. TCE CONCENTRATIONS FOR EXTRACTION WELL COS-71 & COS-71A

Note: Well COS-71 was abandoned April 10, 2014 and was replaced by Well COS-71A.

EXPLANATION

- TCE Non-Detect / TCE Detected Value

North Indian Bend Wash Superfund Site

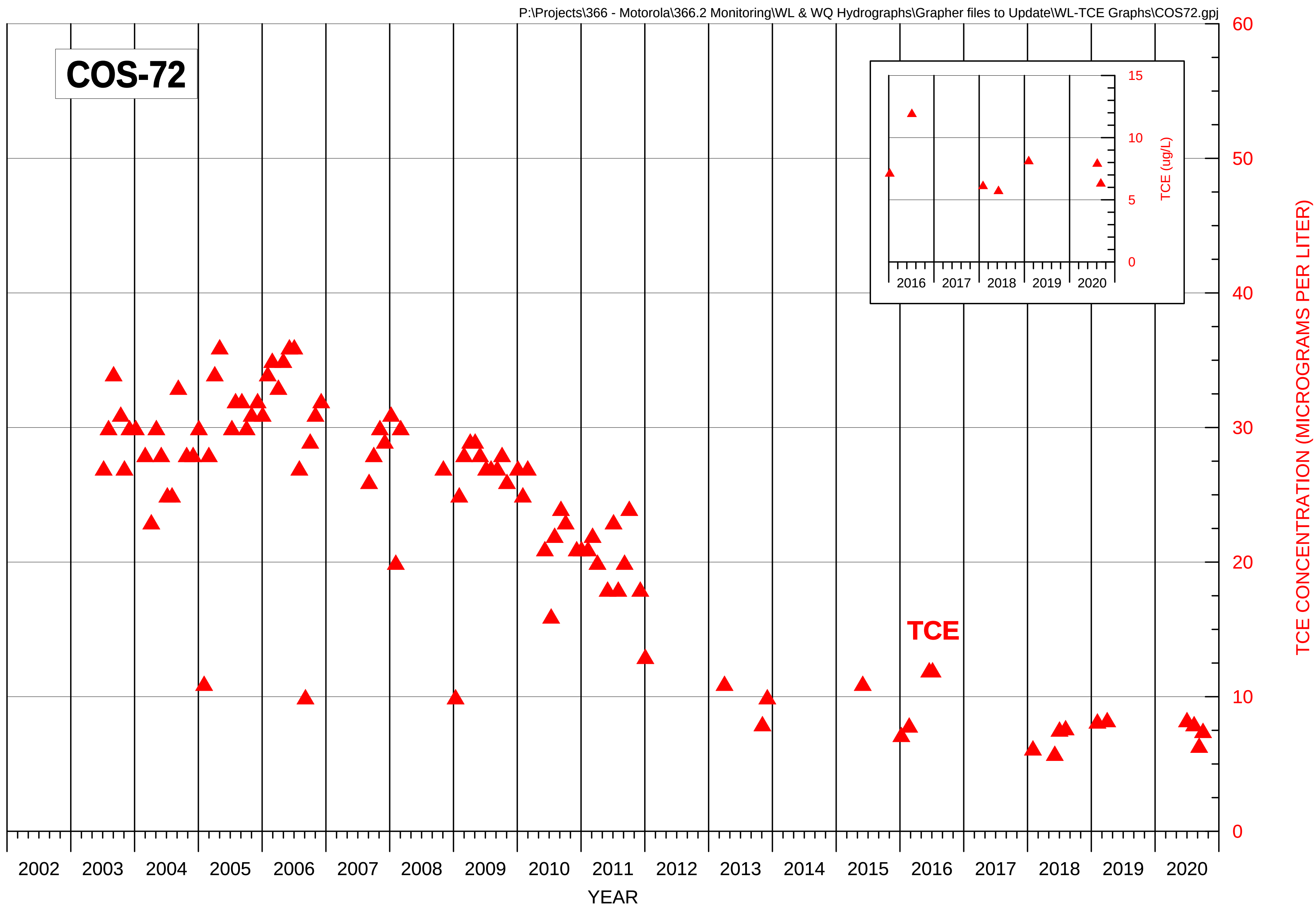


FIGURE D-6. TCE CONCENTRATIONS FOR EXTRACTION WELL COS-72

North Indian Bend Wash Superfund Site

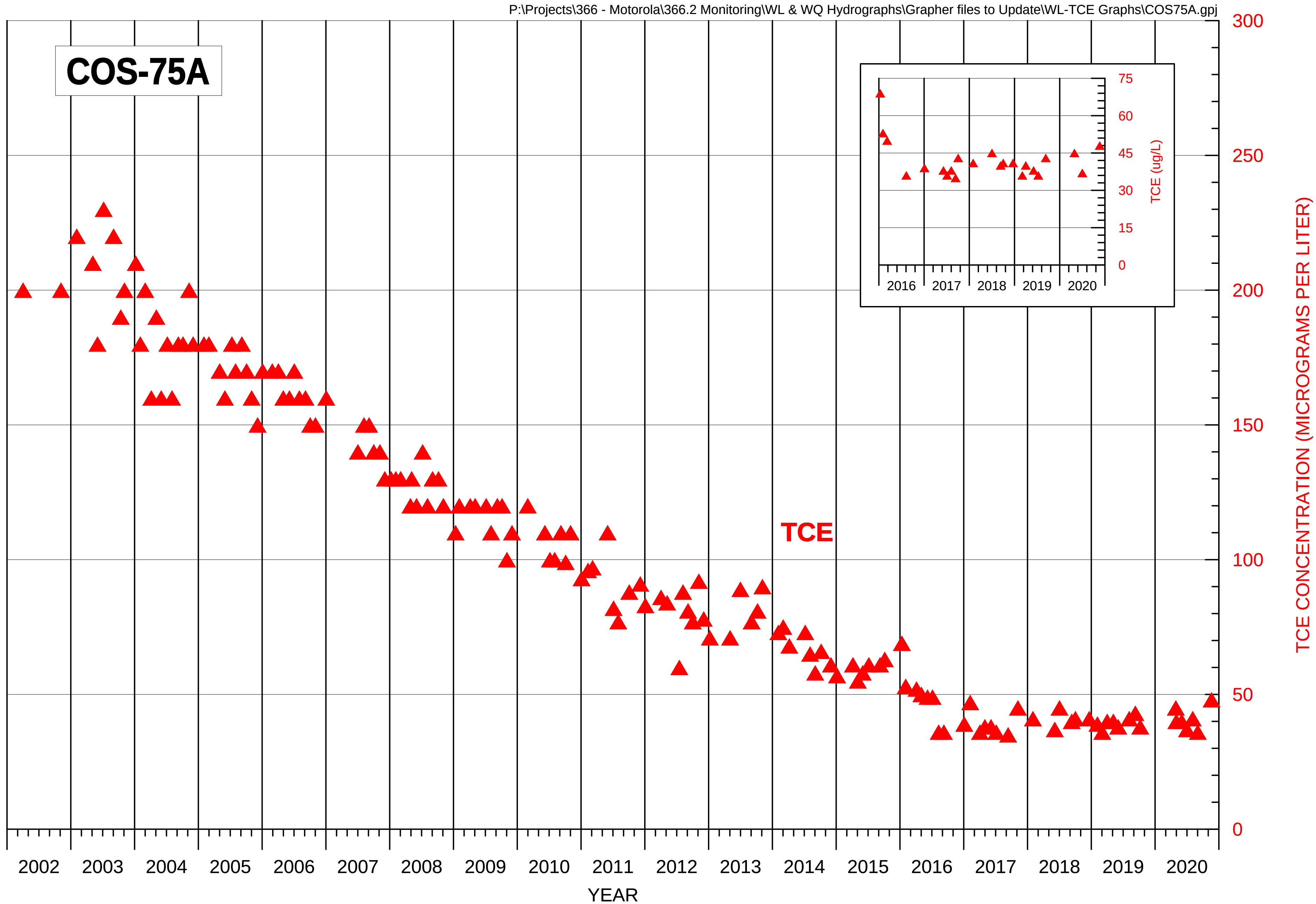


FIGURE D-7. TCE CONCENTRATIONS FOR EXTRACTION WELL COS-75A

North Indian Bend Wash Superfund Site

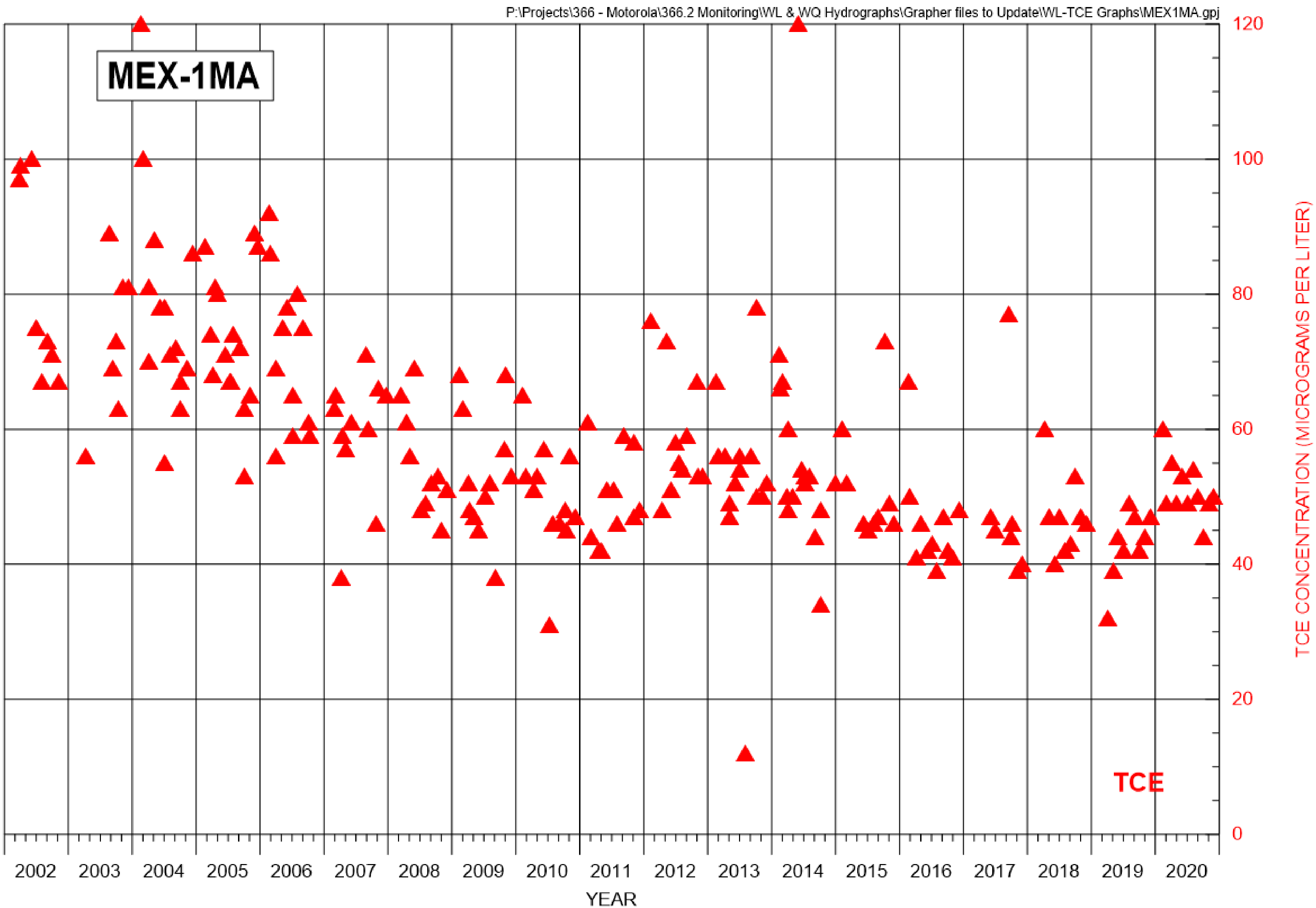


FIGURE D-8. TCE CONCENTRATIONS FOR EXTRACTION WELL MEX-1MA

North Indian Bend Wash Superfund Site

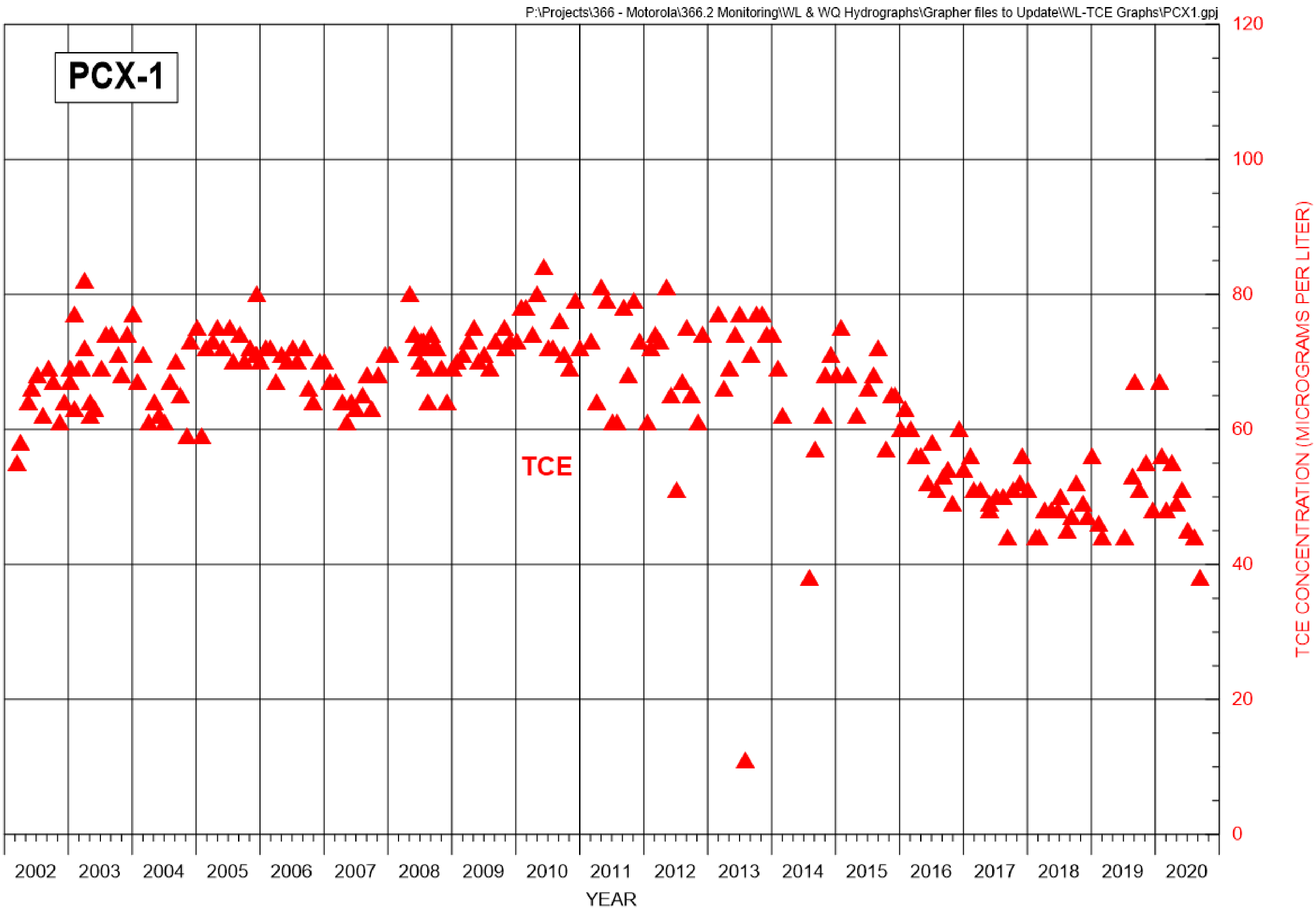


FIGURE D-9. TCE CONCENTRATIONS FOR EXTRACTION WELL PCX-1

North Indian Bend Wash Superfund Site

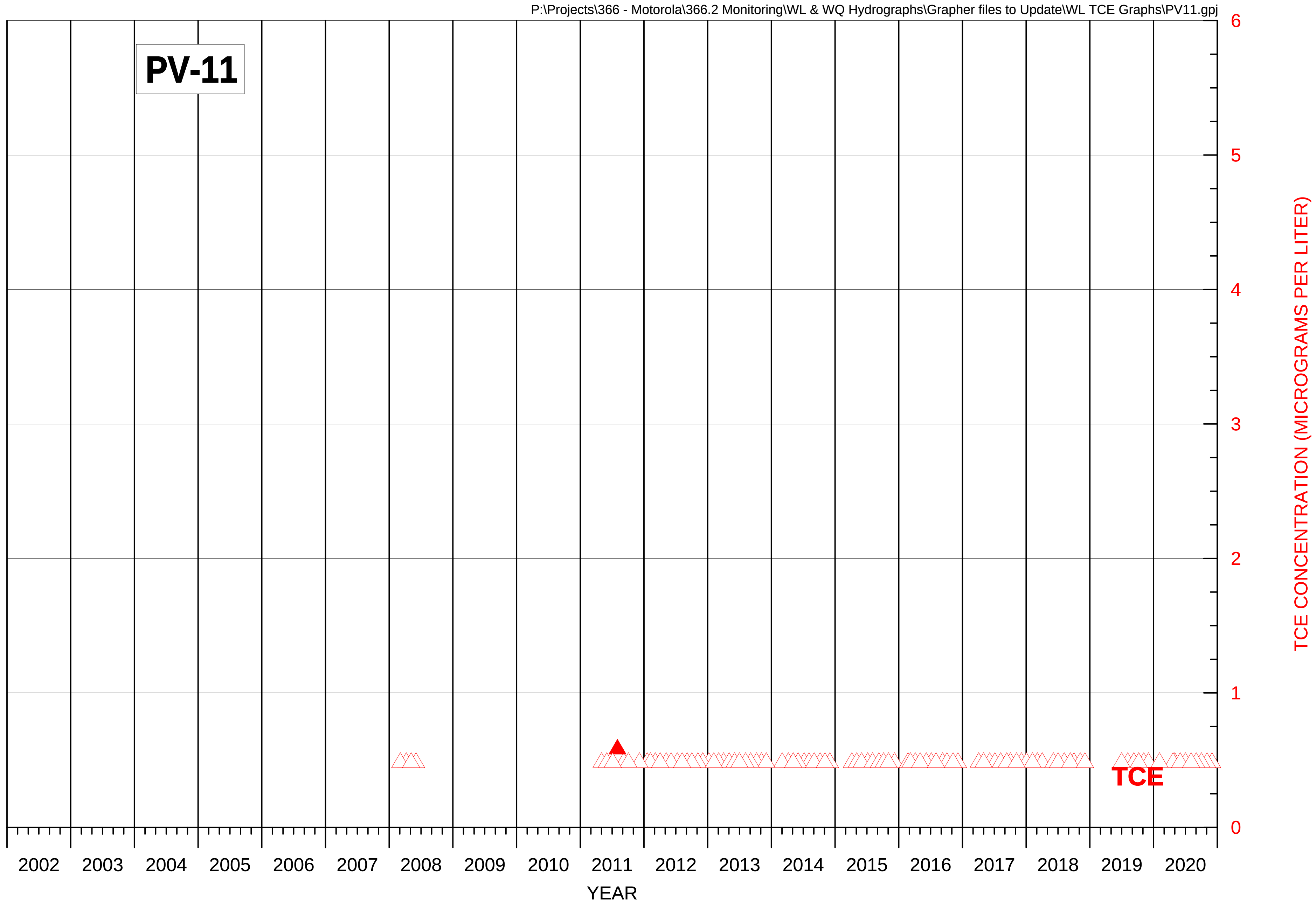


FIGURE D-10. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-11

EXPLANATION

- TCE Non-Detect / TCE Detected Value

North Indian Bend Wash Superfund Site

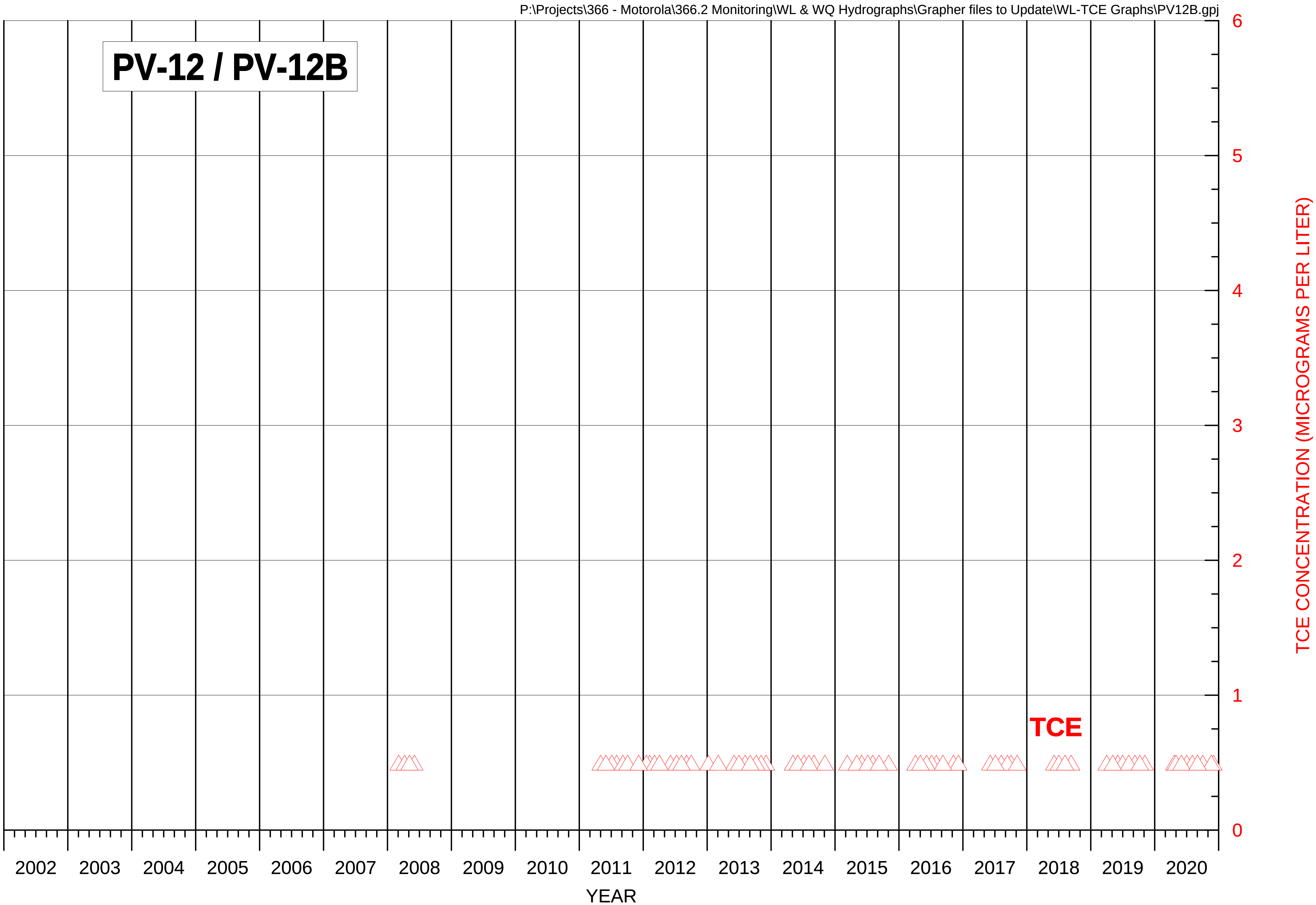


FIGURE D-11. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-12B

EXPLANATION
- TCE Non-Detect
/ TCE Detected Value

North Indian Bend Wash Superfund Site

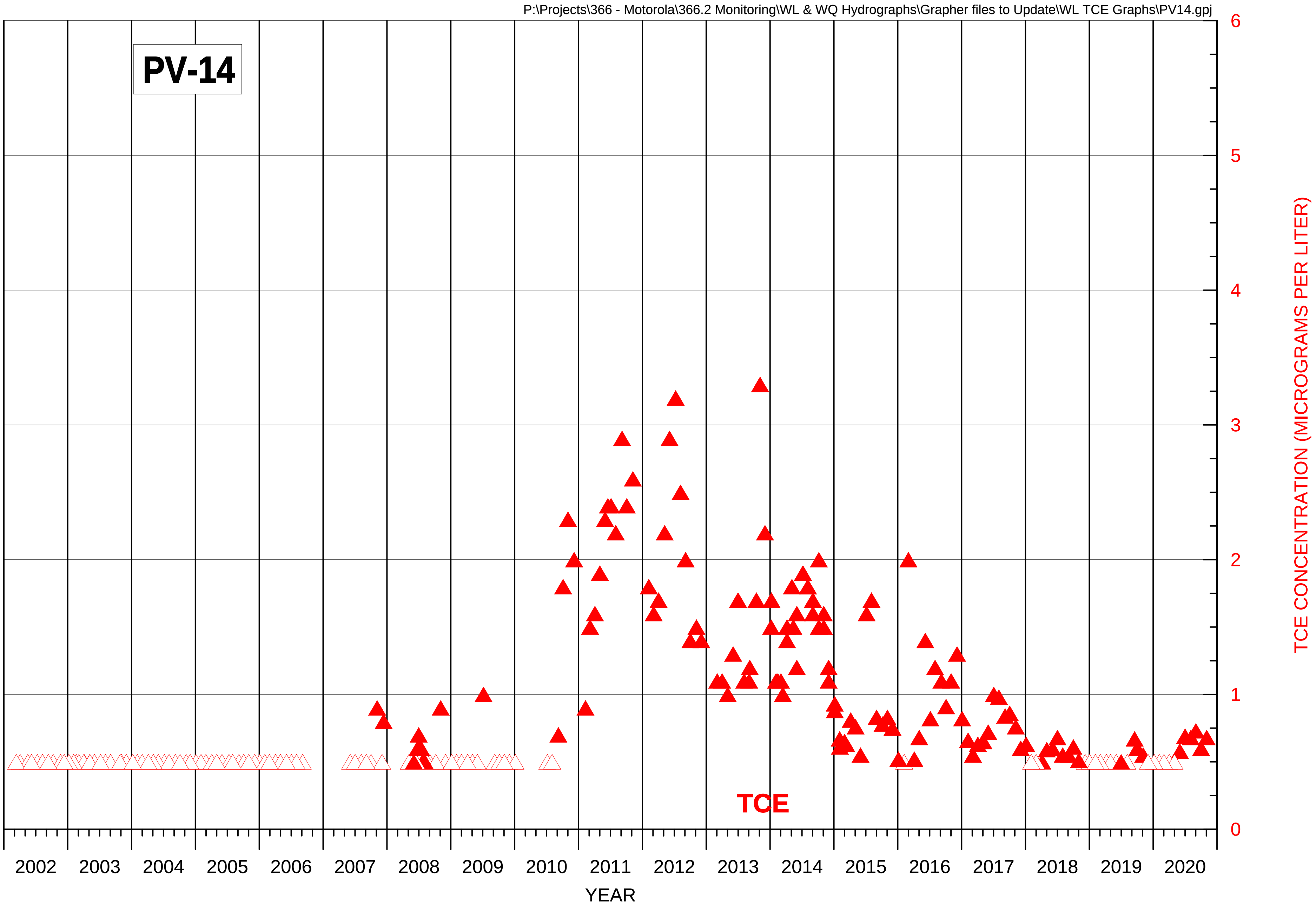


FIGURE D-12. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-14

EXPLANATION
- TCE Non-Detect / TCE Detected Value

North Indian Bend Wash Superfund Site

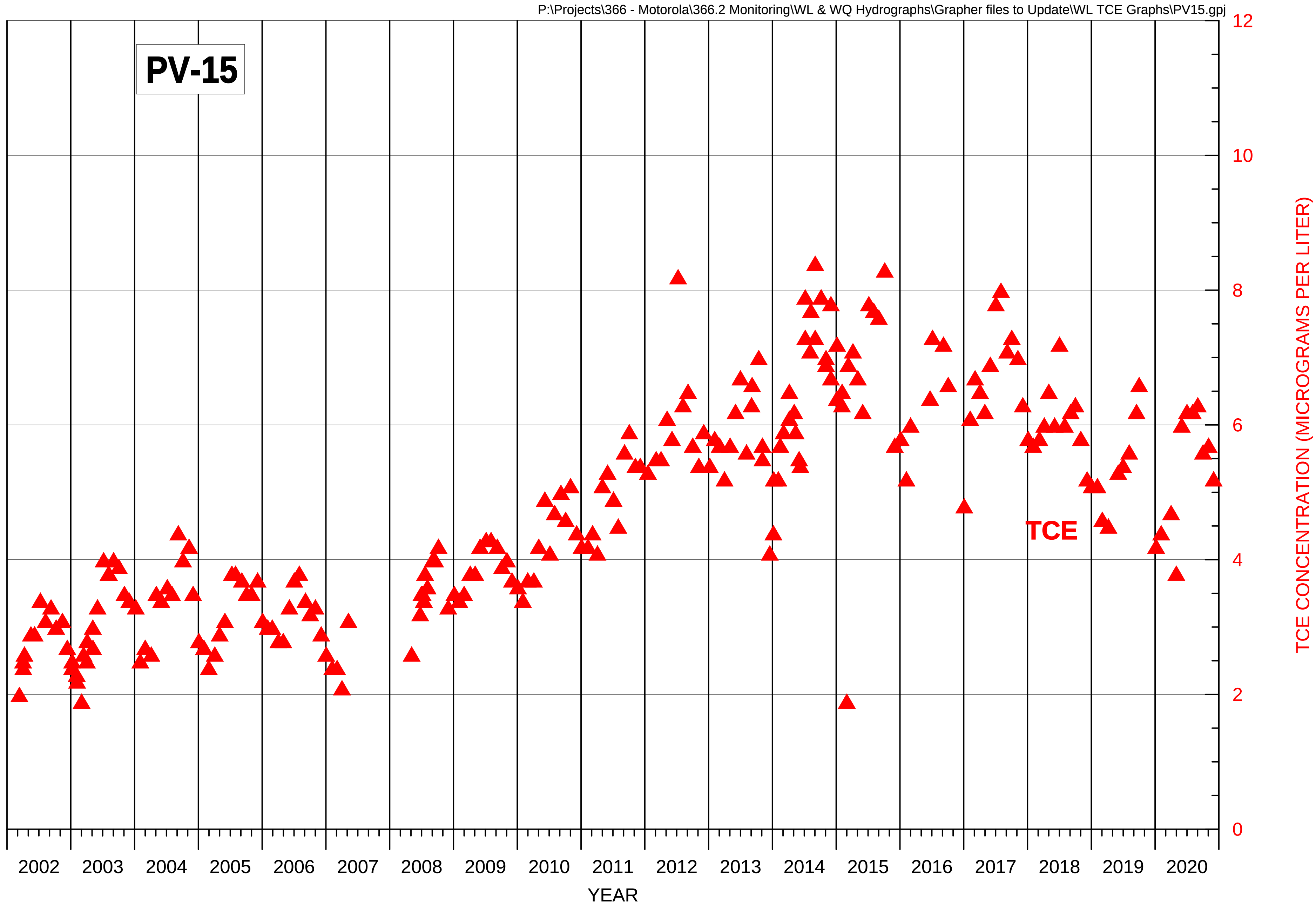


FIGURE D-13. TCE CONCENTRATIONS FOR PRODUCTION WELL PV-15

North Indian Bend Wash Superfund Site

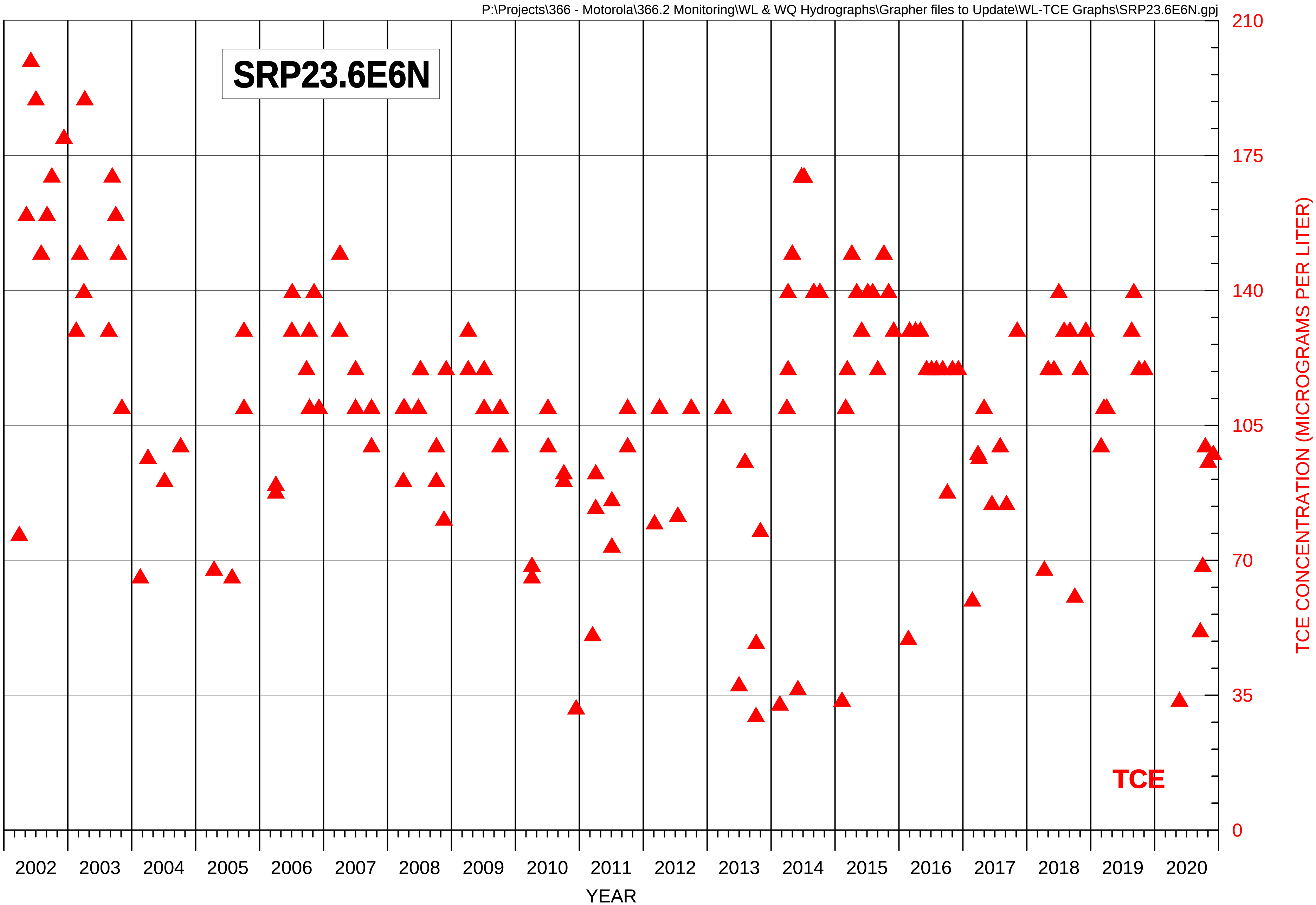


FIGURE D-14. TCE CONCENTRATIONS FOR EXTRACTION WELL SRP23.6E6N

North Indian Bend Wash Superfund Site

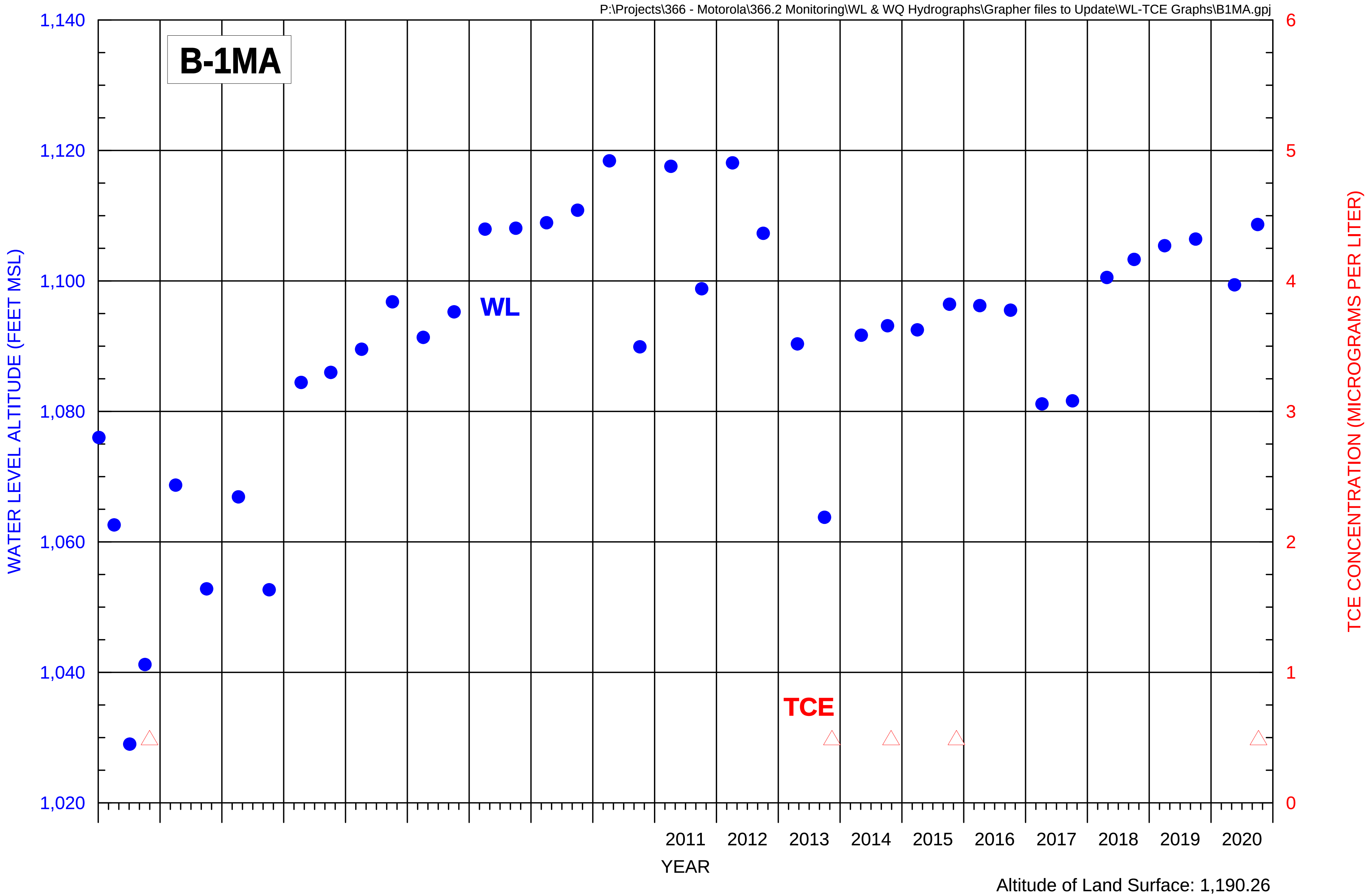
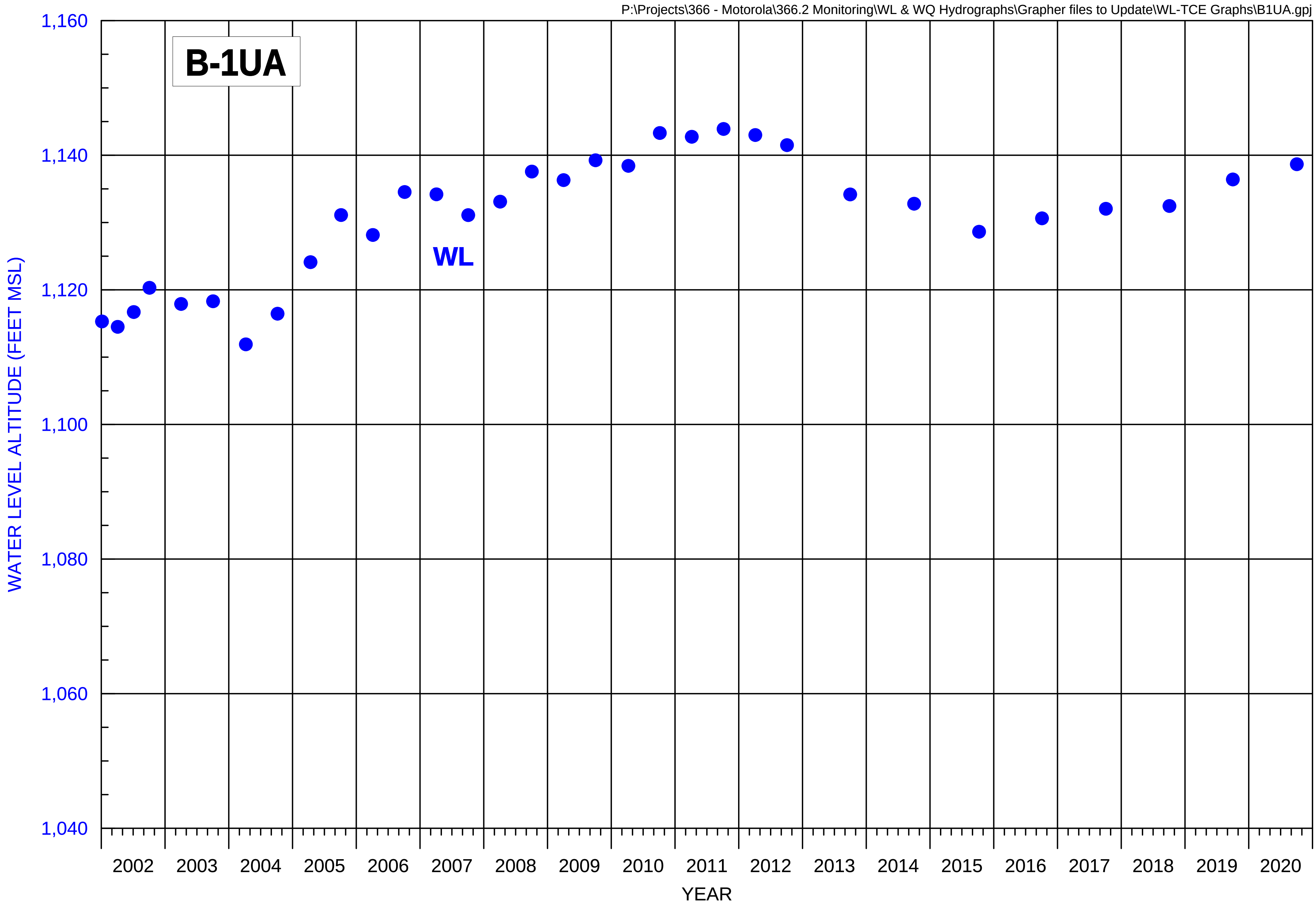


FIGURE D-15. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL B-1MA

EXPLANATION

- TCE Non-Detect
/ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,190.32

FIGURE D-16. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL B-1UA

North Indian Bend Wash Superfund Site

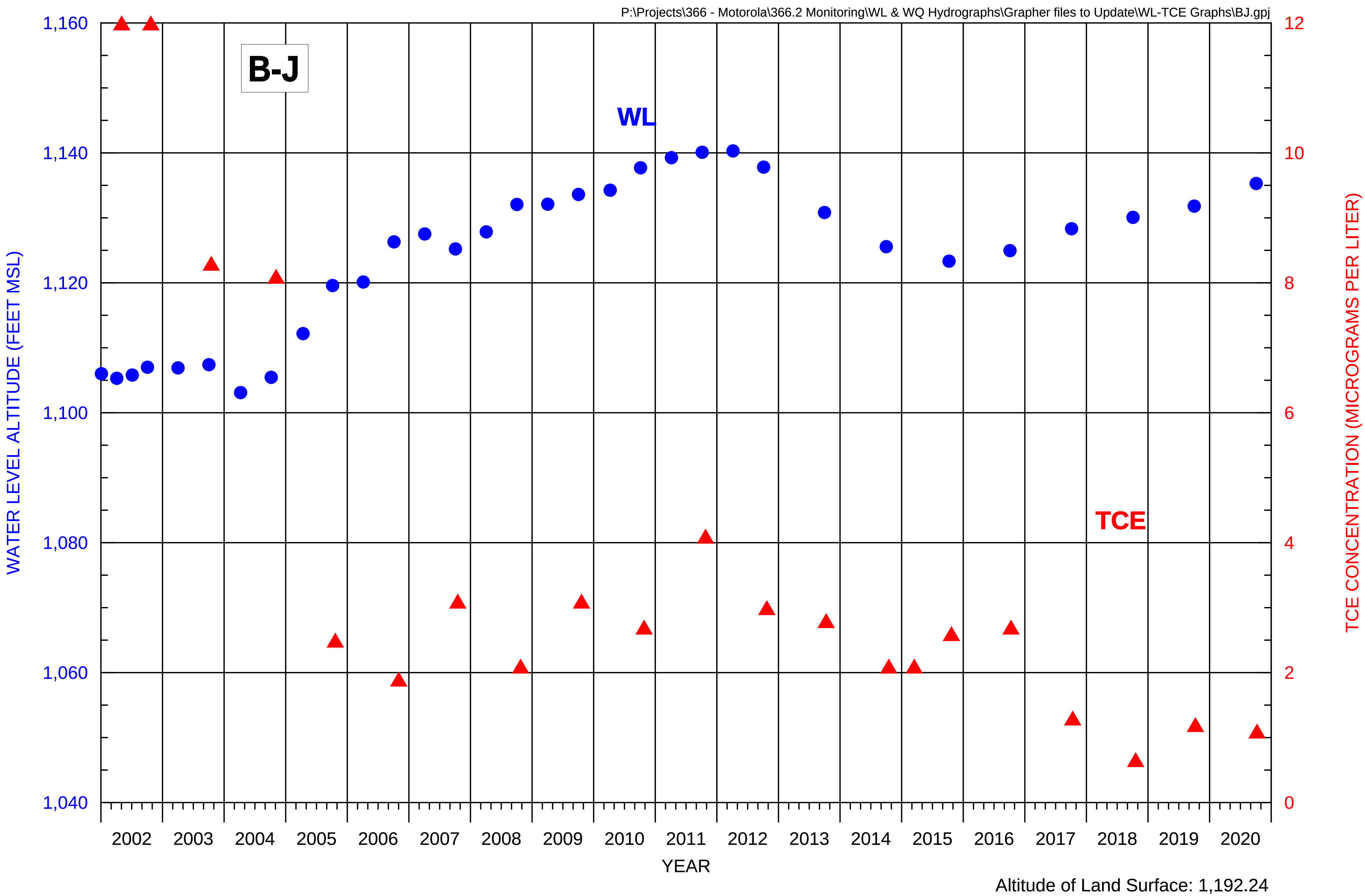
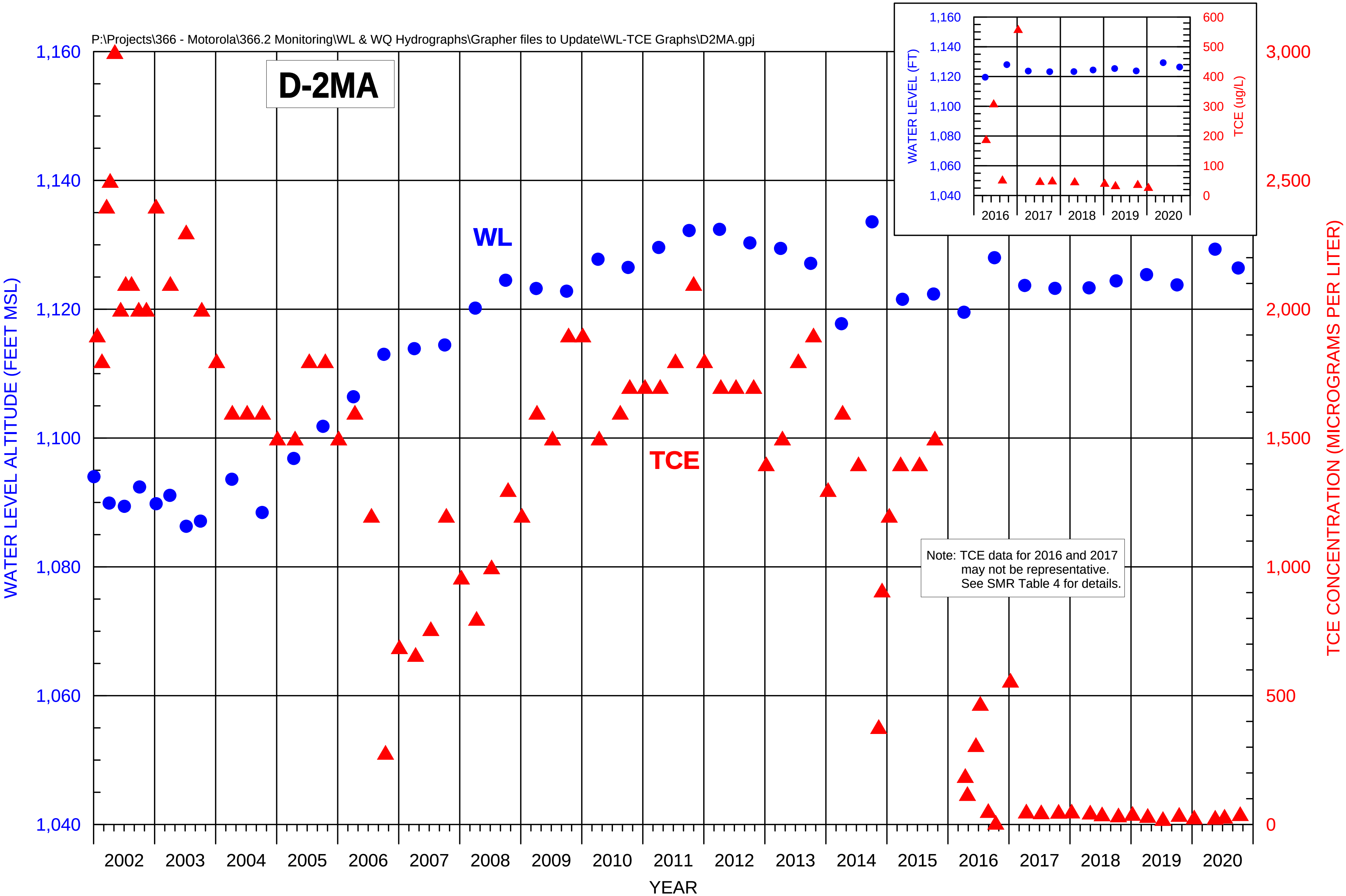


FIGURE D-17. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL B-J

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,240.03

FIGURE D-18. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL D-2MA

North Indian Bend Wash Superfund Site

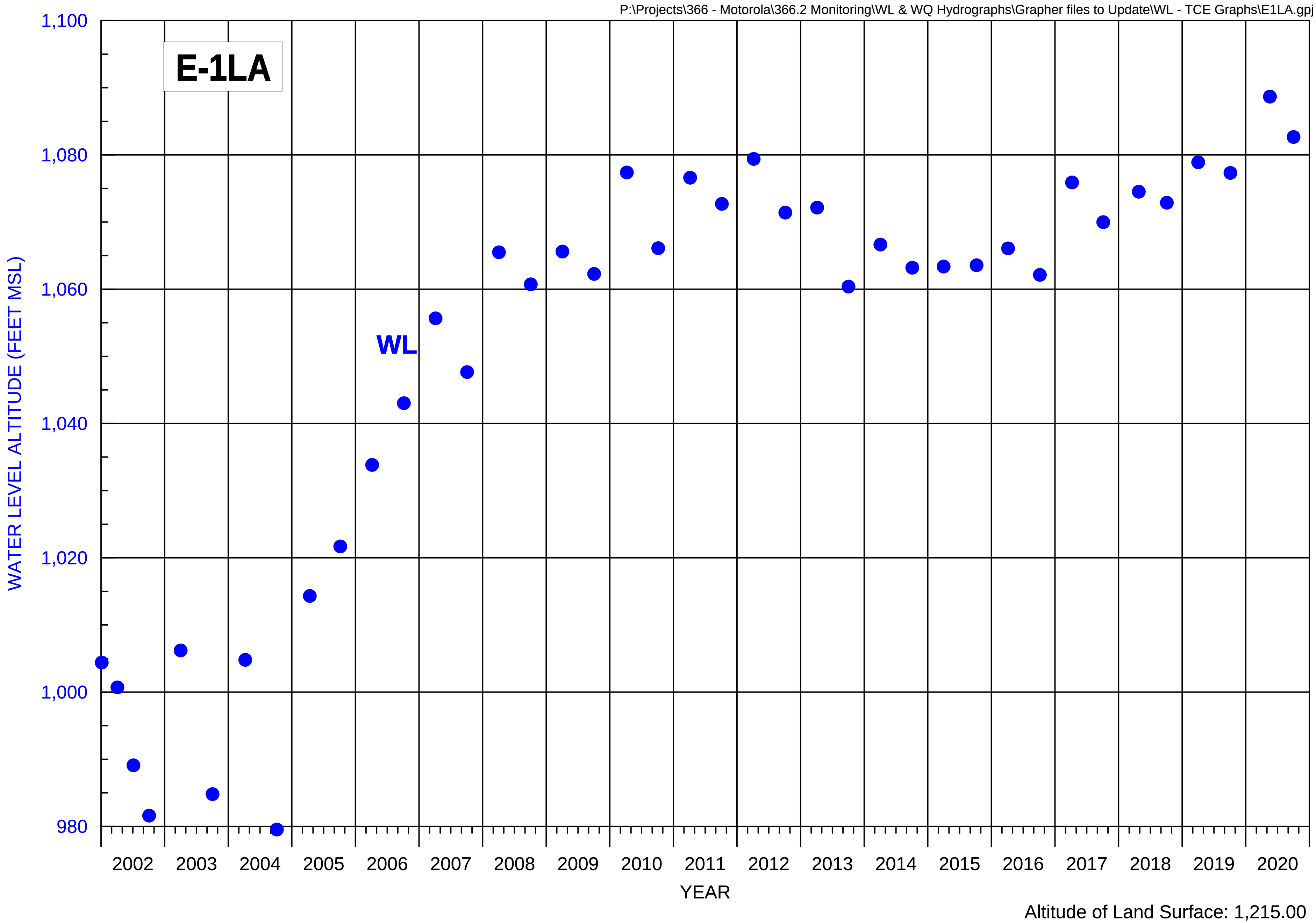
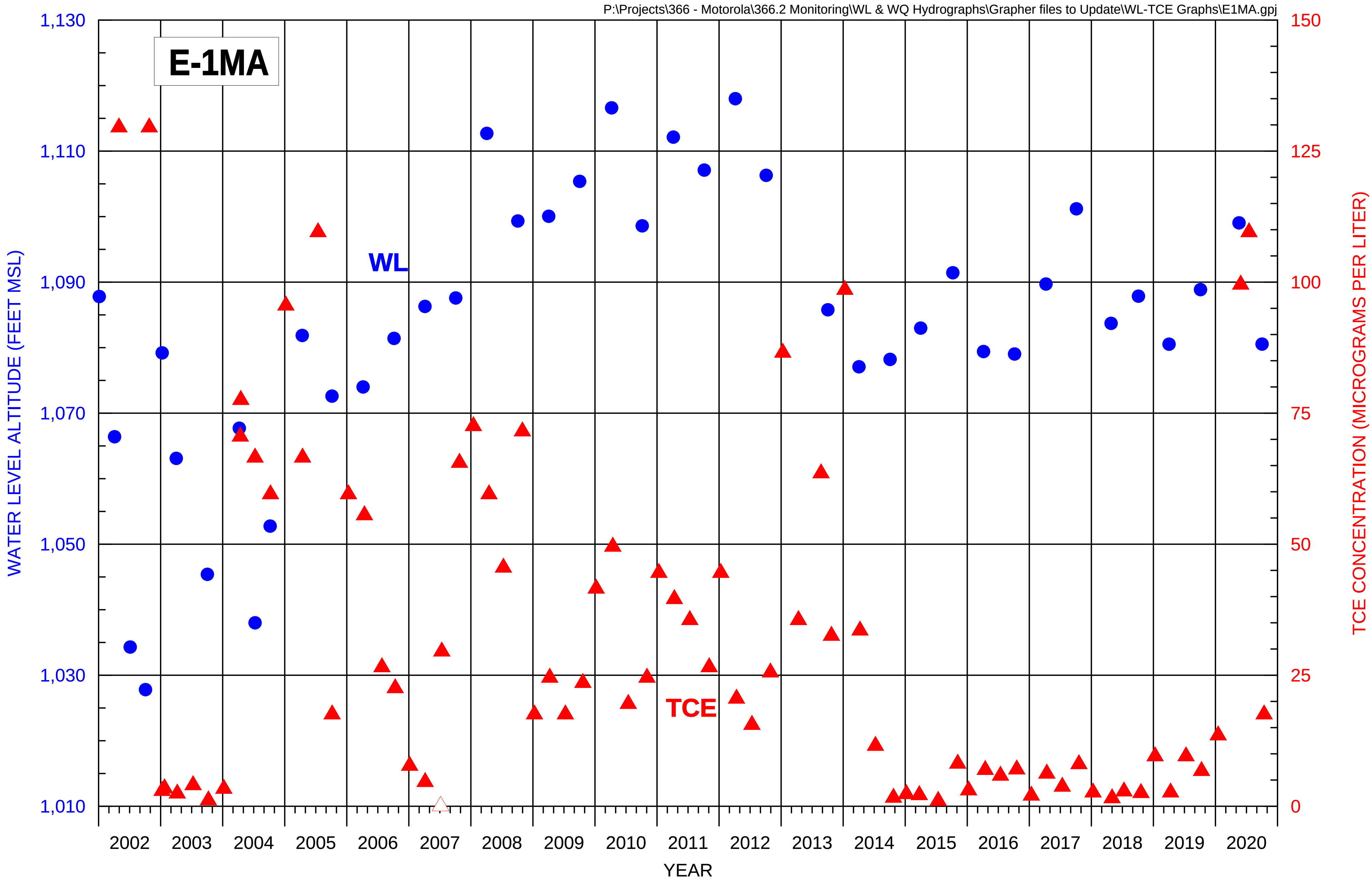


FIGURE D-19. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-1LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,214.37

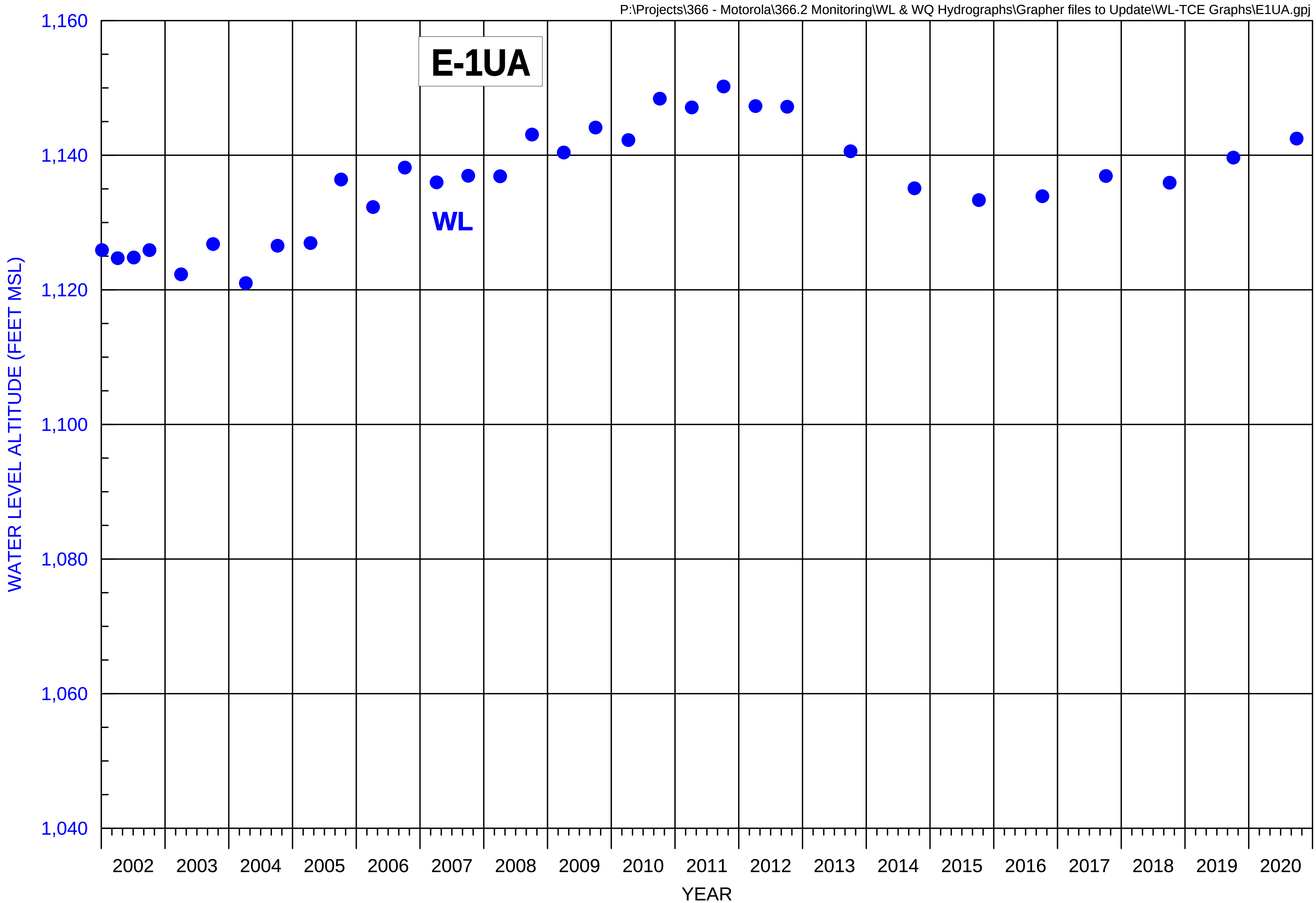
FIGURE D-20. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-1MA

EXPLANATION

- TCE Non-Detect

/ TCE Detected Value

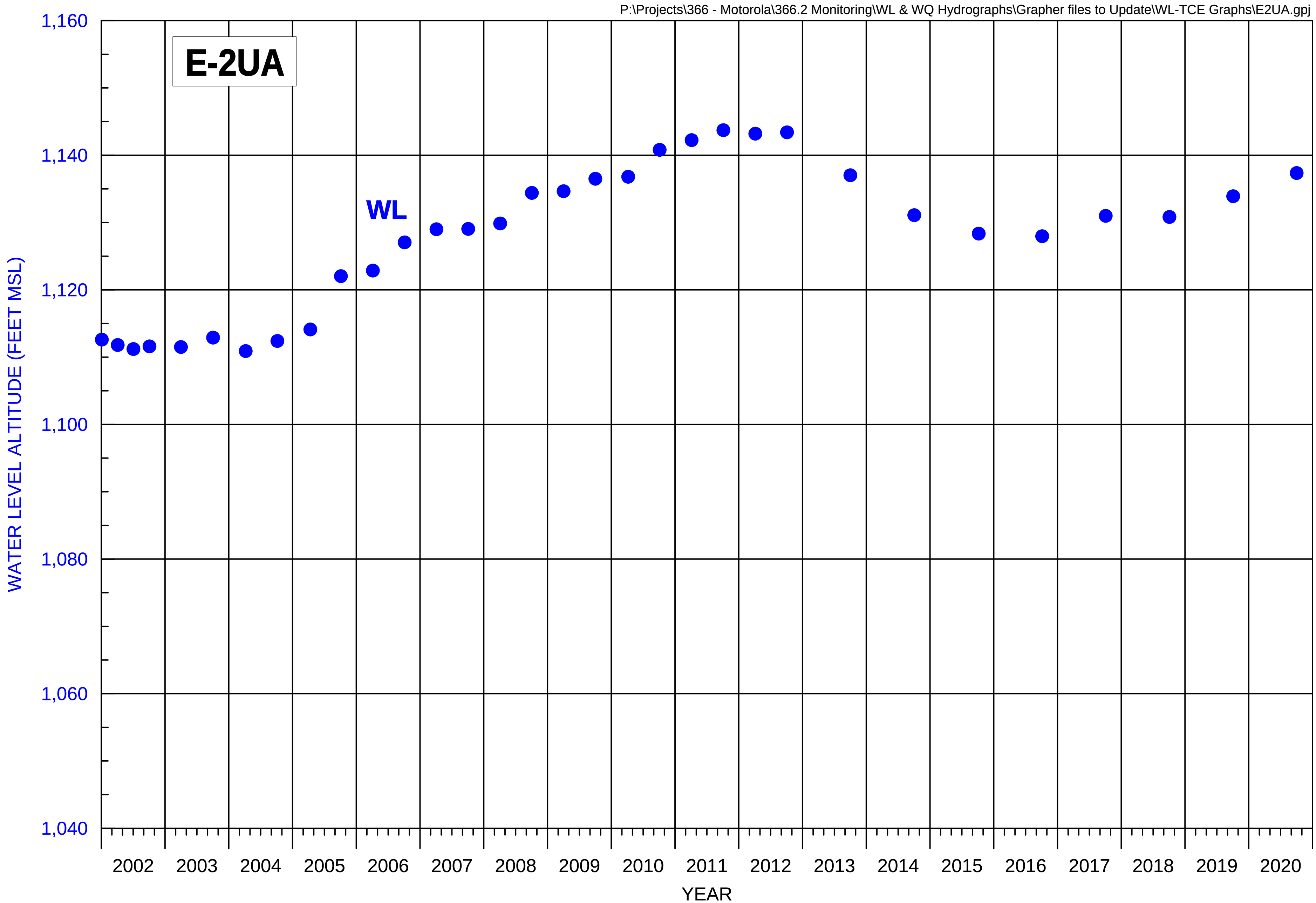
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,215.36

FIGURE D-21. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-1UA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,225.03

FIGURE D-22. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-2UA

North Indian Bend Wash Superfund Site

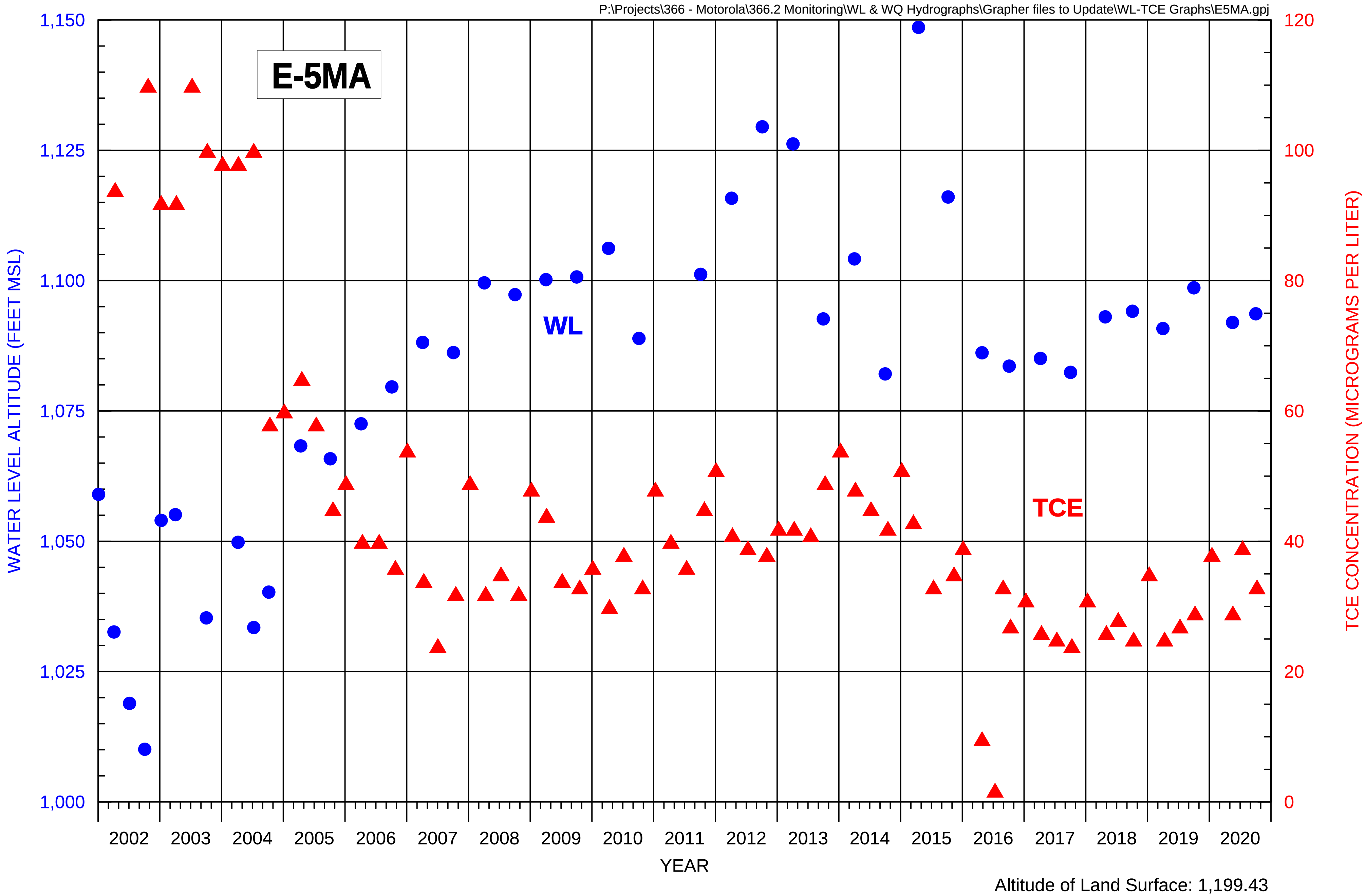


FIGURE D-23. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-5MA

North Indian Bend Wash Superfund Site

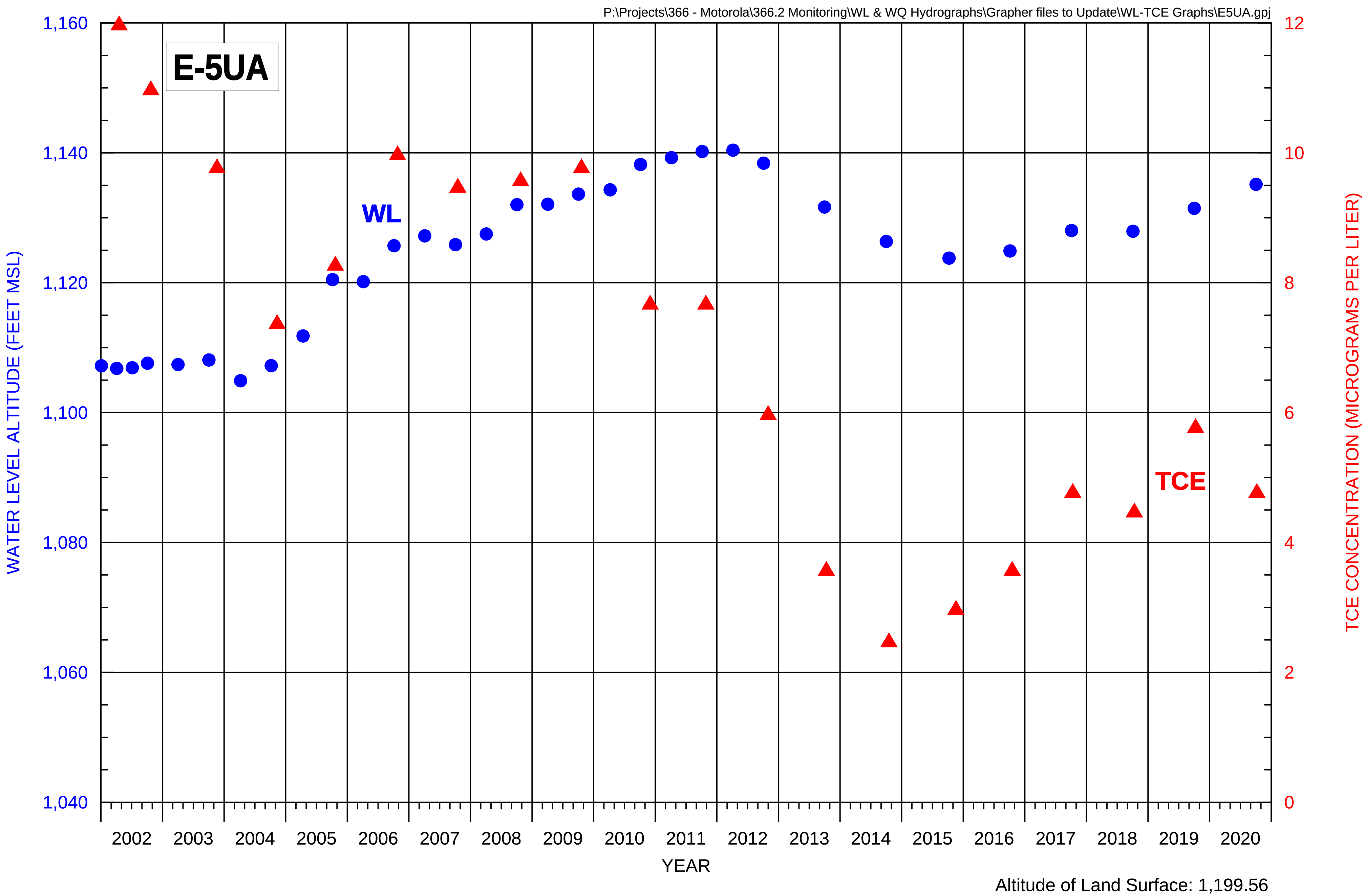


FIGURE D-24. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-5UA

North Indian Bend Wash Superfund Site

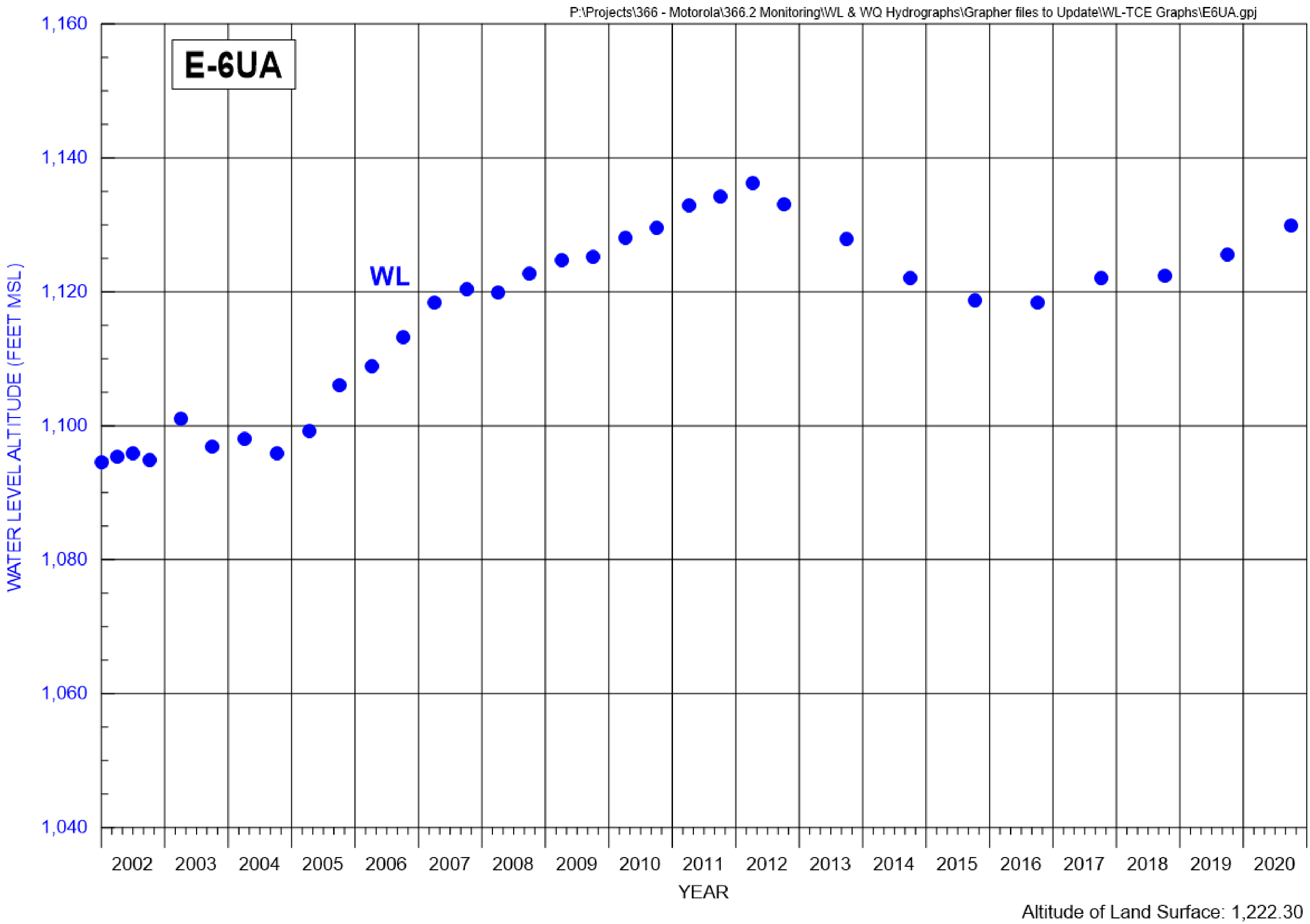


FIGURE D-25. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-6UA

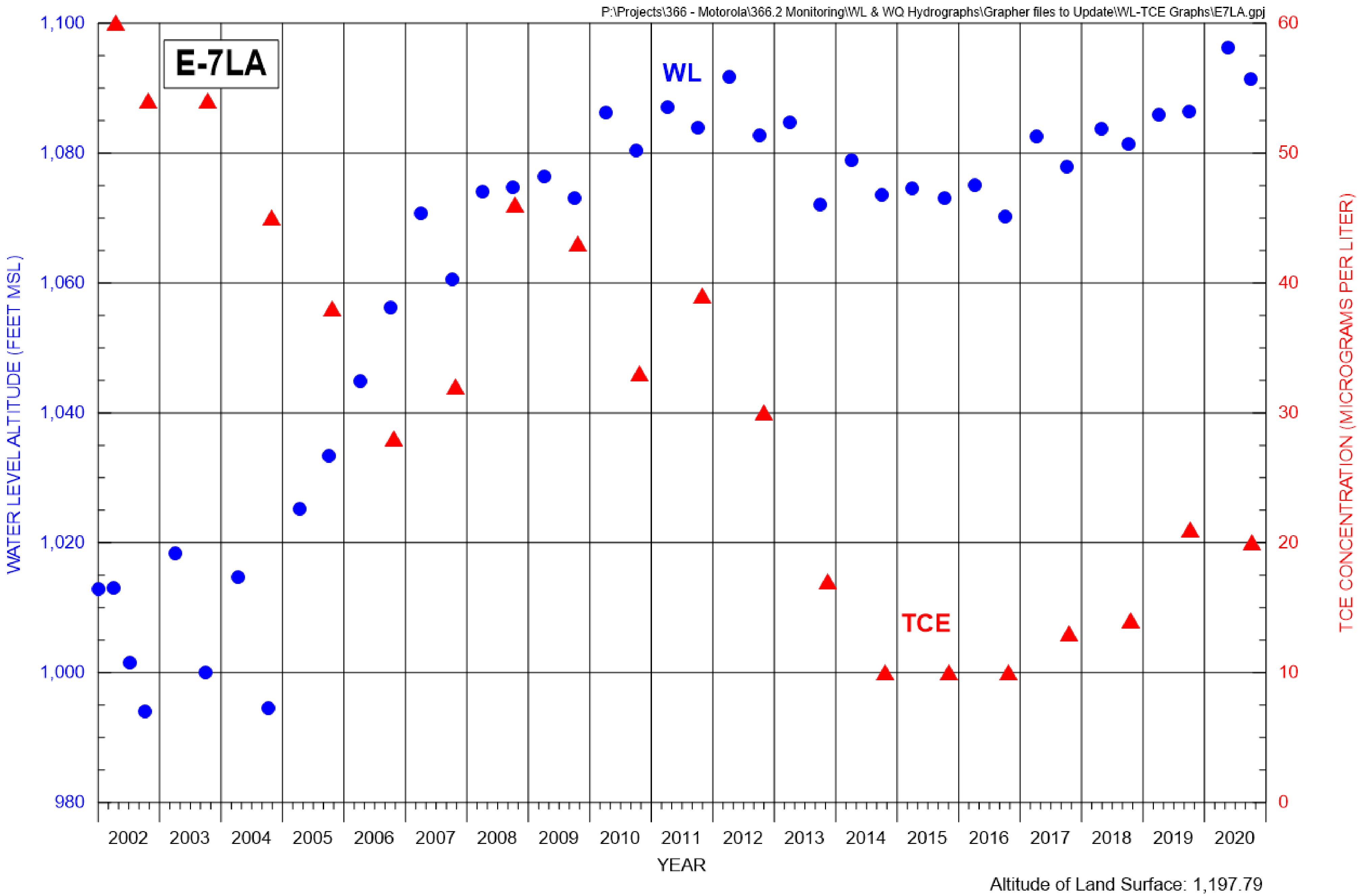
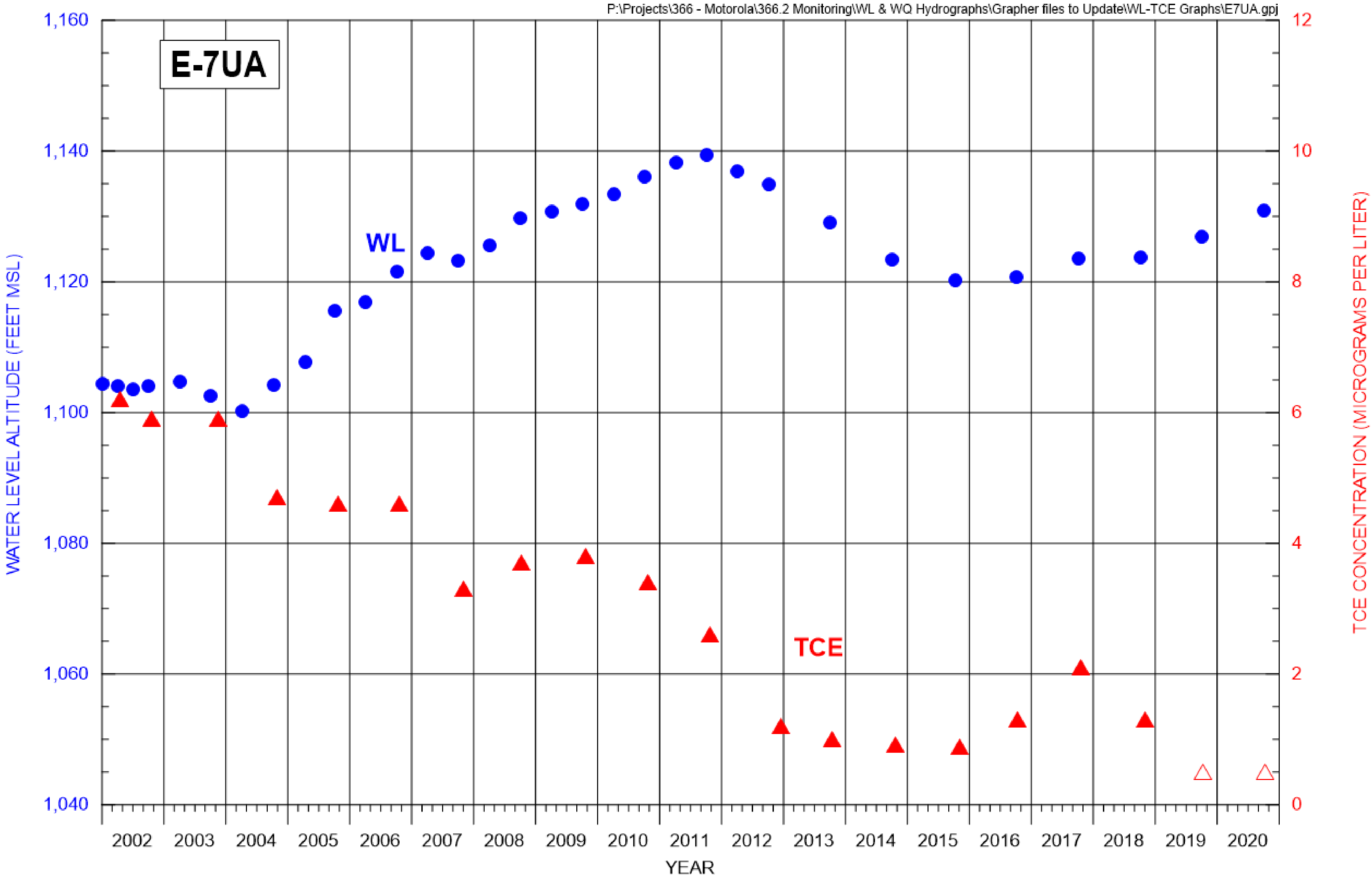


FIGURE D-26. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-7LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,197.41

FIGURE D-27. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-7UA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

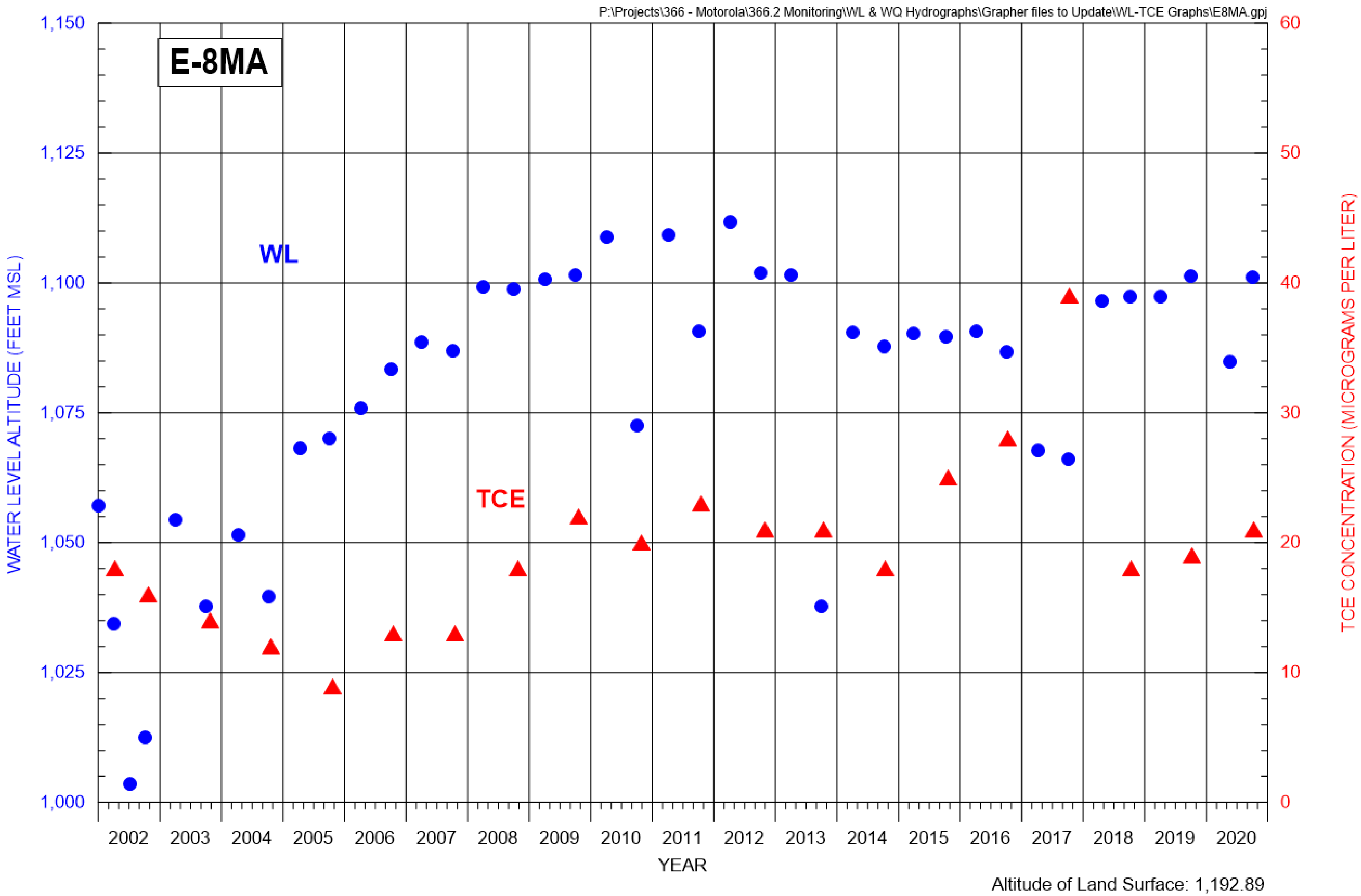


FIGURE D-28. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-8MA

North Indian Bend Wash Superfund Site

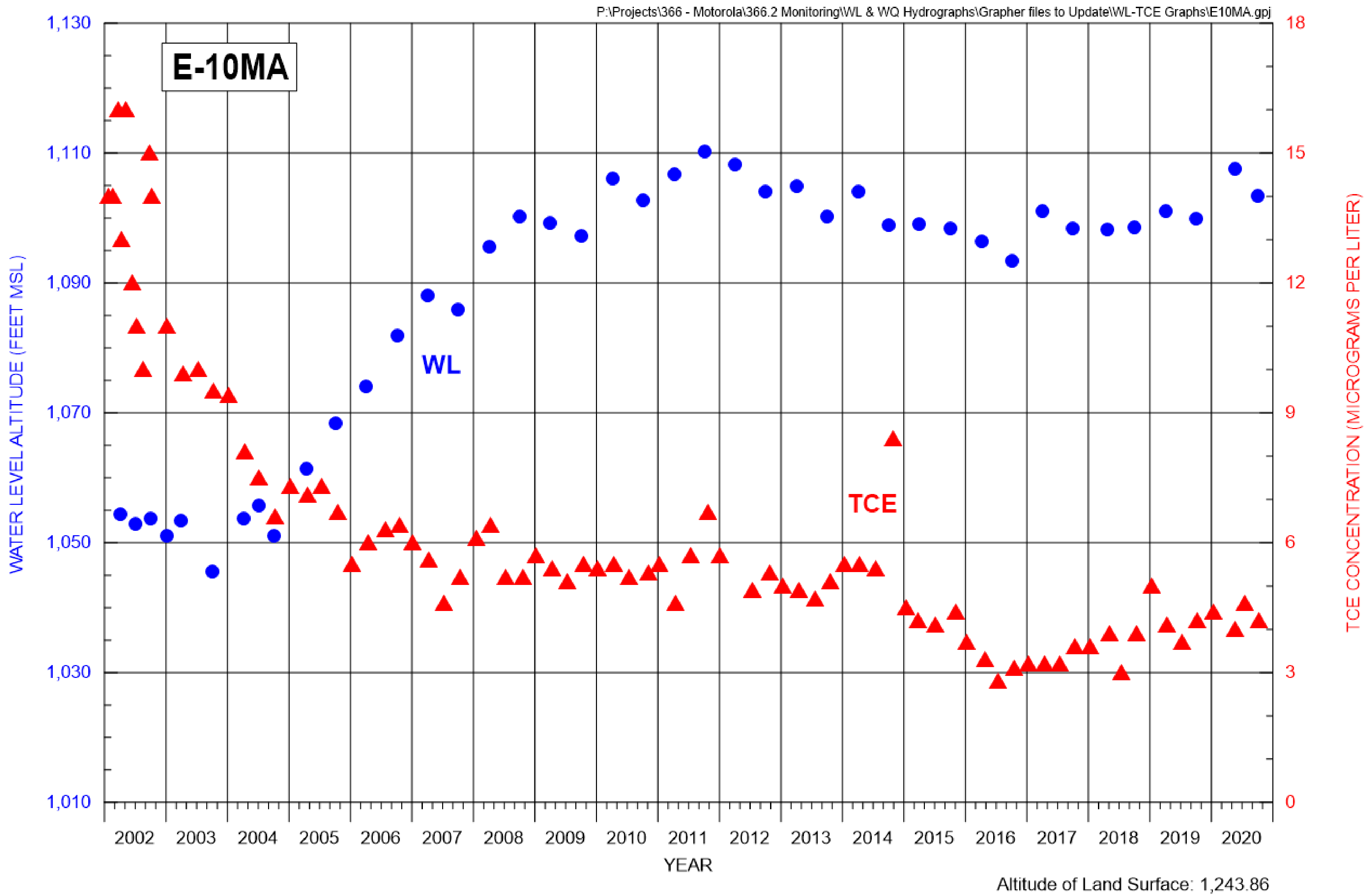
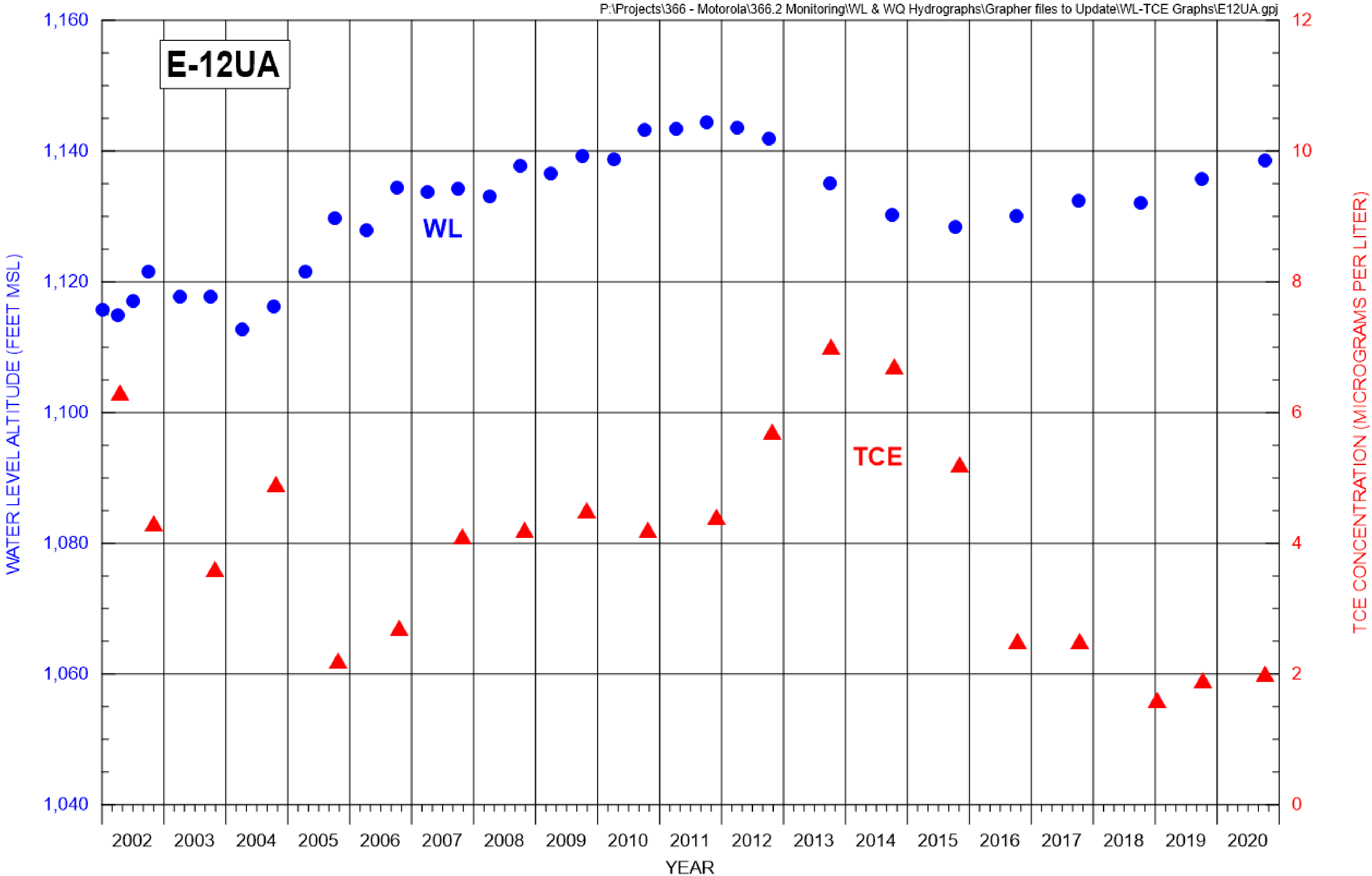


FIGURE D-29. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-10MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,203.63

FIGURE D-30. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-12UA

North Indian Bend Wash Superfund Site

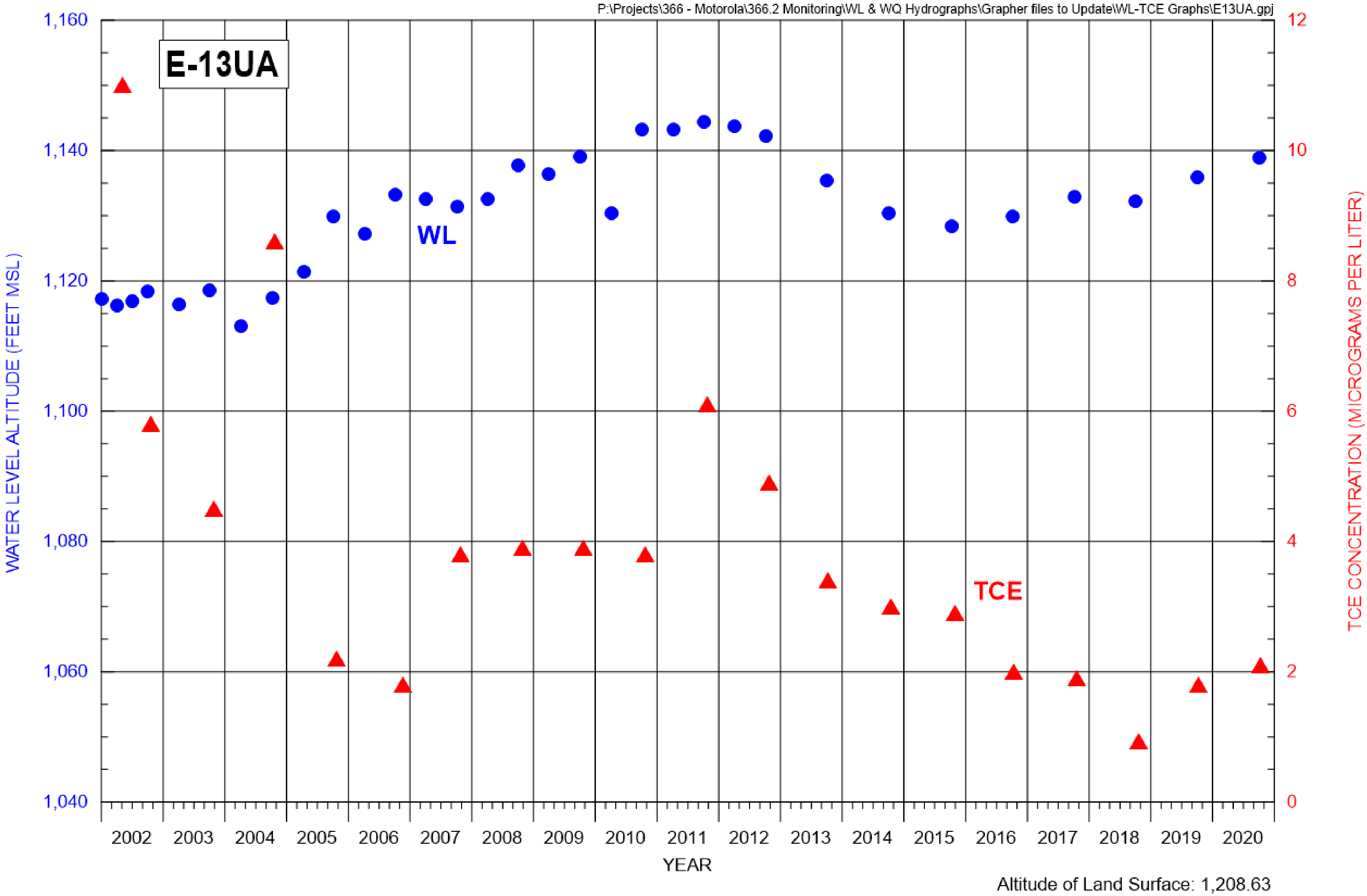


FIGURE D-31. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL E-13UA

North Indian Bend Wash Superfund Site

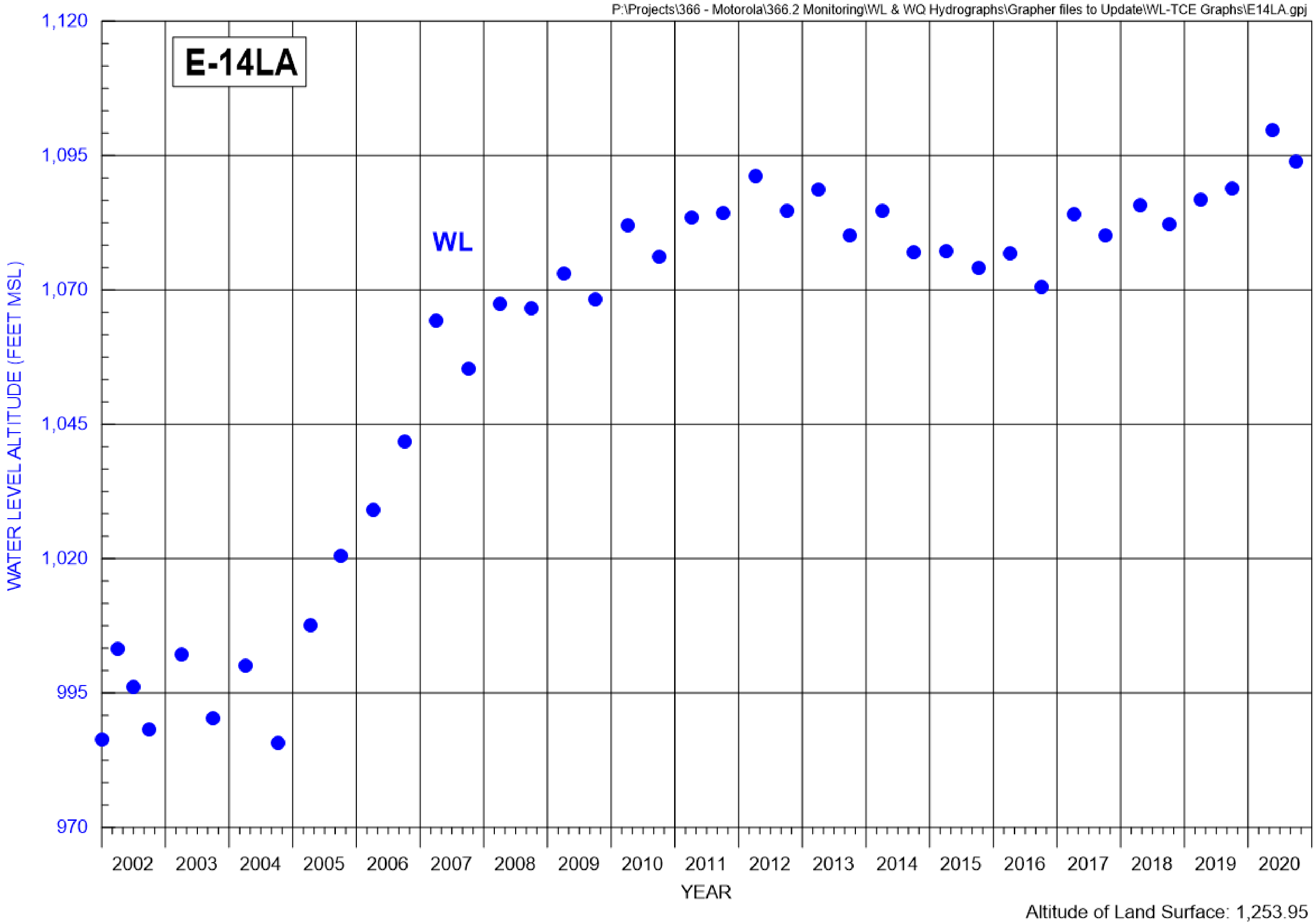


FIGURE D-32. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL E-14LA

North Indian Bend Wash Superfund Site

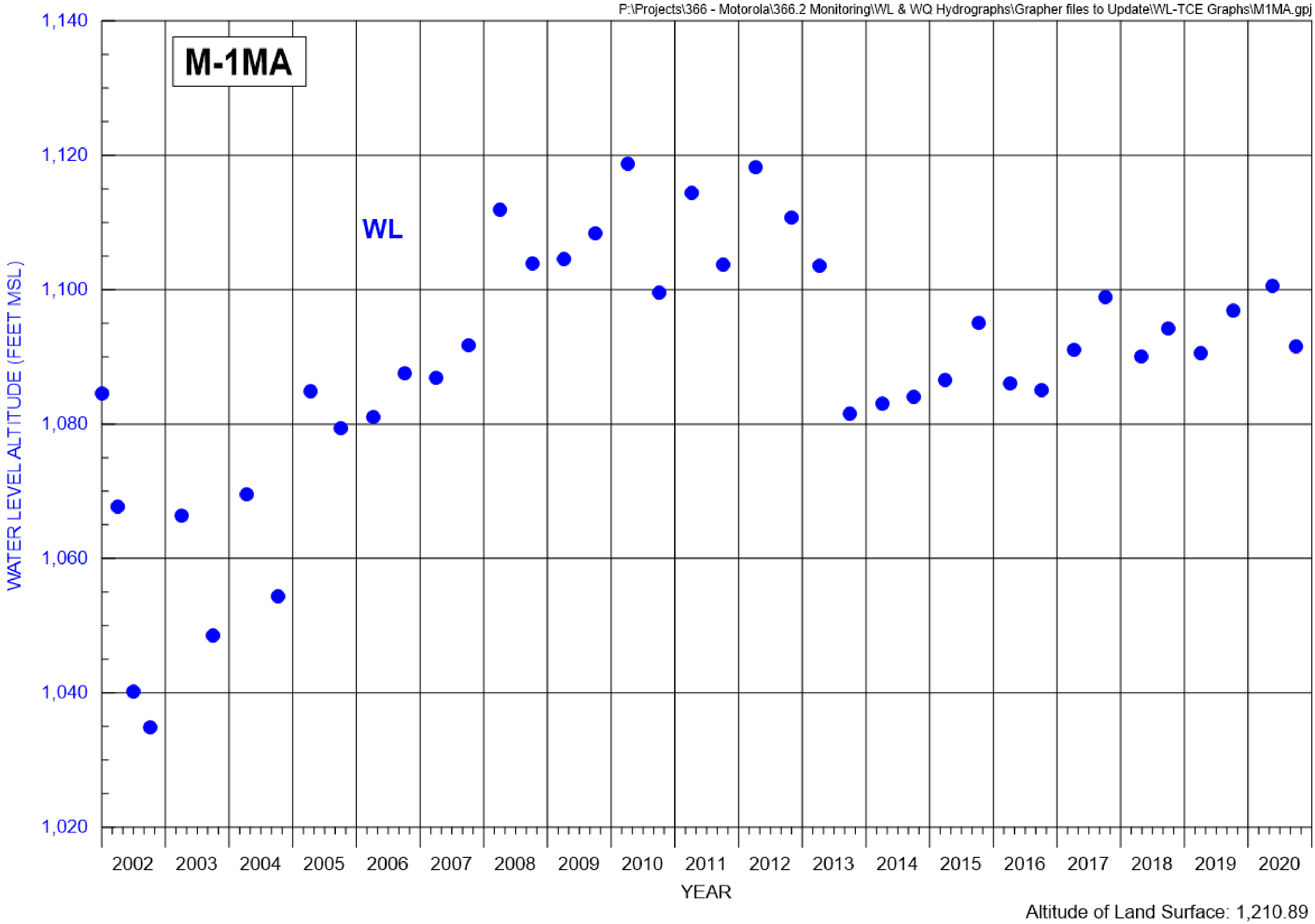


FIGURE D-33. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-1MA

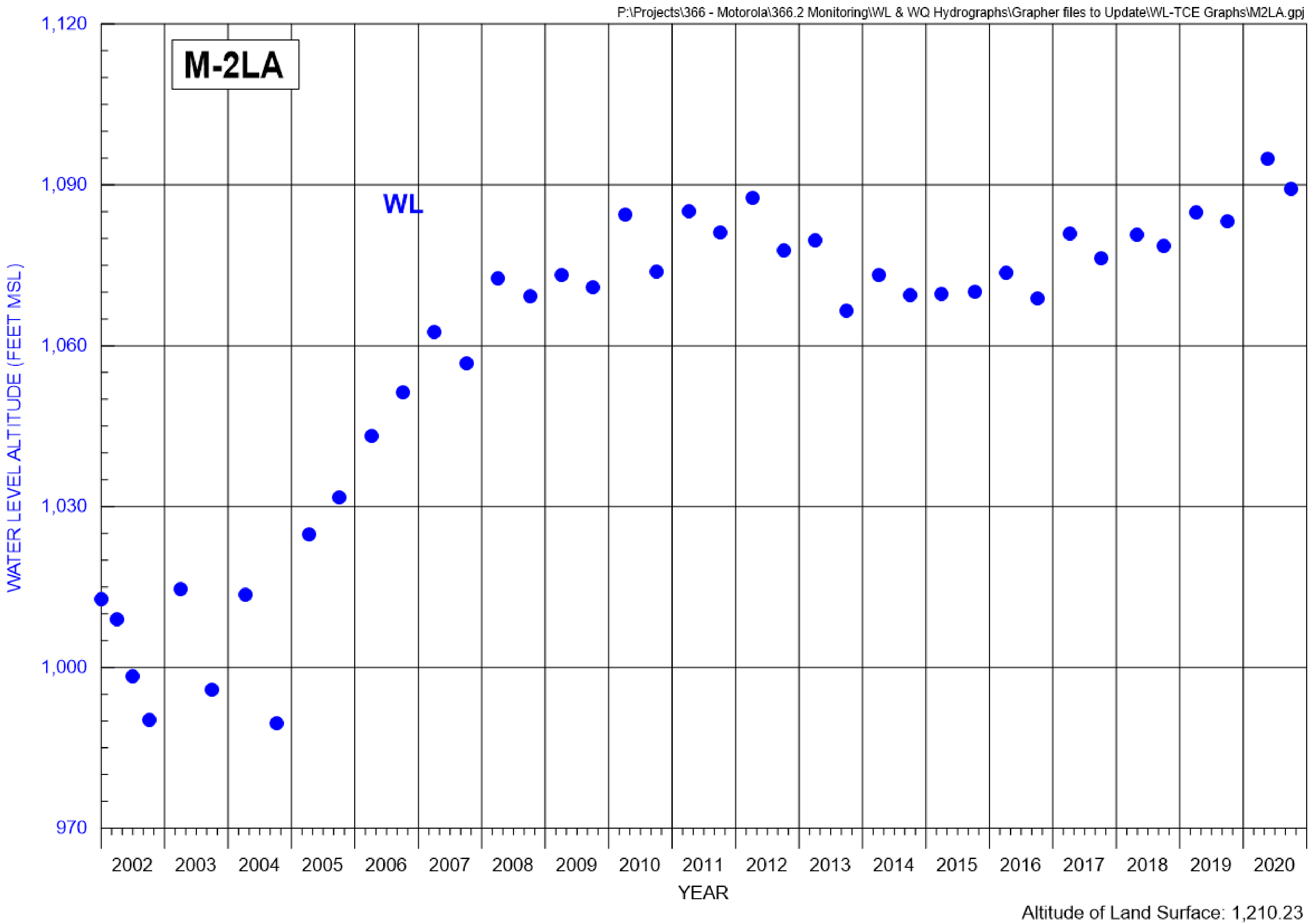


FIGURE D-34. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-2LA

North Indian Bend Wash Superfund Site

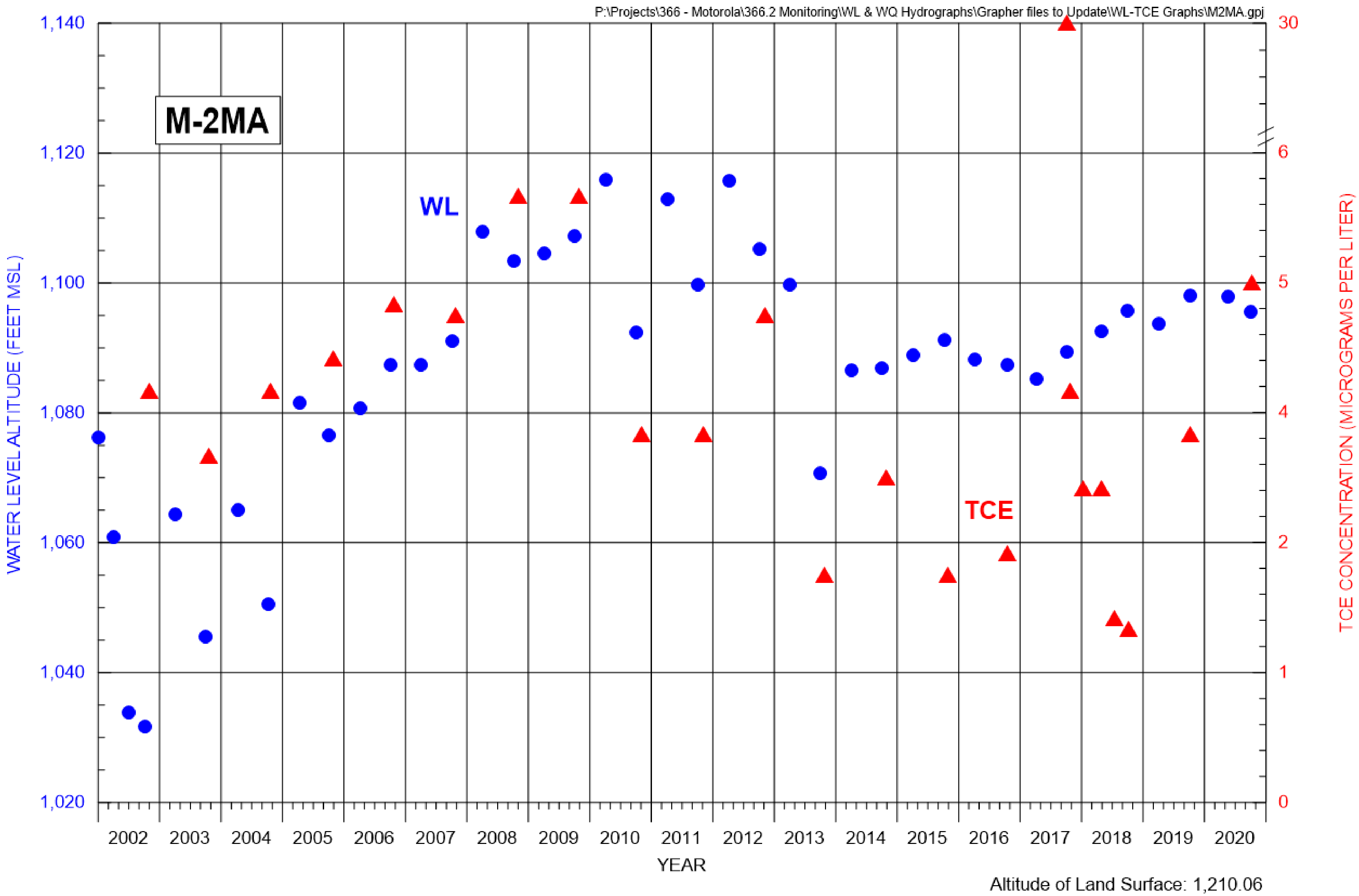


FIGURE D-35. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-2MA

North Indian Bend Wash Superfund Site

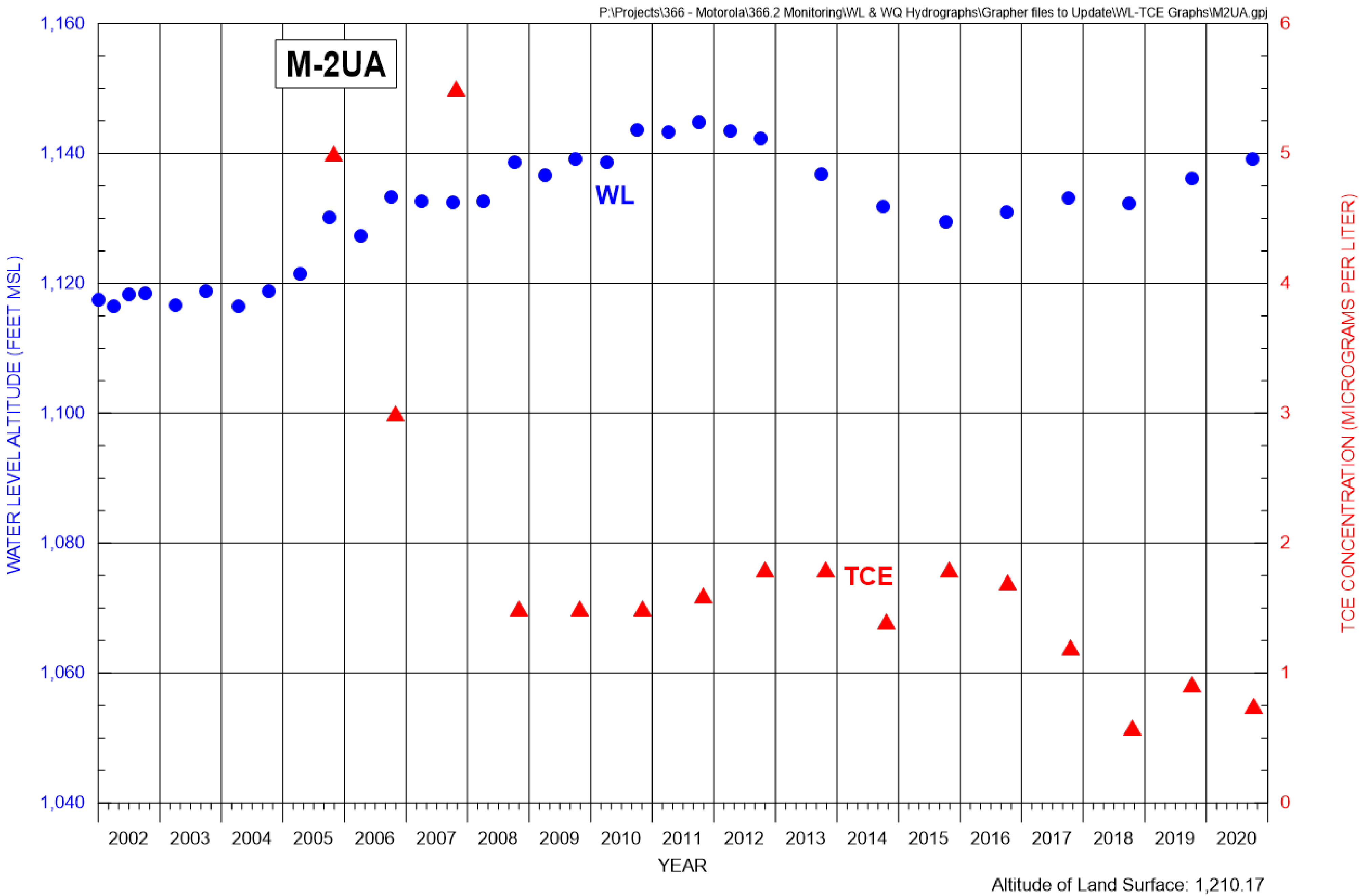


FIGURE D-36. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-2UA

North Indian Bend Wash Superfund Site

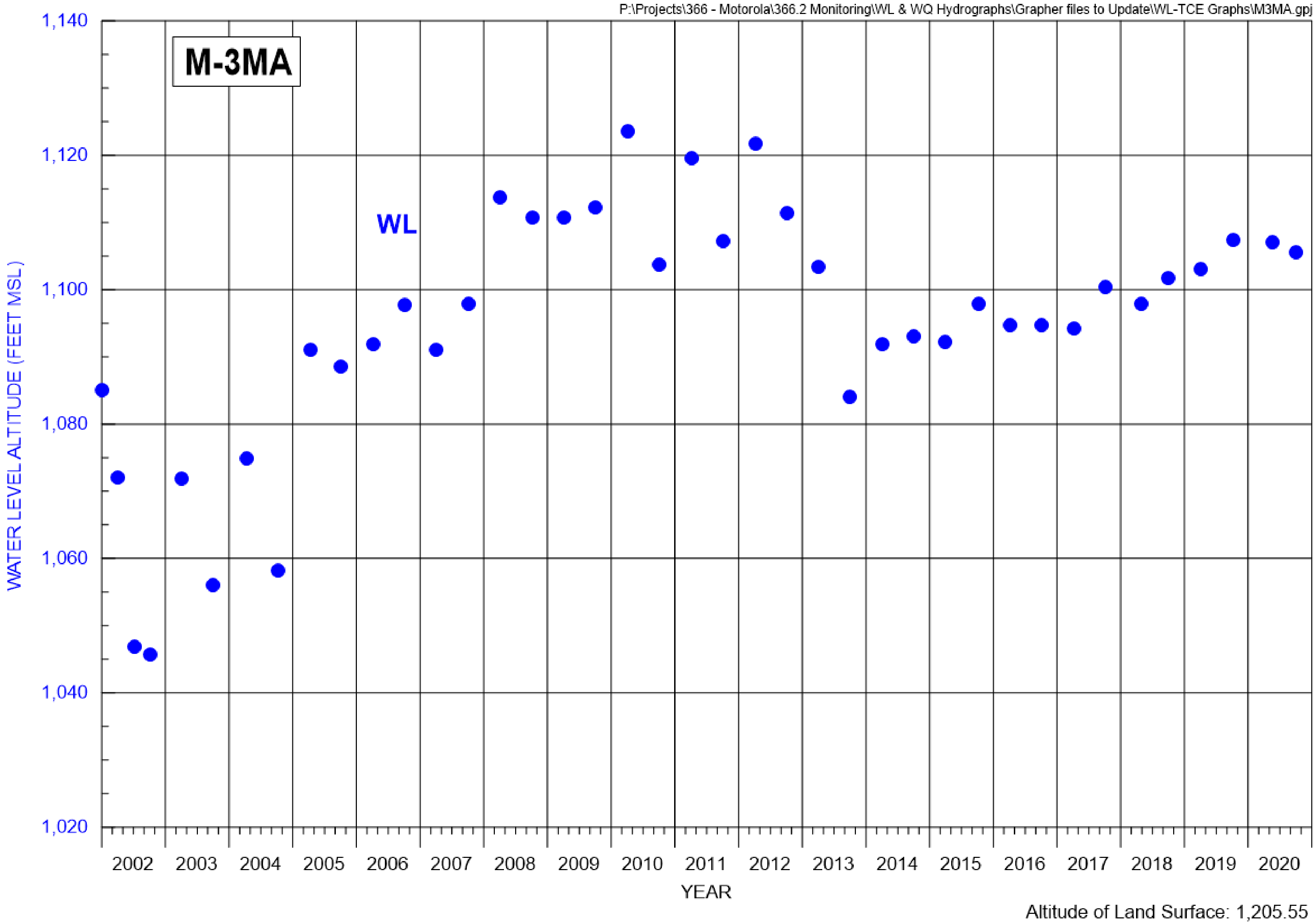


FIGURE D-37. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-3MA

North Indian Bend Wash Superfund Site

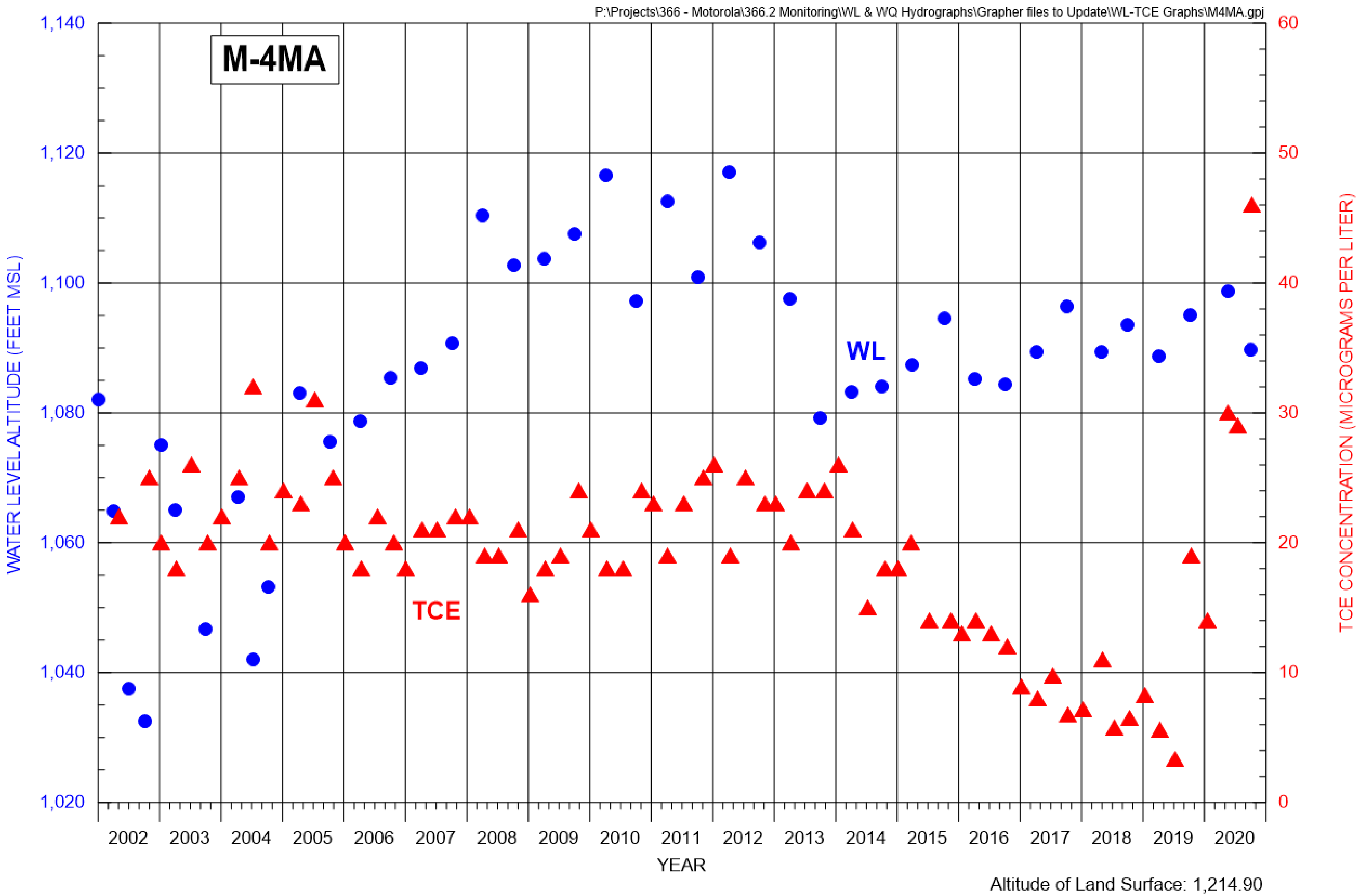


FIGURE D-38. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-4MA

North Indian Bend Wash Superfund Site

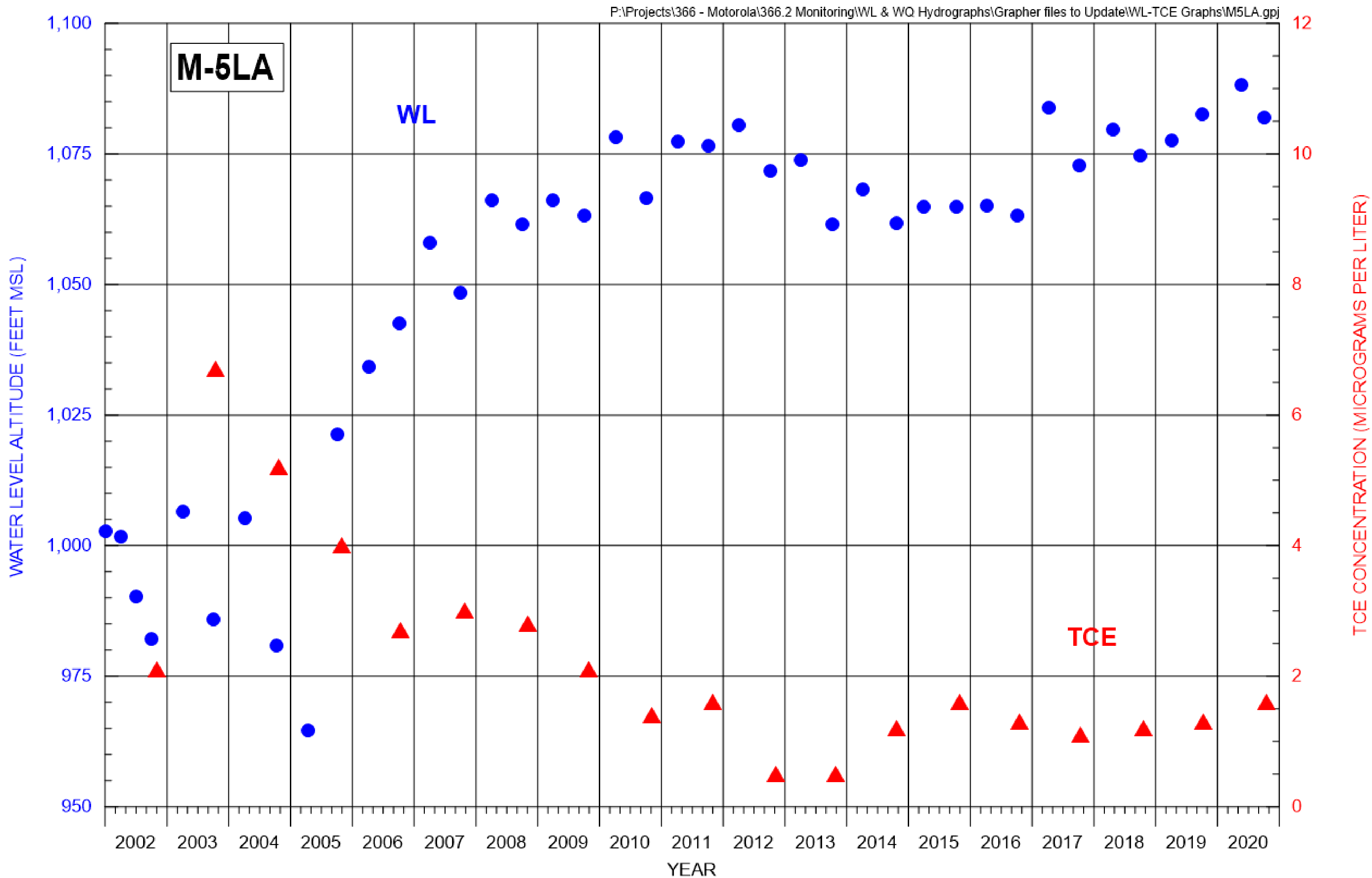


FIGURE D-39. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-5LA

North Indian Bend Wash Superfund Site

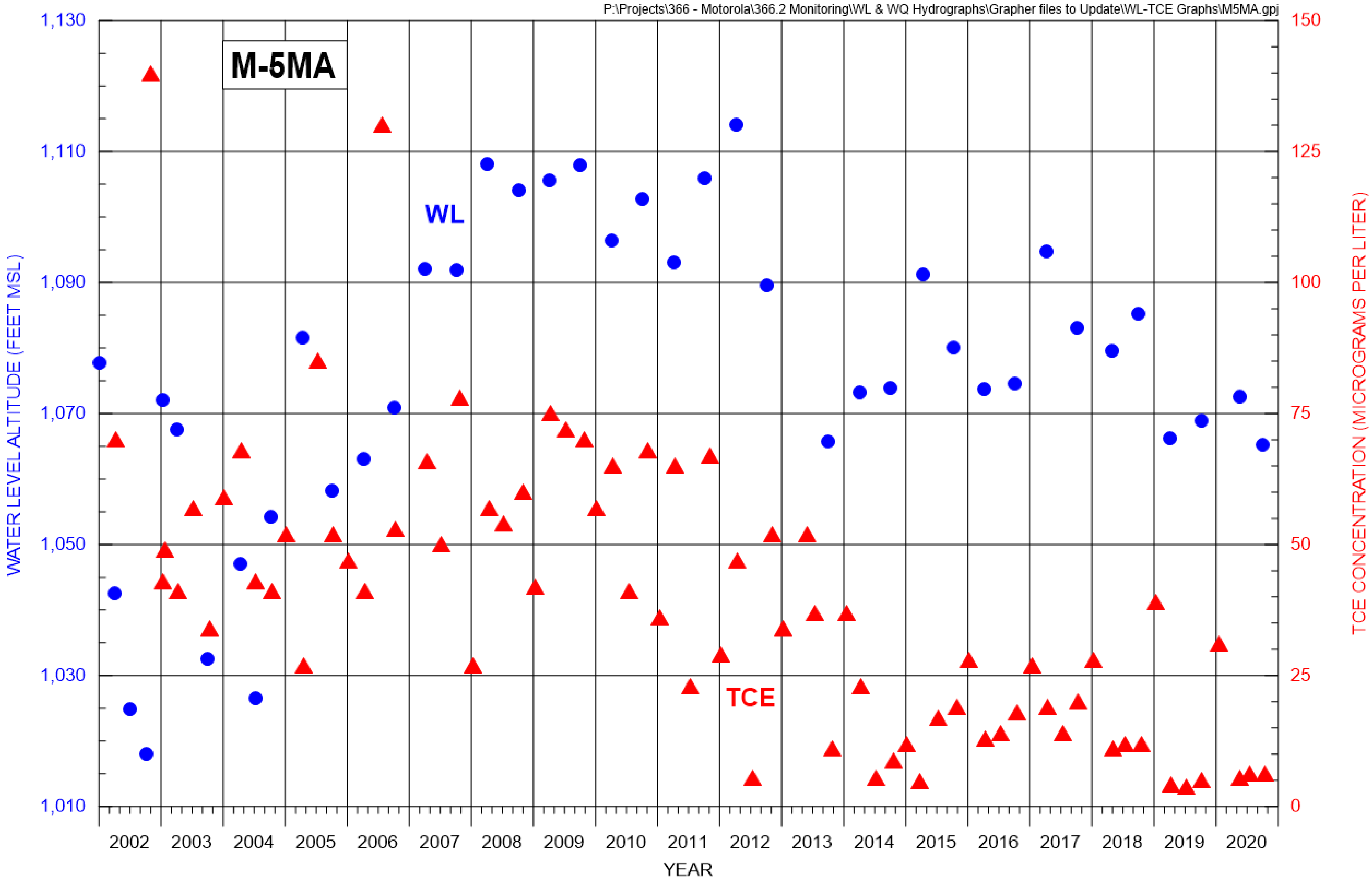


FIGURE D-40. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-5MA

North Indian Bend Wash Superfund Site

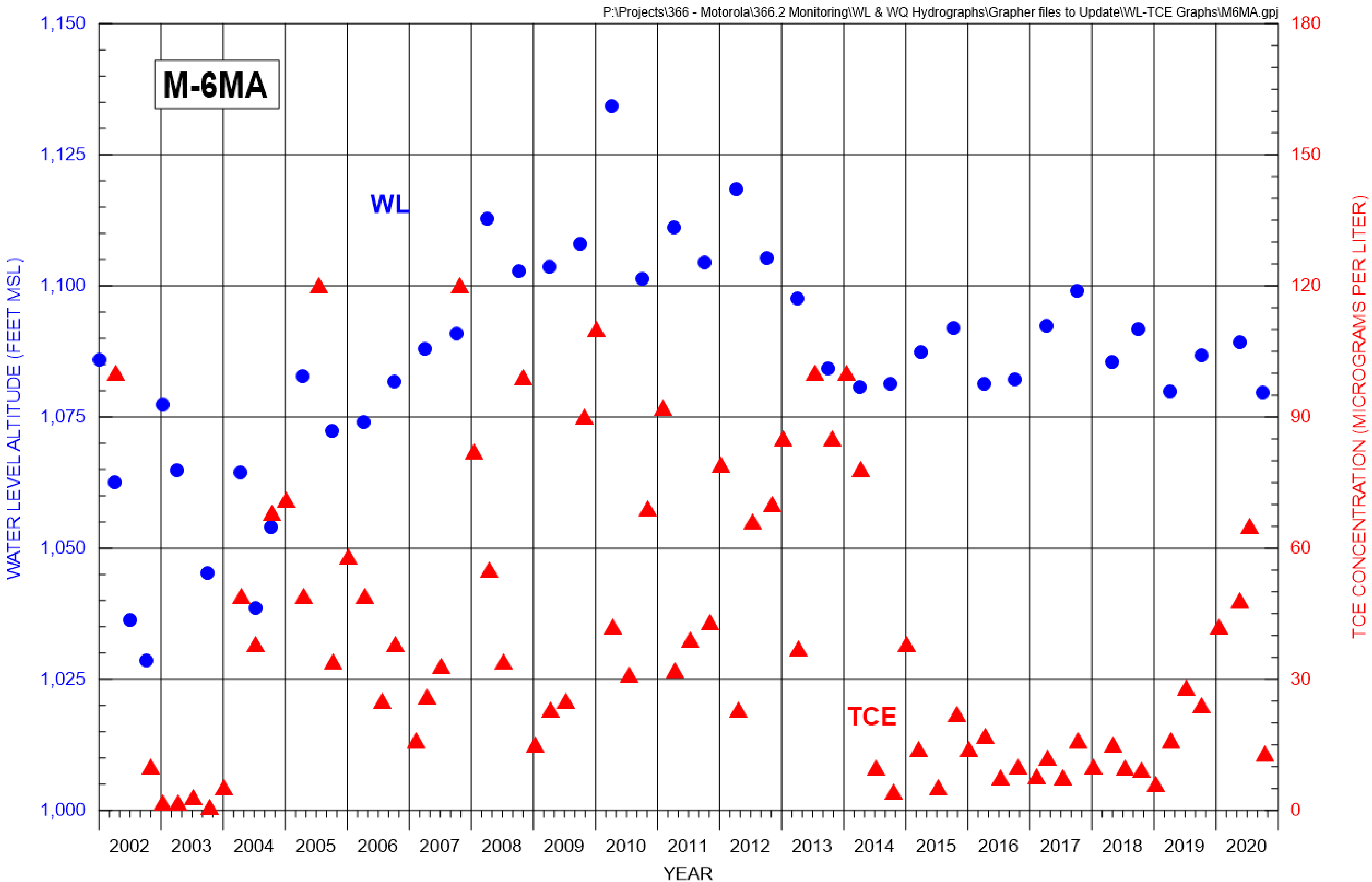


FIGURE D-41. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-6MA

North Indian Bend Wash Superfund Site

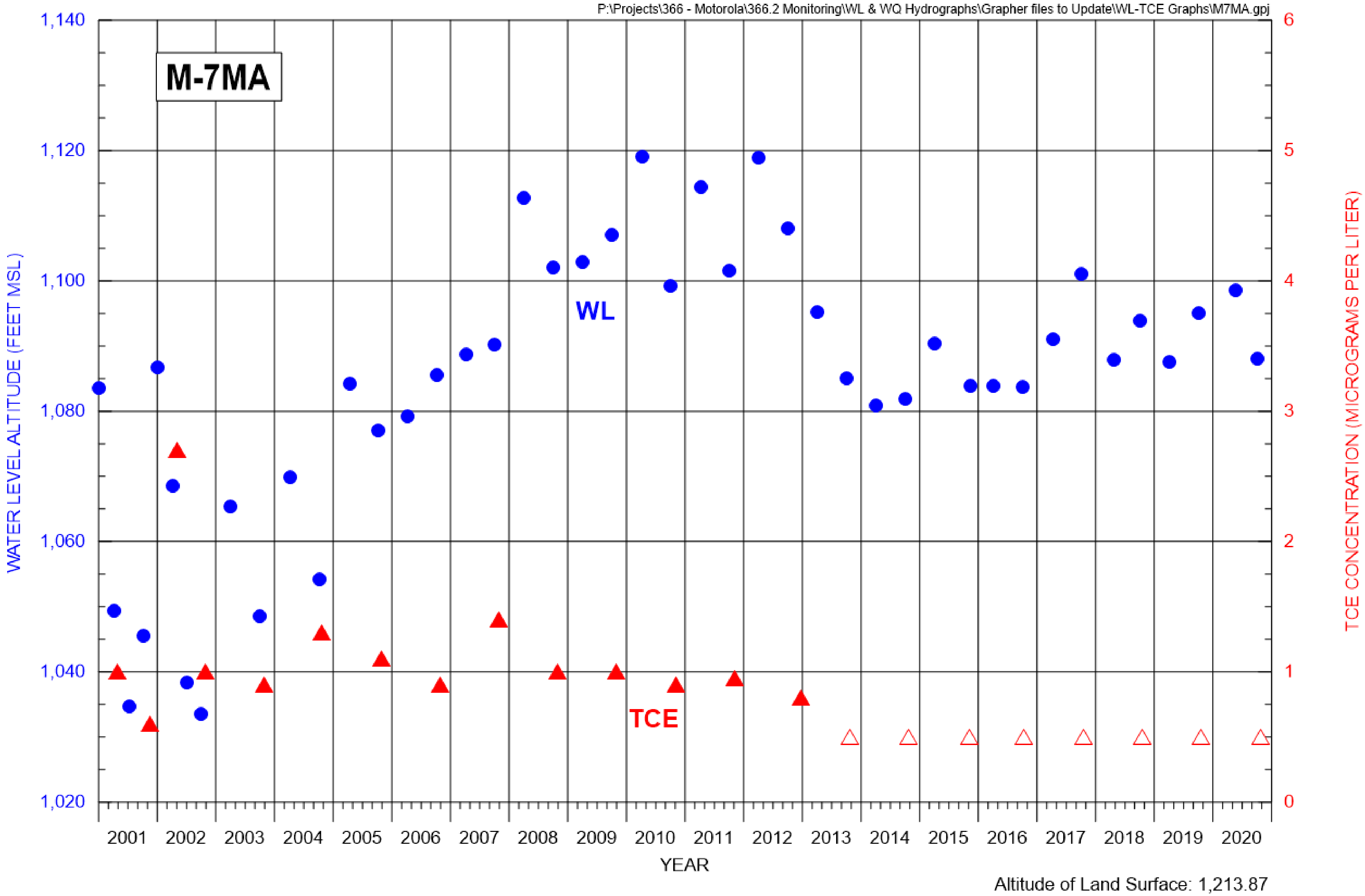


FIGURE D-42. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-7MA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

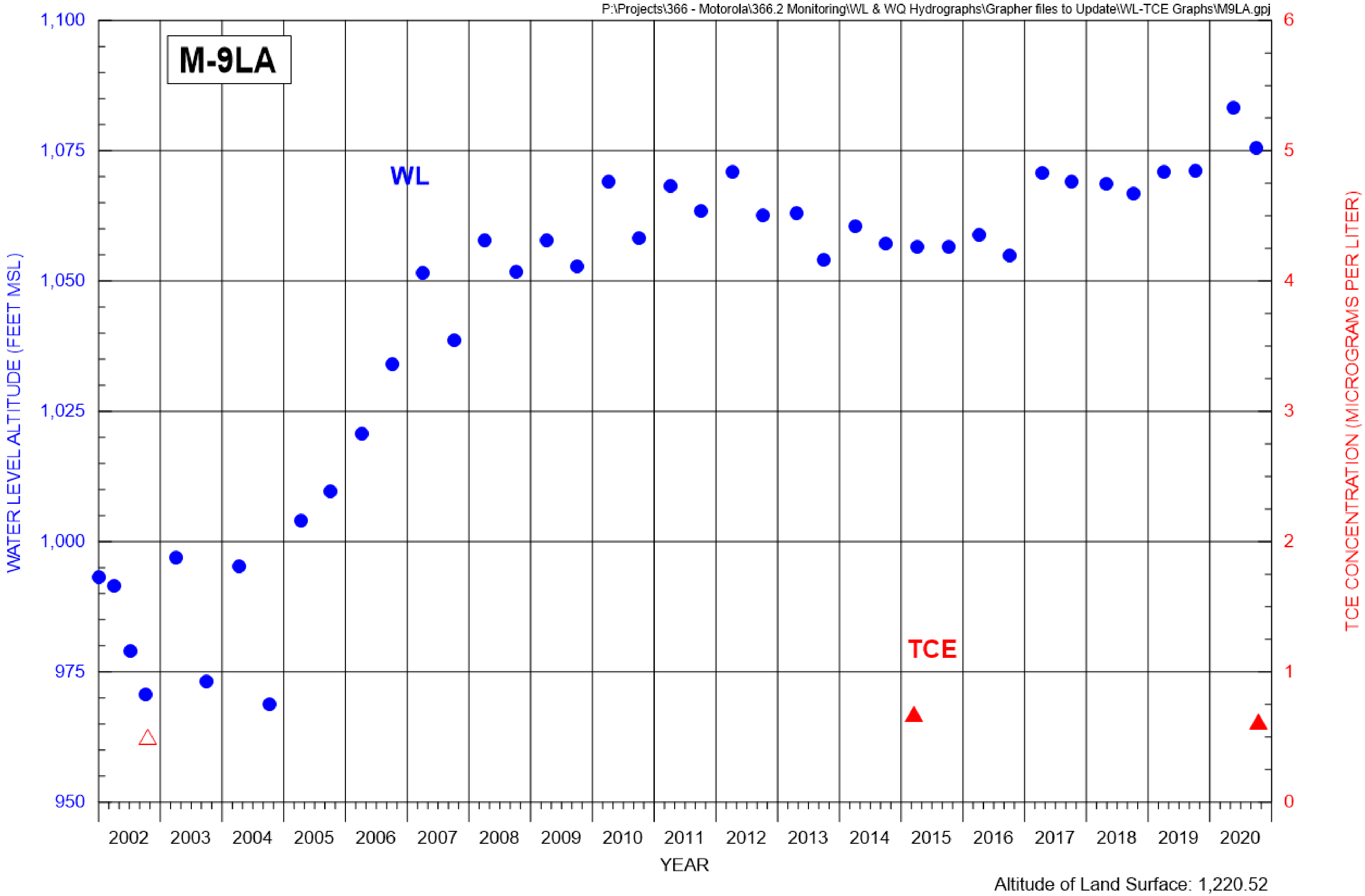


FIGURE D-43. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-9LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

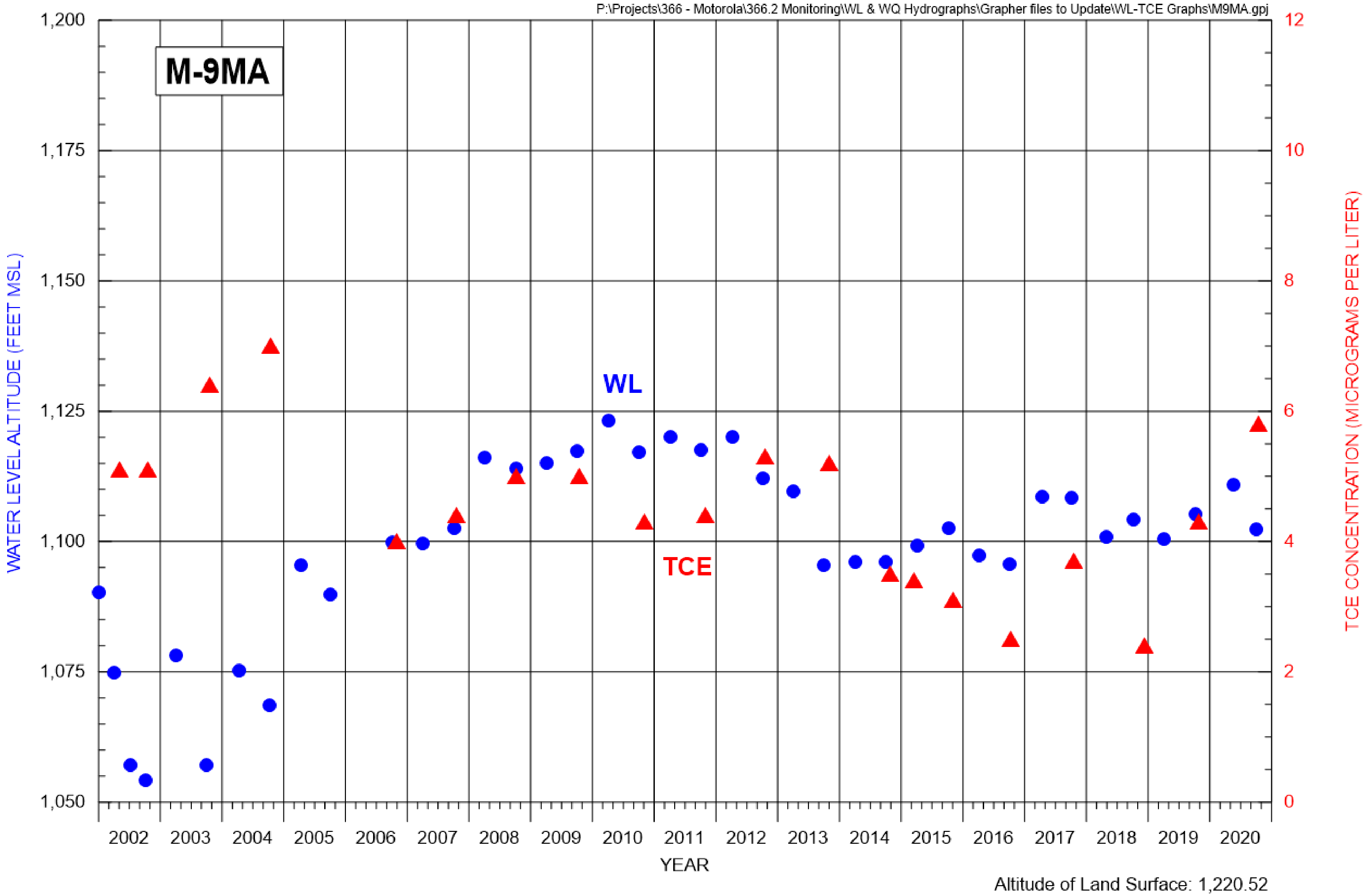
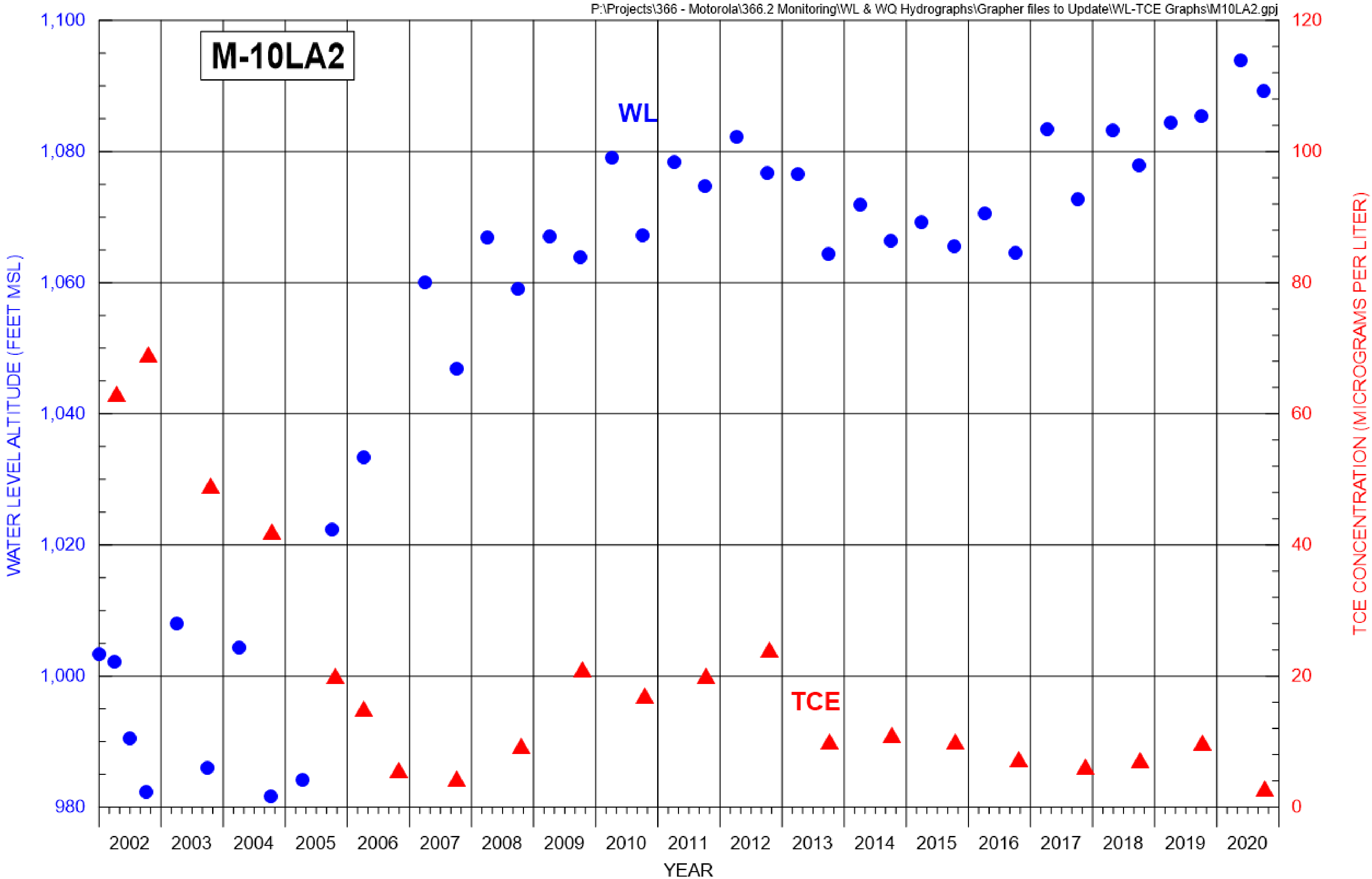


FIGURE D-44. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-9MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,219.70

FIGURE D-45. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-10LA2

North Indian Bend Wash Superfund Site

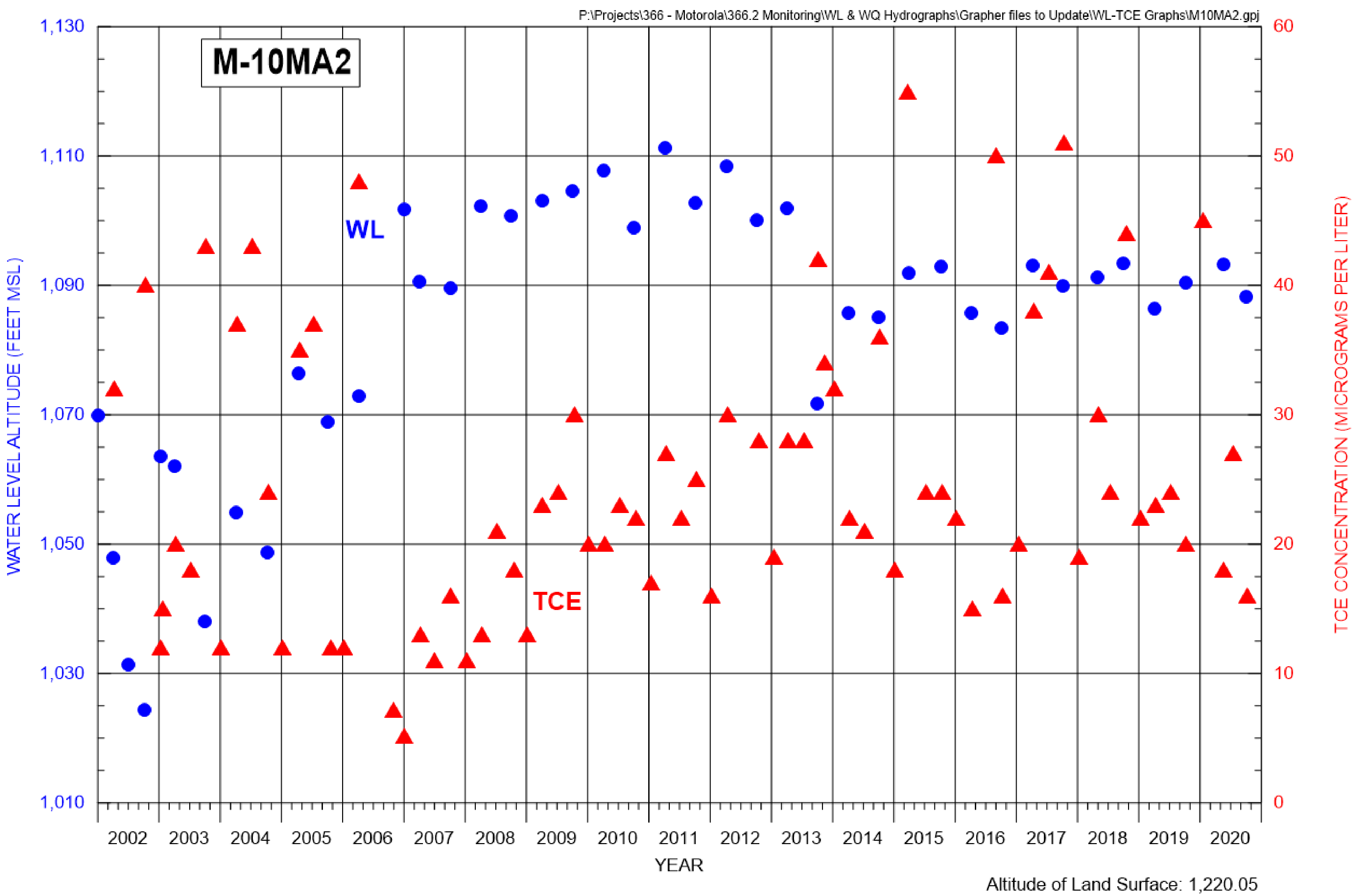


FIGURE D-46. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-10MA2

North Indian Bend Wash Superfund Site

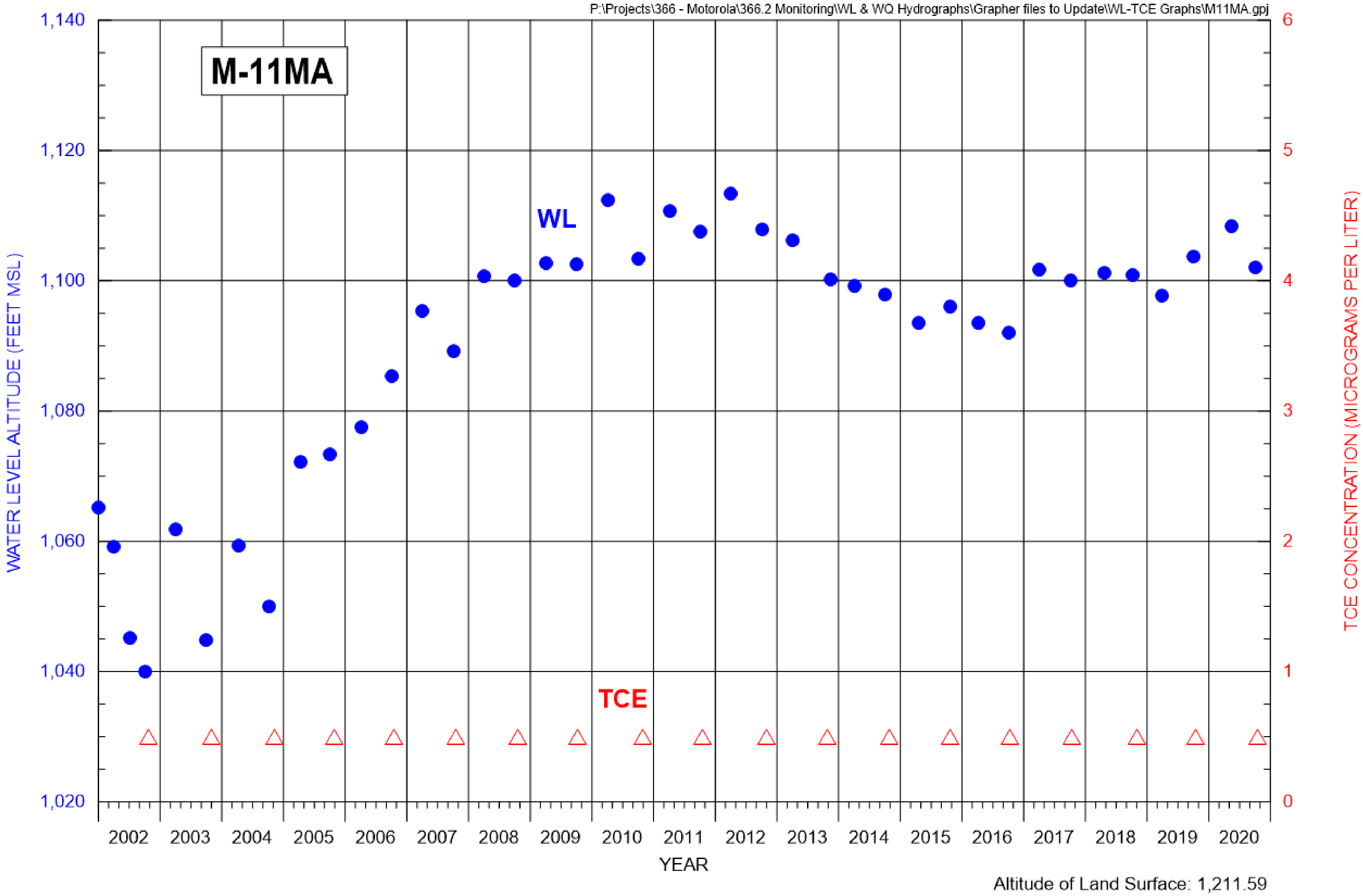


FIGURE D-47. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-11MA

EXPLANATION

△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

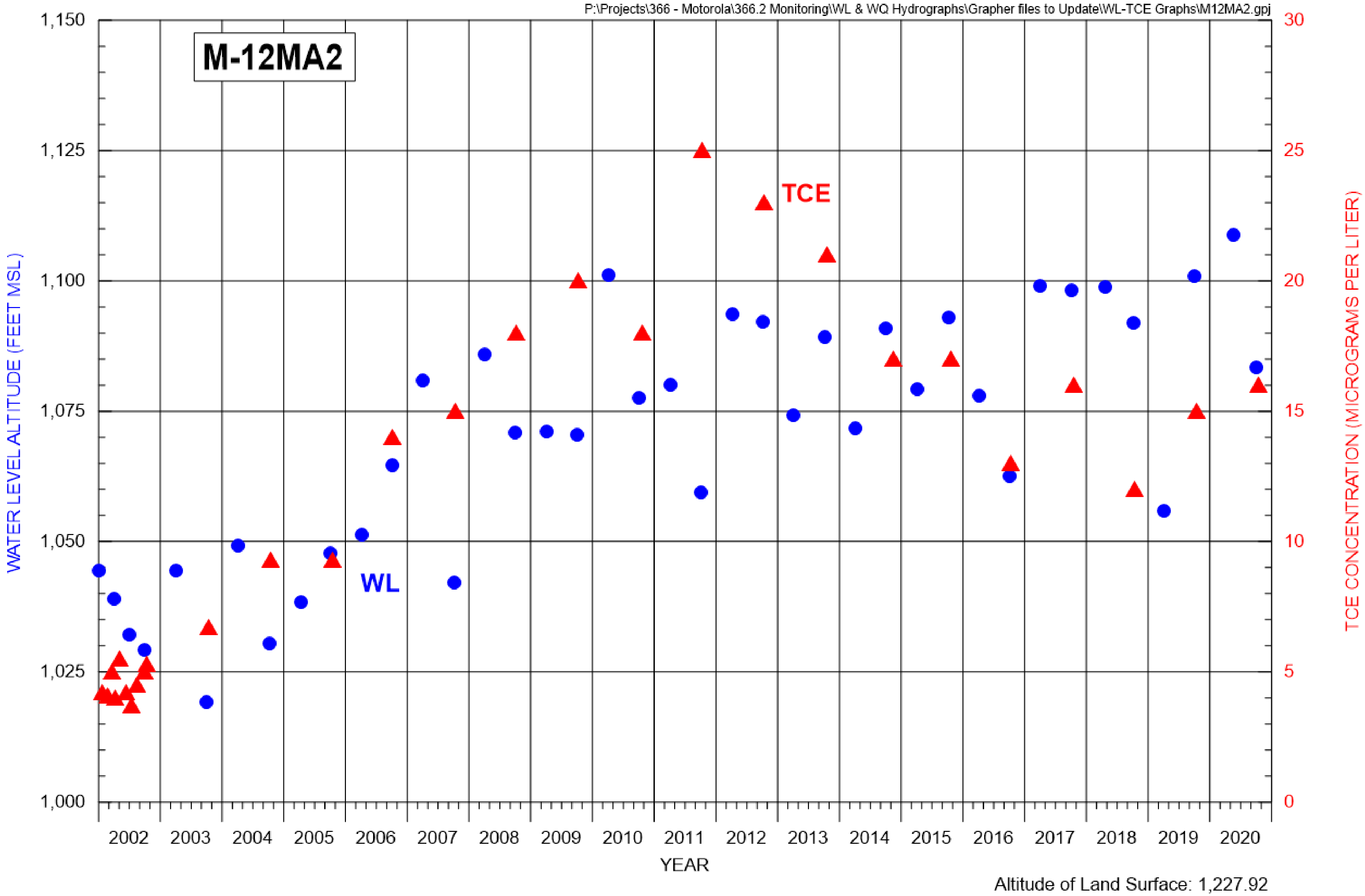


FIGURE D-48. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-12MA2

North Indian Bend Wash Superfund Site

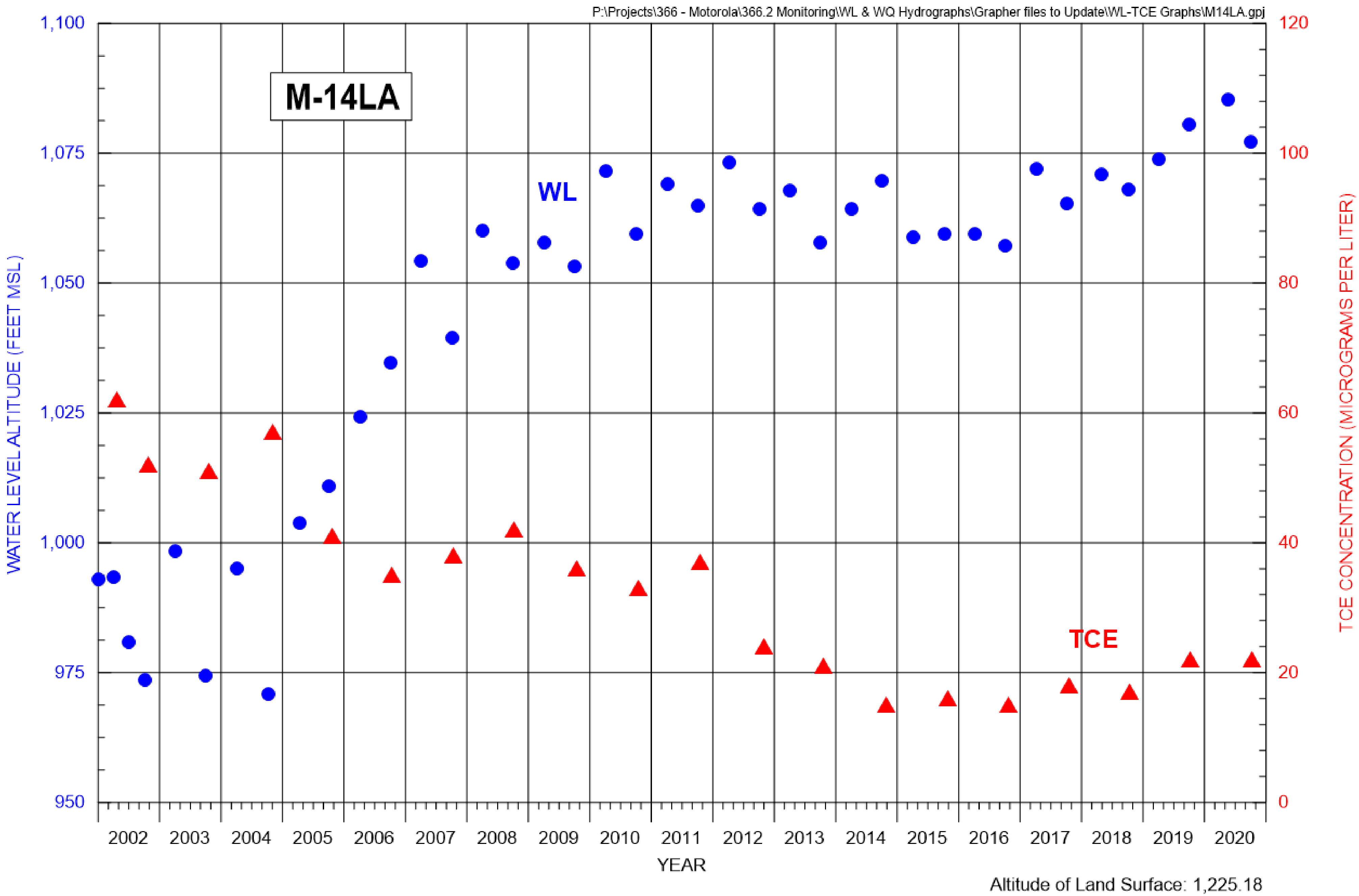


FIGURE D-49. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-14LA

North Indian Bend Wash Superfund Site

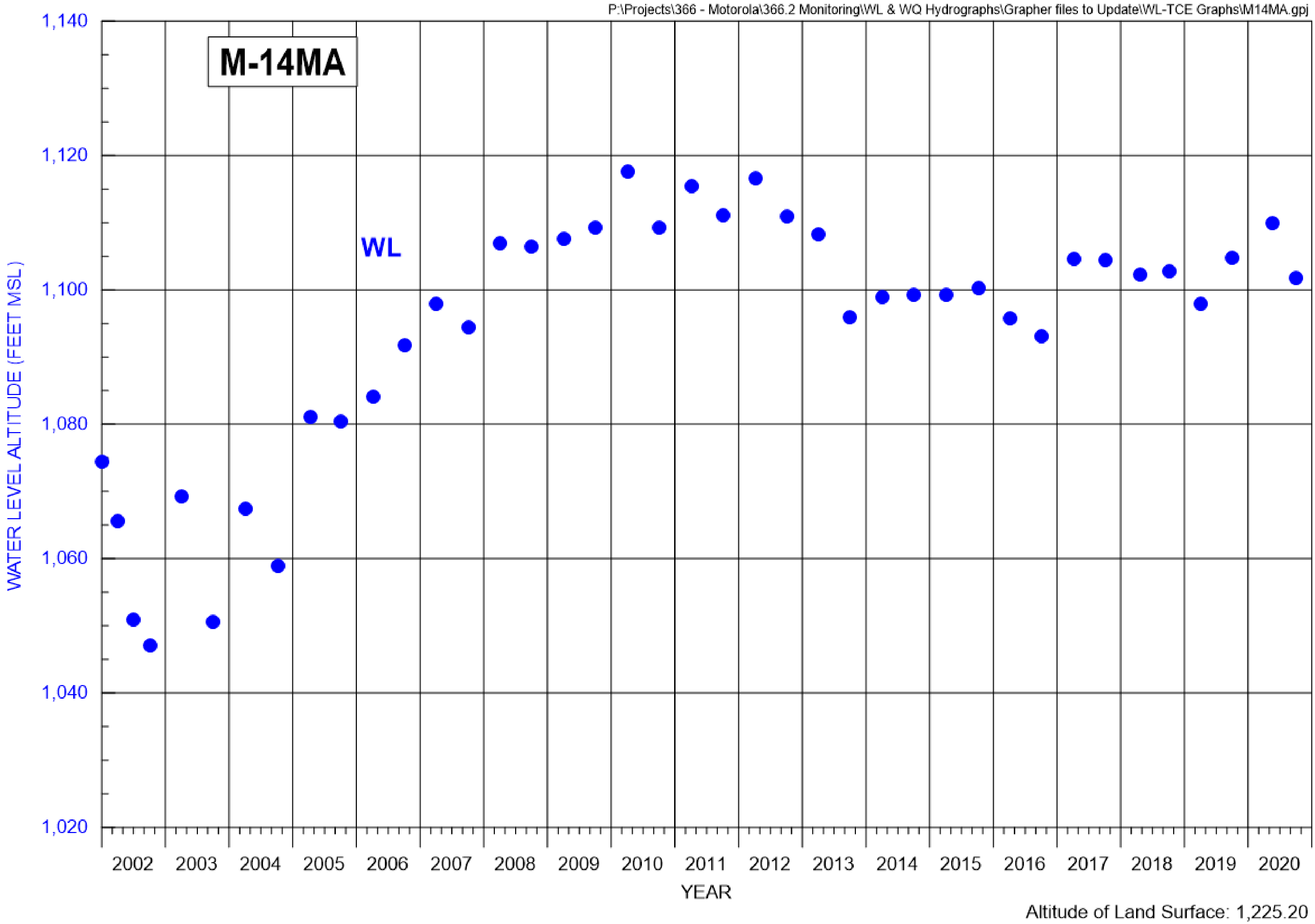


FIGURE D-50. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL M-14MA

North Indian Bend Wash Superfund Site

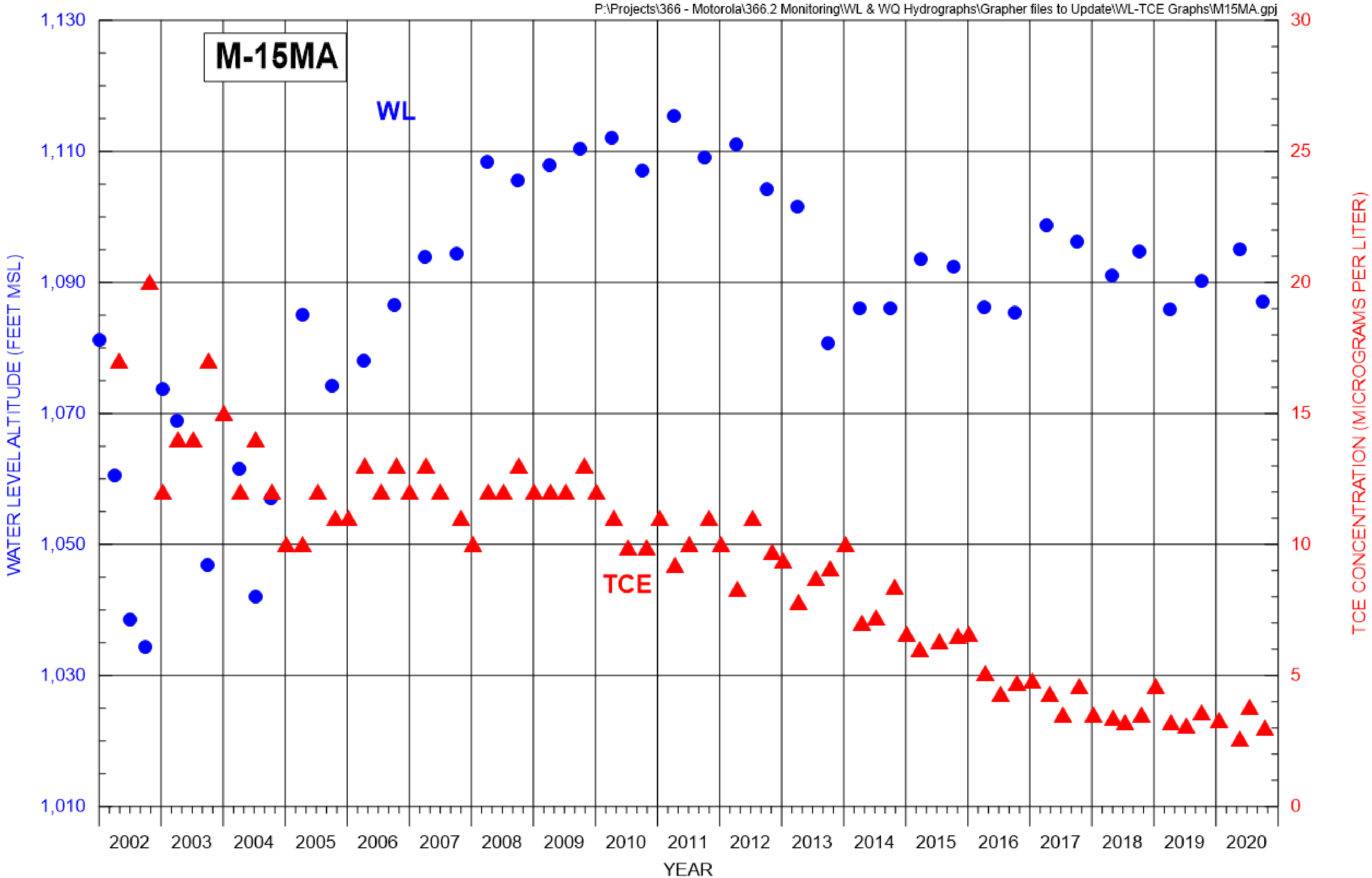
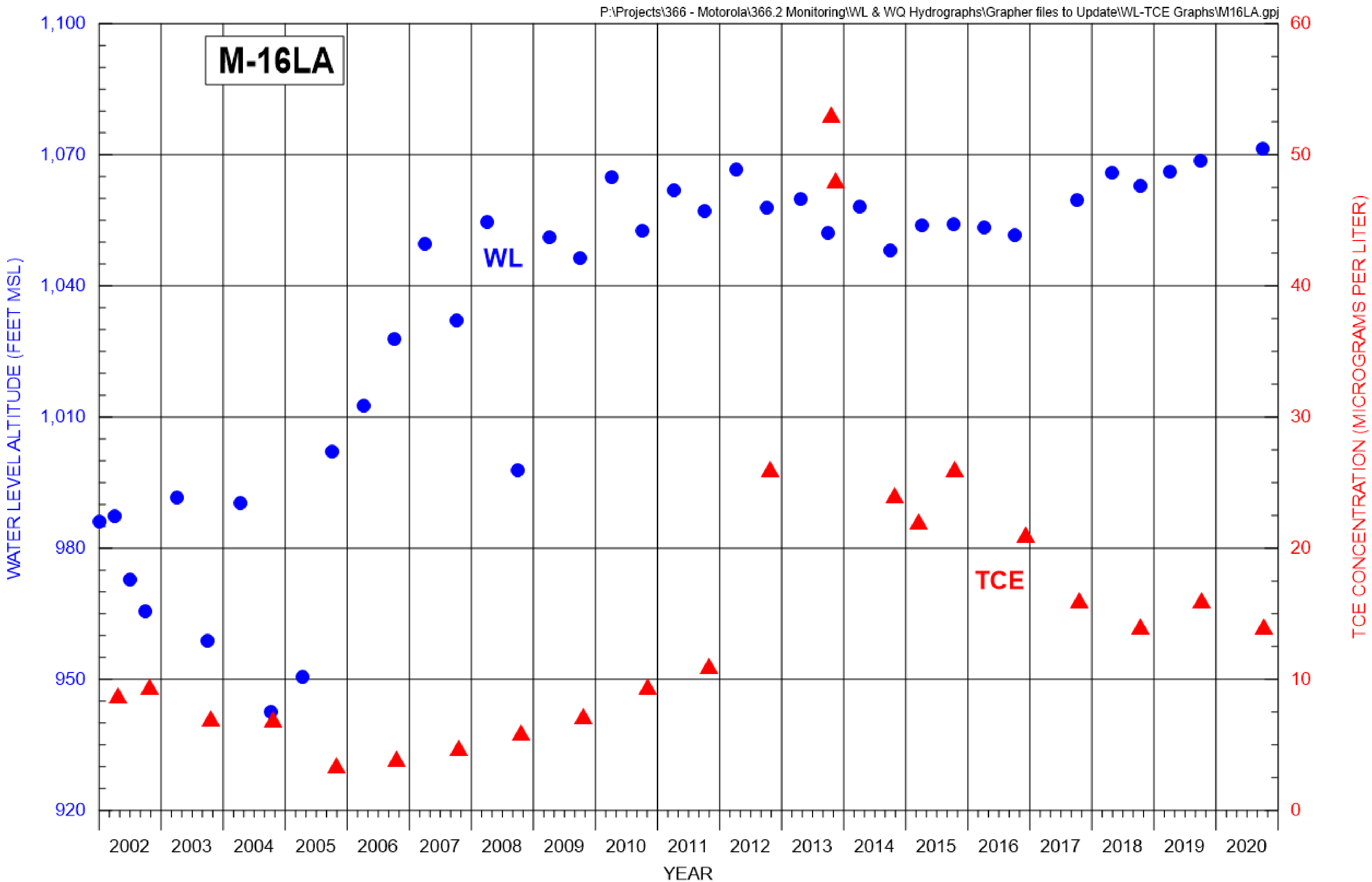


FIGURE D-51. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-15MA

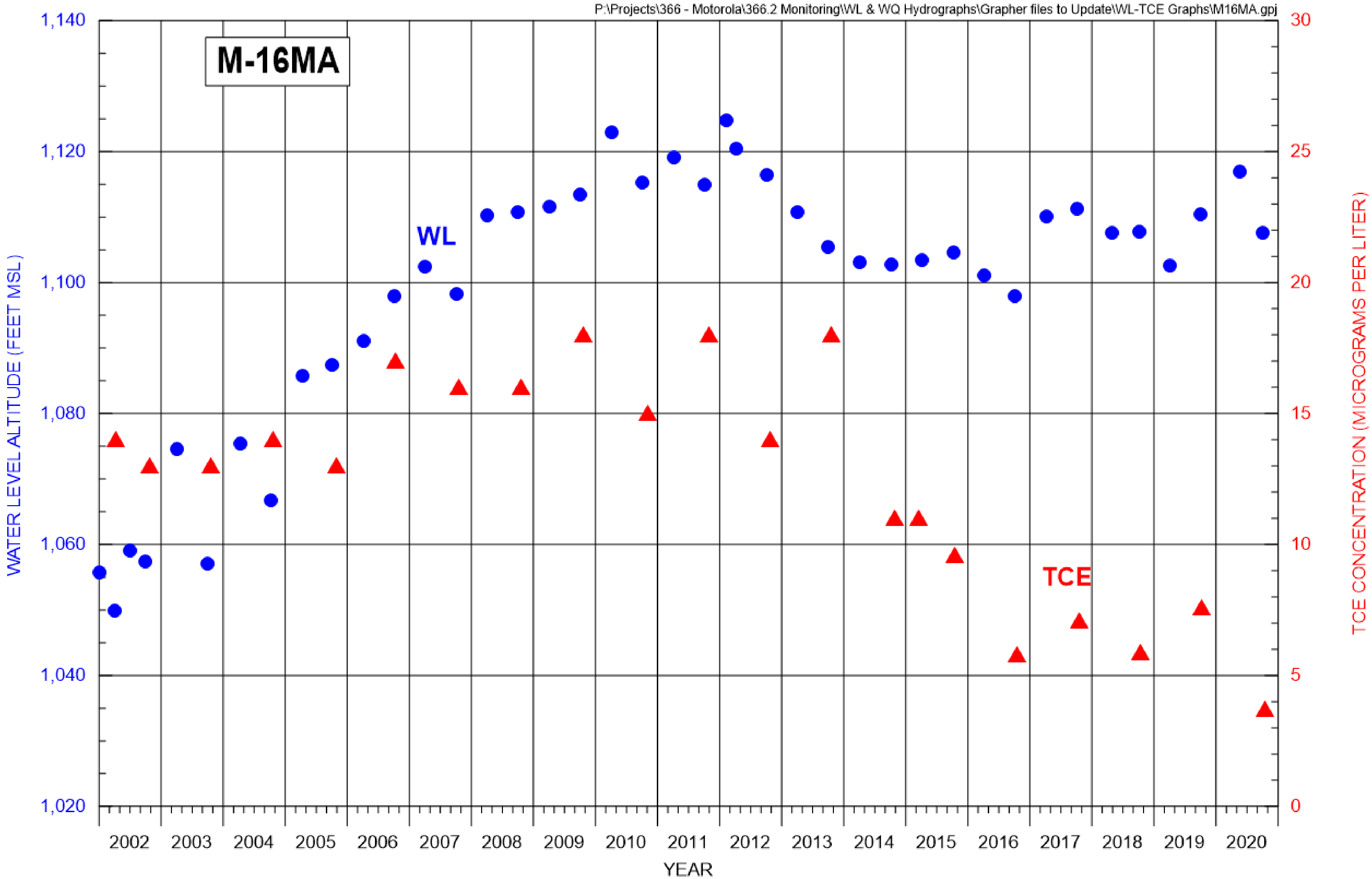
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,228.08

FIGURE D-52. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-16LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,228.15

FIGURE D-53. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-16MA

North Indian Bend Wash Superfund Site

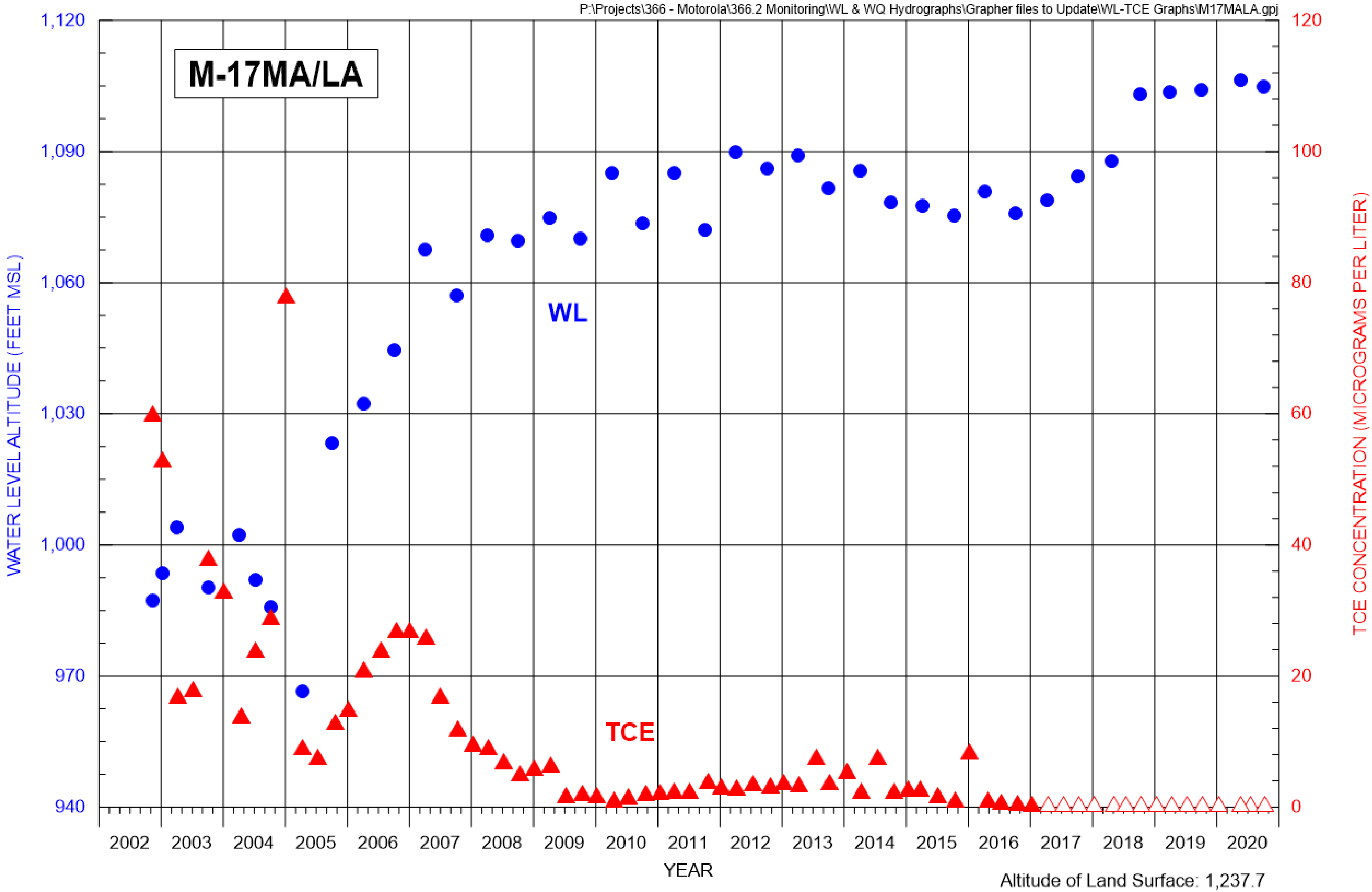
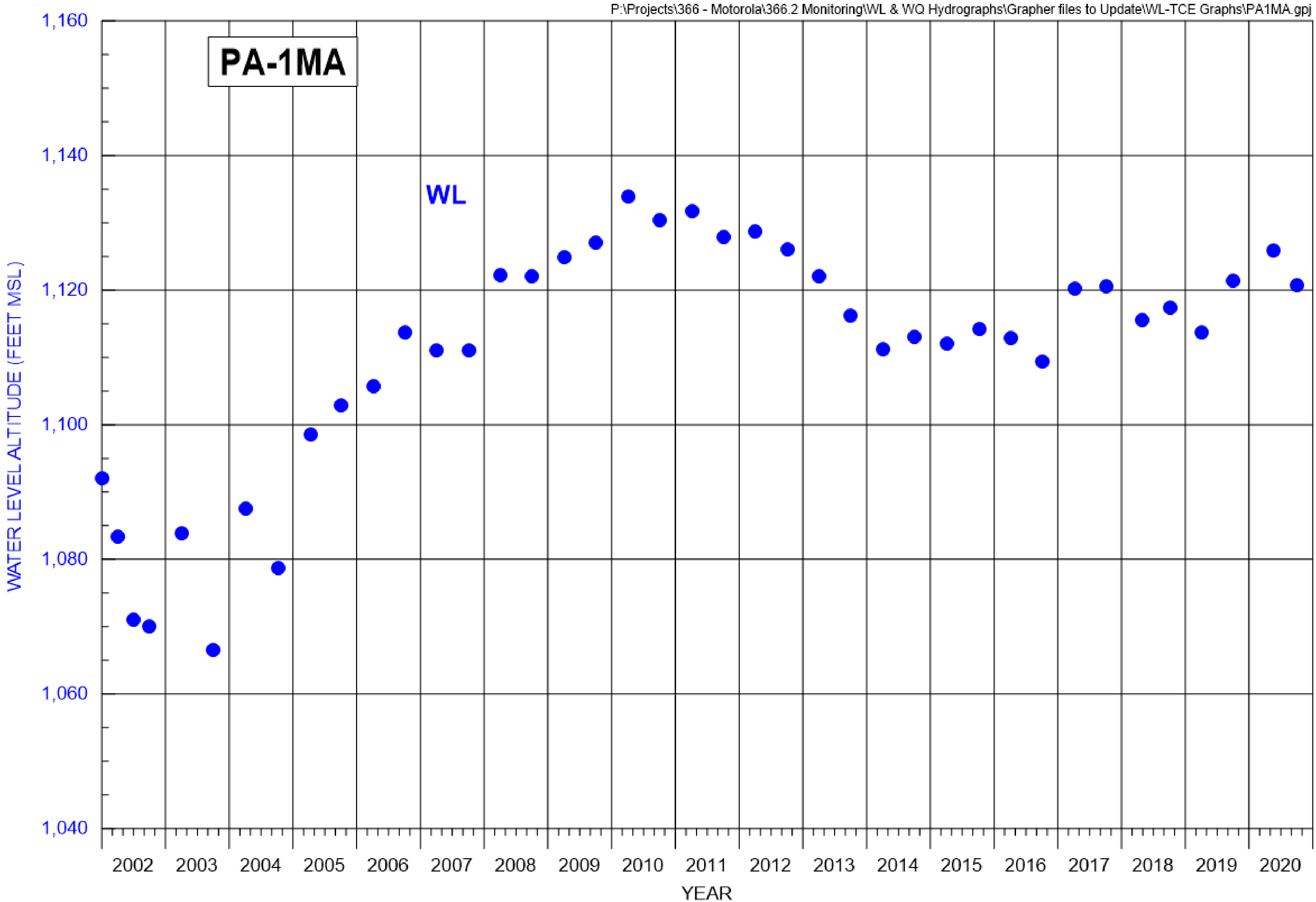


FIGURE D-54. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL M-17MA/LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

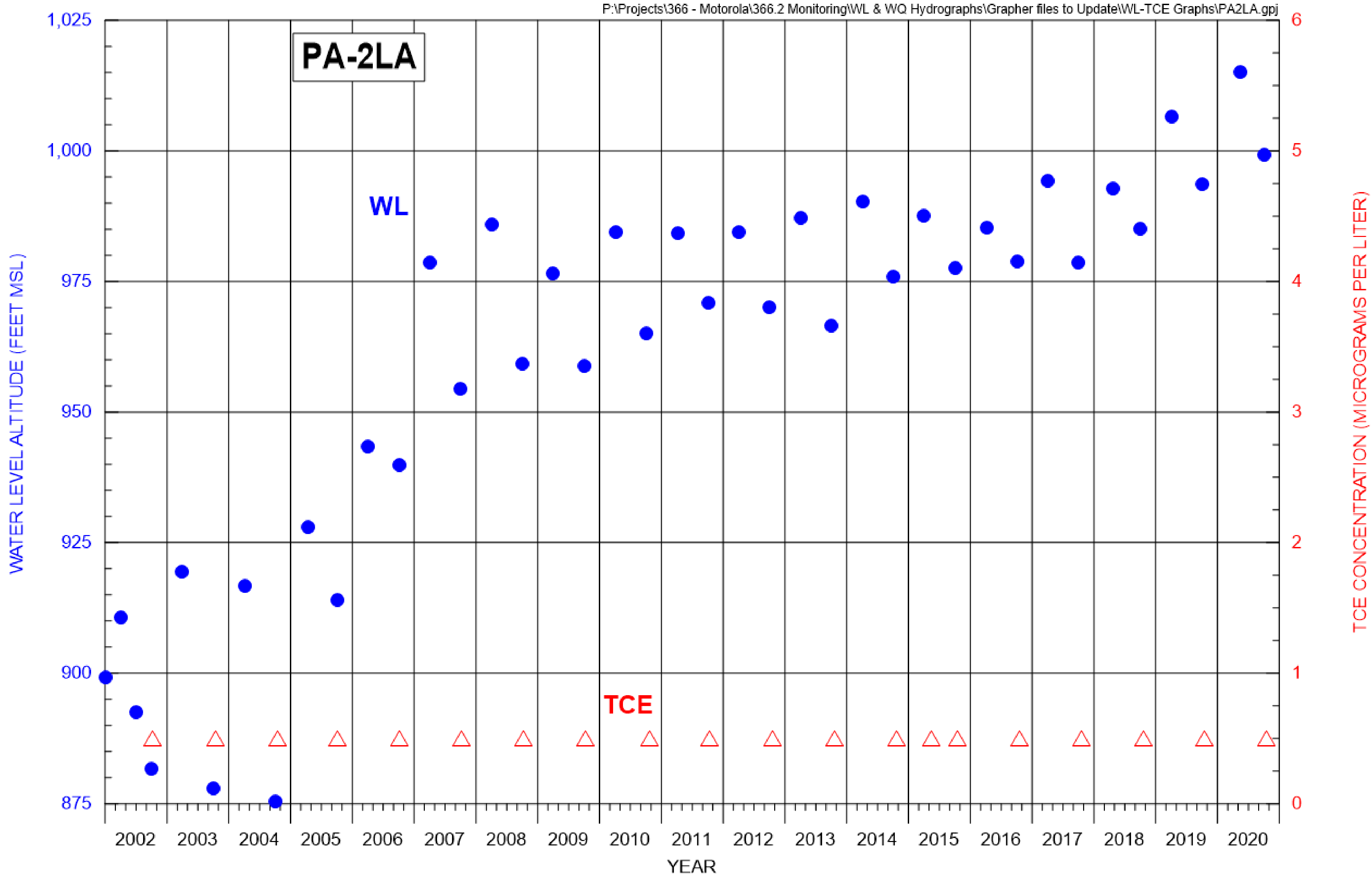
North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,225.50

FIGURE D-55. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-1MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,253.76

FIGURE D-56. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-2LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

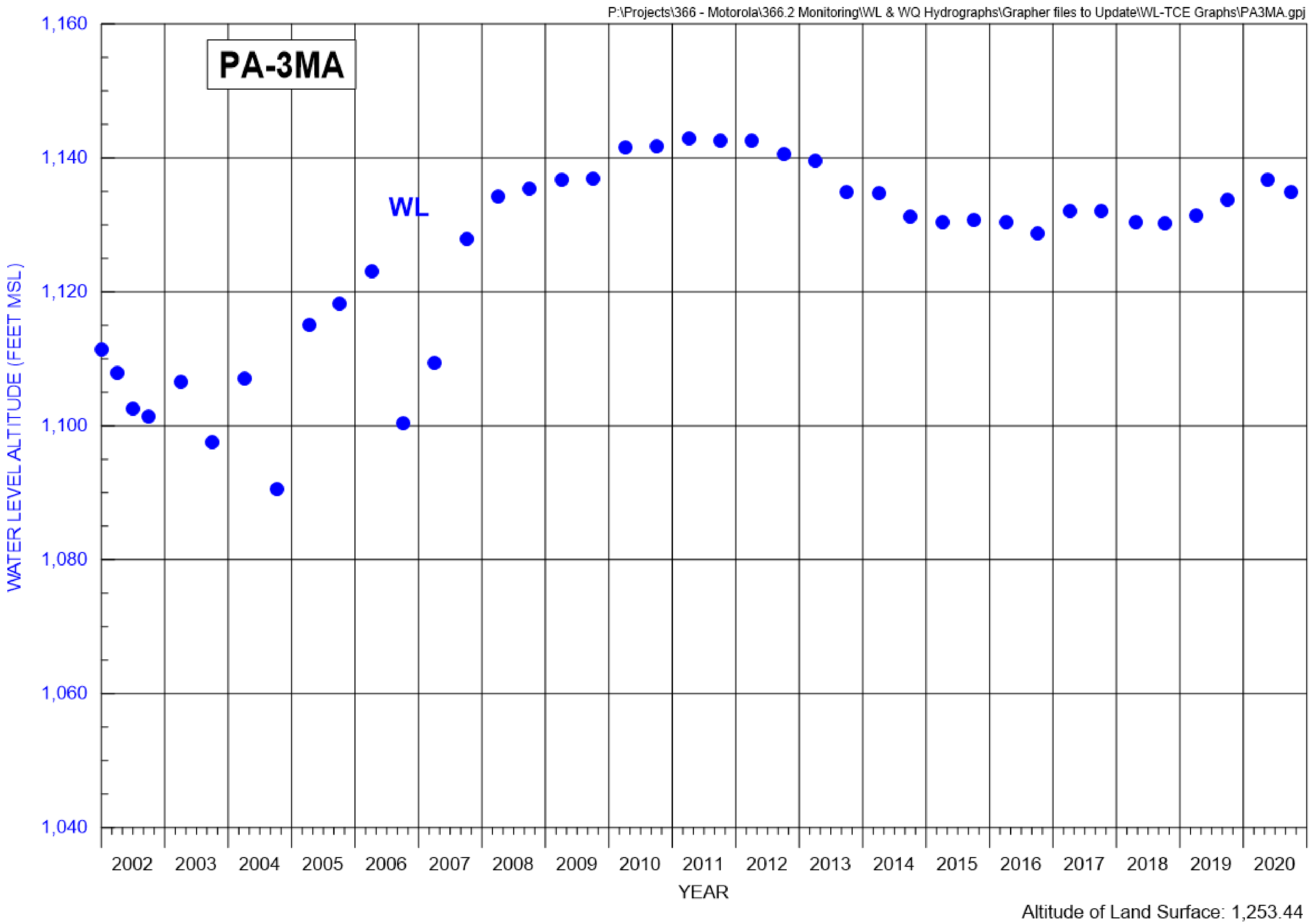
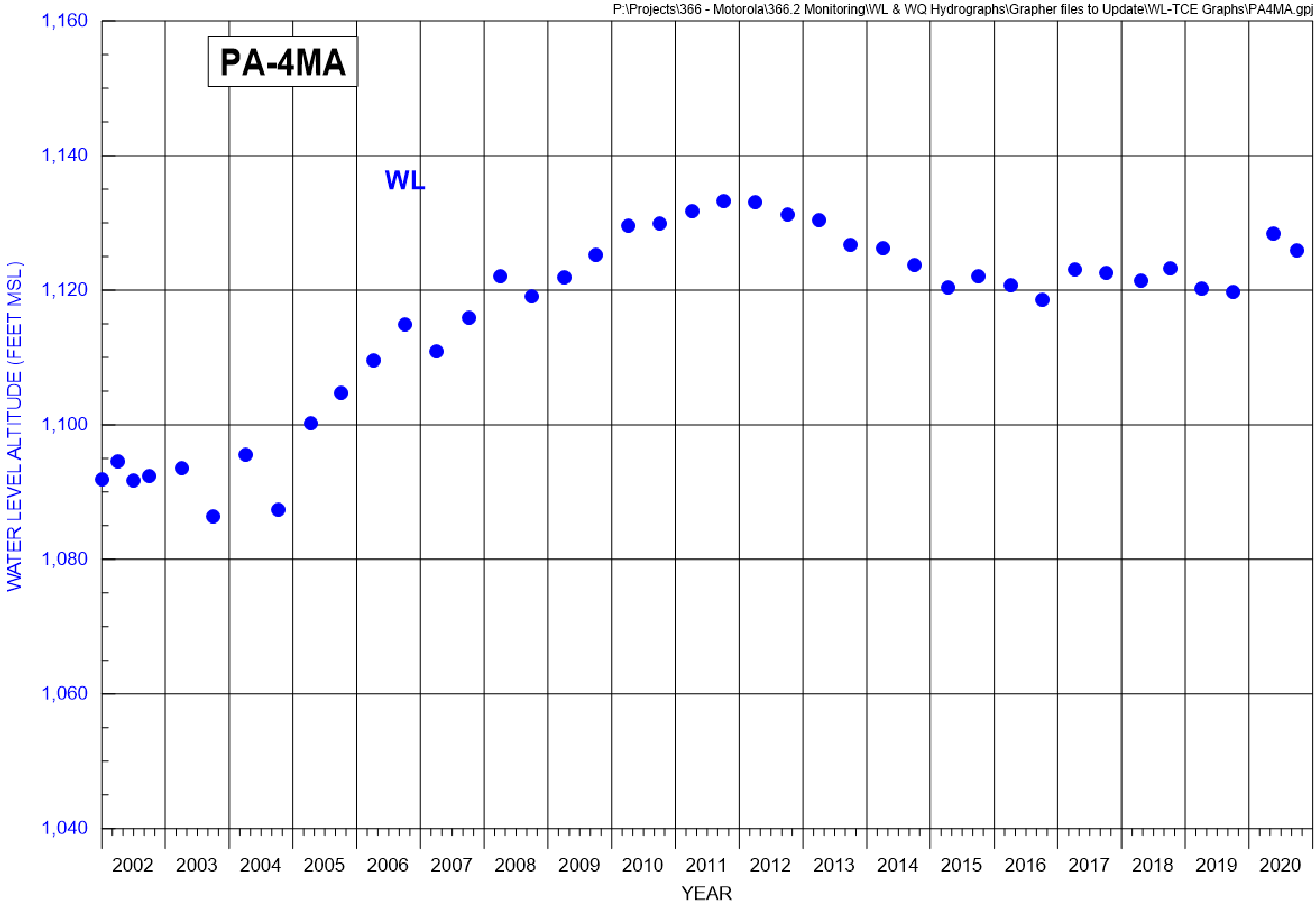


FIGURE D-57. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-3MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,230.92

FIGURE D-58. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-4MA

North Indian Bend Wash Superfund Site

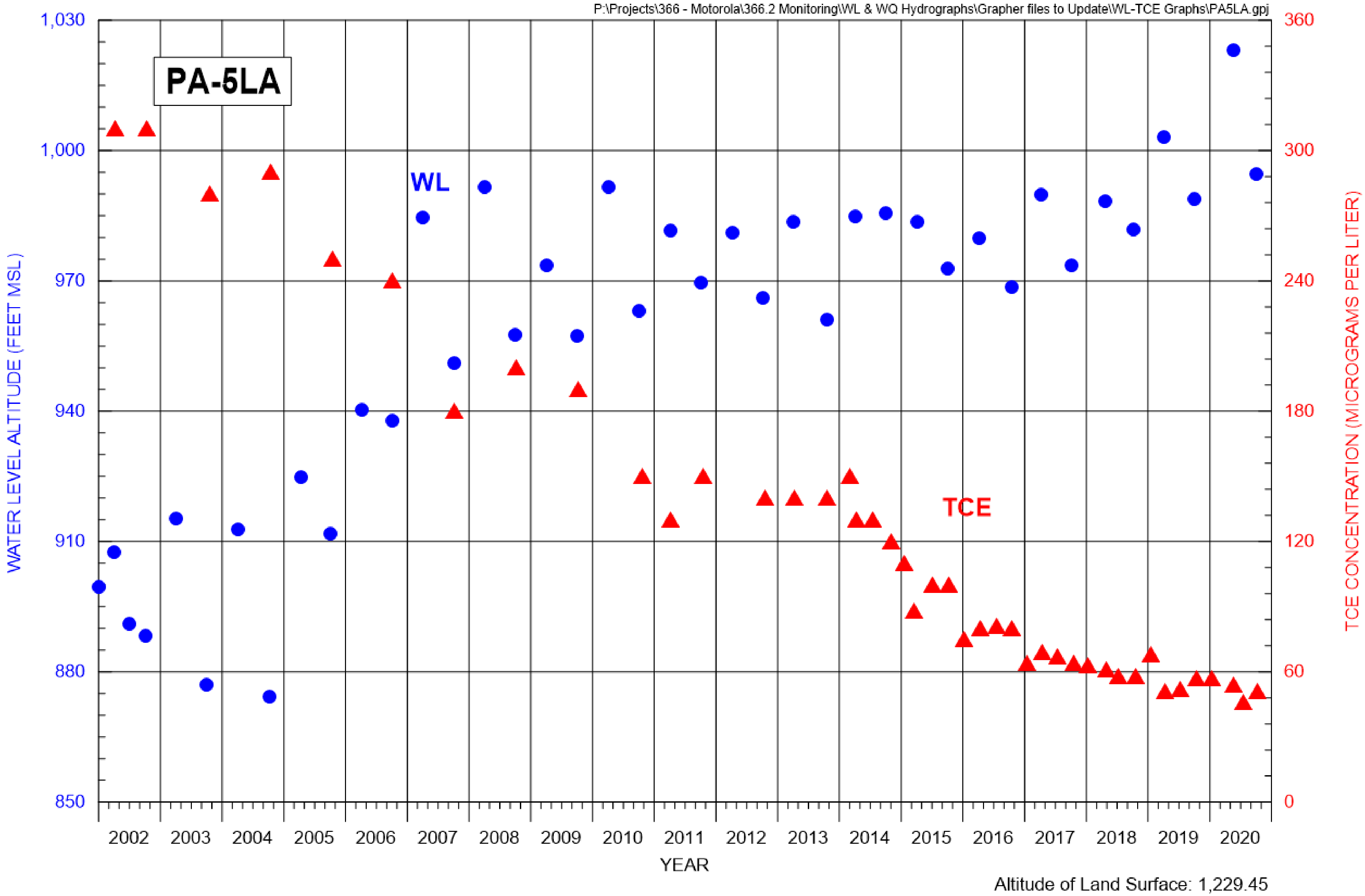


FIGURE D-59. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-5LA

North Indian Bend Wash Superfund Site

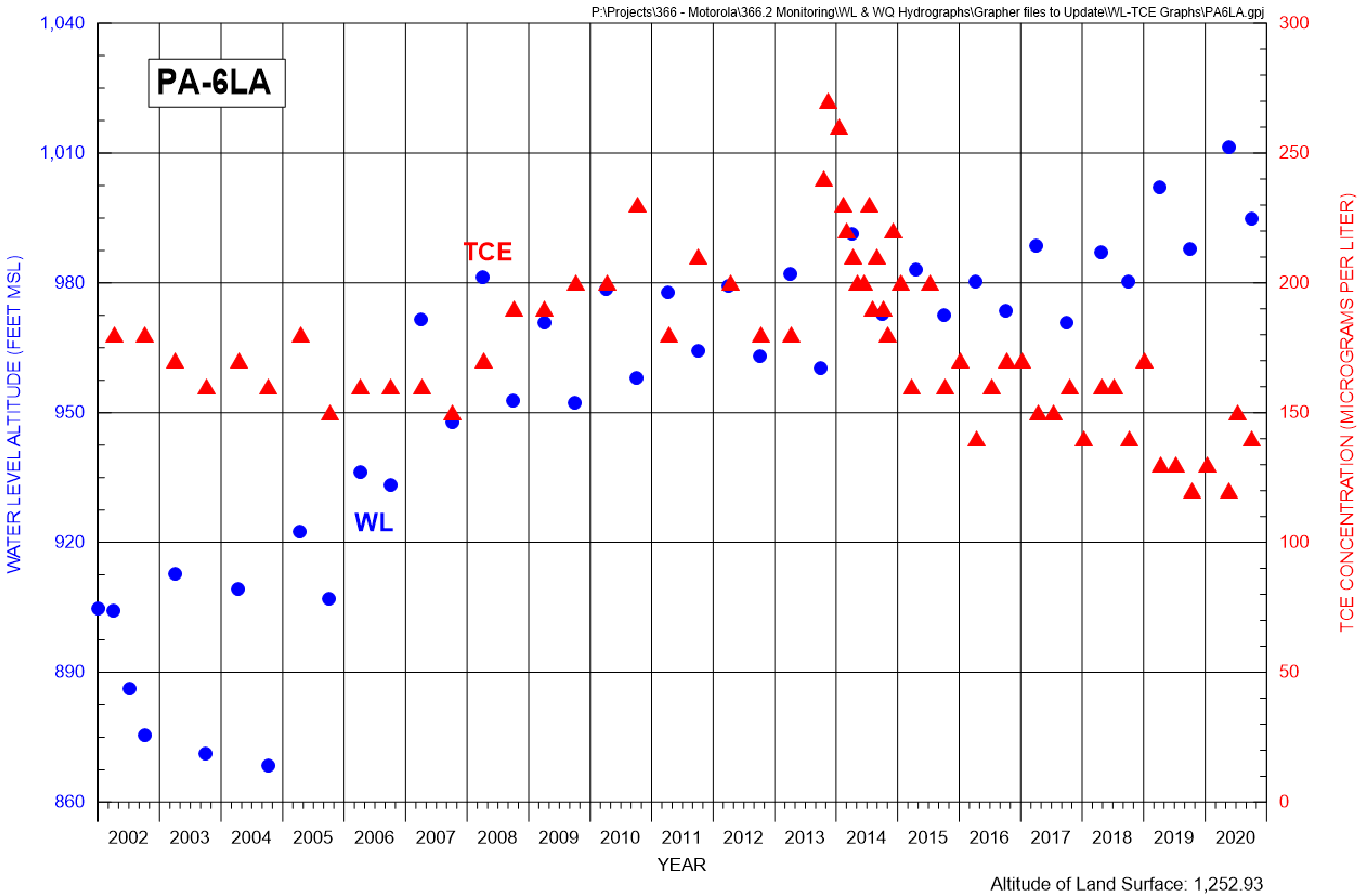
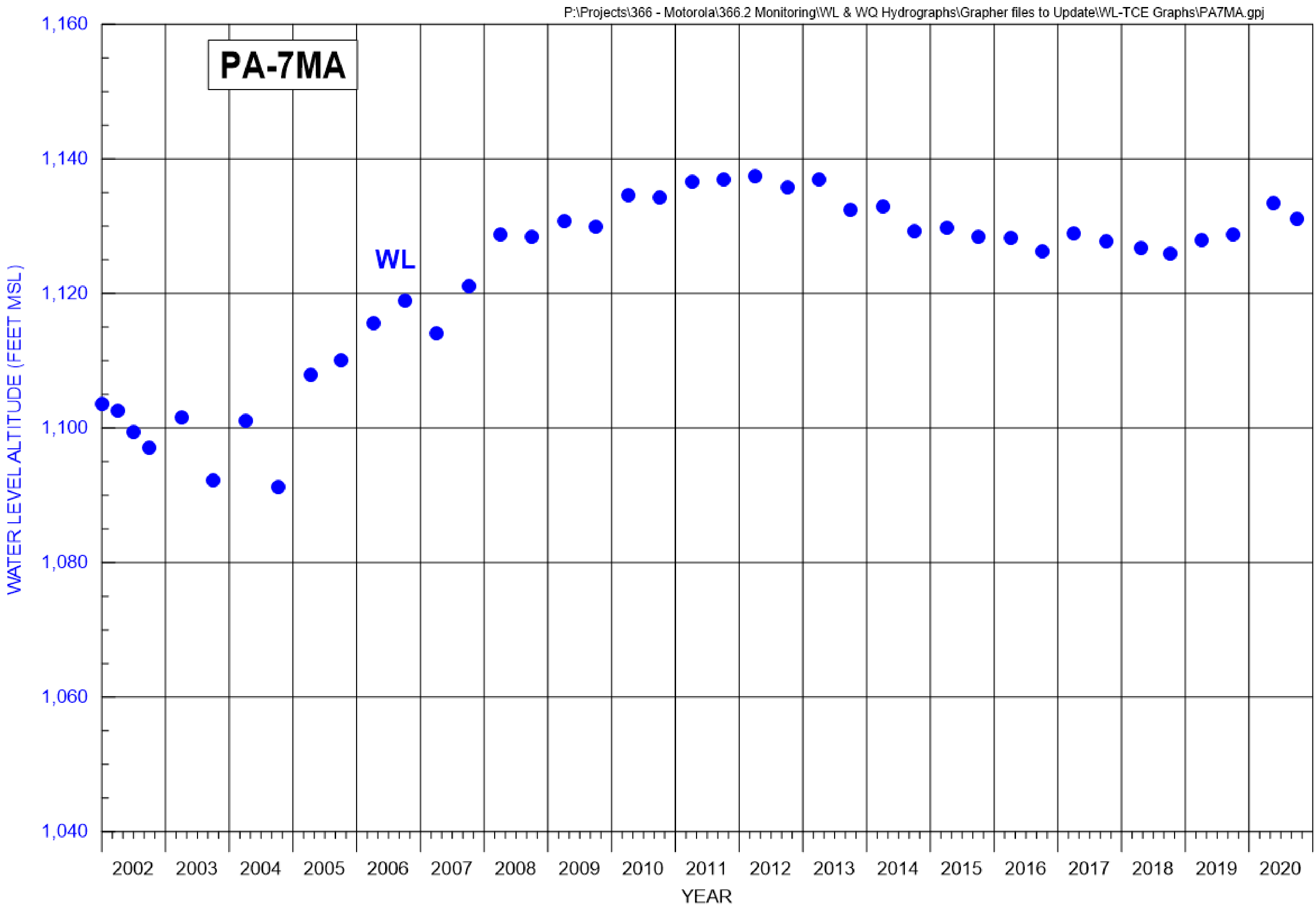


FIGURE D-60. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-6LA



Altitude of Land Surface: 1,253.06

FIGURE D-61. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-7MA

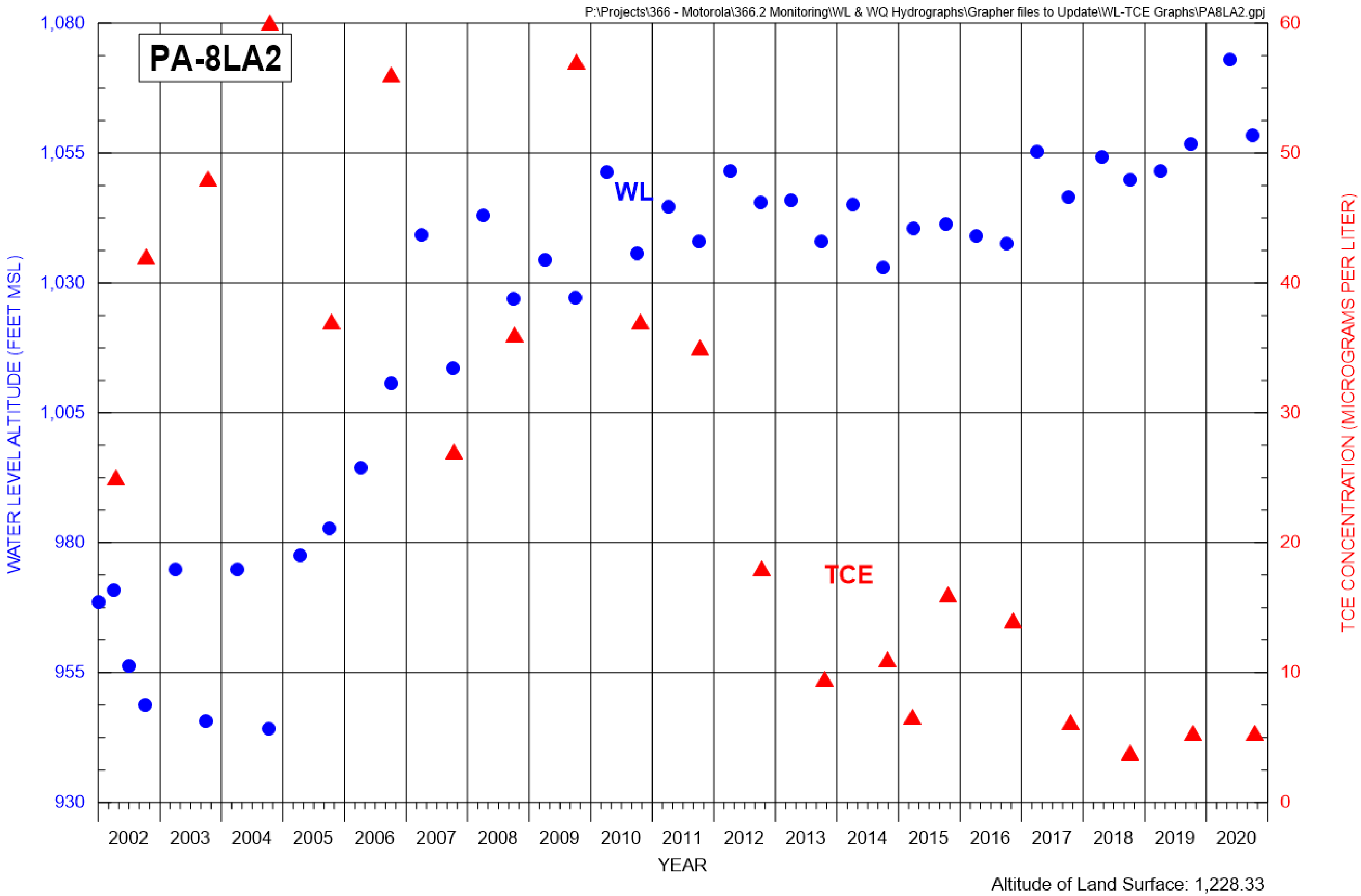


FIGURE D-62. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-8LA2

North Indian Bend Wash Superfund Site

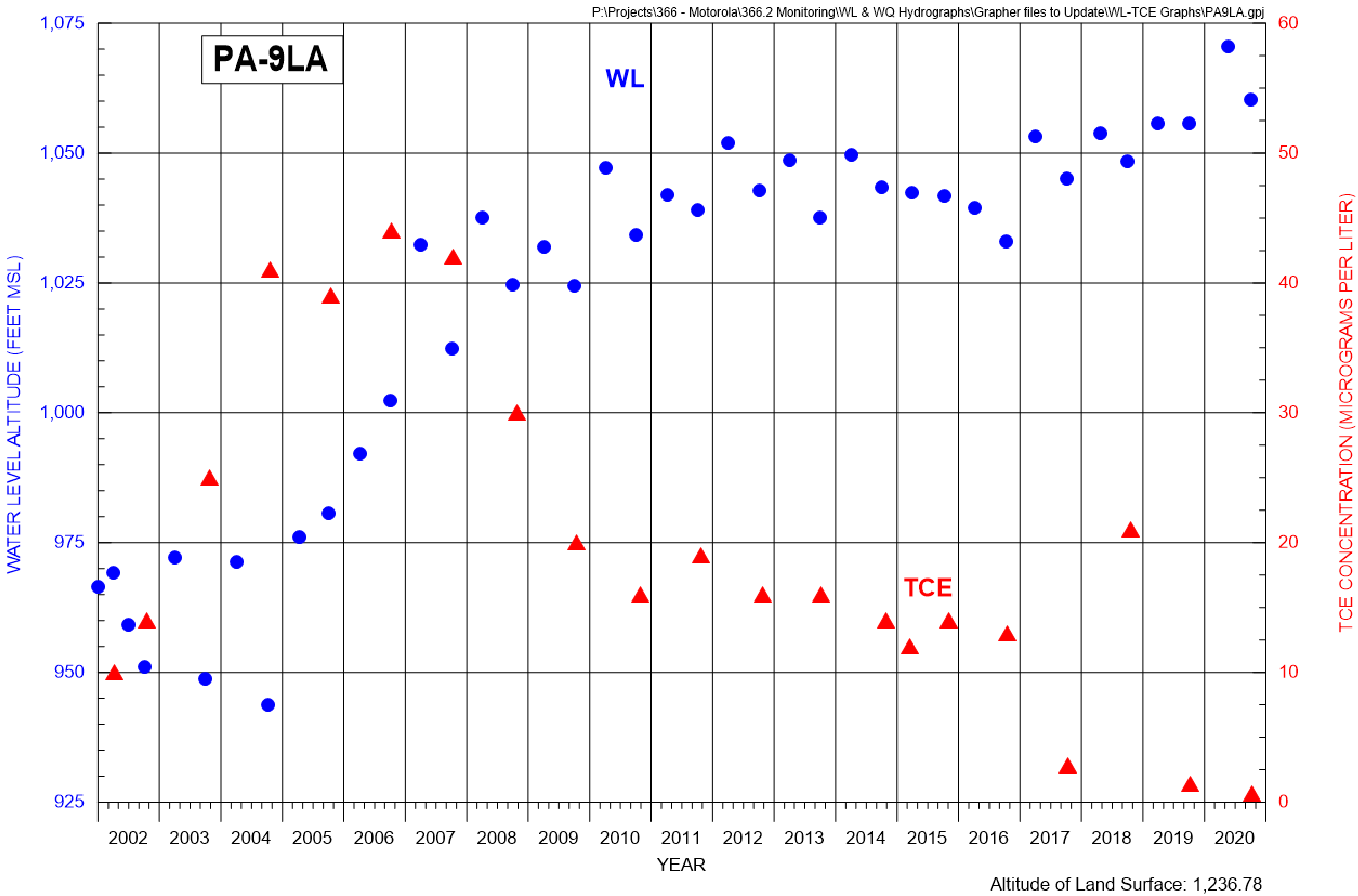


FIGURE D-63. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-9LA

North Indian Bend Wash Superfund Site

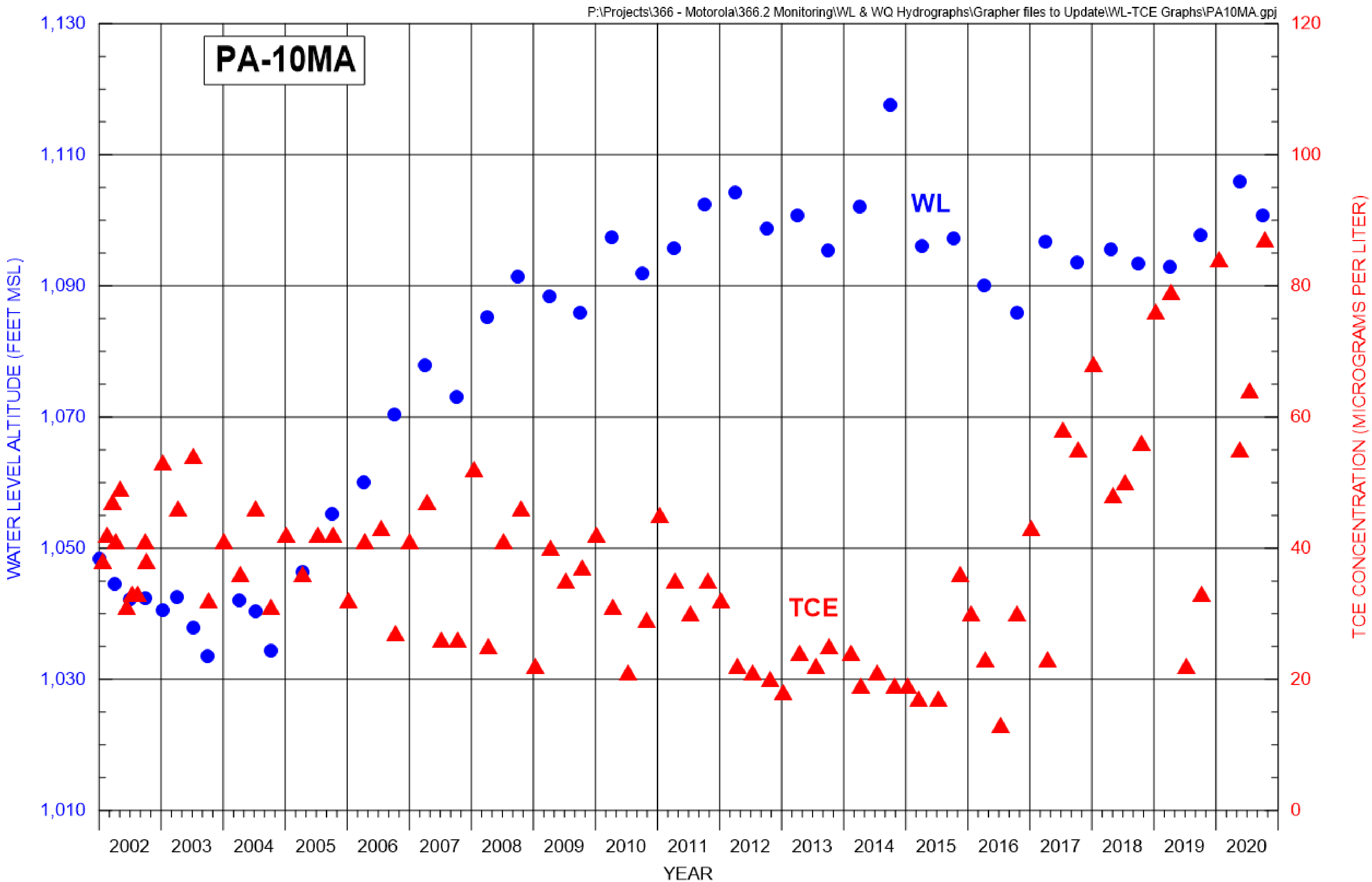


FIGURE D-64. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-10MA

North Indian Bend Wash Superfund Site

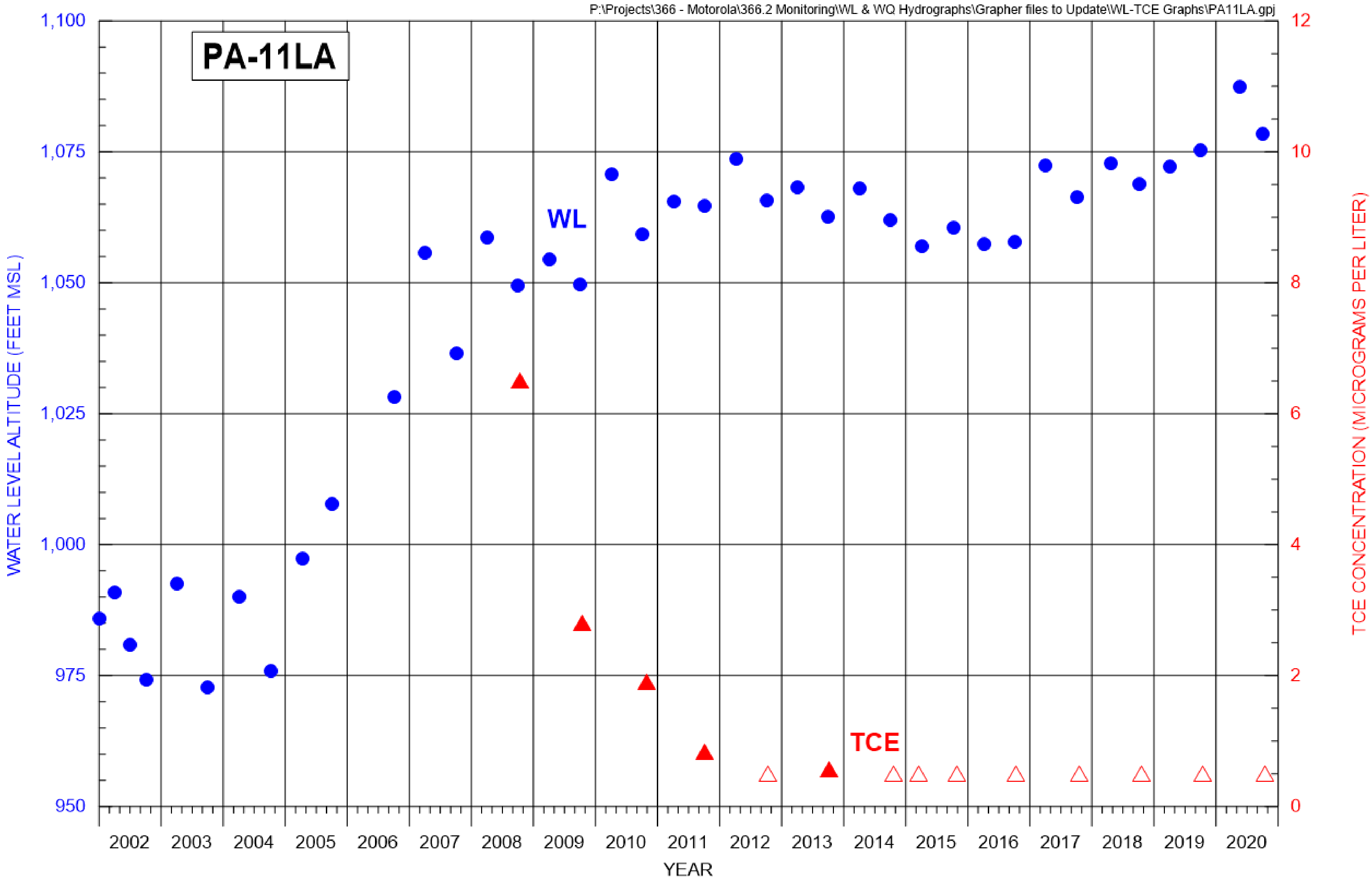


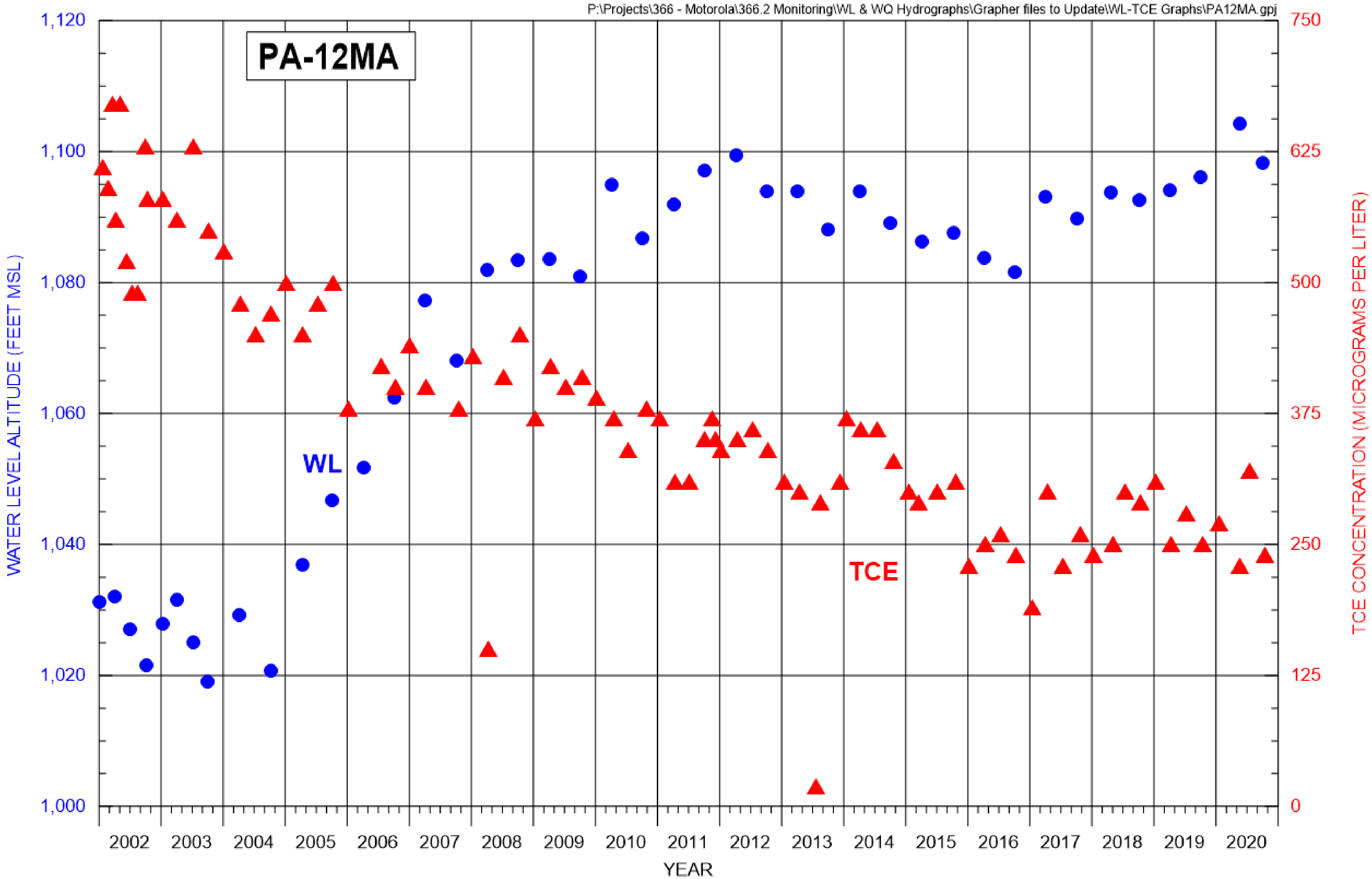
FIGURE D-65. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-11LA

Note: Water level collected from LAU completed well at piezometer PA-11/12 located approximately 80 feet northwest of original well PA-11LA.

EXPLANATION

△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,224.96

FIGURE D-66. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-12MA

Note: Water level collected from MAU completed well at piezometer PA-11/12 located approximately 70 feet northwest of original well PA-12MA.

North Indian Bend Wash Superfund Site

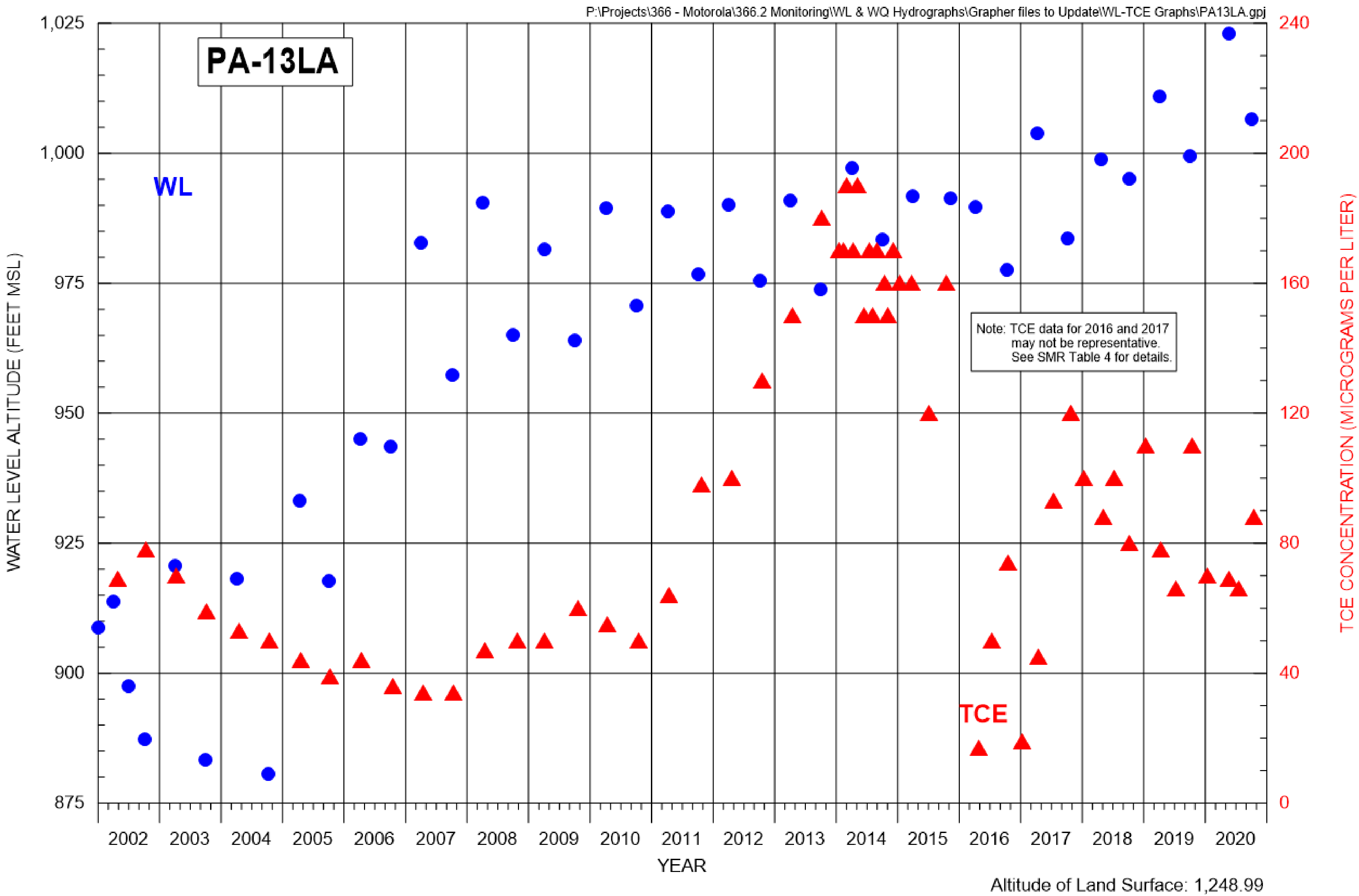


FIGURE D-67. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-13LA

North Indian Bend Wash Superfund Site

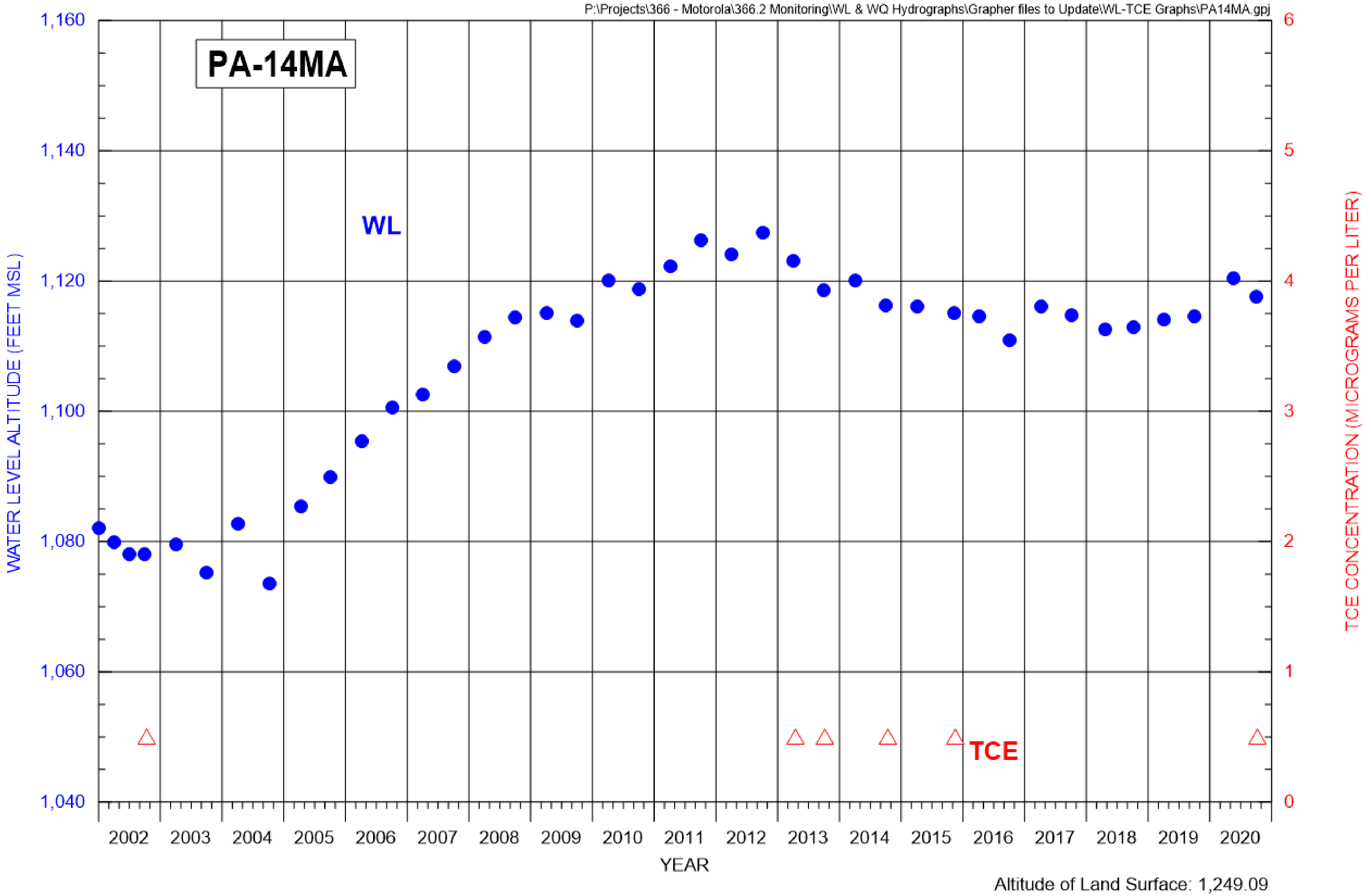
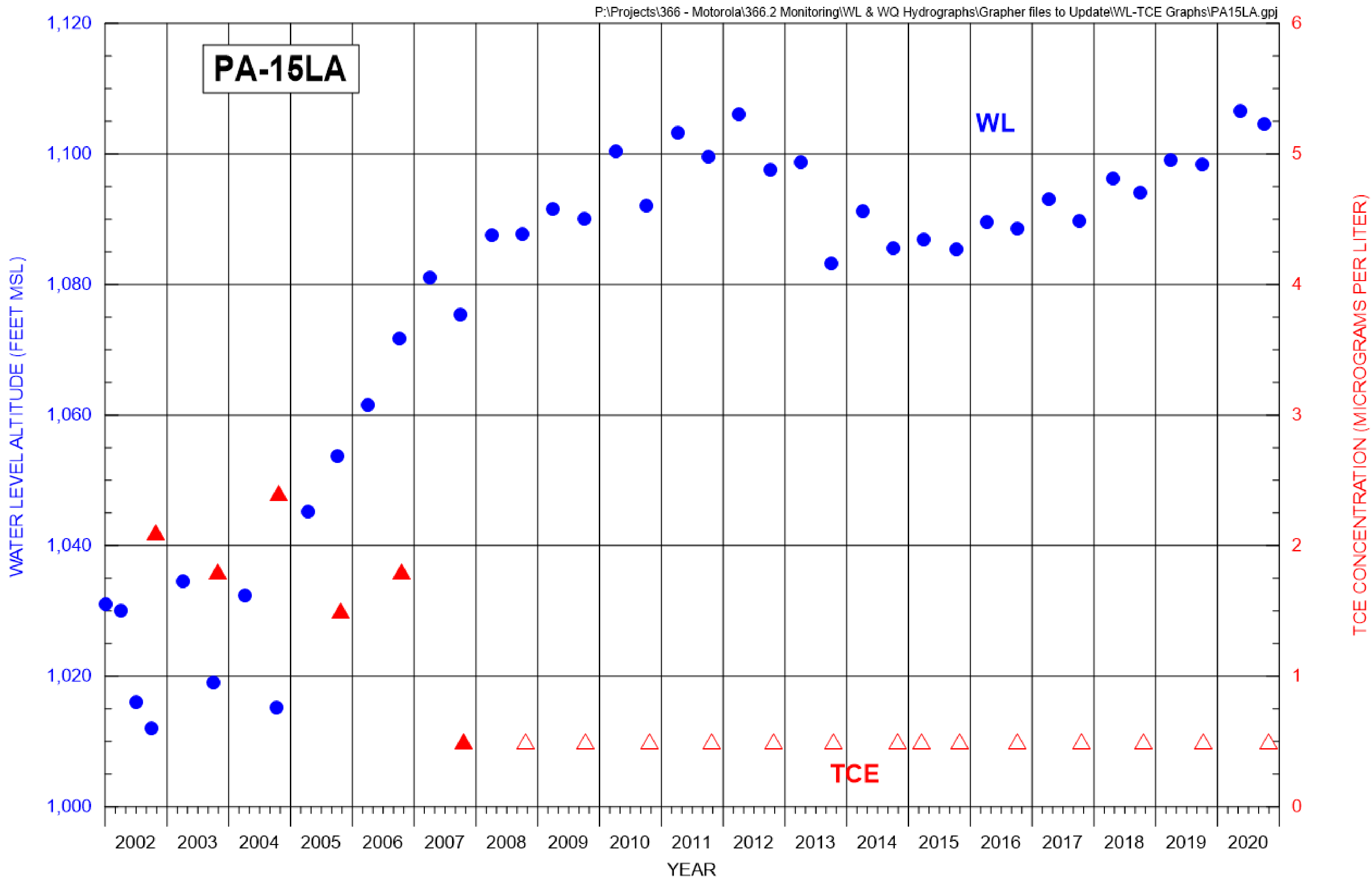


FIGURE D-68. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-14MA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,204.28

FIGURE D-69. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-15LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

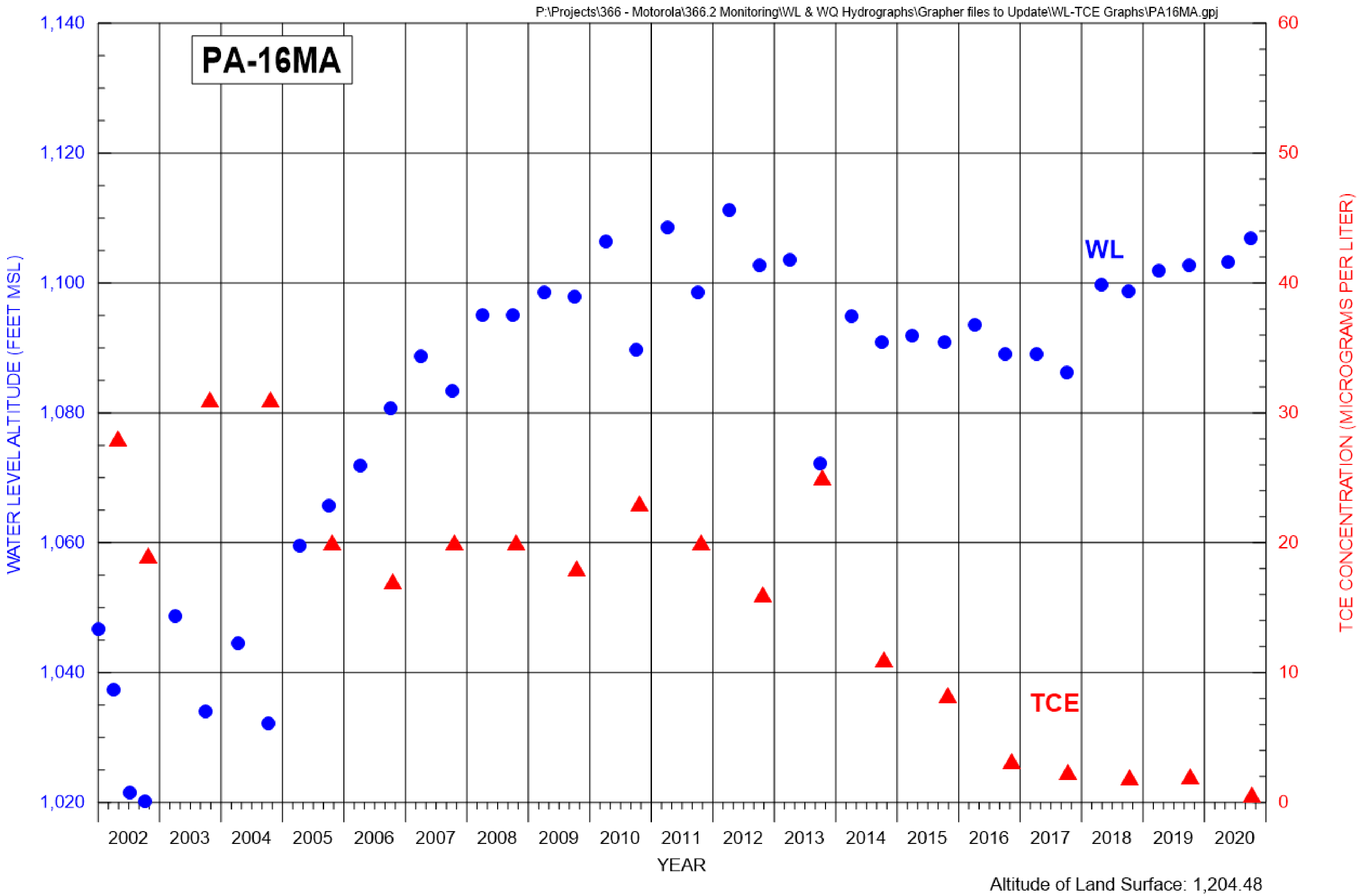


FIGURE D-70. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-16MA

North Indian Bend Wash Superfund Site

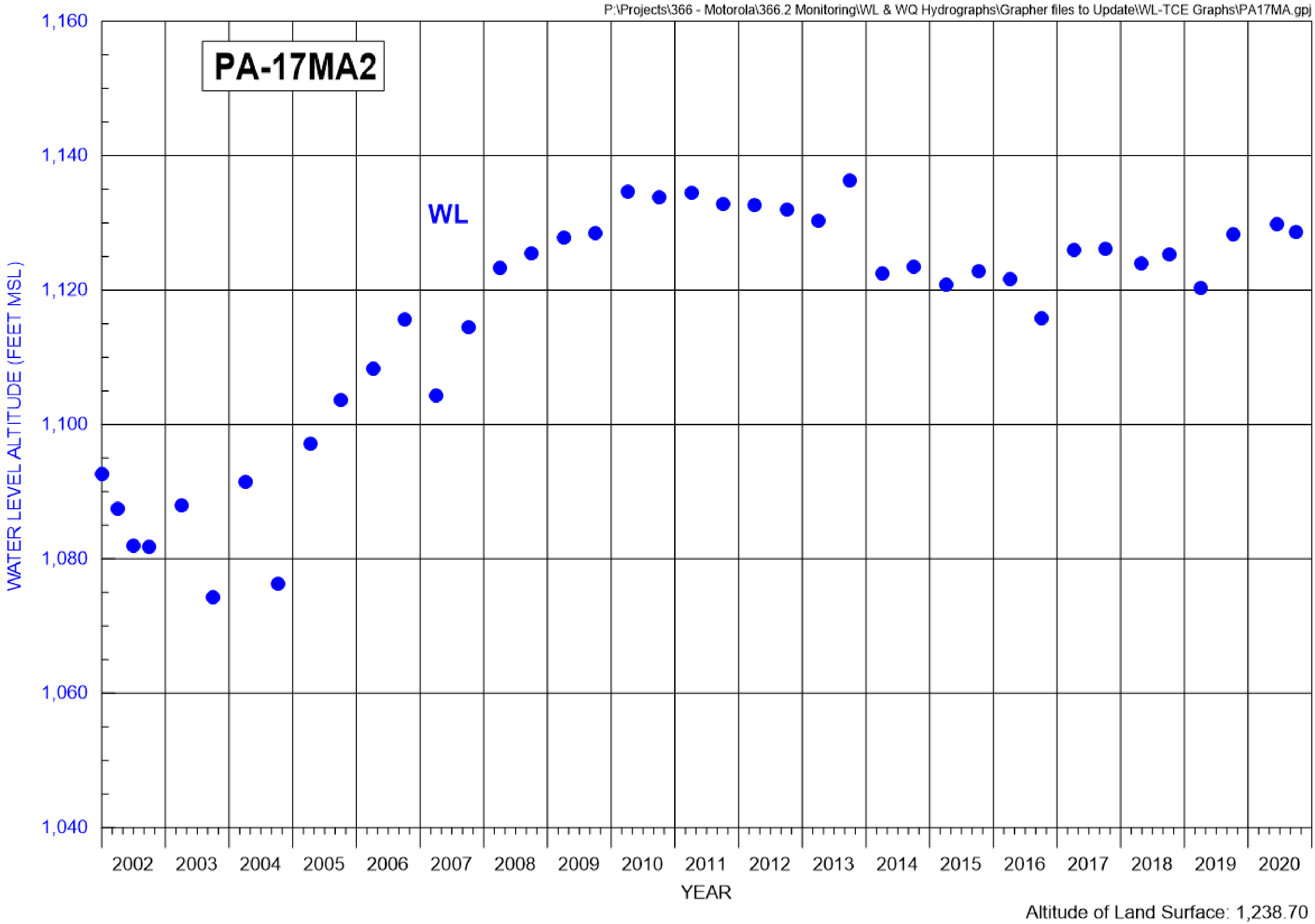


FIGURE D-71. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-17MA2

North Indian Bend Wash Superfund Site

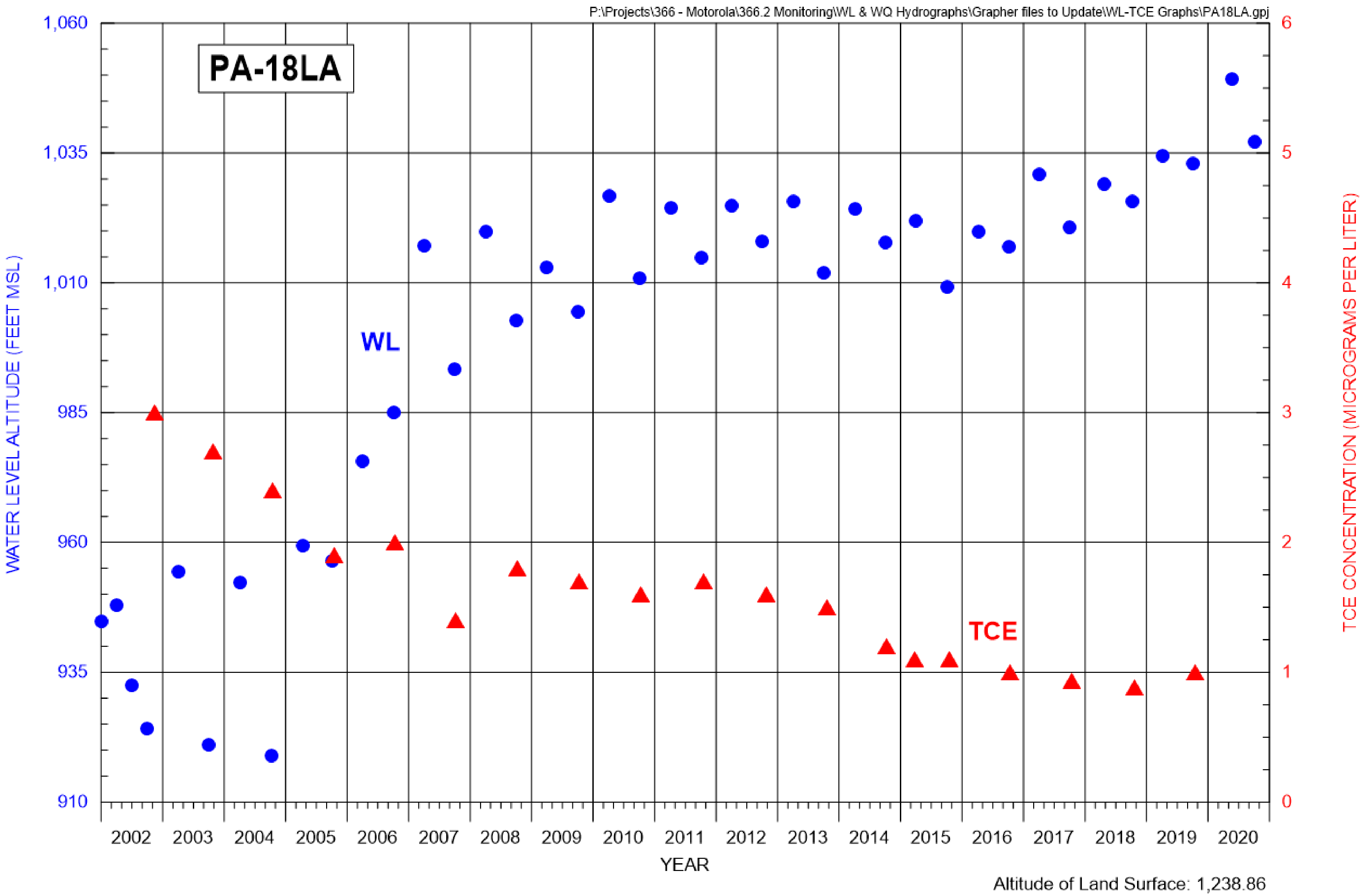


FIGURE D-72. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-18LA

North Indian Bend Wash Superfund Site

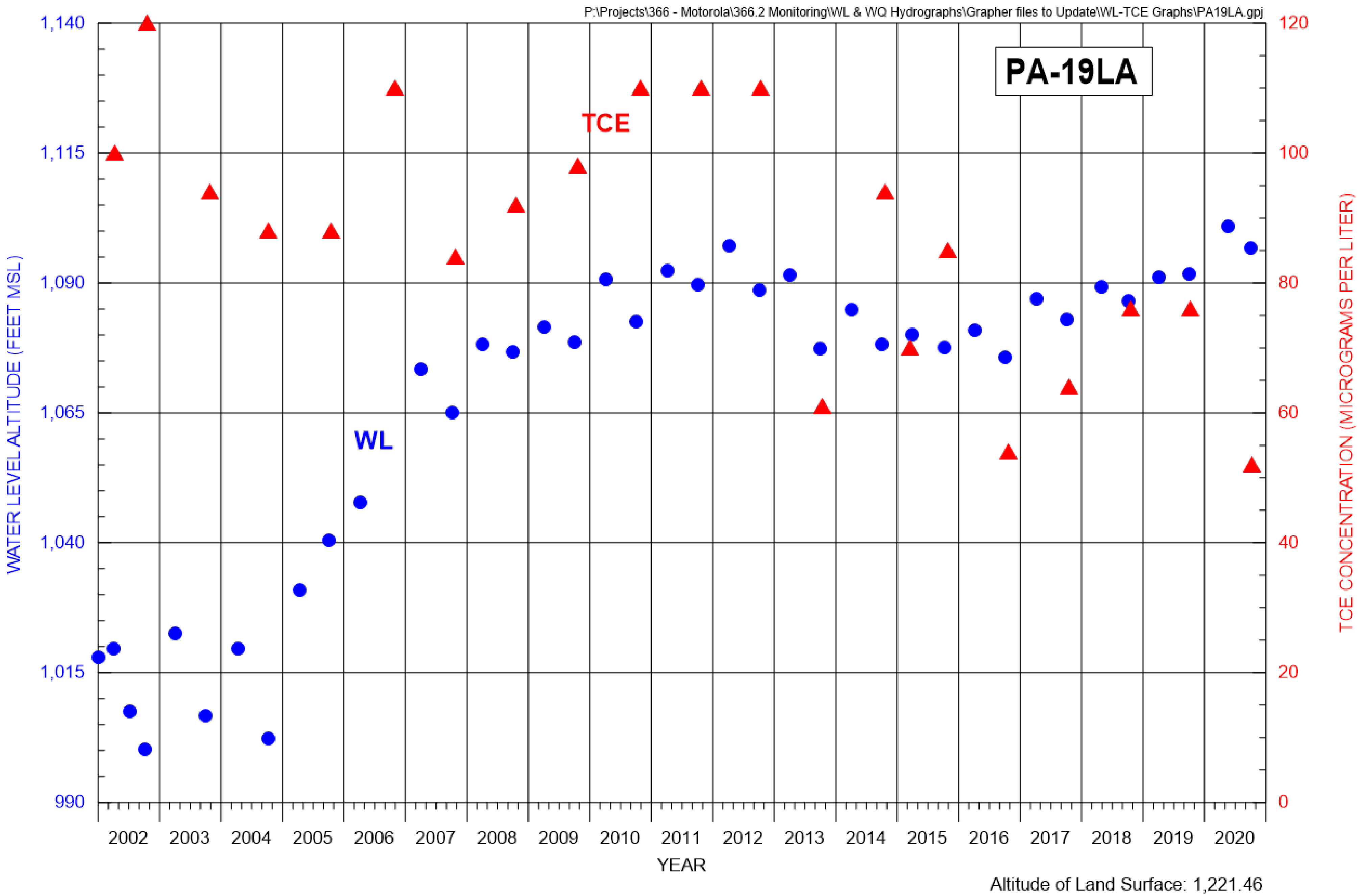


FIGURE D-73. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-19LA

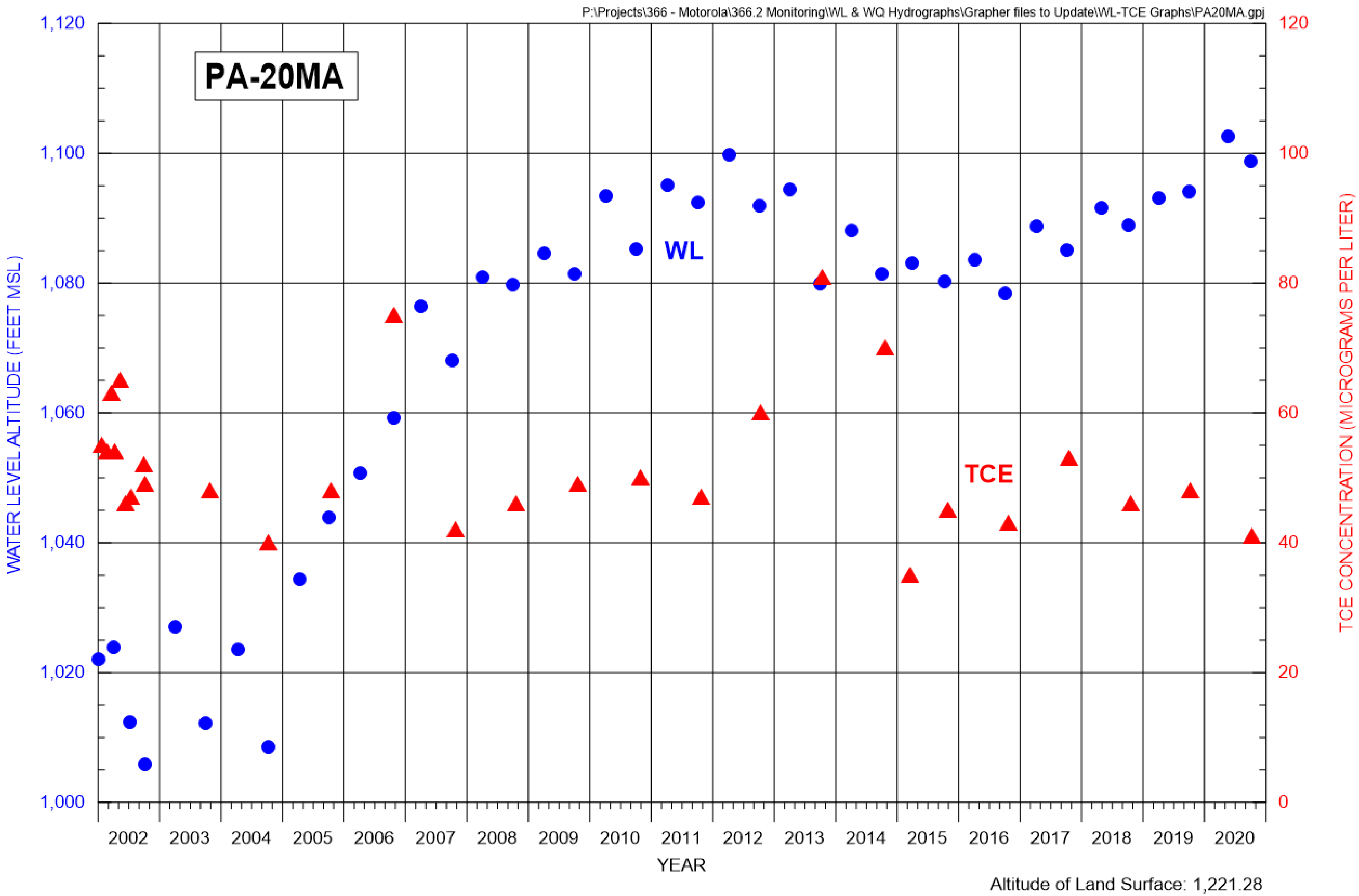
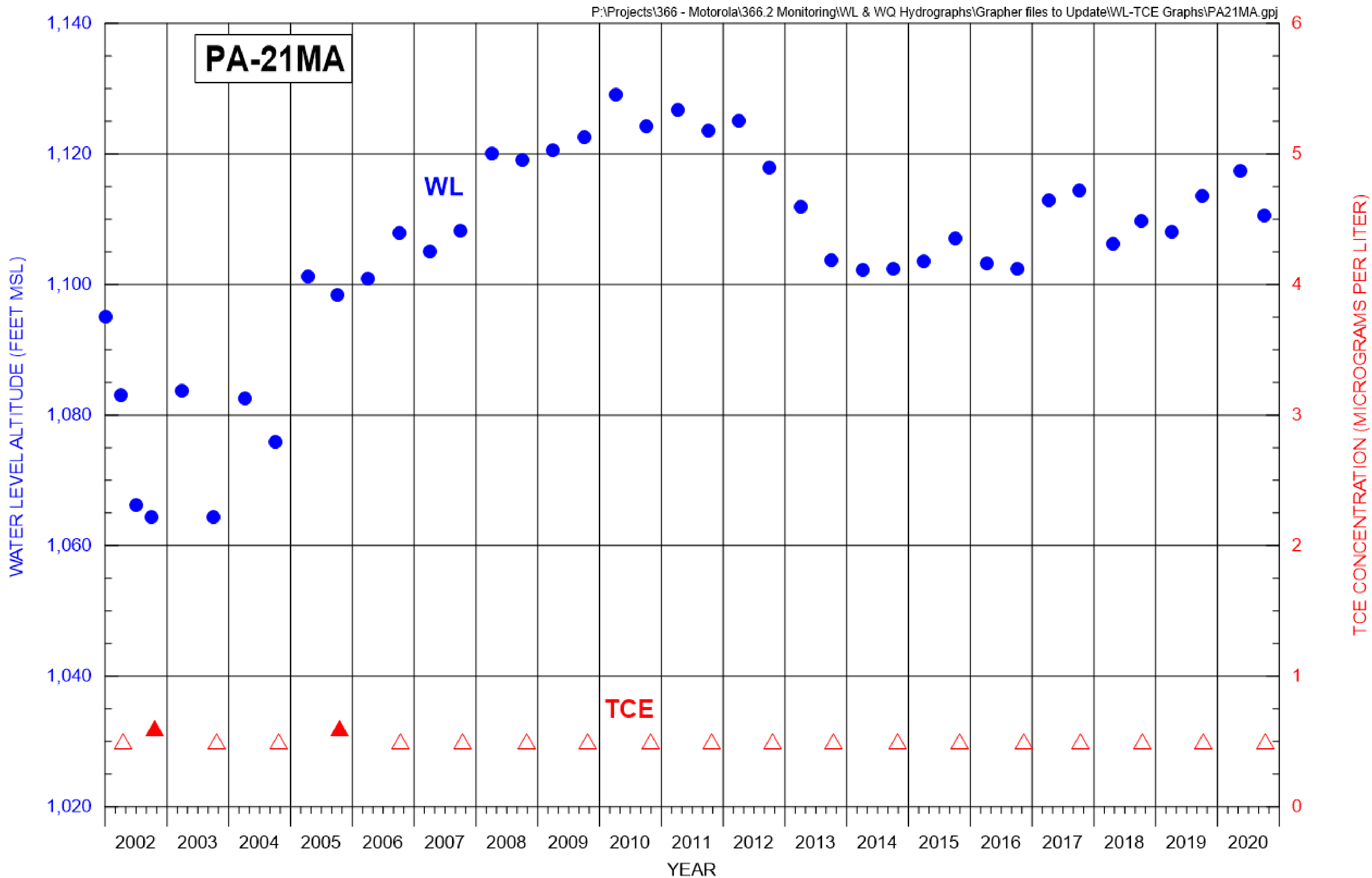


FIGURE D-74. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-20MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,225.19

FIGURE D-75. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PA-21MA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

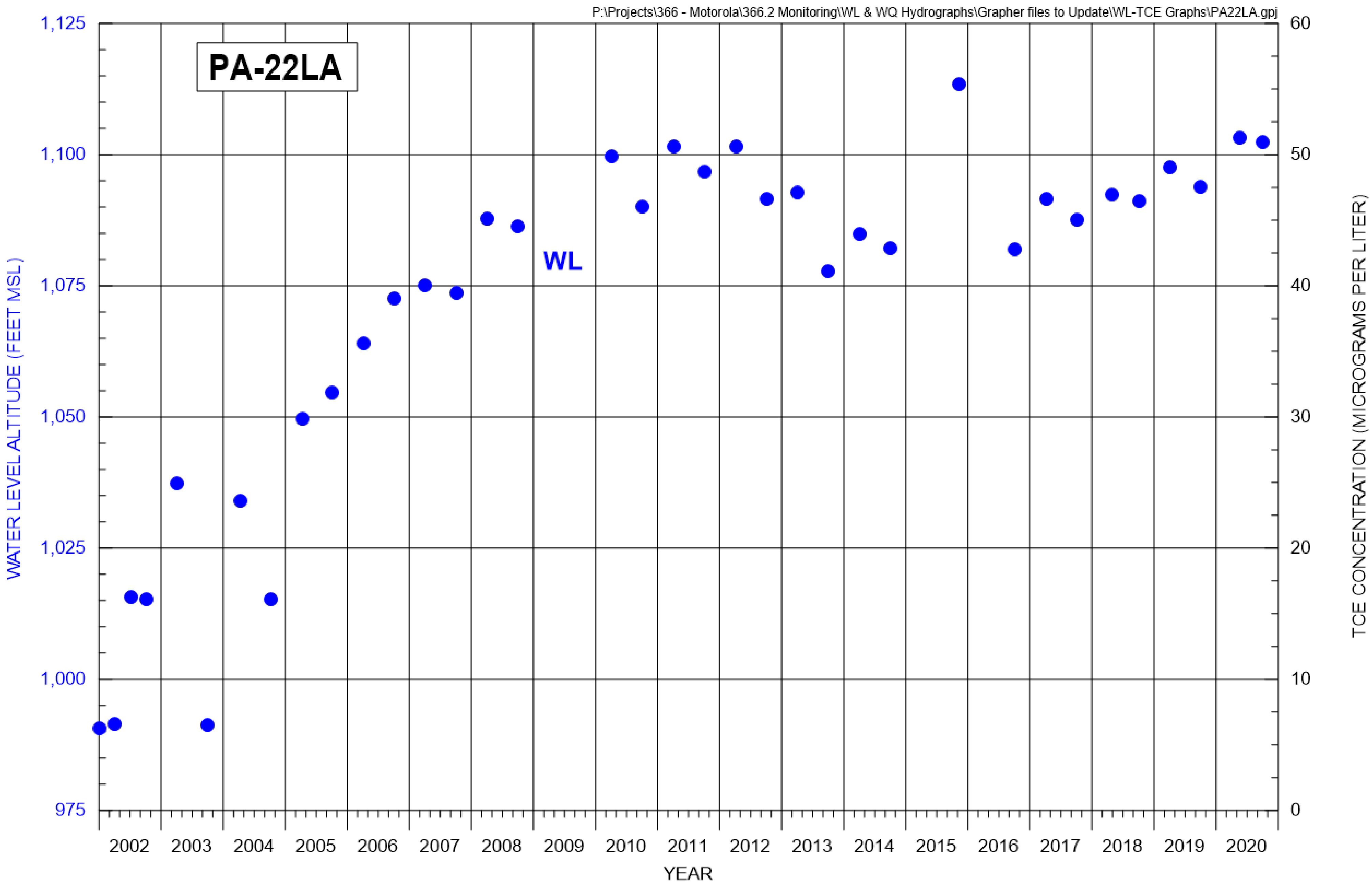
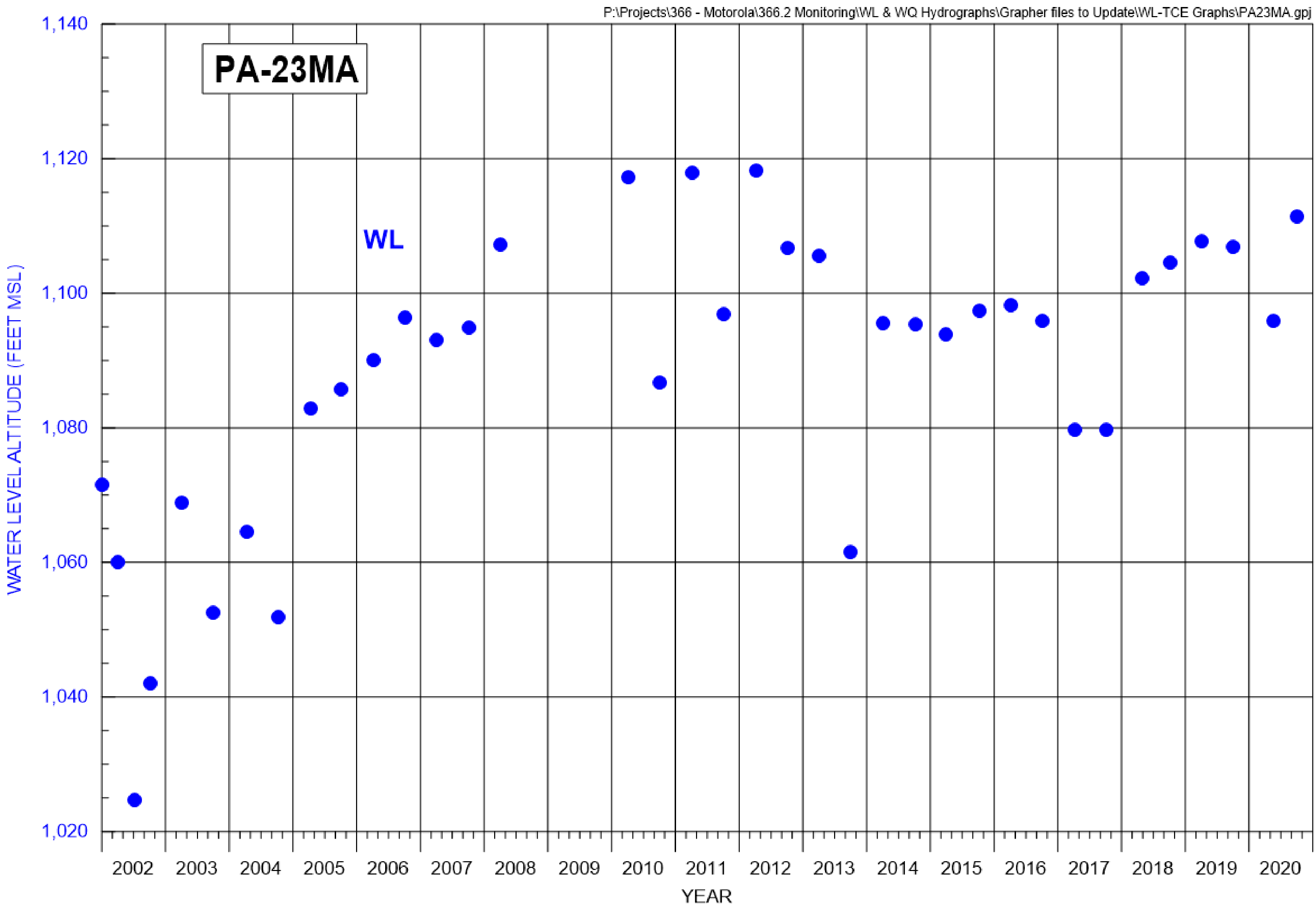


FIGURE D-76. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-22LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,184.42

FIGURE D-77. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PA-23MA

North Indian Bend Wash Superfund Site

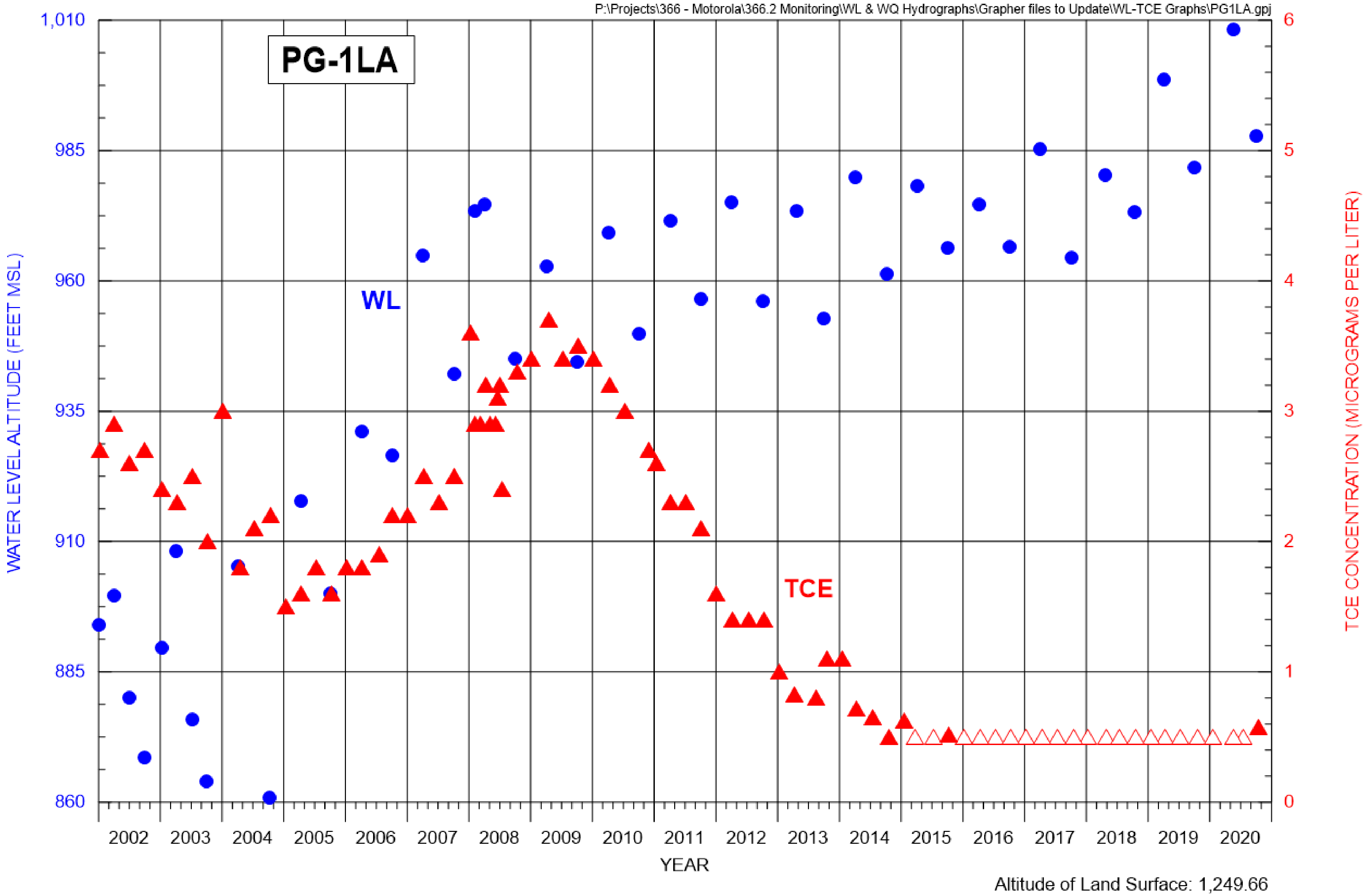
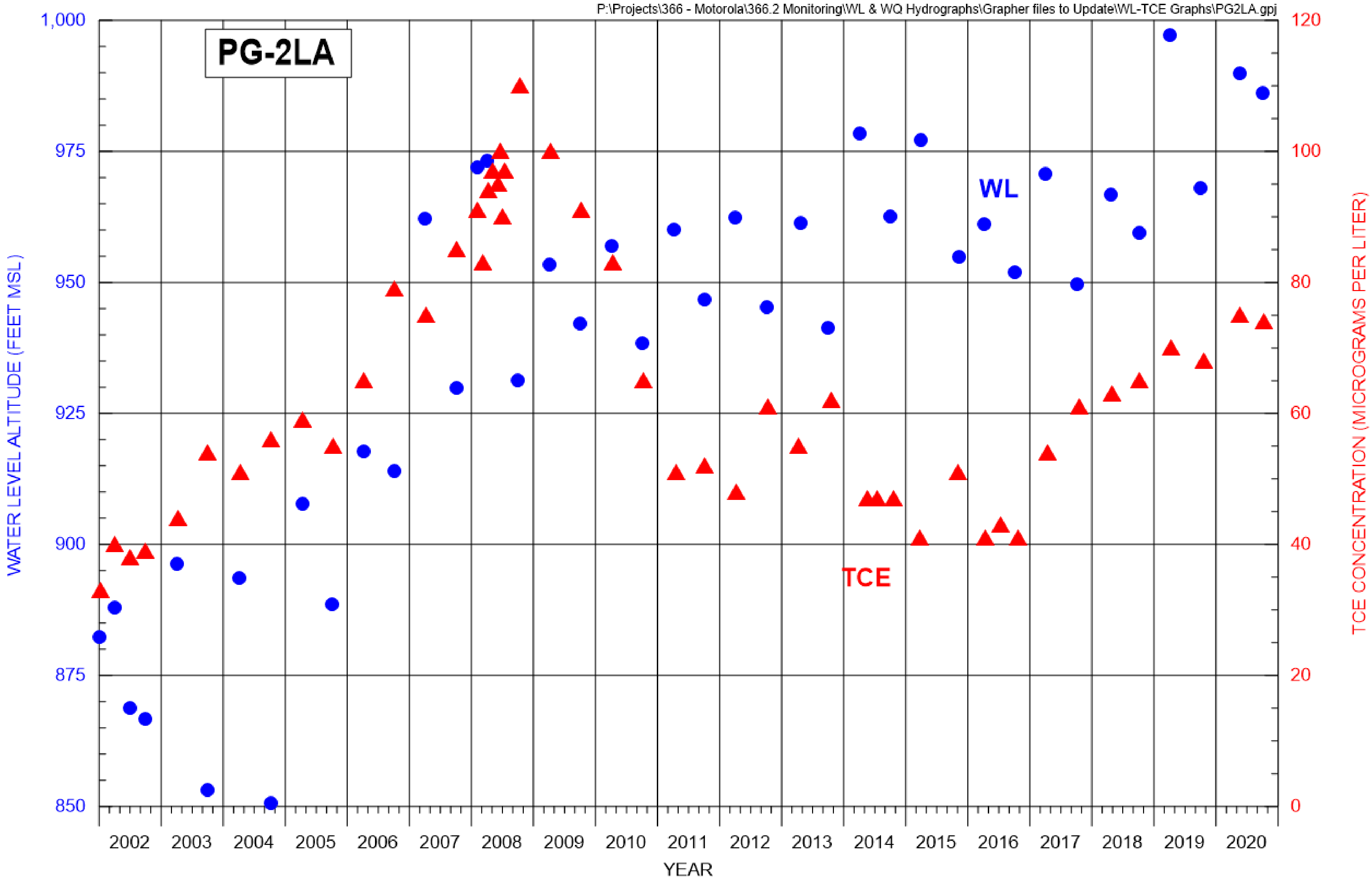


FIGURE D-78. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-1LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,271.06

FIGURE D-79. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-2LA

North Indian Bend Wash Superfund Site

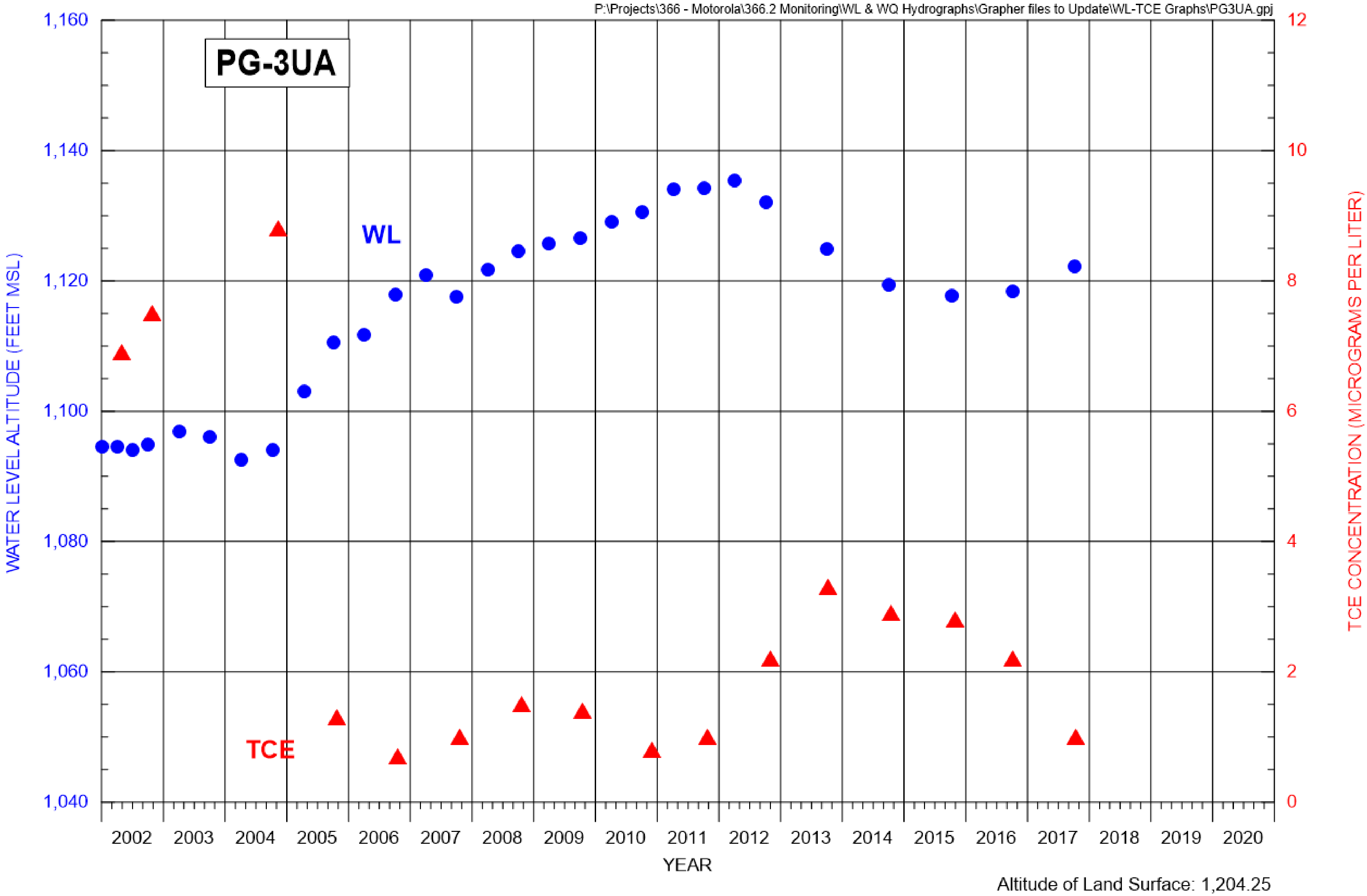


FIGURE D-80. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-3UA

Note: Well was abandoned 3/12/2018.

North Indian Bend Wash Superfund Site

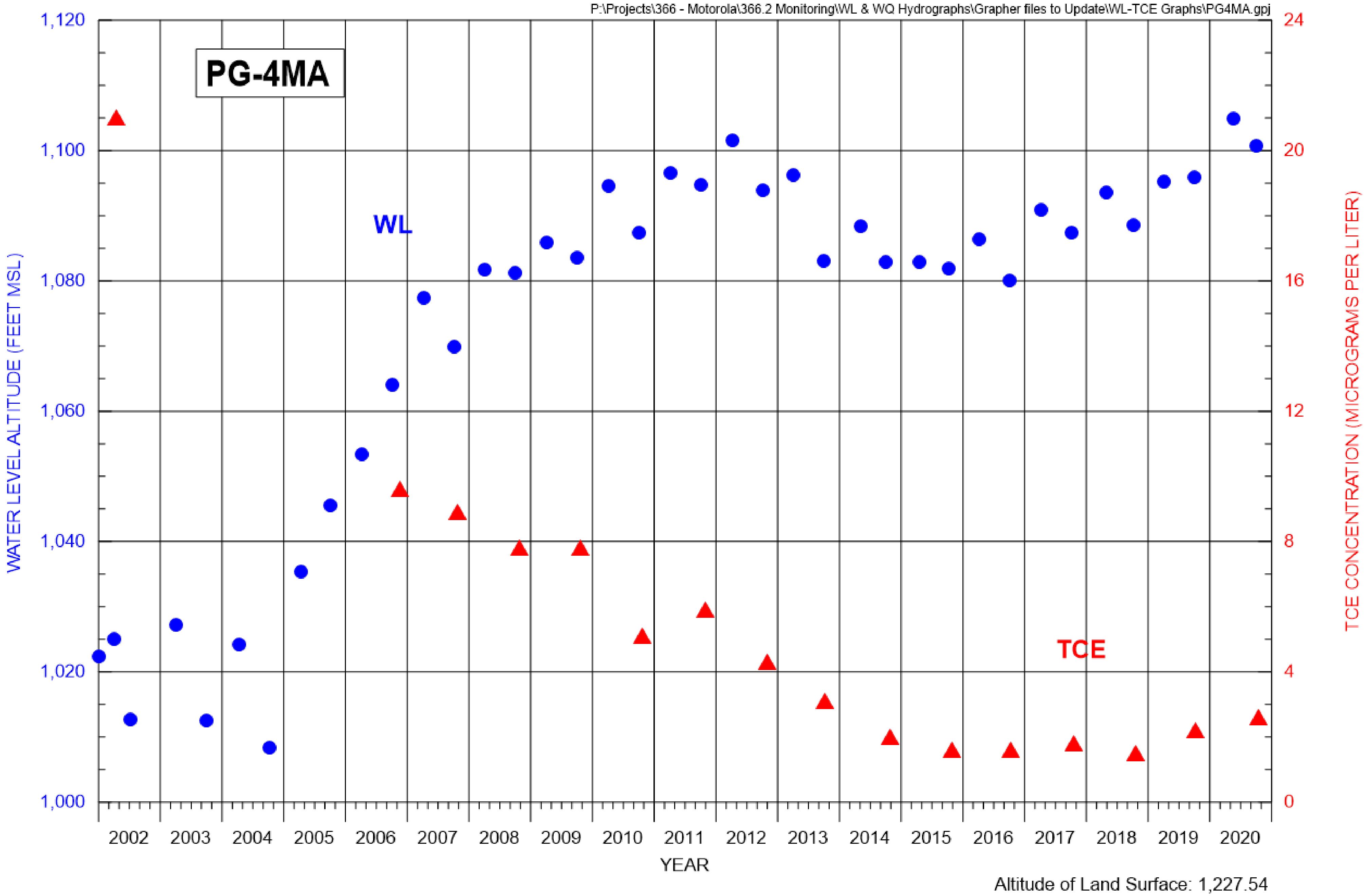


FIGURE D-81. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-4MA

North Indian Bend Wash Superfund Site

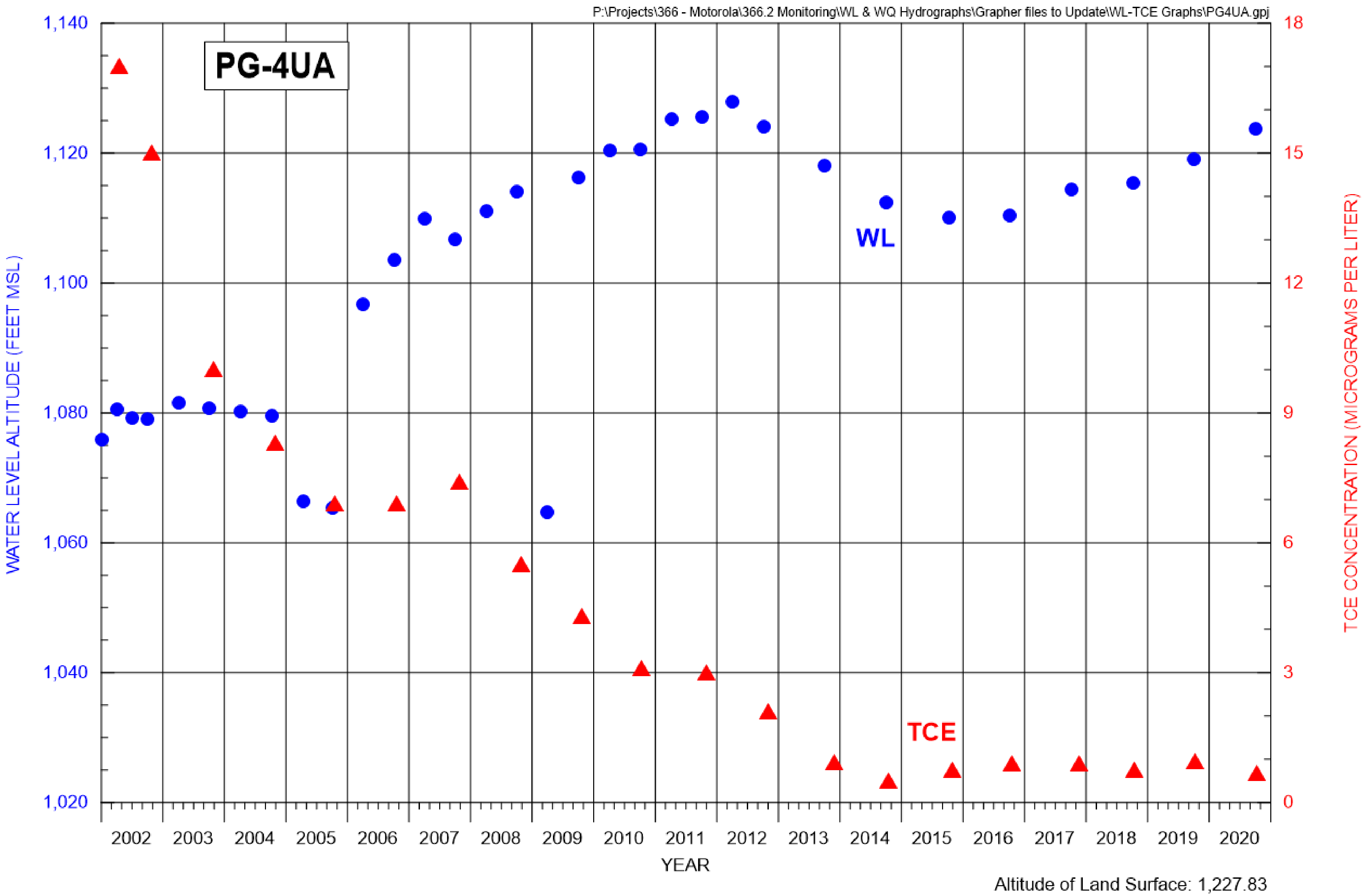


FIGURE D-82. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-4UA

North Indian Bend Wash Superfund Site

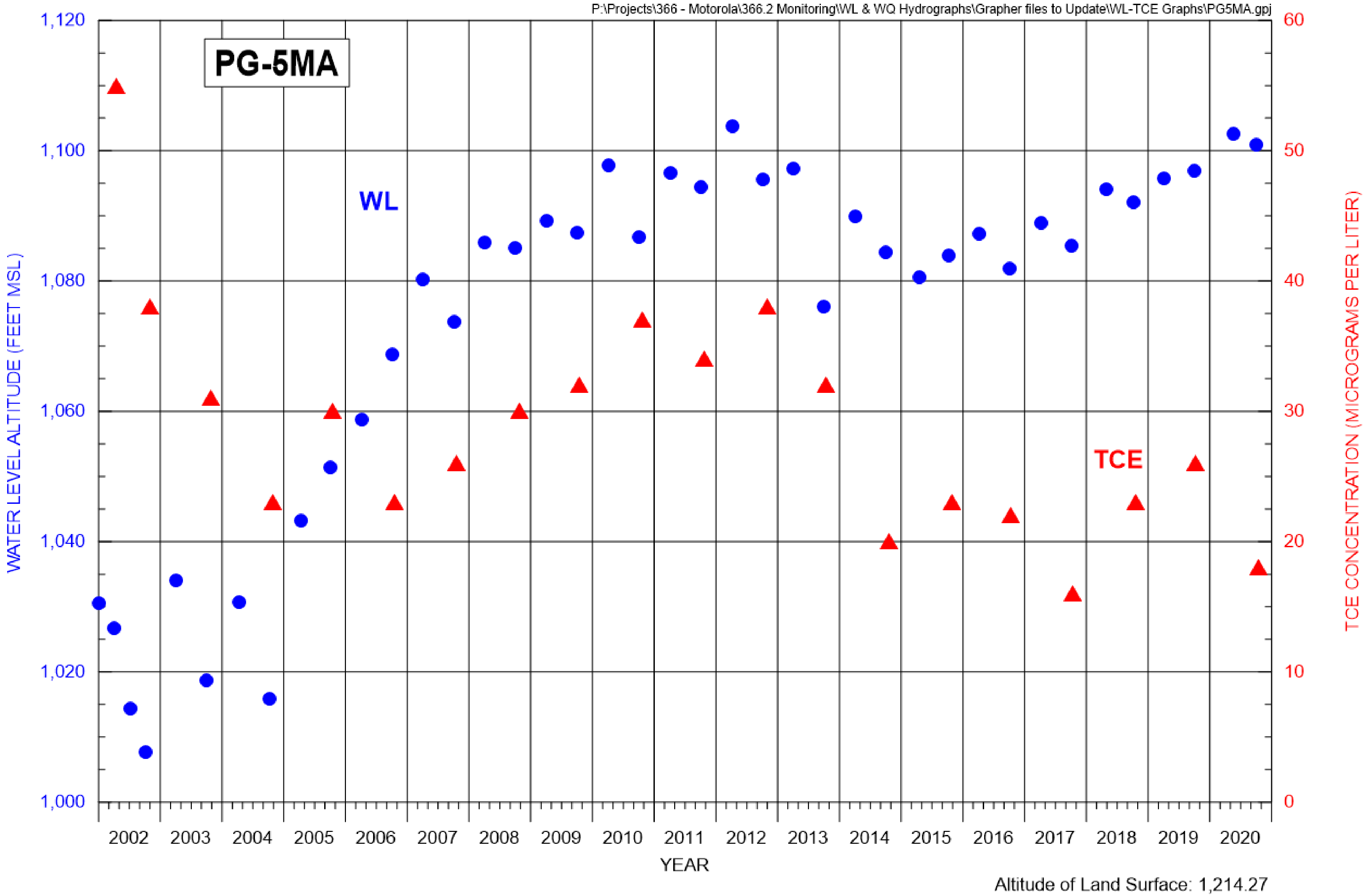


FIGURE D-83. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-5MA

North Indian Bend Wash Superfund Site

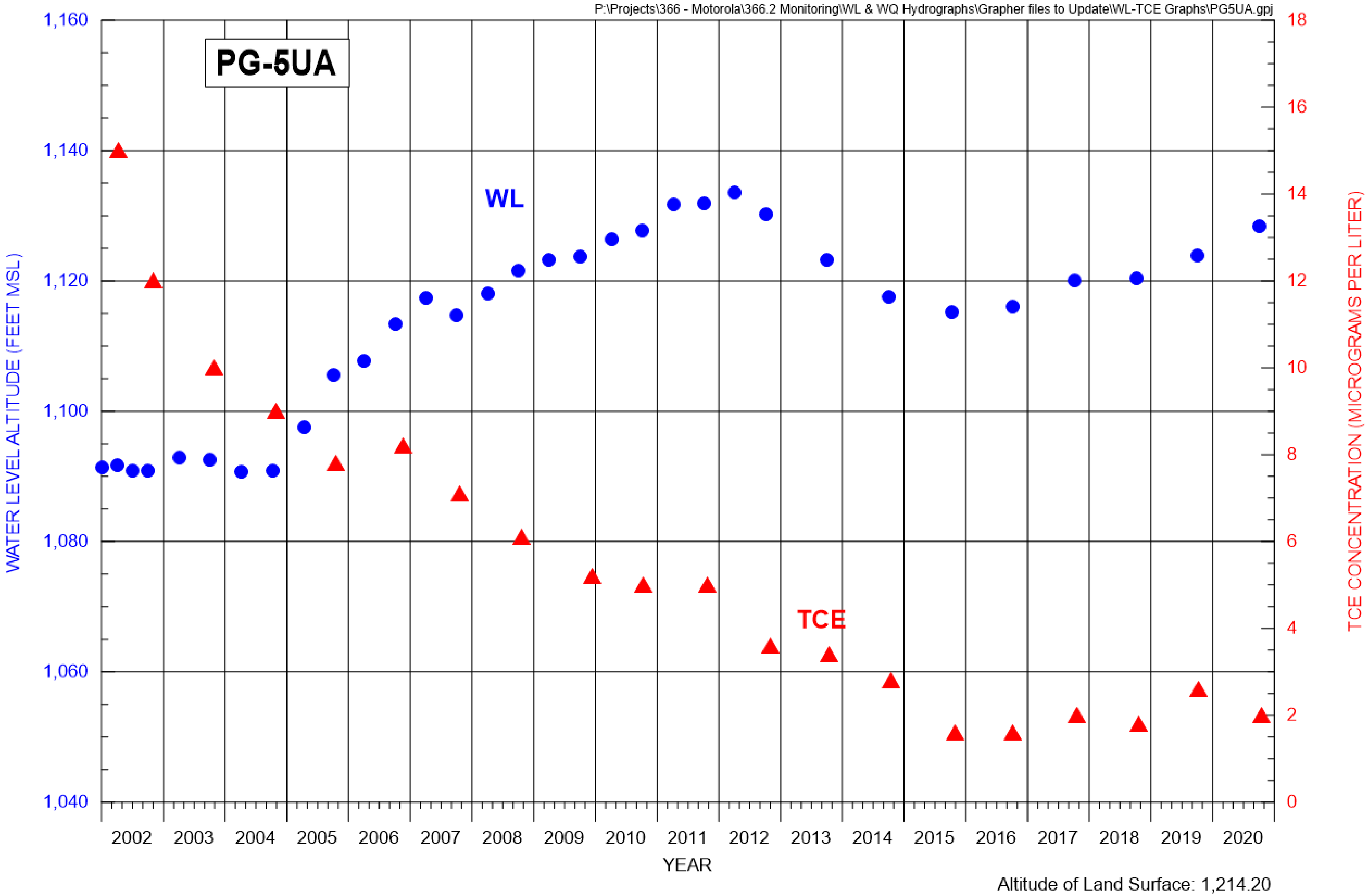


FIGURE D-84. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-5UA

North Indian Bend Wash Superfund Site

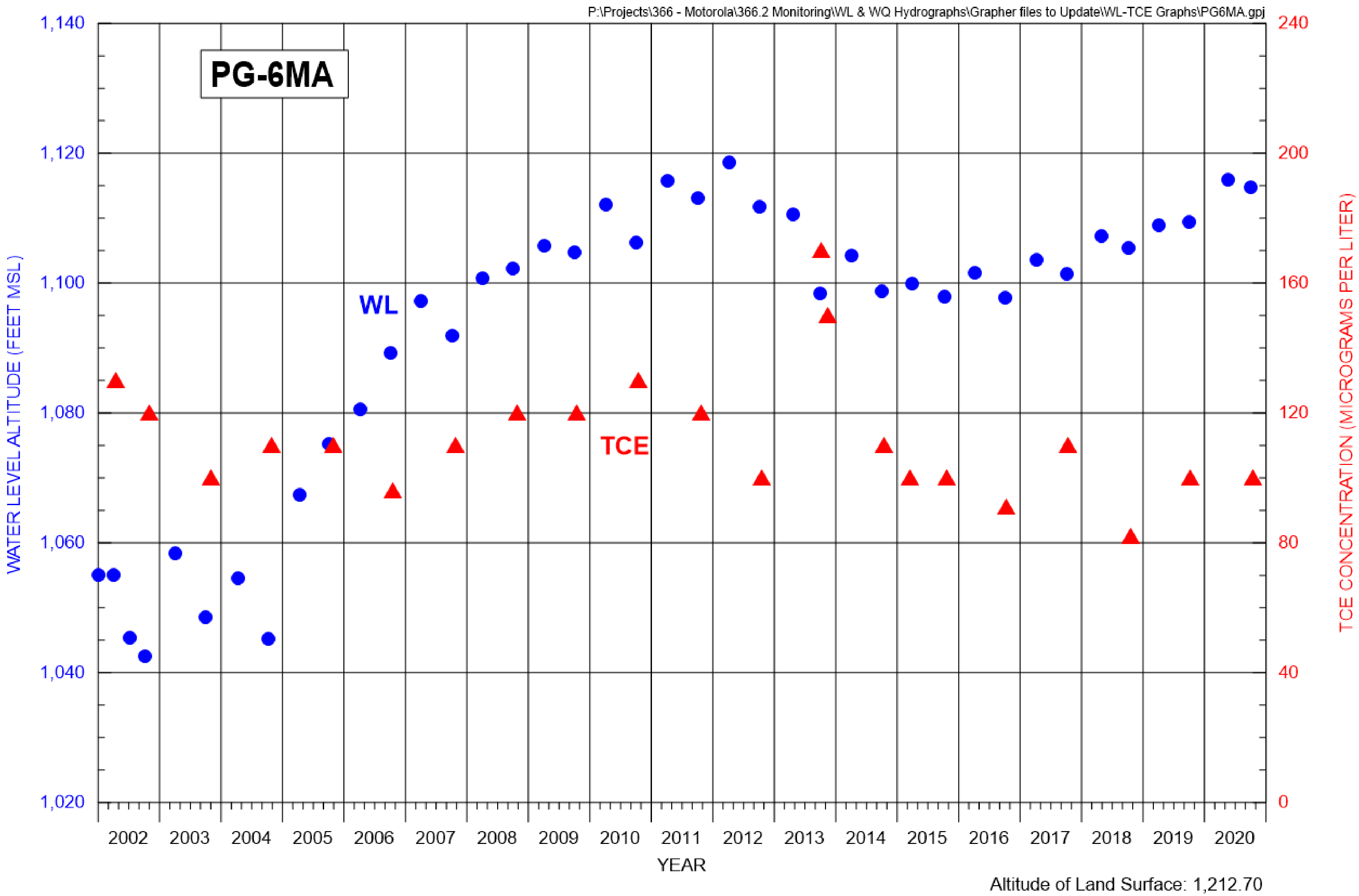


FIGURE D-85. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-6MA

North Indian Bend Wash Superfund Site

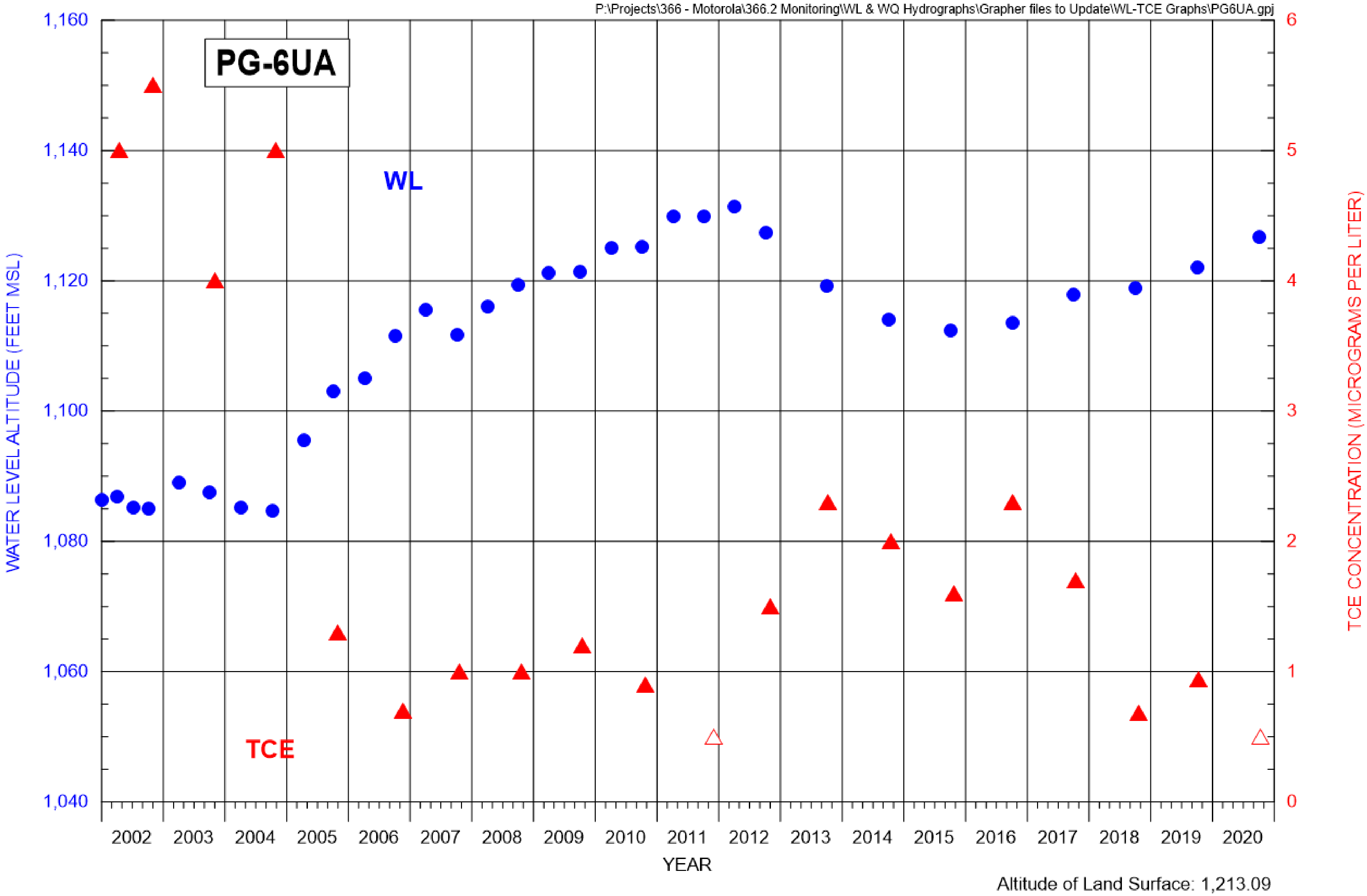


FIGURE D-86. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-6UA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

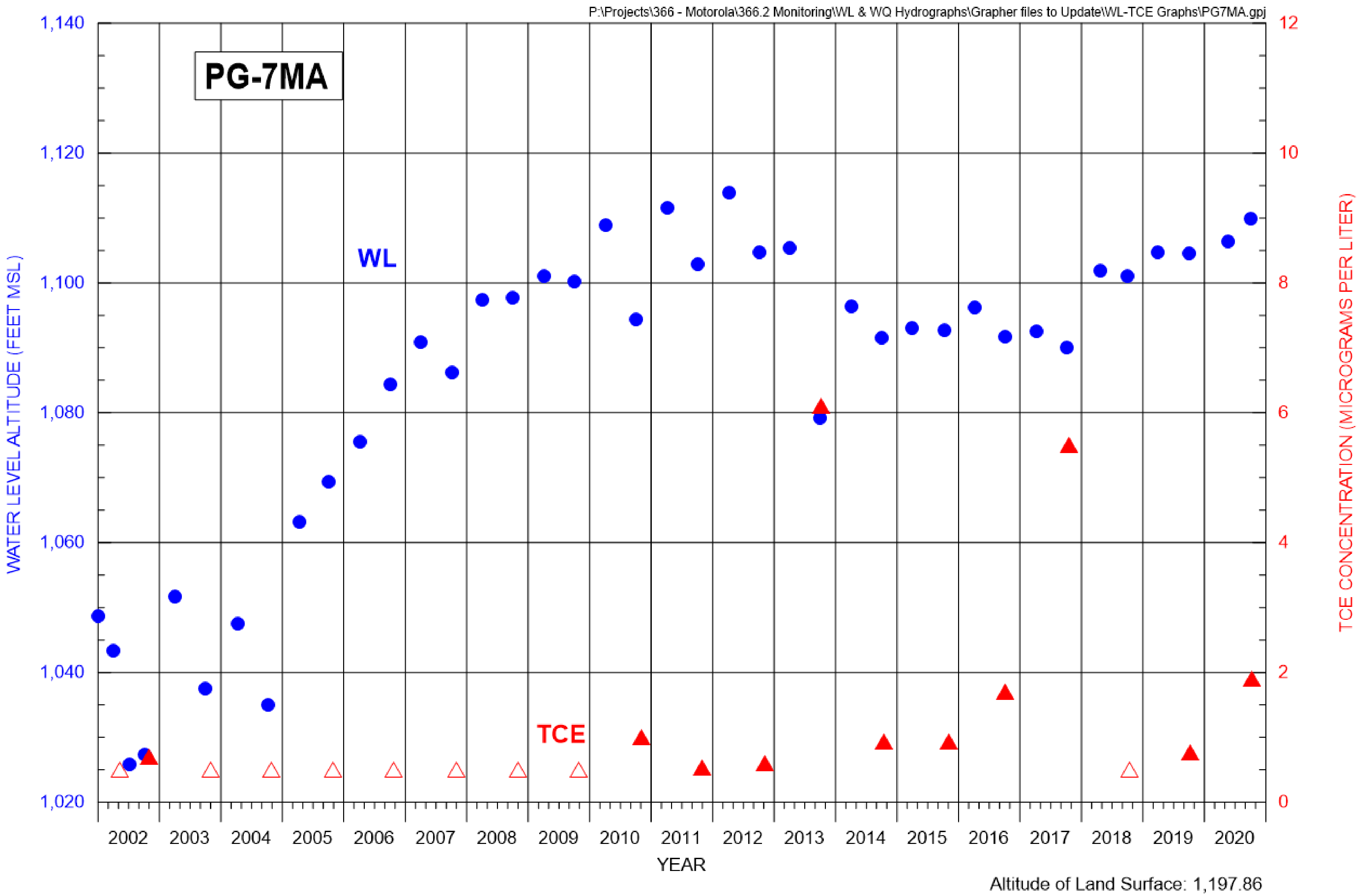
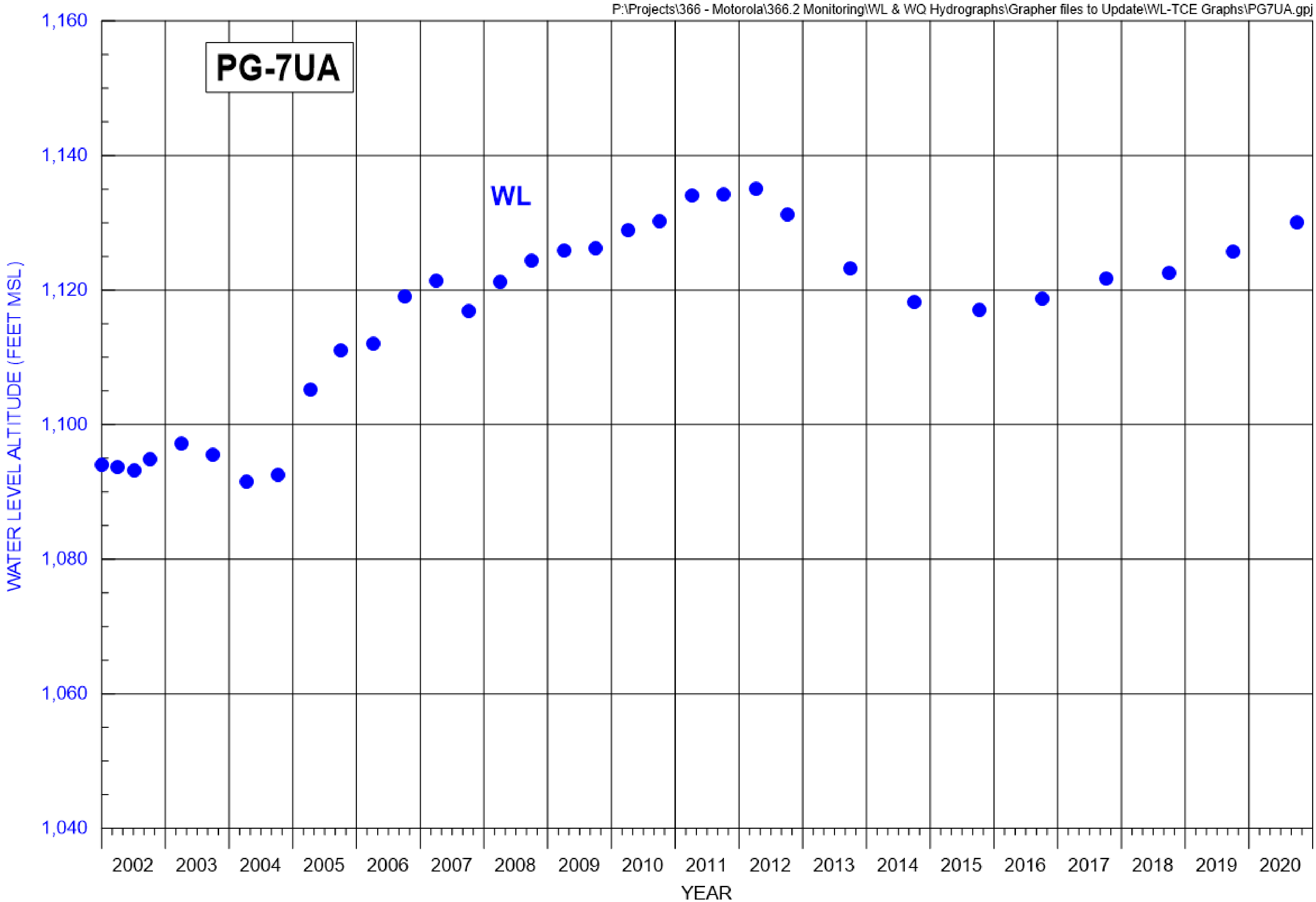


FIGURE D-87. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-7MA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,197.56

FIGURE D-88. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-7UA

North Indian Bend Wash Superfund Site

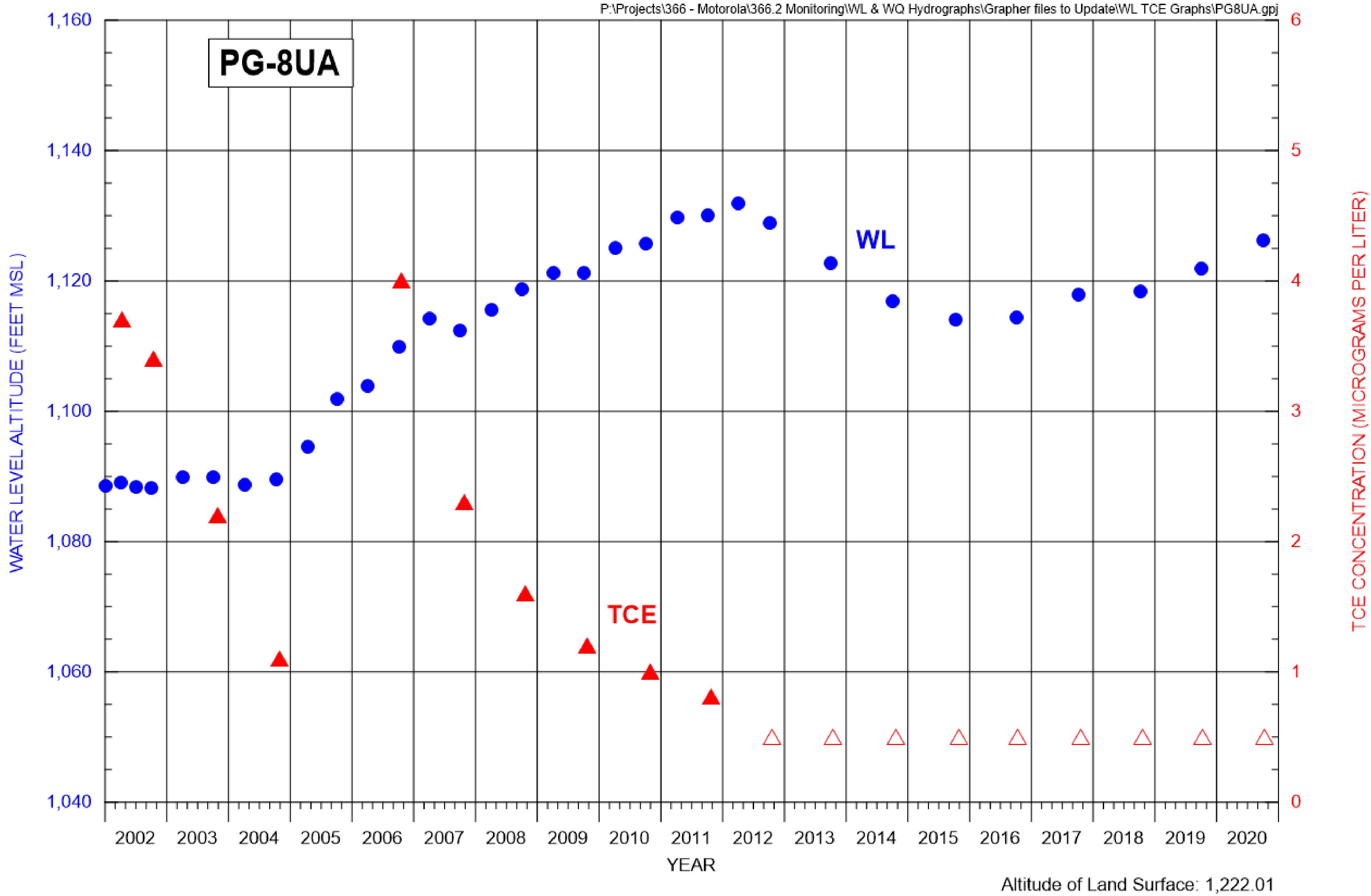


FIGURE D-89. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-8UA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

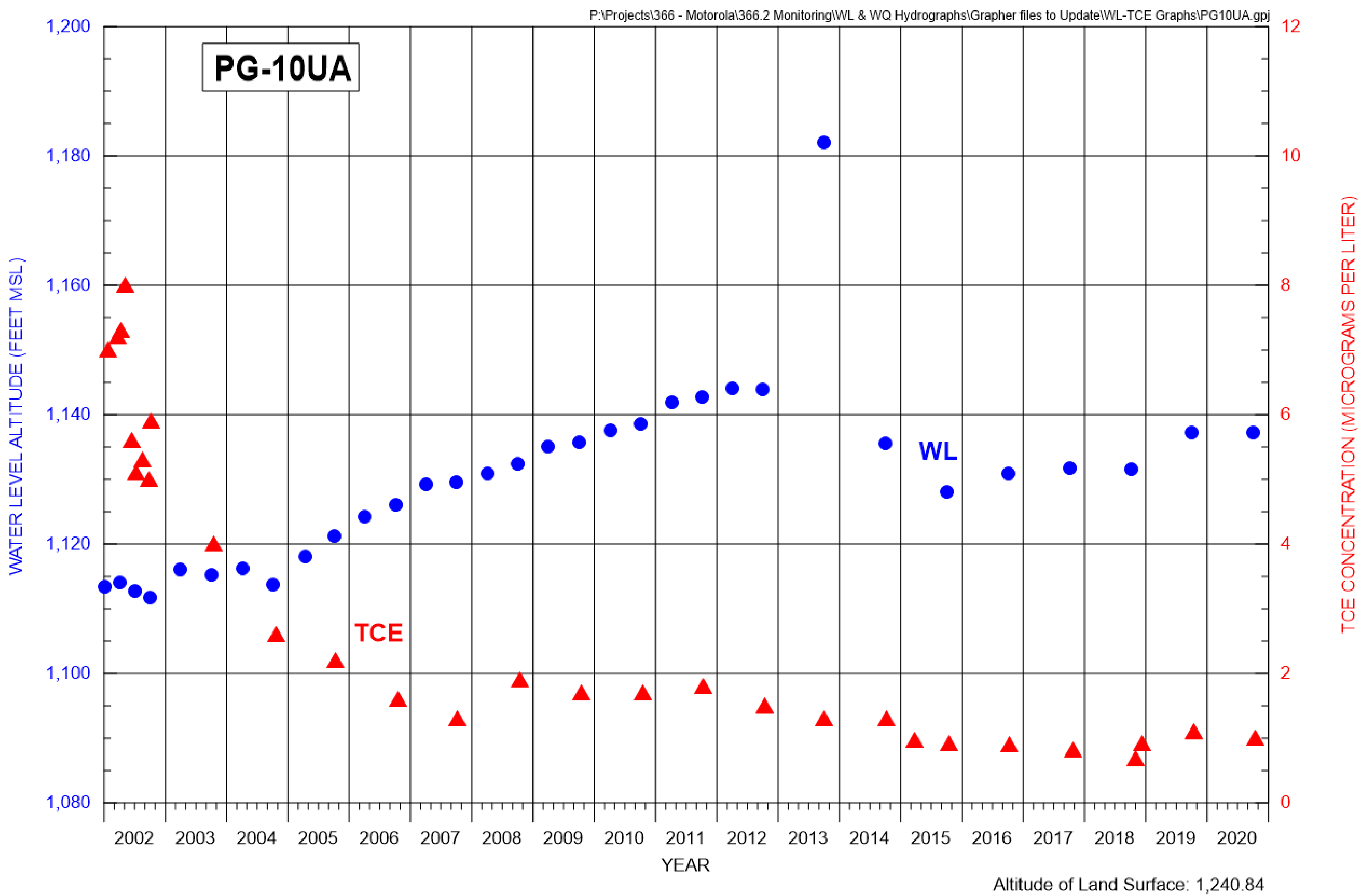


FIGURE D-90. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-10UA

North Indian Bend Wash Superfund Site

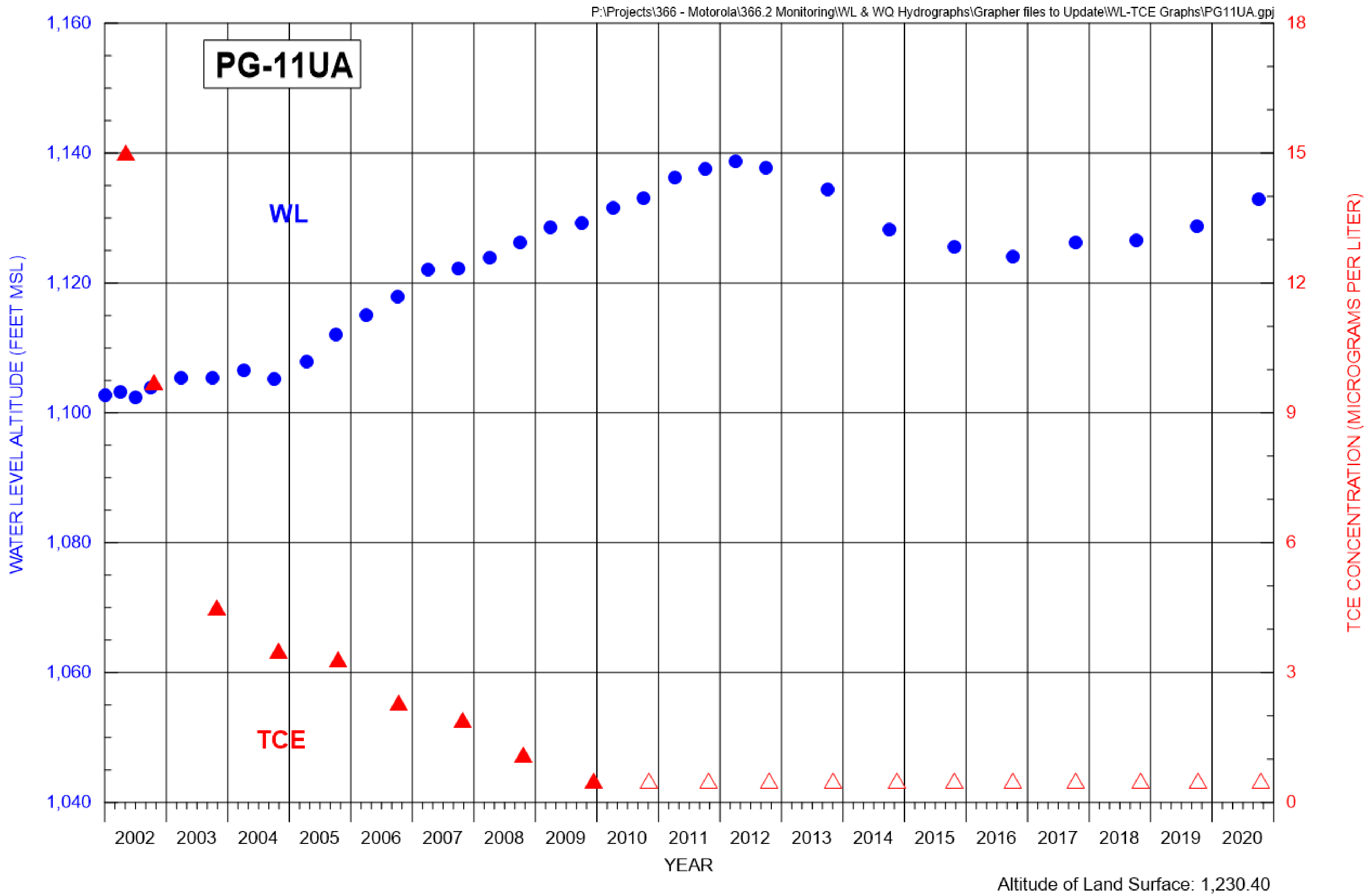


FIGURE D-91. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-11UA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

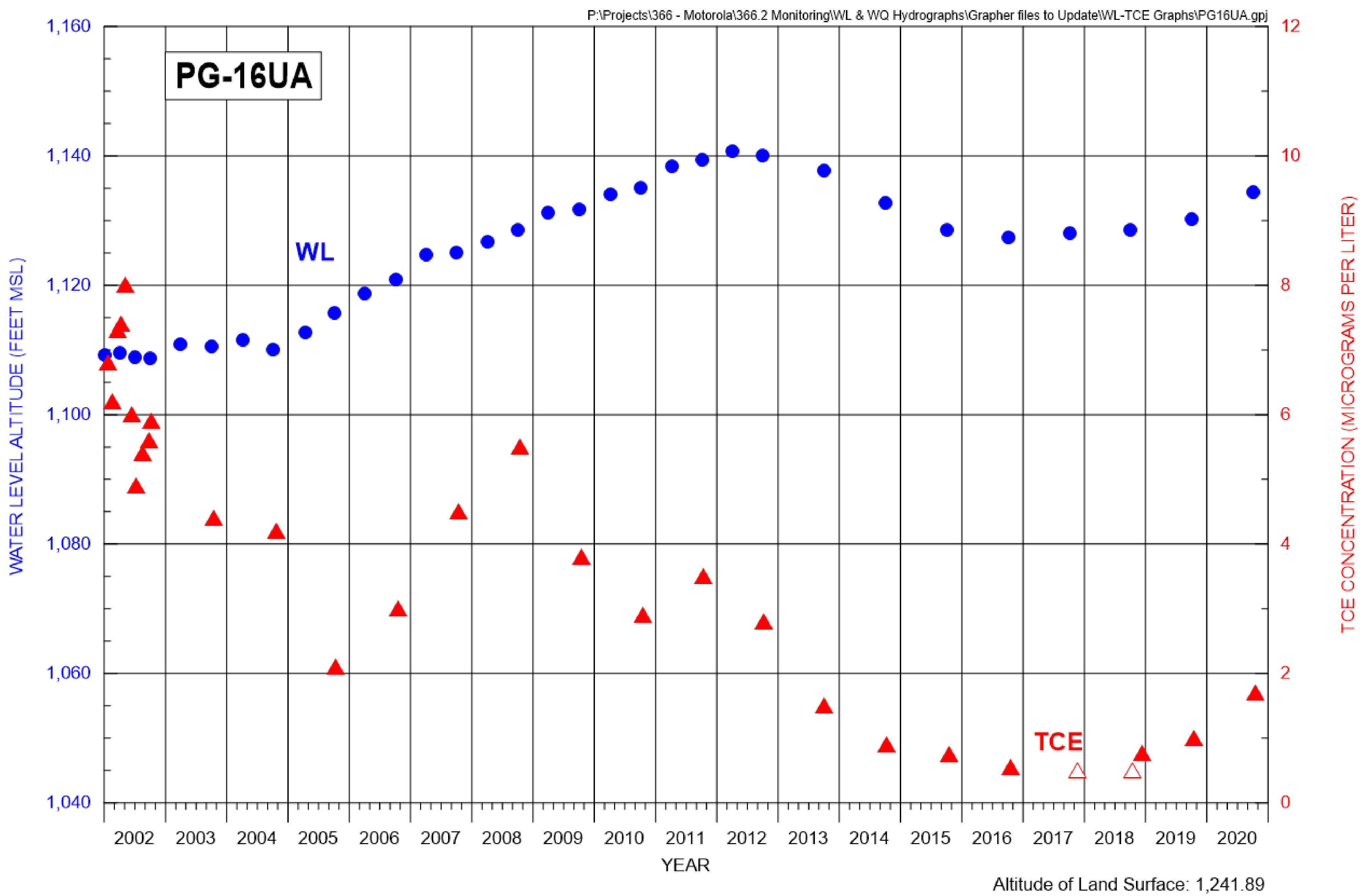


FIGURE D-92. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-16UA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

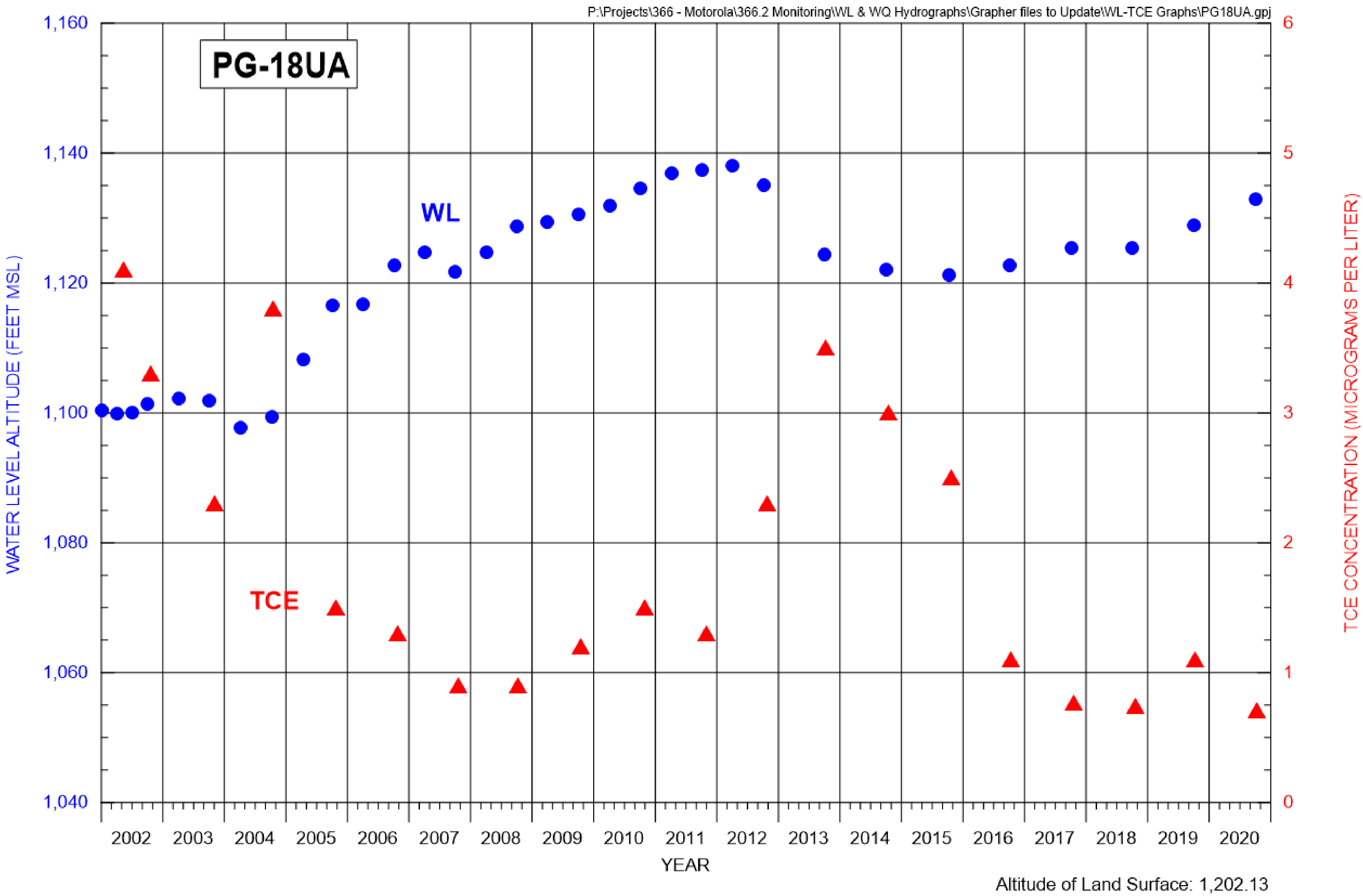


FIGURE D-93. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-18UA

North Indian Bend Wash Superfund Site

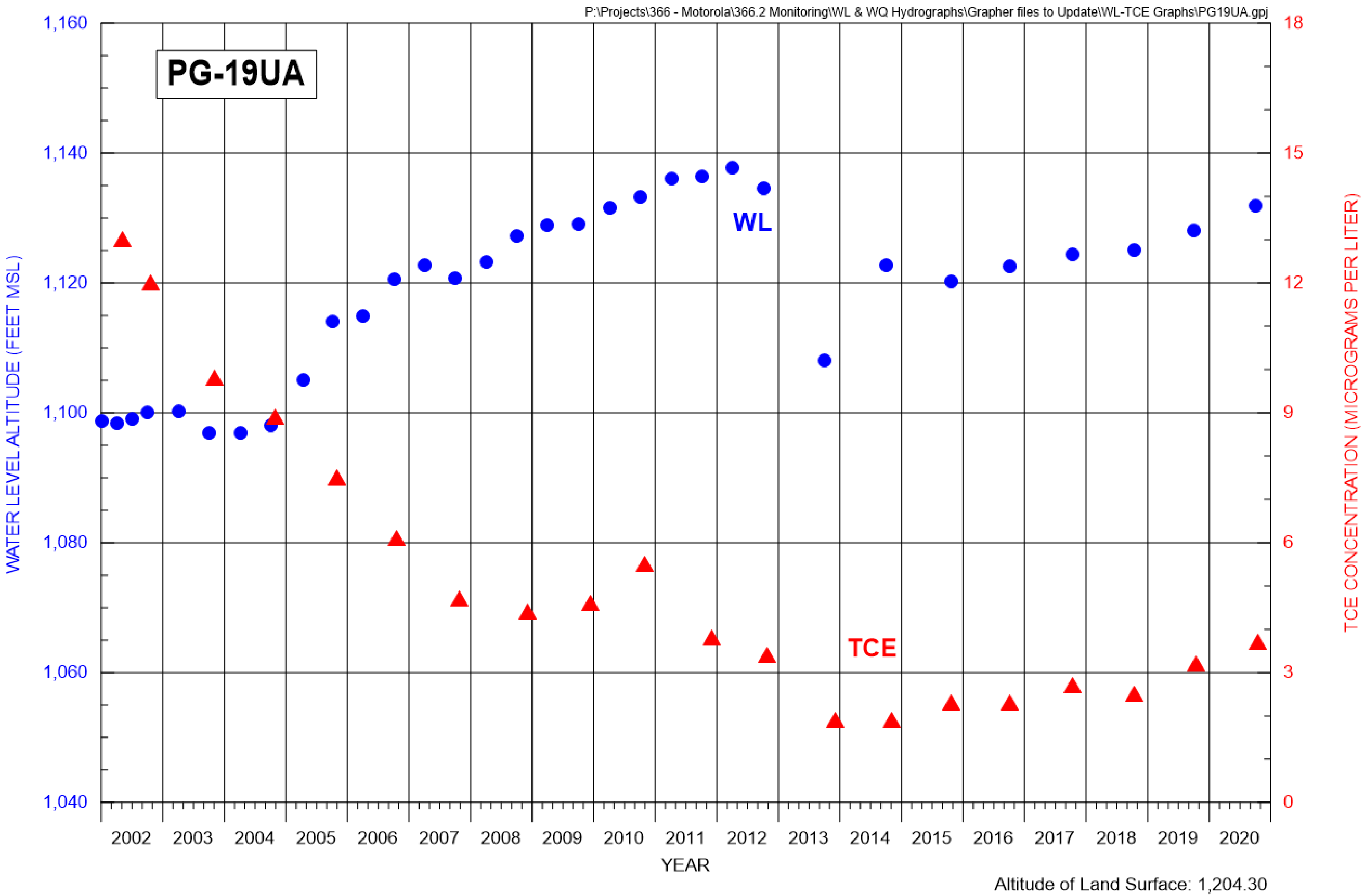


FIGURE D-94. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-19UA

North Indian Bend Wash Superfund Site

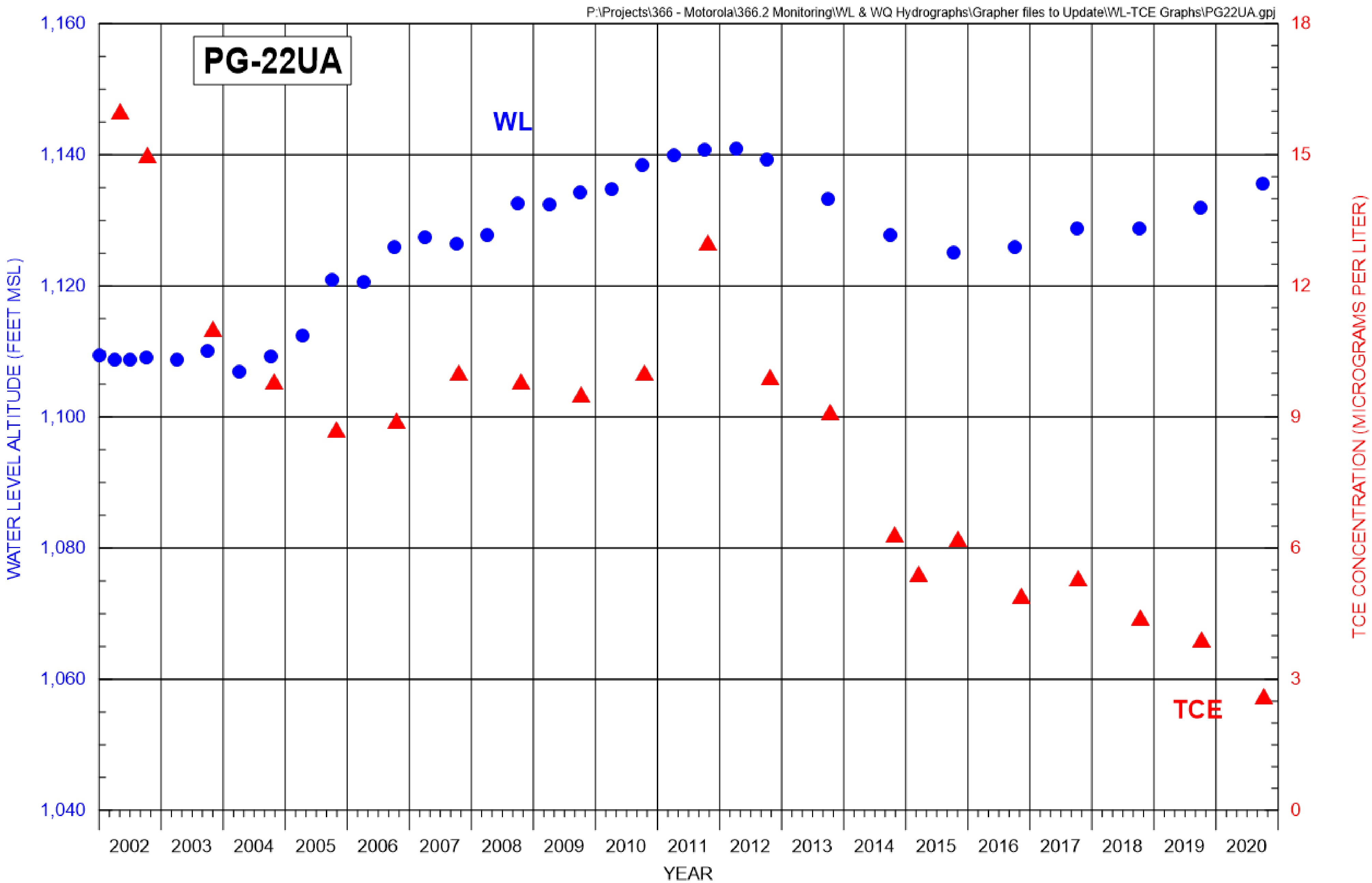


FIGURE D-95. WATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-22UA

North Indian Bend Wash Superfund Site

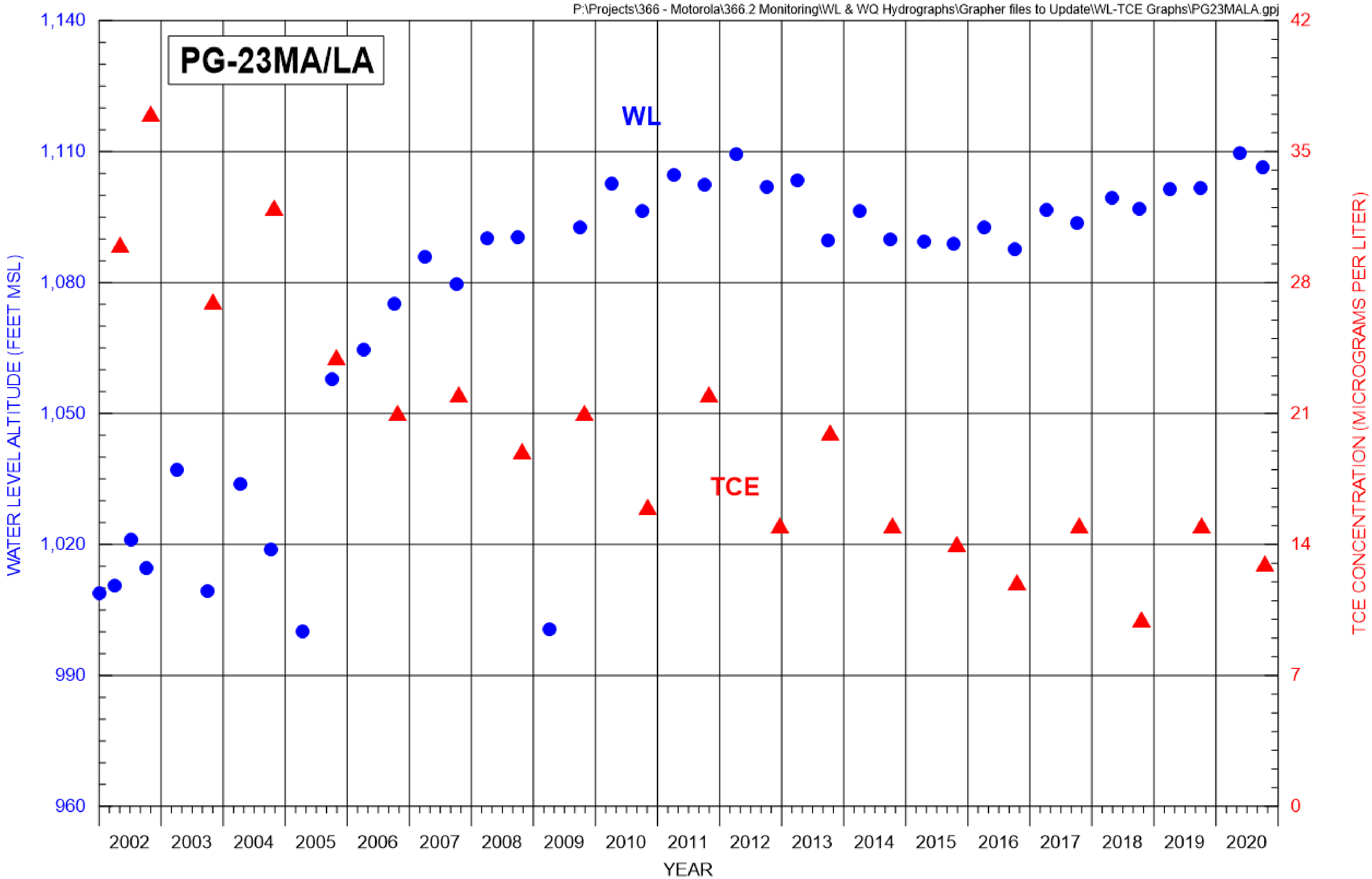


FIGURE D-96. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-23MA/LA

North Indian Bend Wash Superfund Site

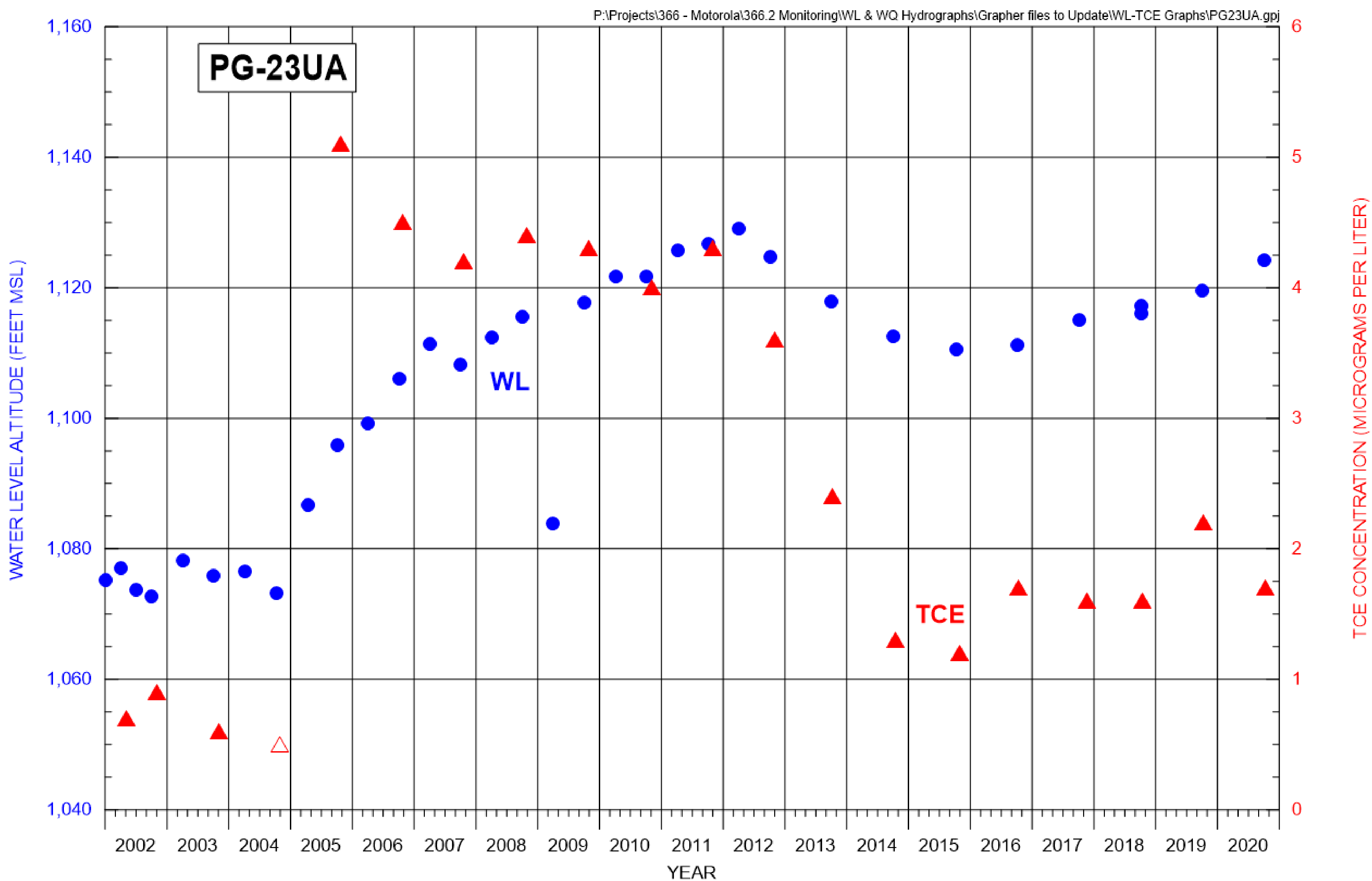
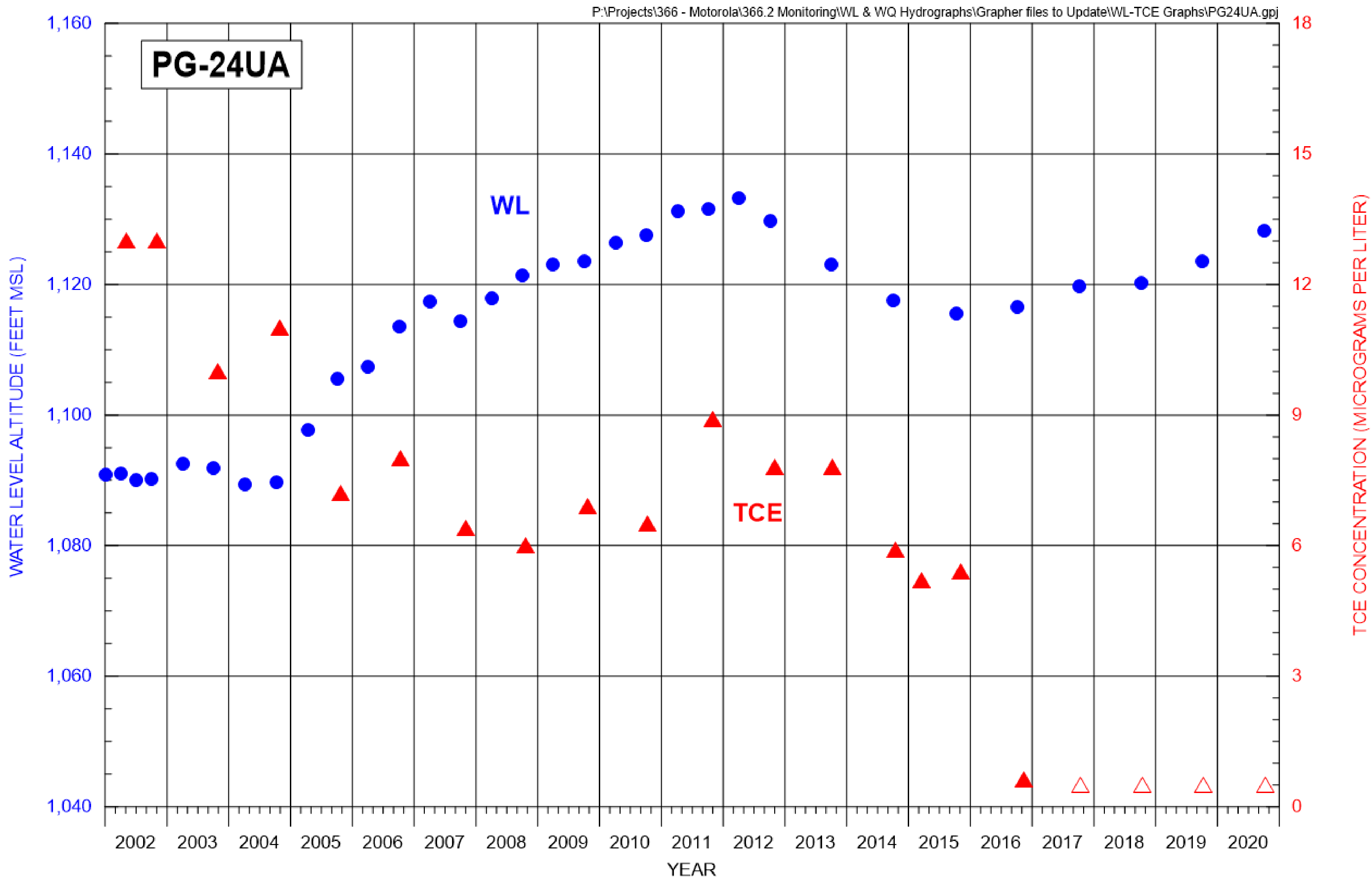


FIGURE D-97. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-23UA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,212.22

FIGURE D-98. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-24UA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

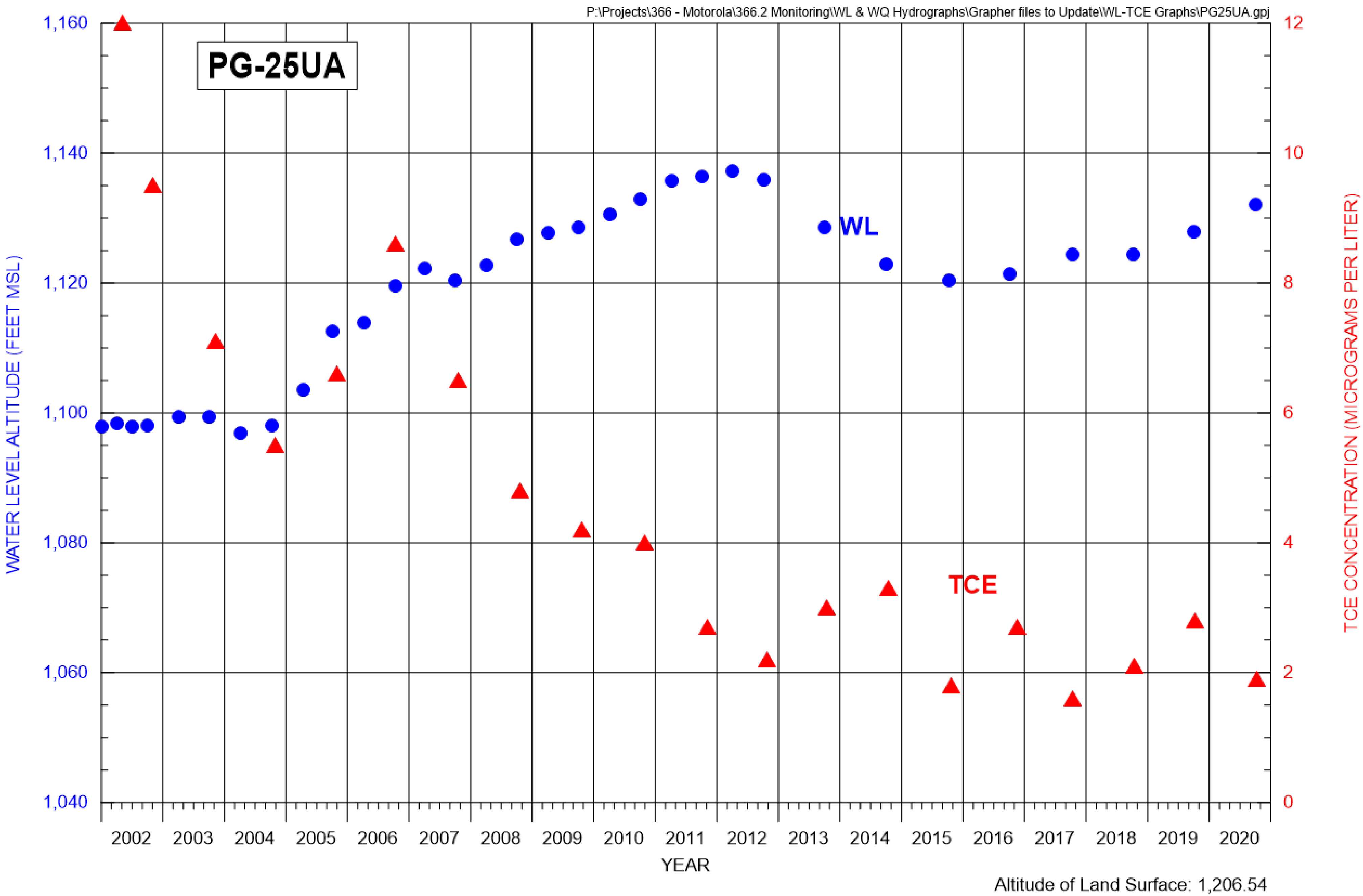


FIGURE D-99. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-25UA

North Indian Bend Wash Superfund Site

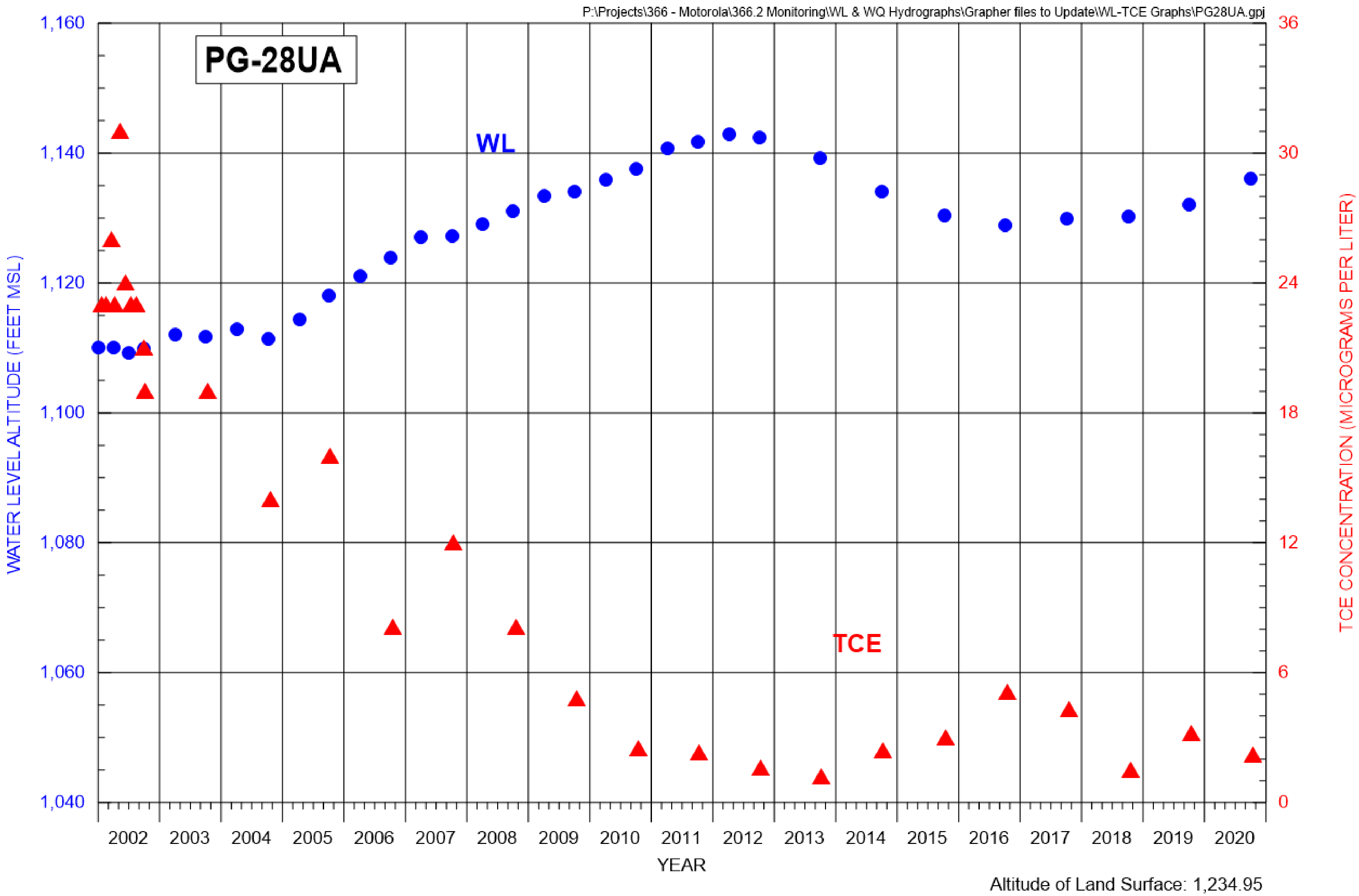


FIGURE D-100. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-28UA

North Indian Bend Wash Superfund Site

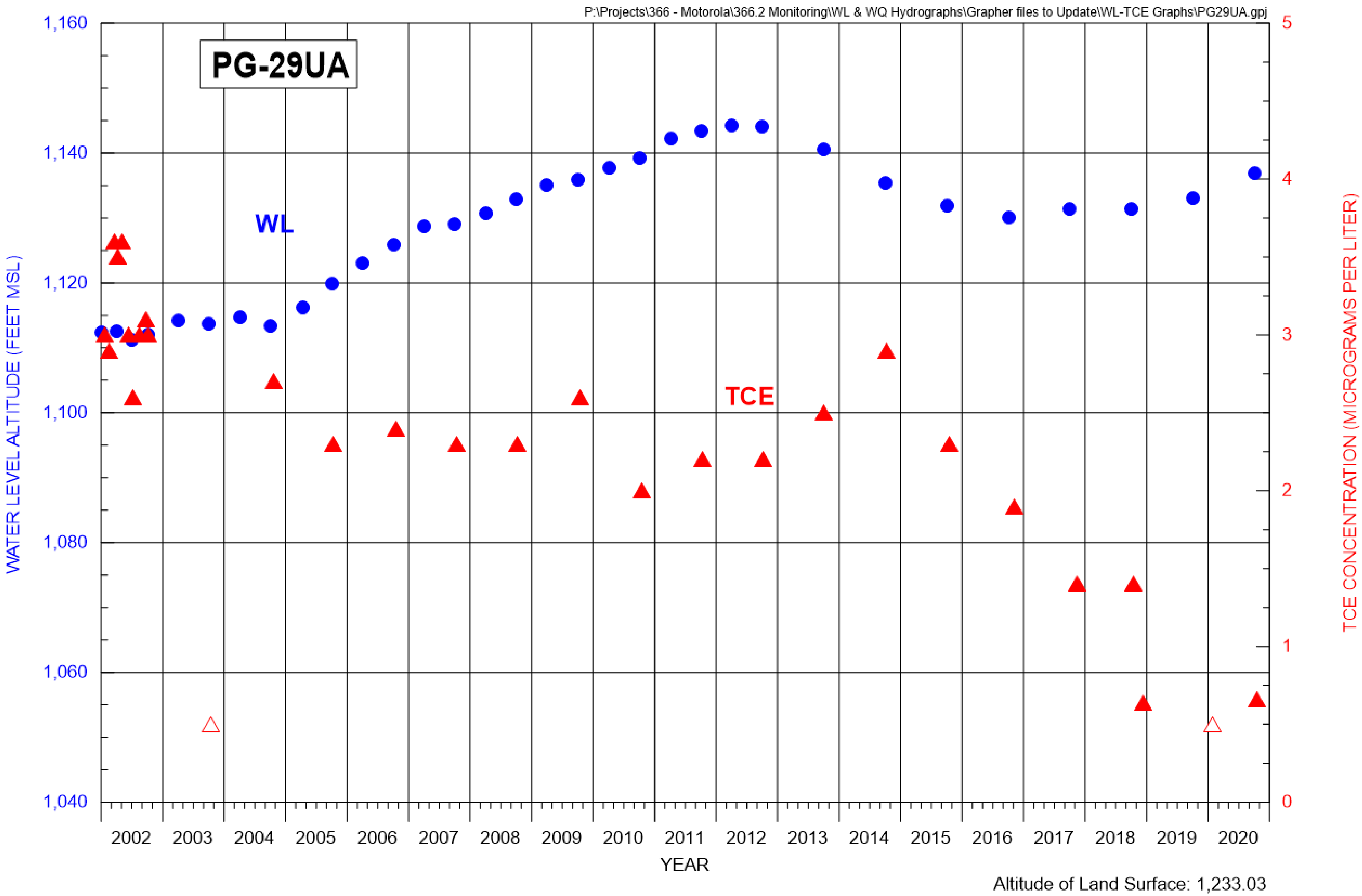


FIGURE D-101. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-29UA

*Note: Sampler was unable to collect water quality sample in October 2019. Sample was collected January 27, 2020.

EXPLANATION
△ TCE Non-Detect
▲ TCE Detected Value

North Indian Bend Wash Superfund Site

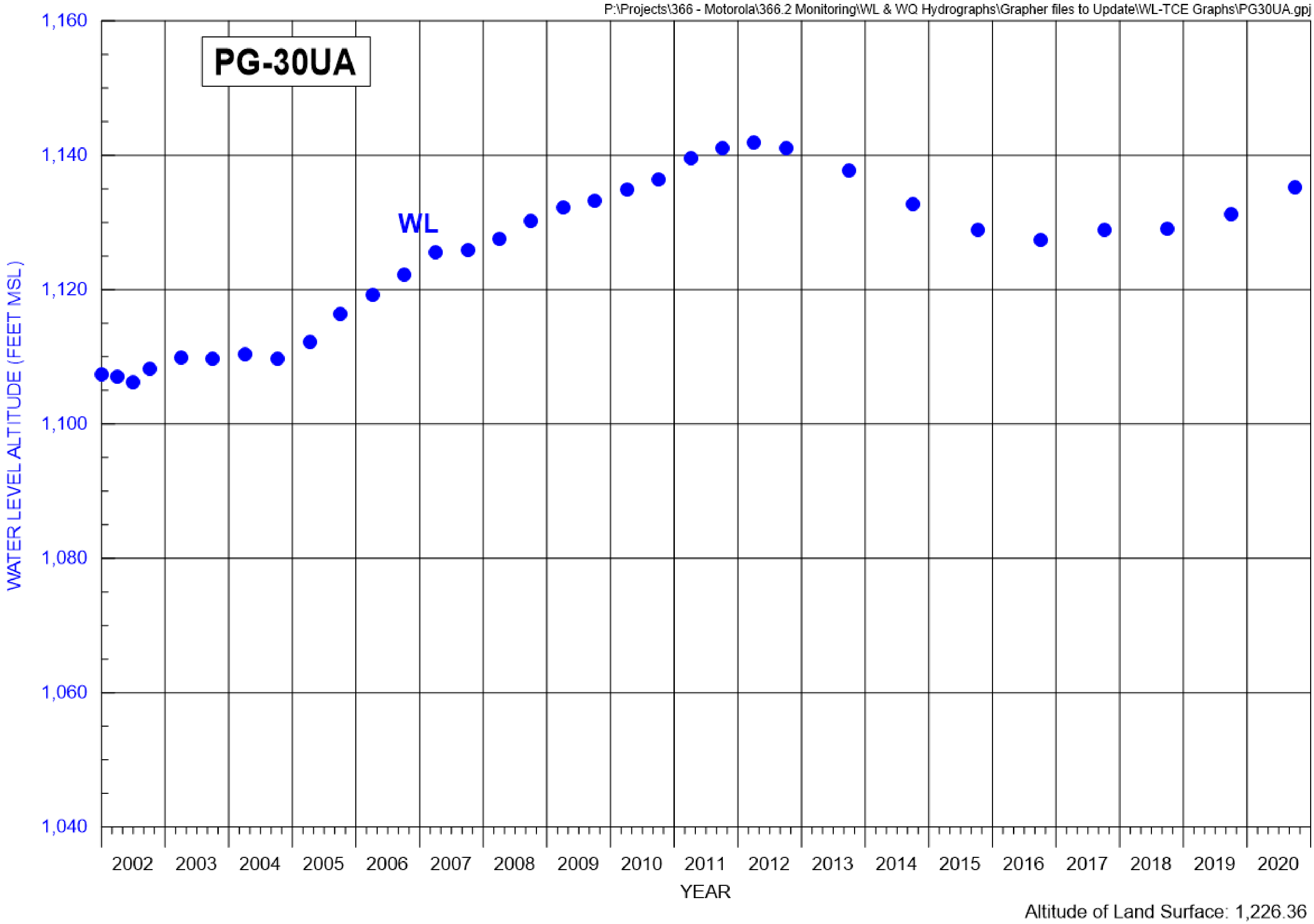
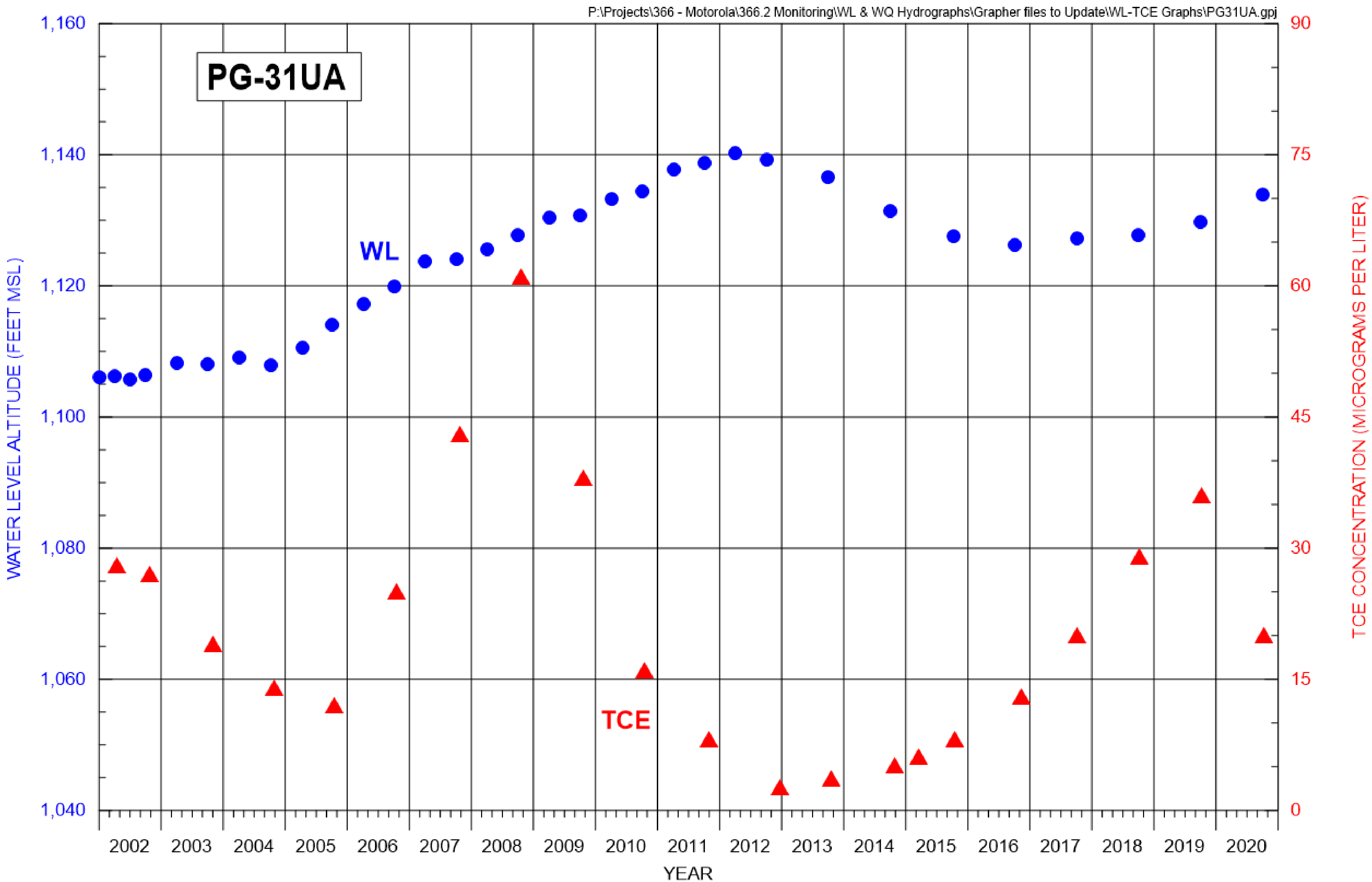


FIGURE D-102. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-30UA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,235.45

FIGURE D-103. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-31UA

North Indian Bend Wash Superfund Site

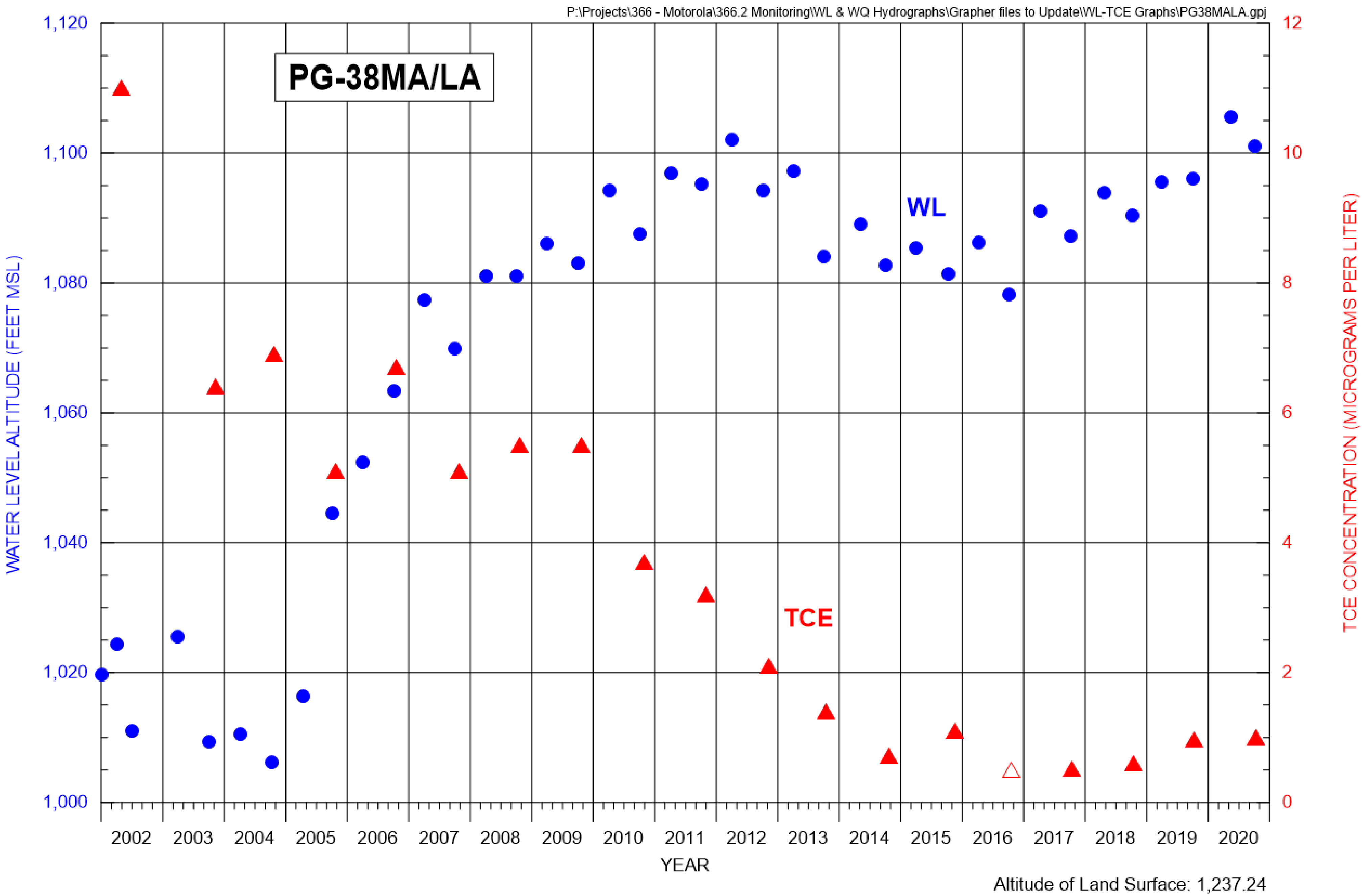
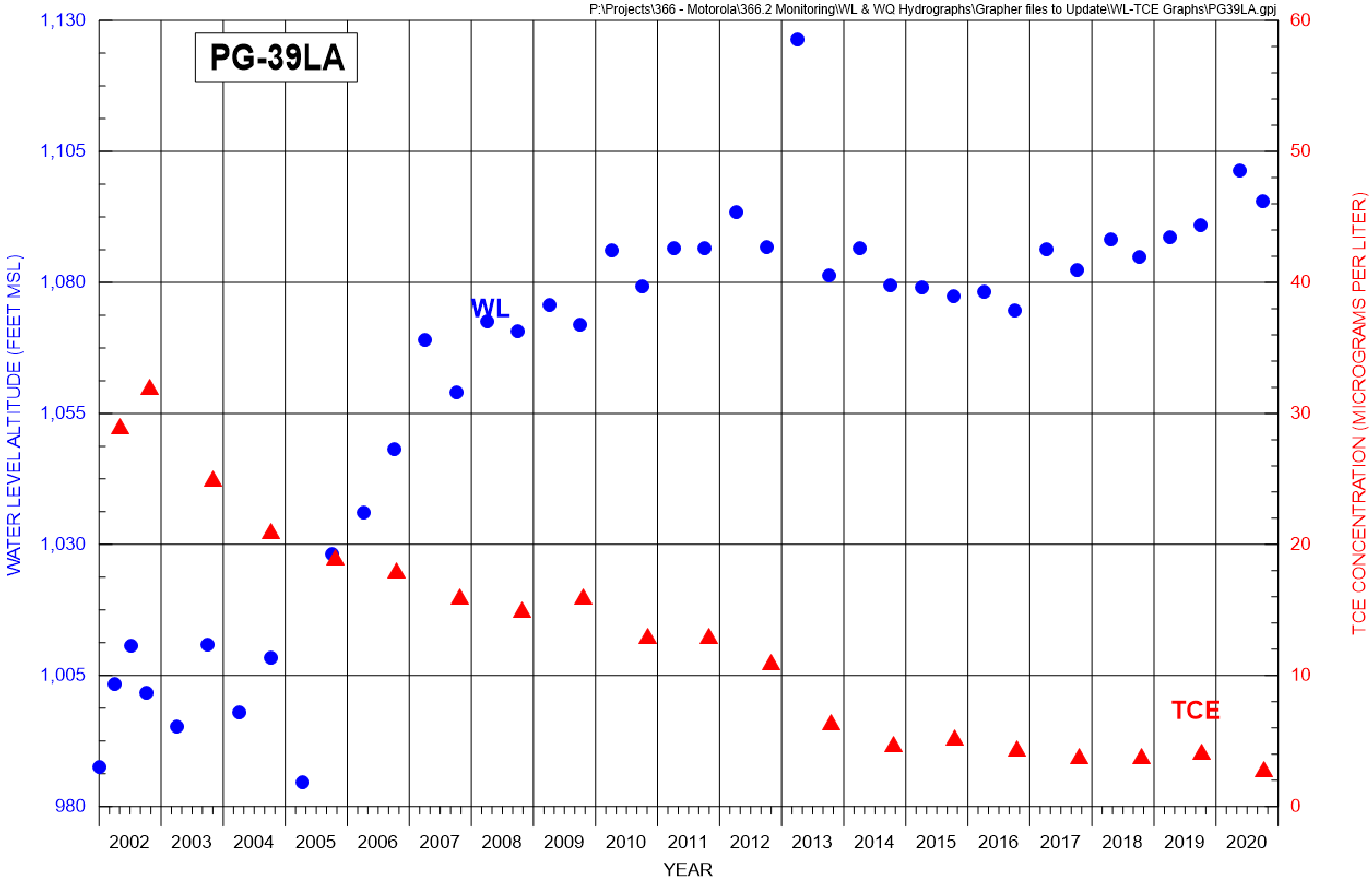


FIGURE D-104. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-38MA/LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,232.58

FIGURE D-105. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-39LA

North Indian Bend Wash Superfund Site

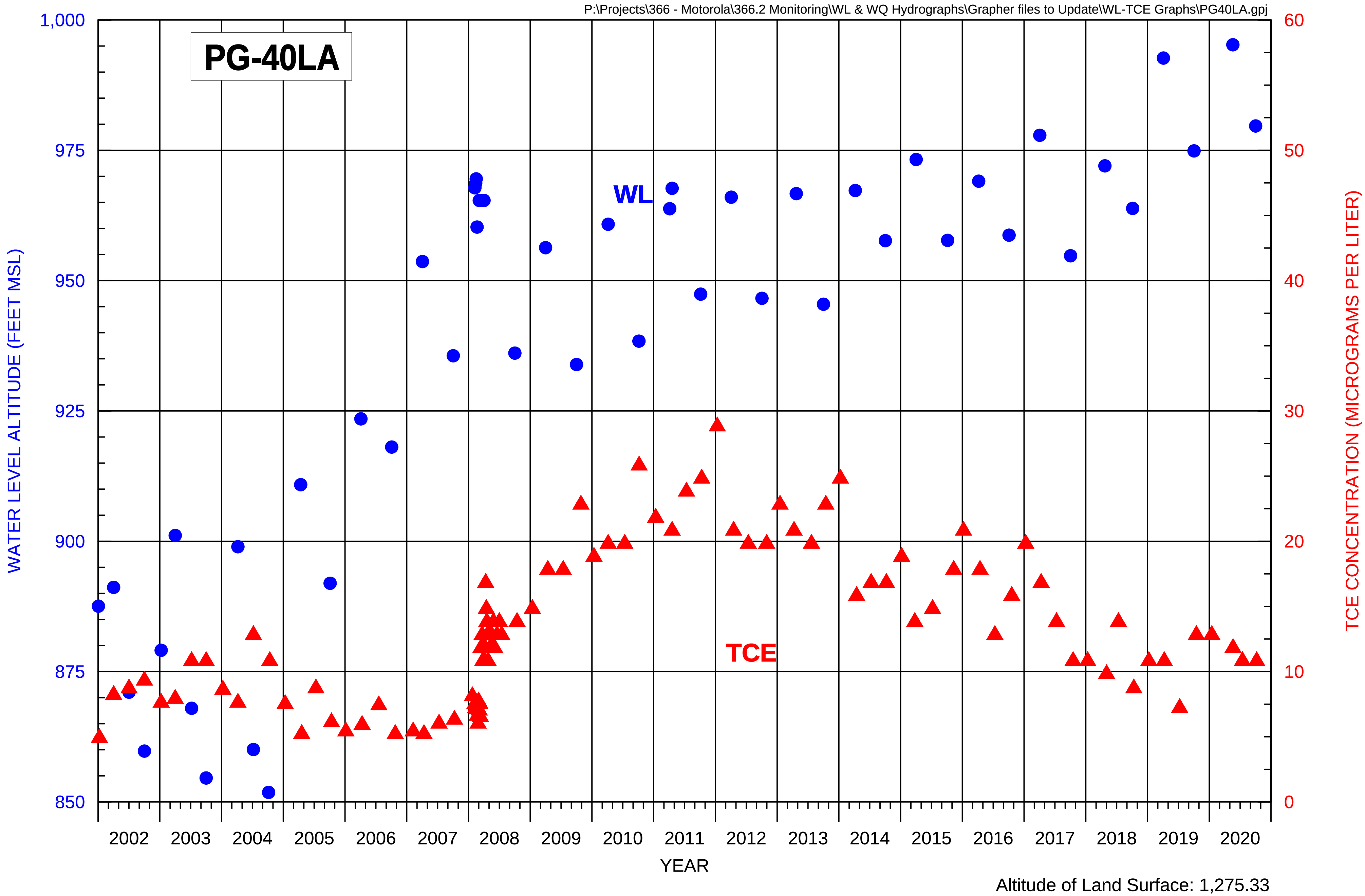


FIGURE D-106. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-40LA

North Indian Bend Wash Superfund Site

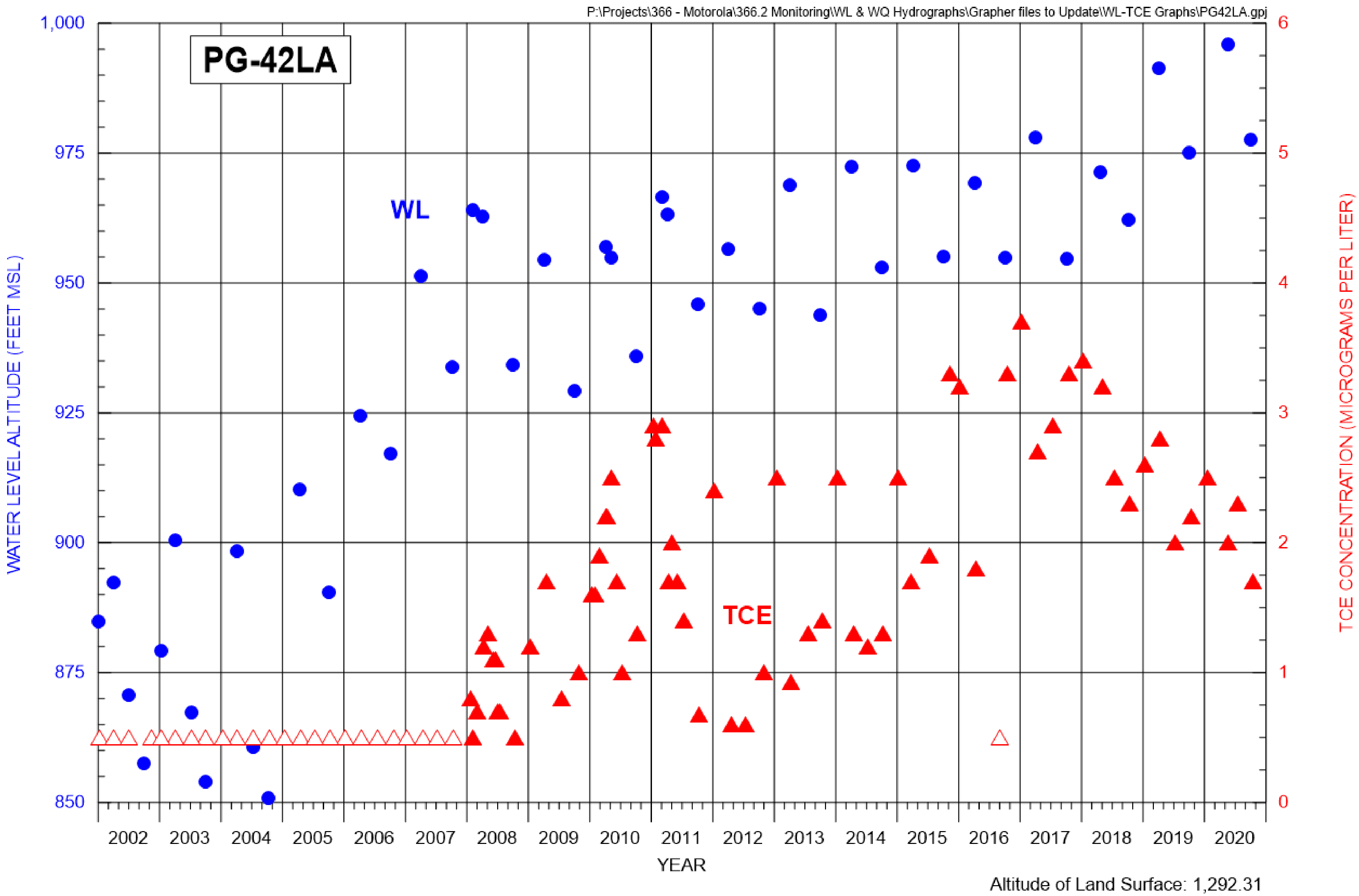


FIGURE D-107. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-42LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

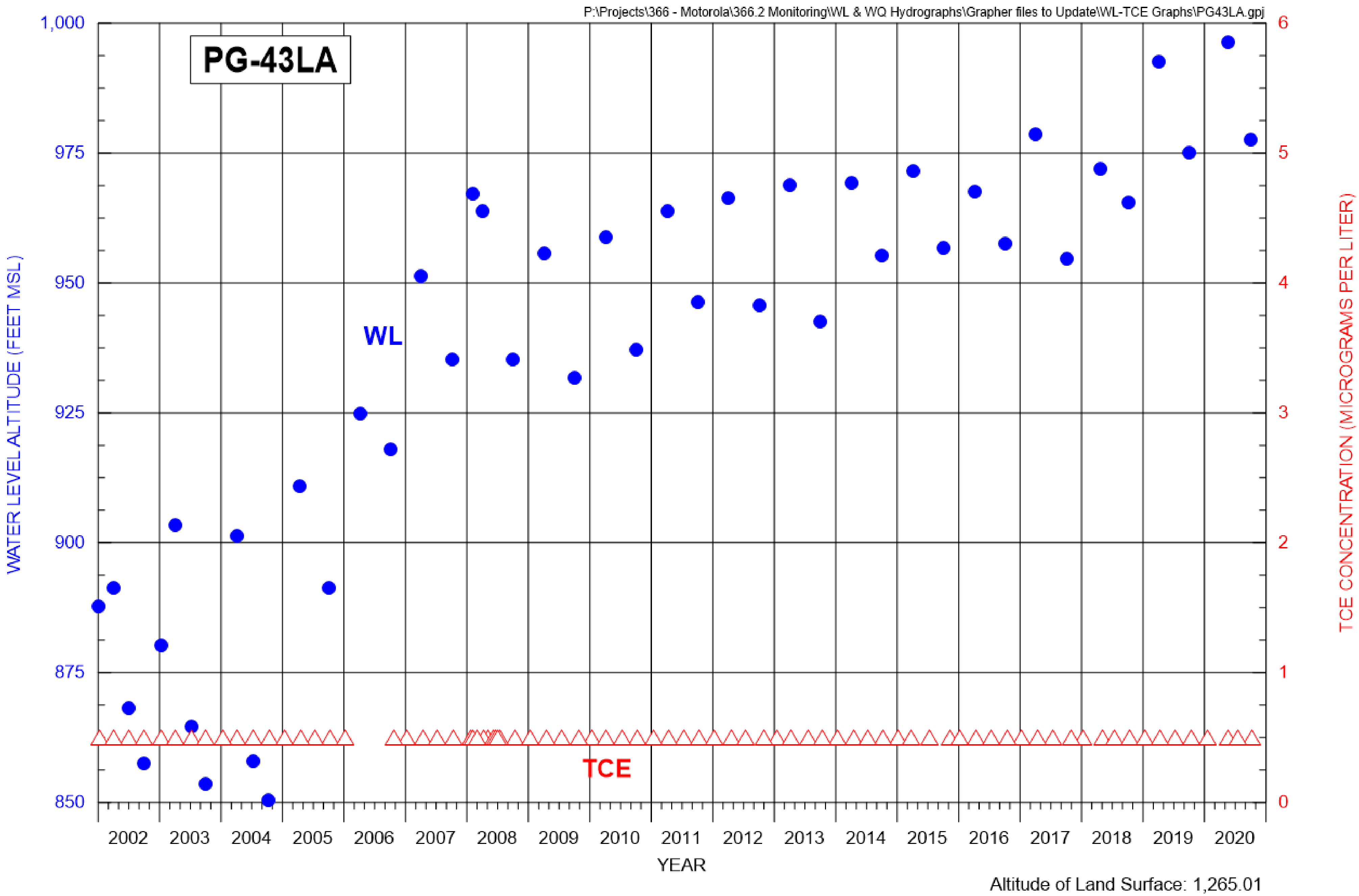


FIGURE D-108. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-43LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

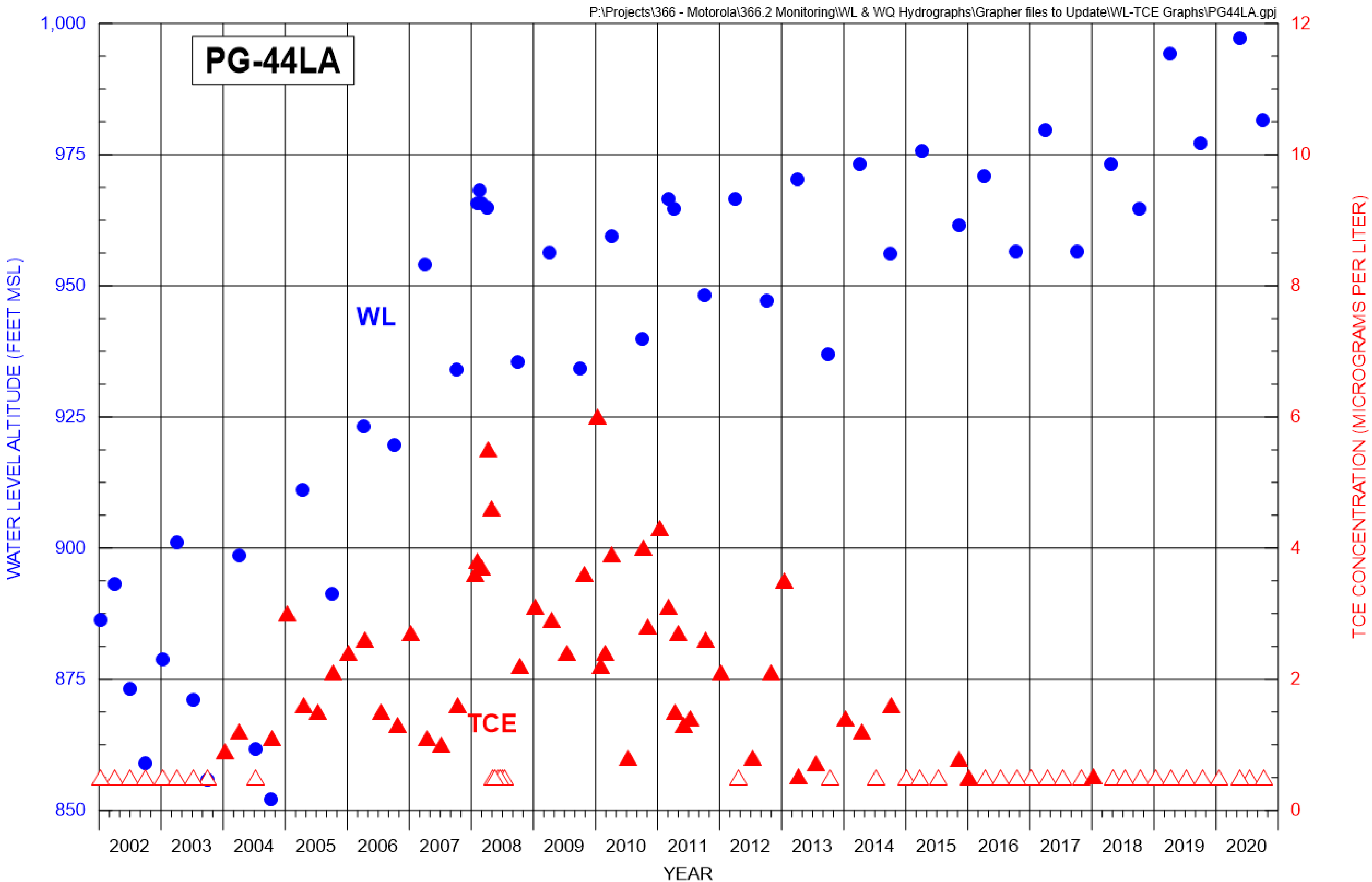
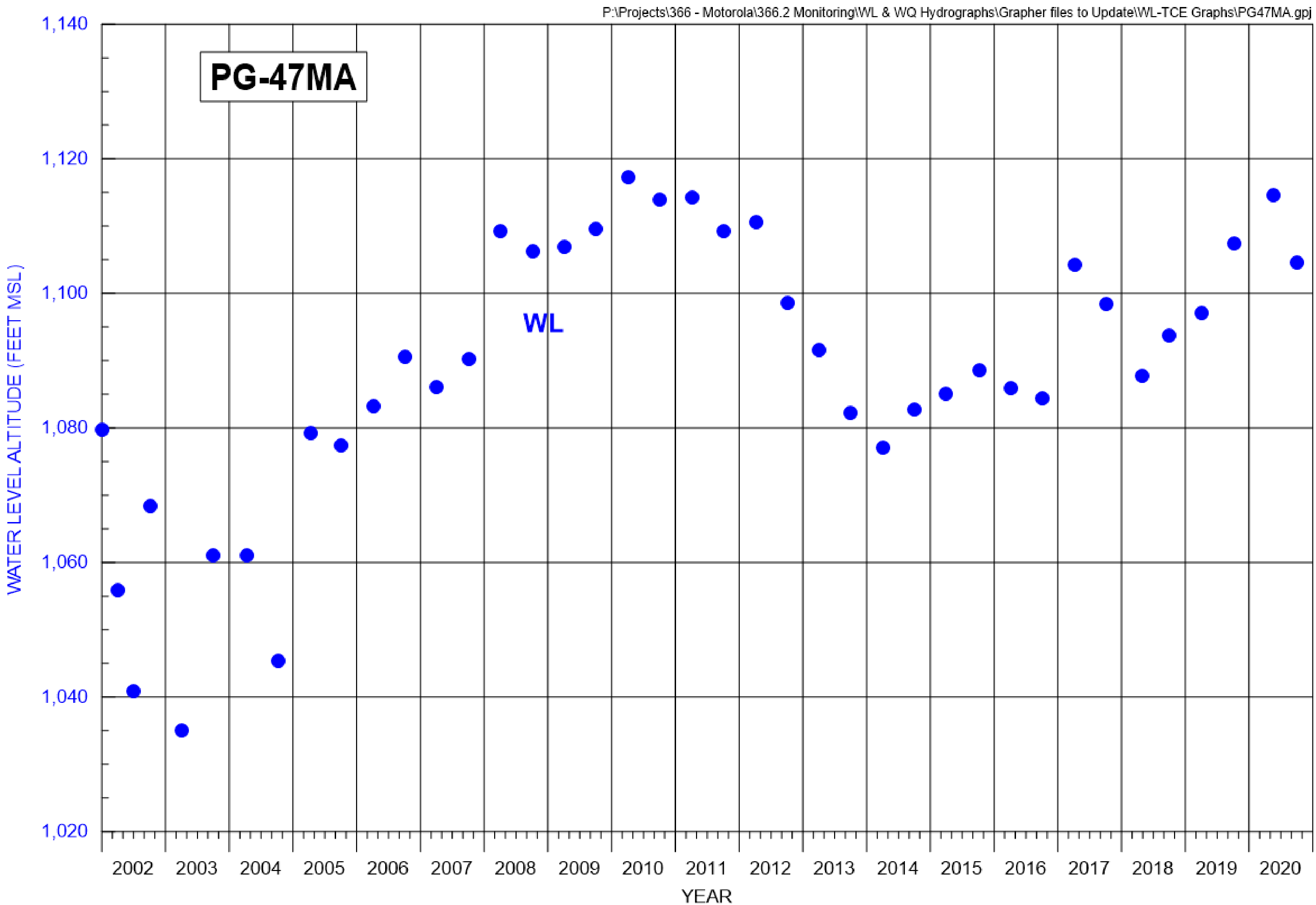


FIGURE D-109. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-44LA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,216.69

FIGURE D-110. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-47MA

North Indian Bend Wash Superfund Site

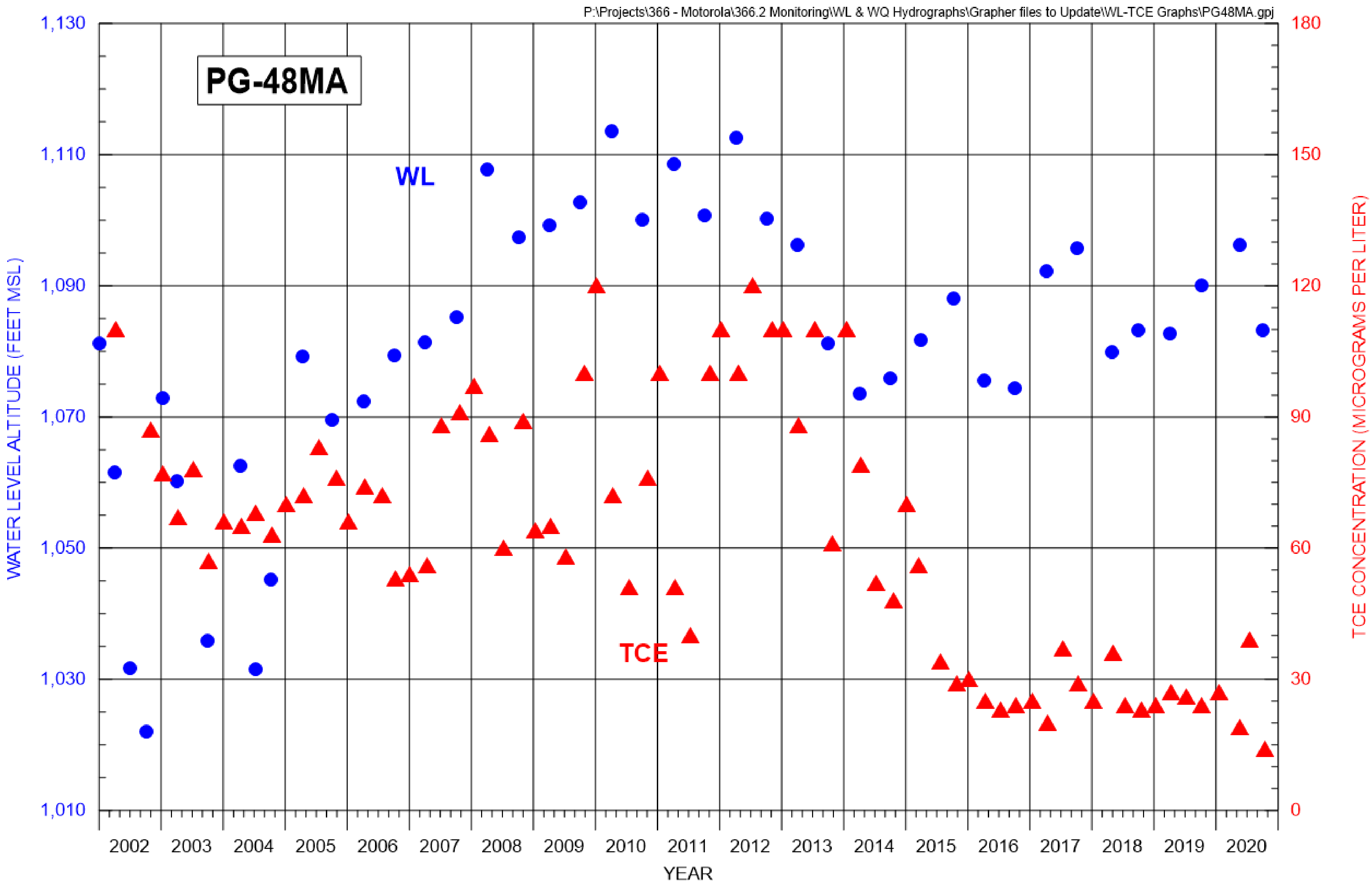
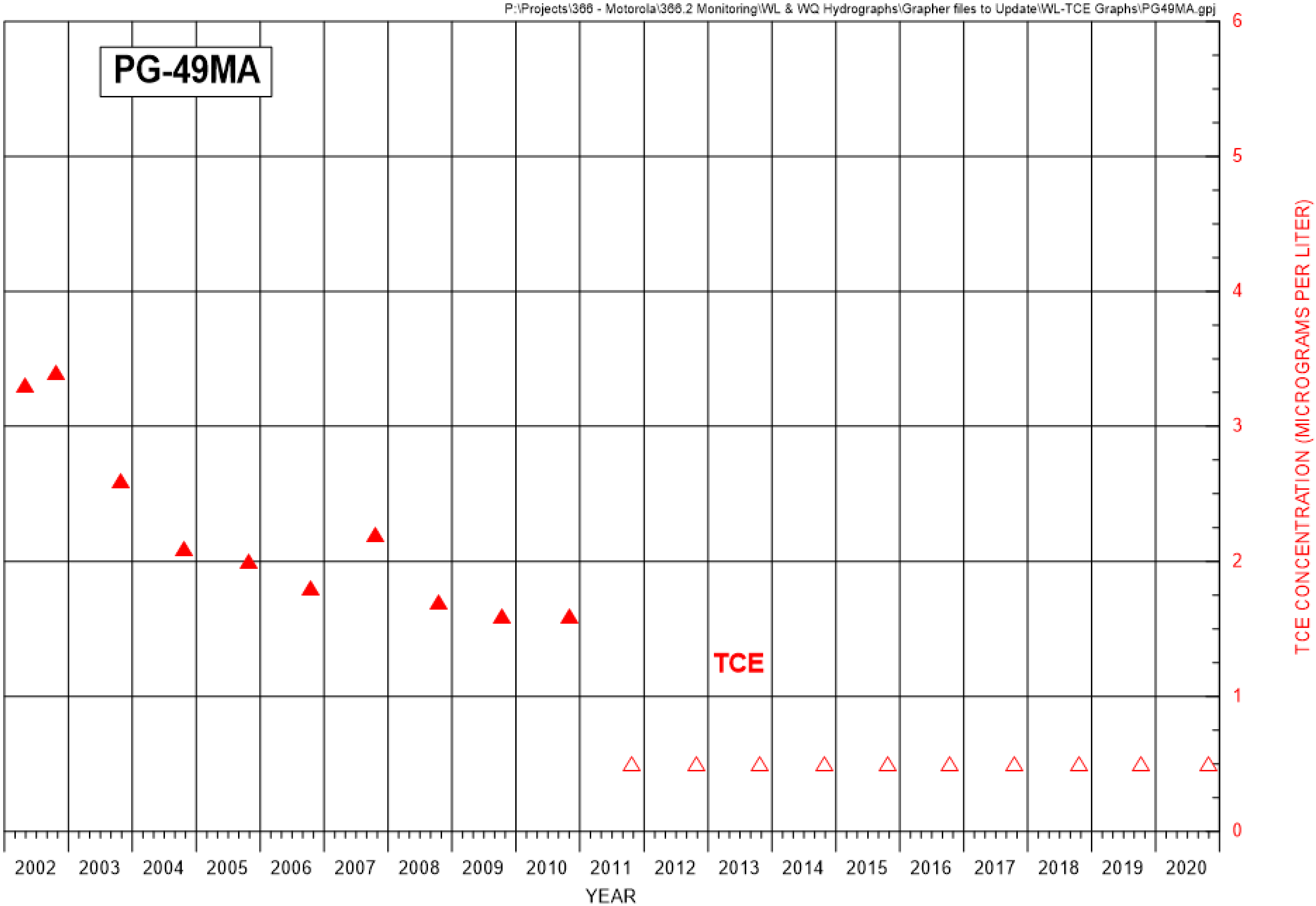


FIGURE D-111. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-48MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,210.48

FIGURE D-112. TCE CONCENTRATIONS FOR MONITOR WELL PG-49MA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

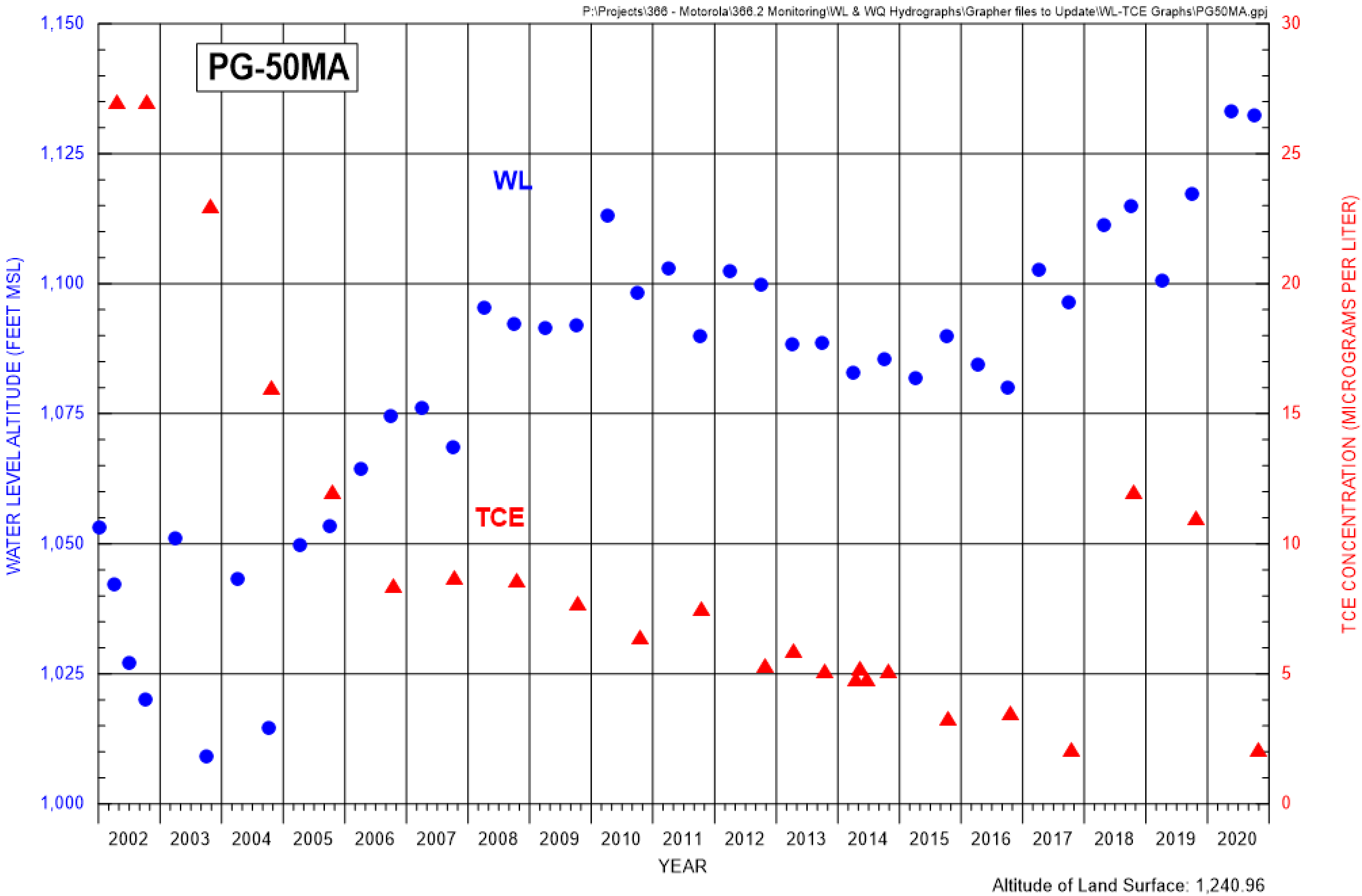


FIGURE D-113. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-50MA

North Indian Bend Wash Superfund Site

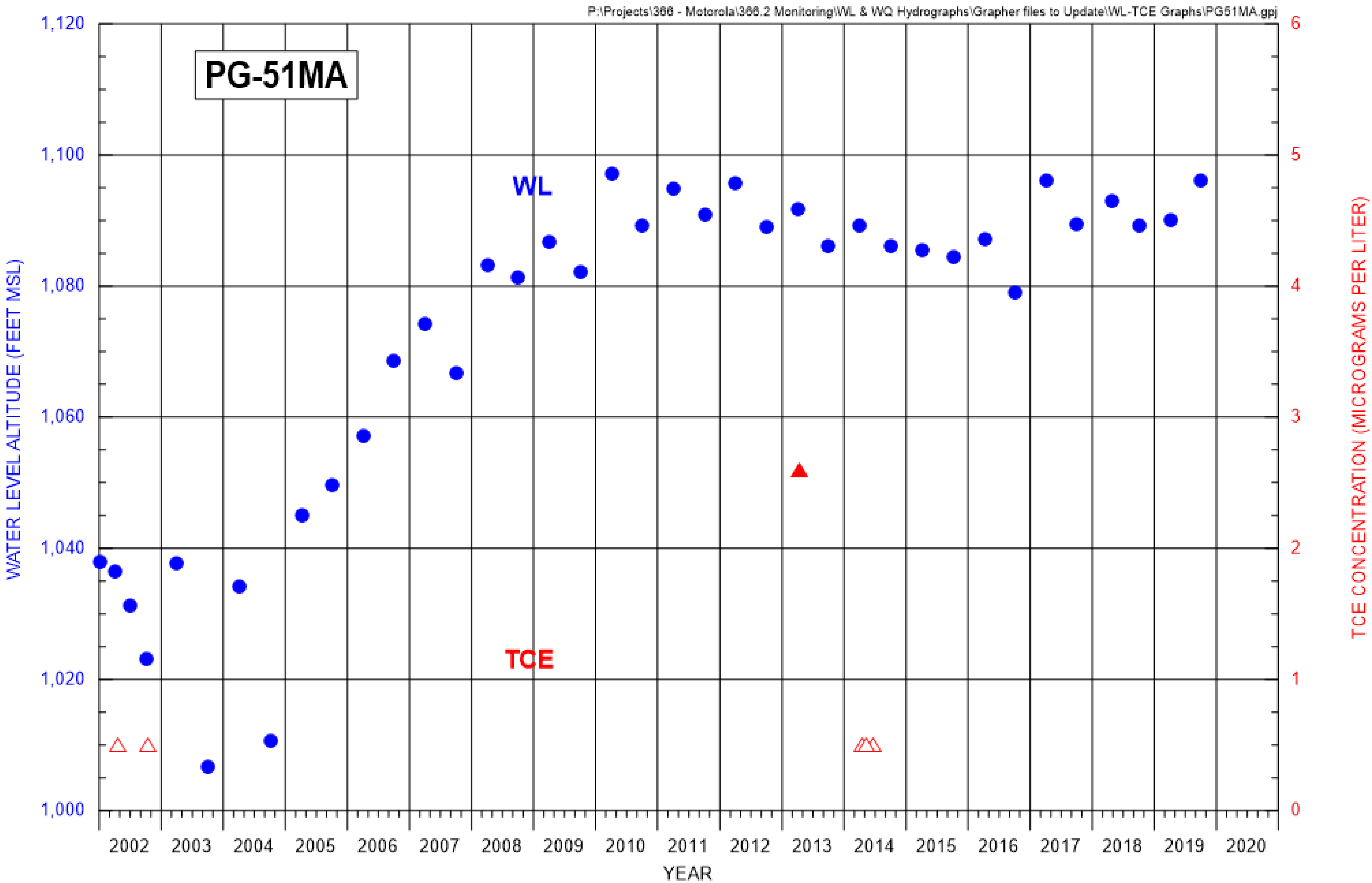
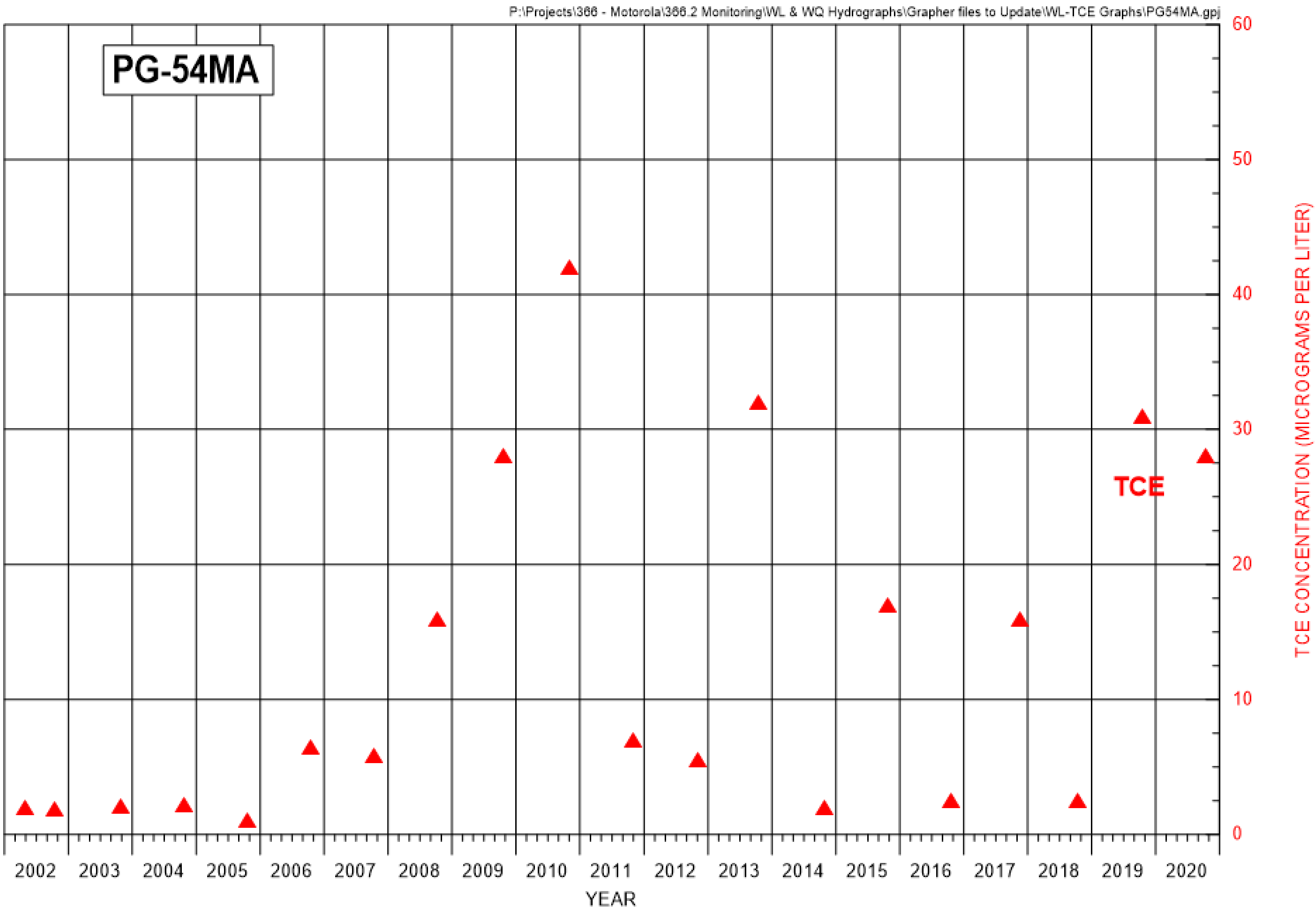


FIGURE D-114. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-51MA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,224.83

FIGURE D-115. TCE CONCENTRATIONS FOR MONITOR WELL PG-54MA

North Indian Bend Wash Superfund Site

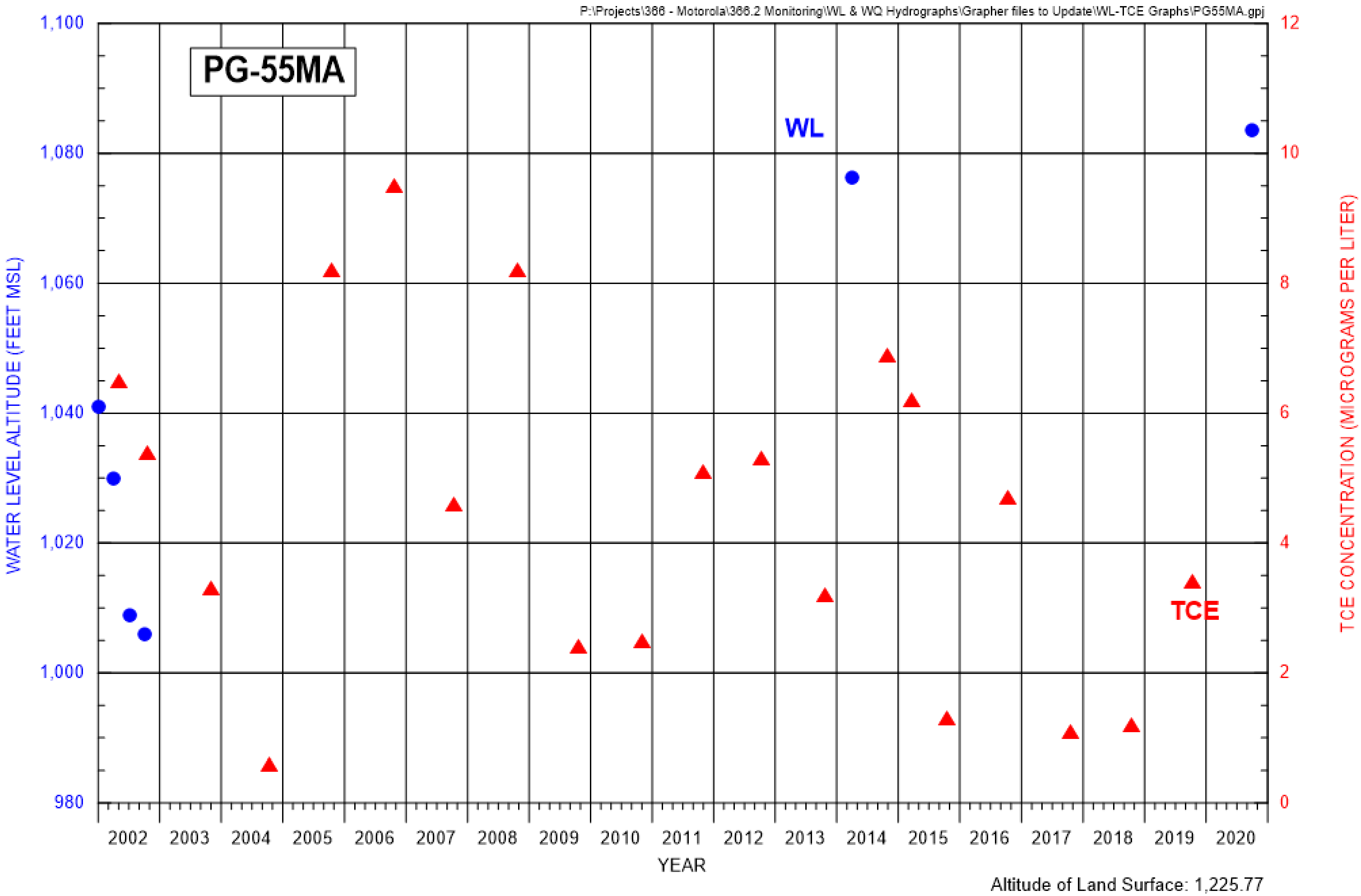
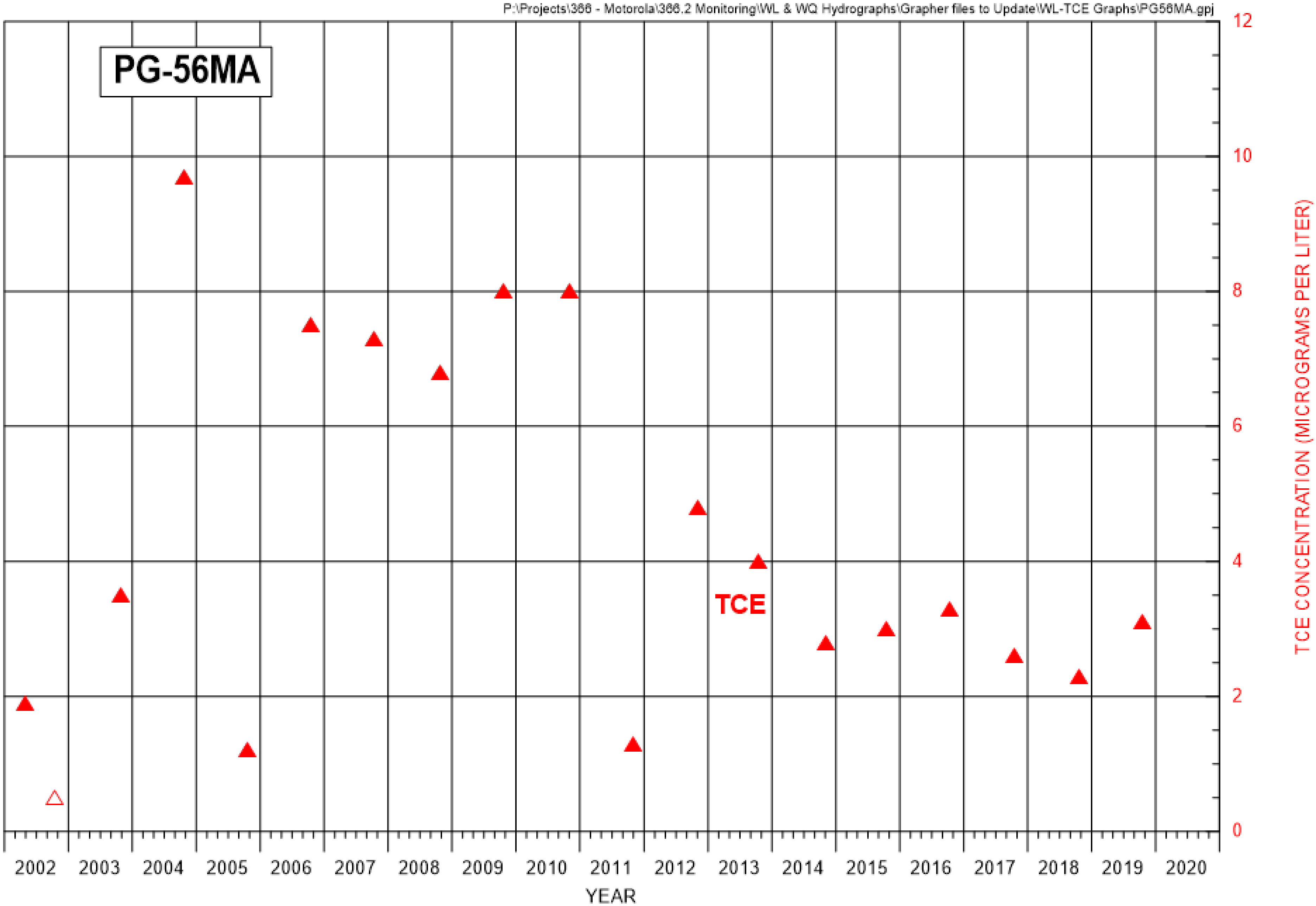


FIGURE D-116. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL PG-55MA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,231.86

FIGURE D-117. TCE CONCENTRATIONS FOR MONITOR WELL PG-56MA

EXPLANATION
△ TCE Non-Detect ▲ TCE Detected Value

North Indian Bend Wash Superfund Site

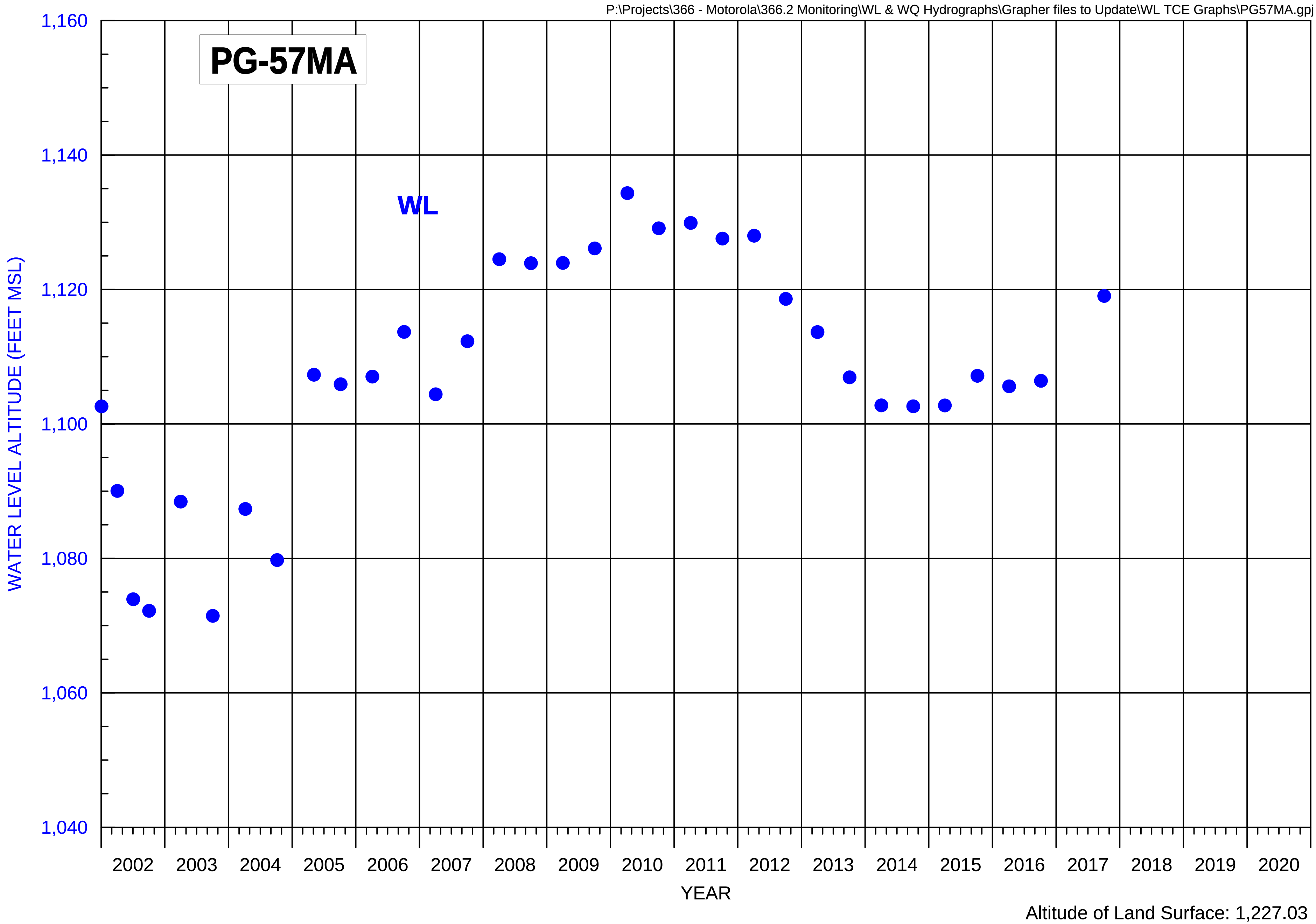


FIGURE D-118. GROUNDWATER LEVEL HYDROGRAPH FOR MONITOR WELL PG-57MA

North Indian Bend Wash Superfund Site

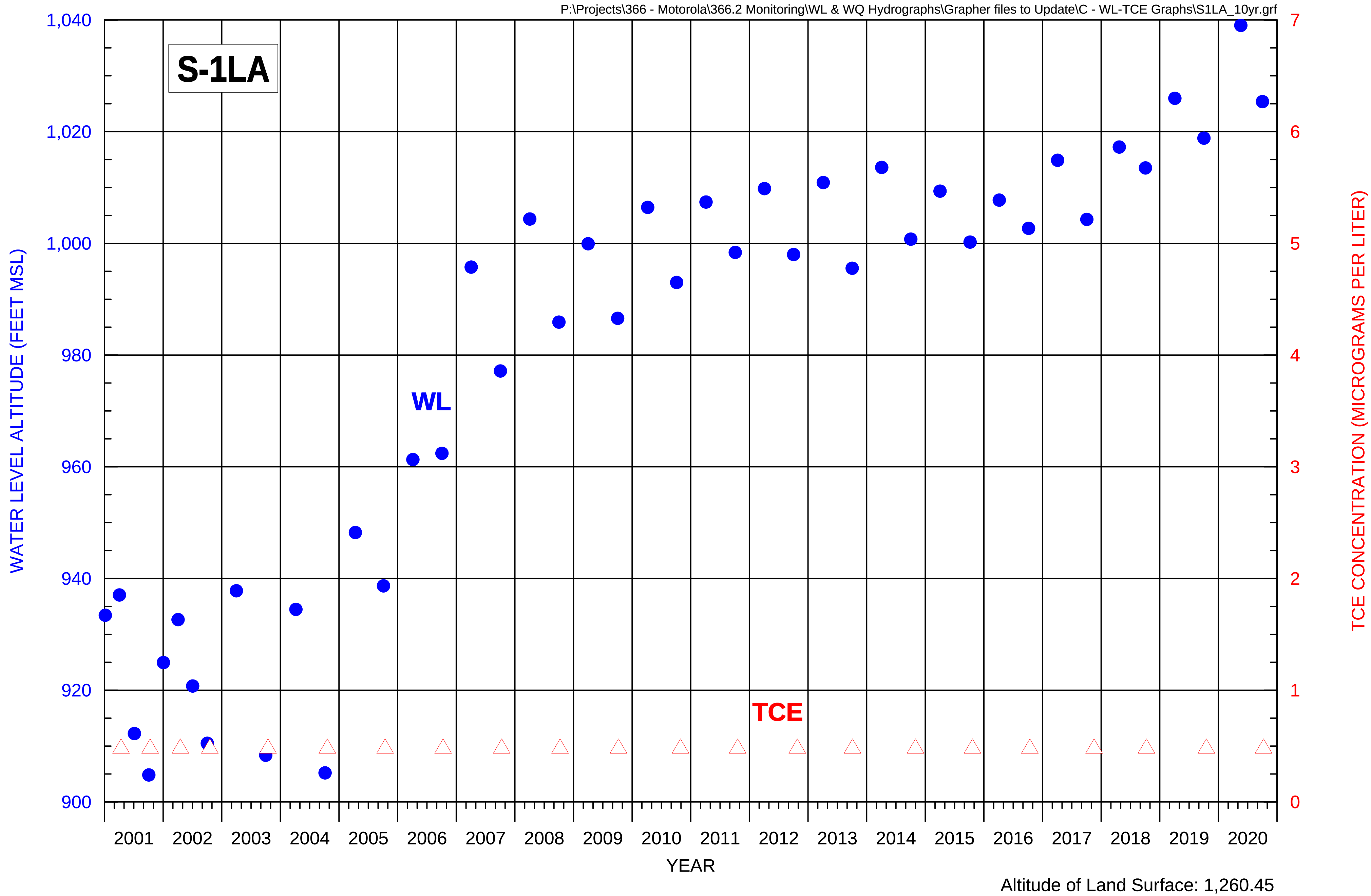


FIGURE C-119. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-1LA

EXPLANATION

- TCE Non-Detect / TCE Detected Value

North Indian Bend Wash Superfund Site

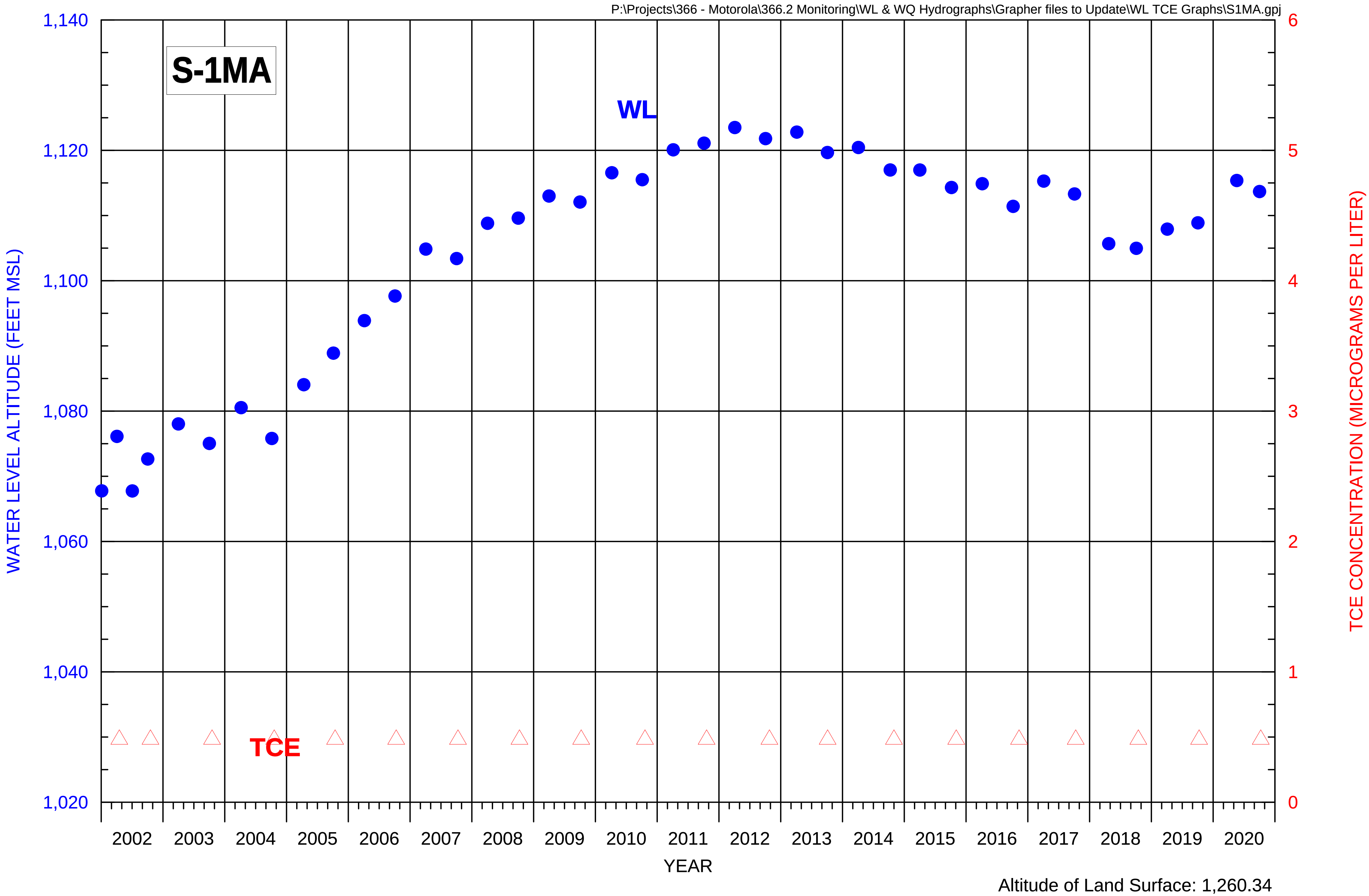


FIGURE D-120. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-1MA

EXPLANATION

- TCE Non-Detect / TCE Detected Value

North Indian Bend Wash Superfund Site

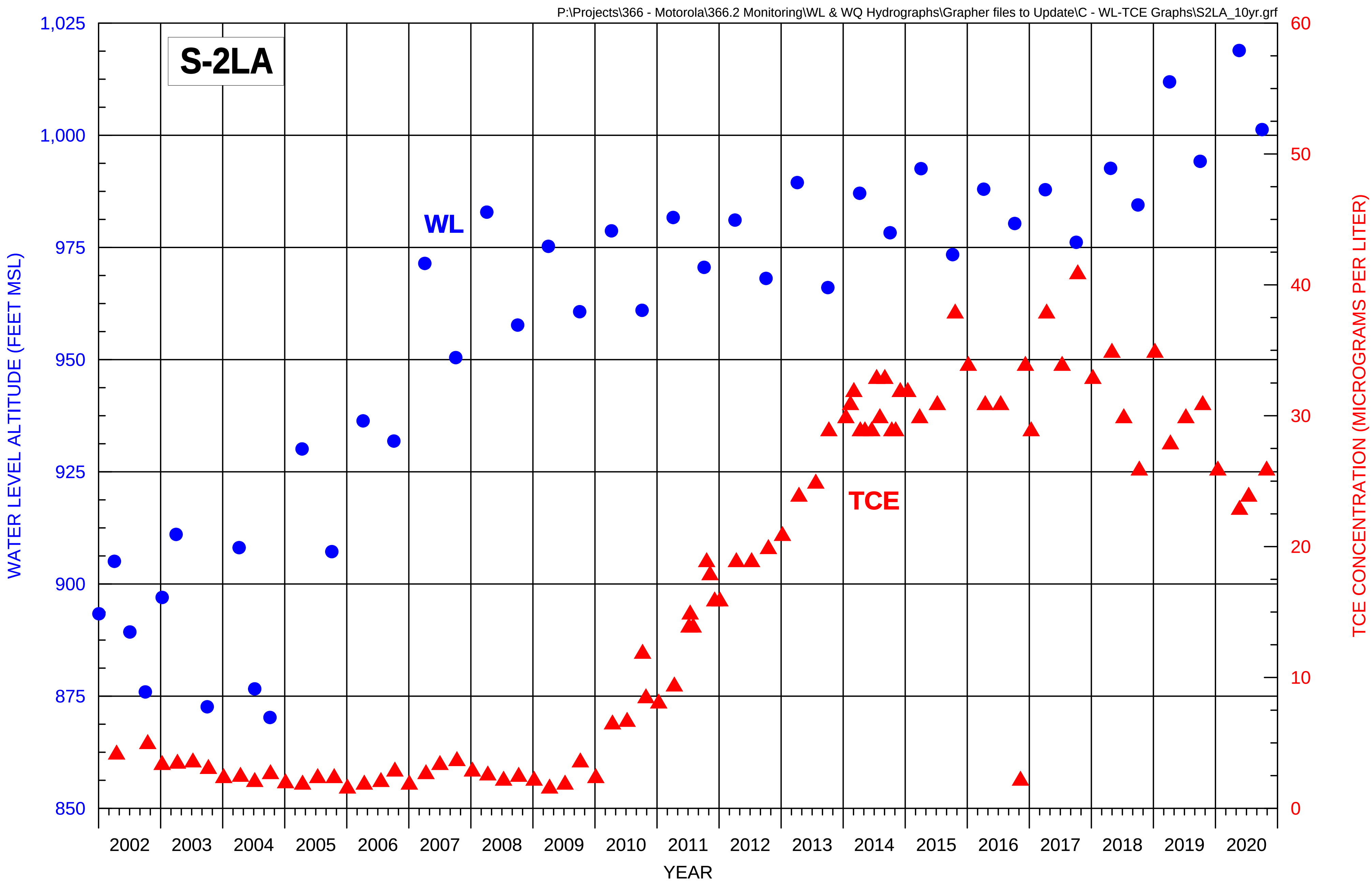
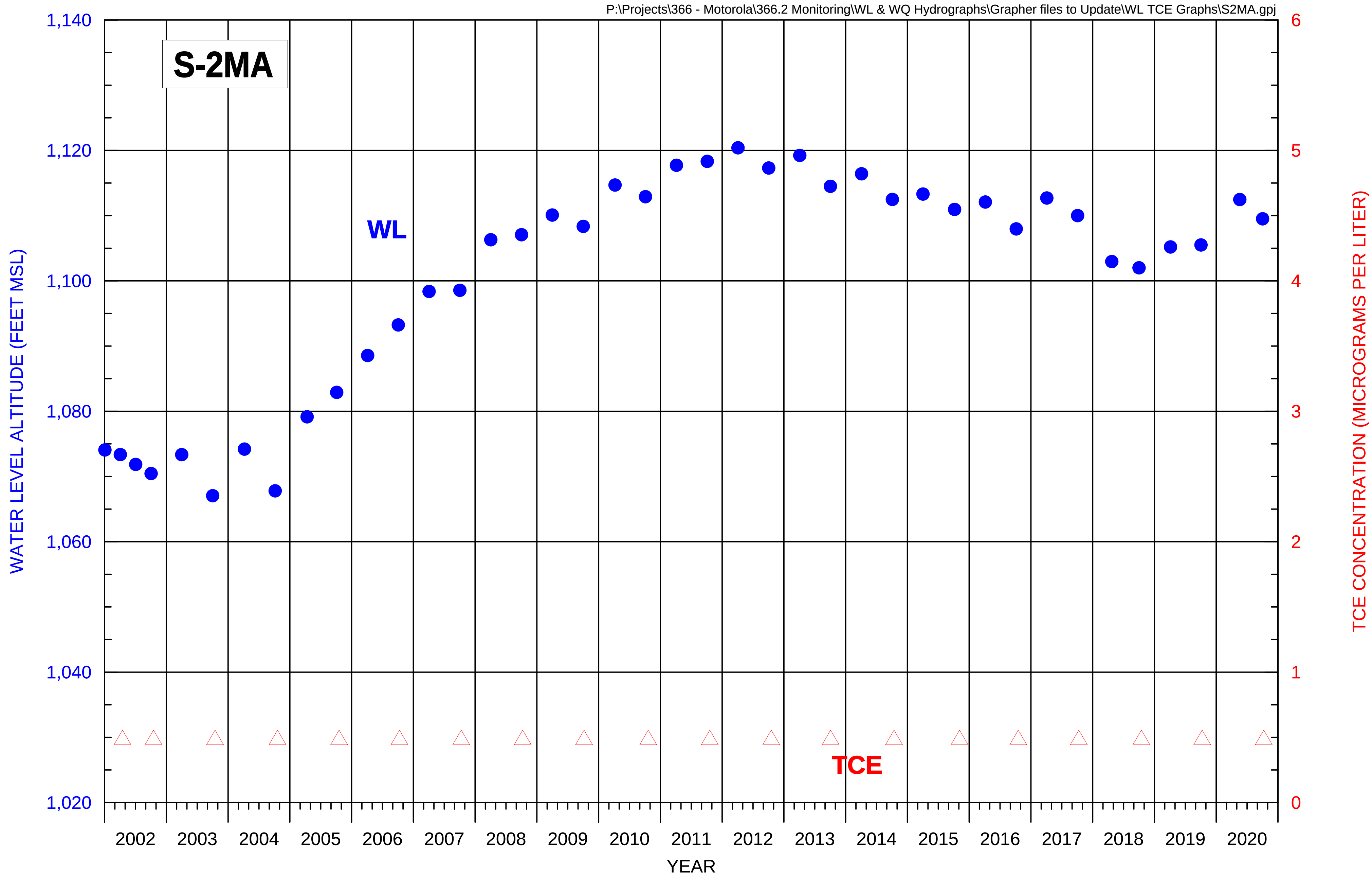


FIGURE D-121. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-2LA

North Indian Bend Wash Superfund Site



Altitude of Land Surface: 1,260.49

FIGURE D-122. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL S-2MA

EXPLANATION
- TCE Non-Detect / TCE Detected Value

North Indian Bend Wash Superfund Site

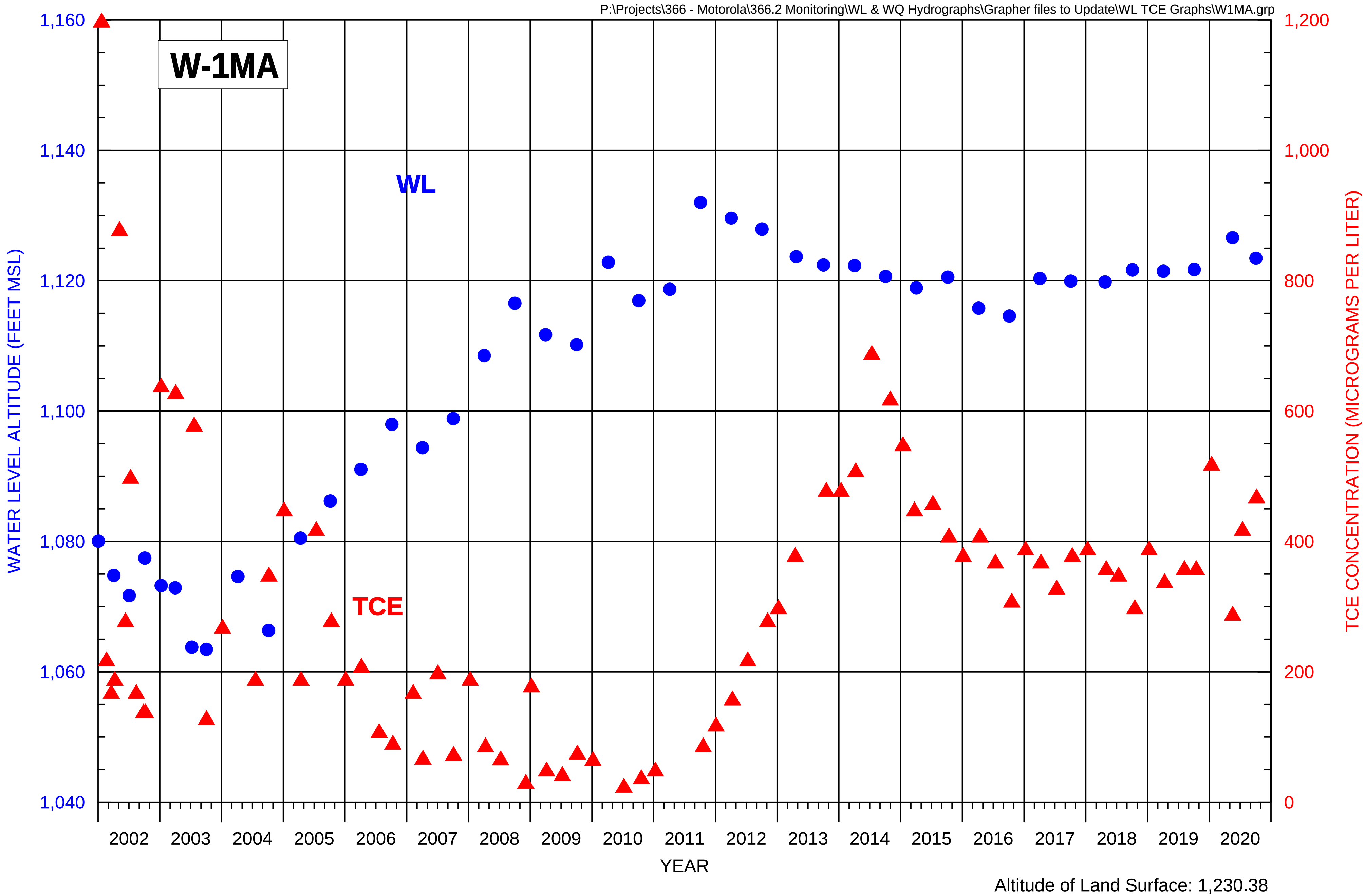


FIGURE D-123. GROUNDWATER LEVEL HYDROGRAPH AND TCE CONCENTRATIONS FOR MONITOR WELL W-1MA

North Indian Bend Wash Superfund Site

APPENDIX E
GROUNDWATER PUMPING AND TCE TIME-SERIES DATA FOR NIBW EXTRACTION WELLS

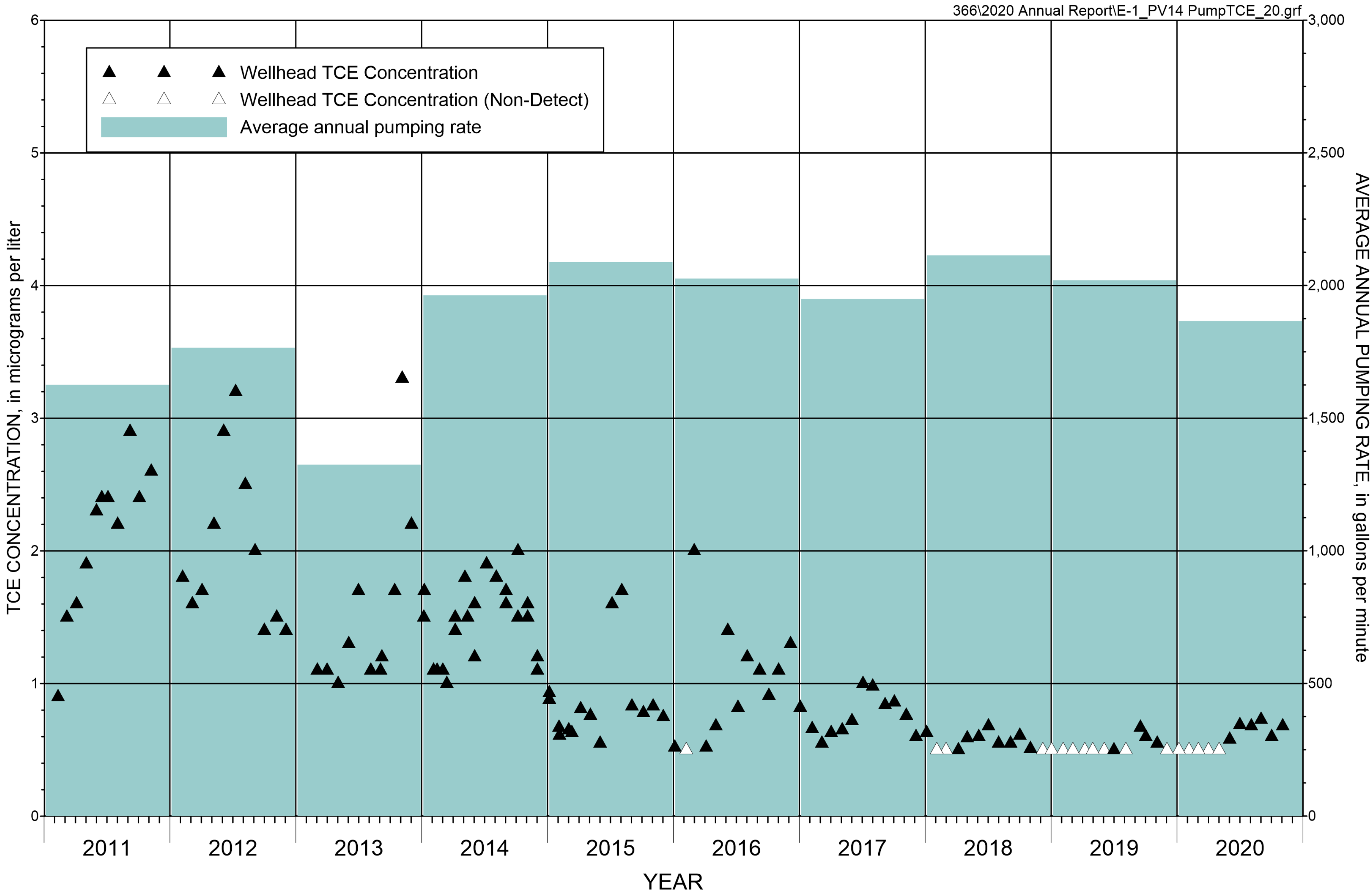


FIGURE E-1. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL PV-14 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

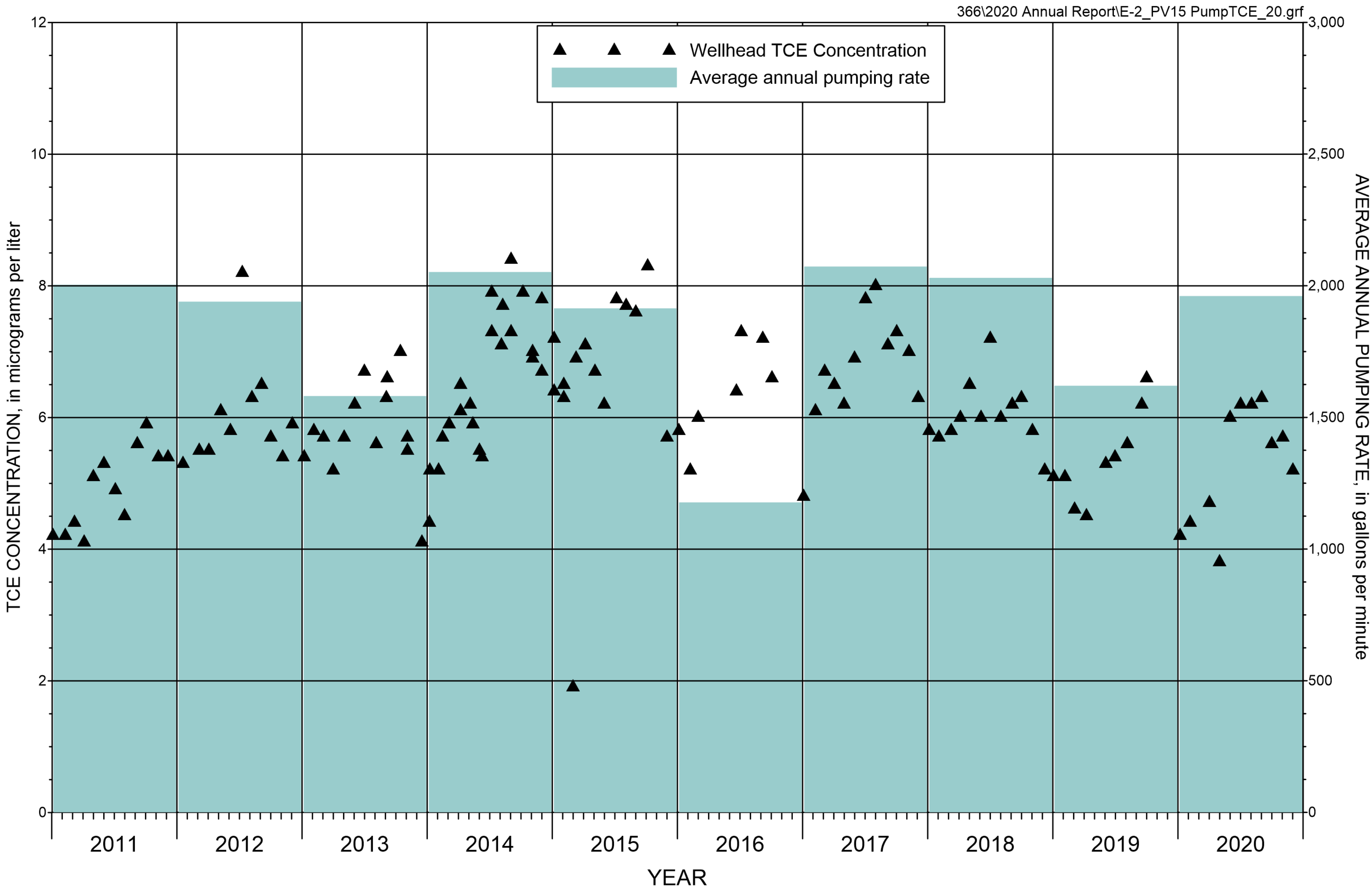


FIGURE E-2. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL PV-15 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

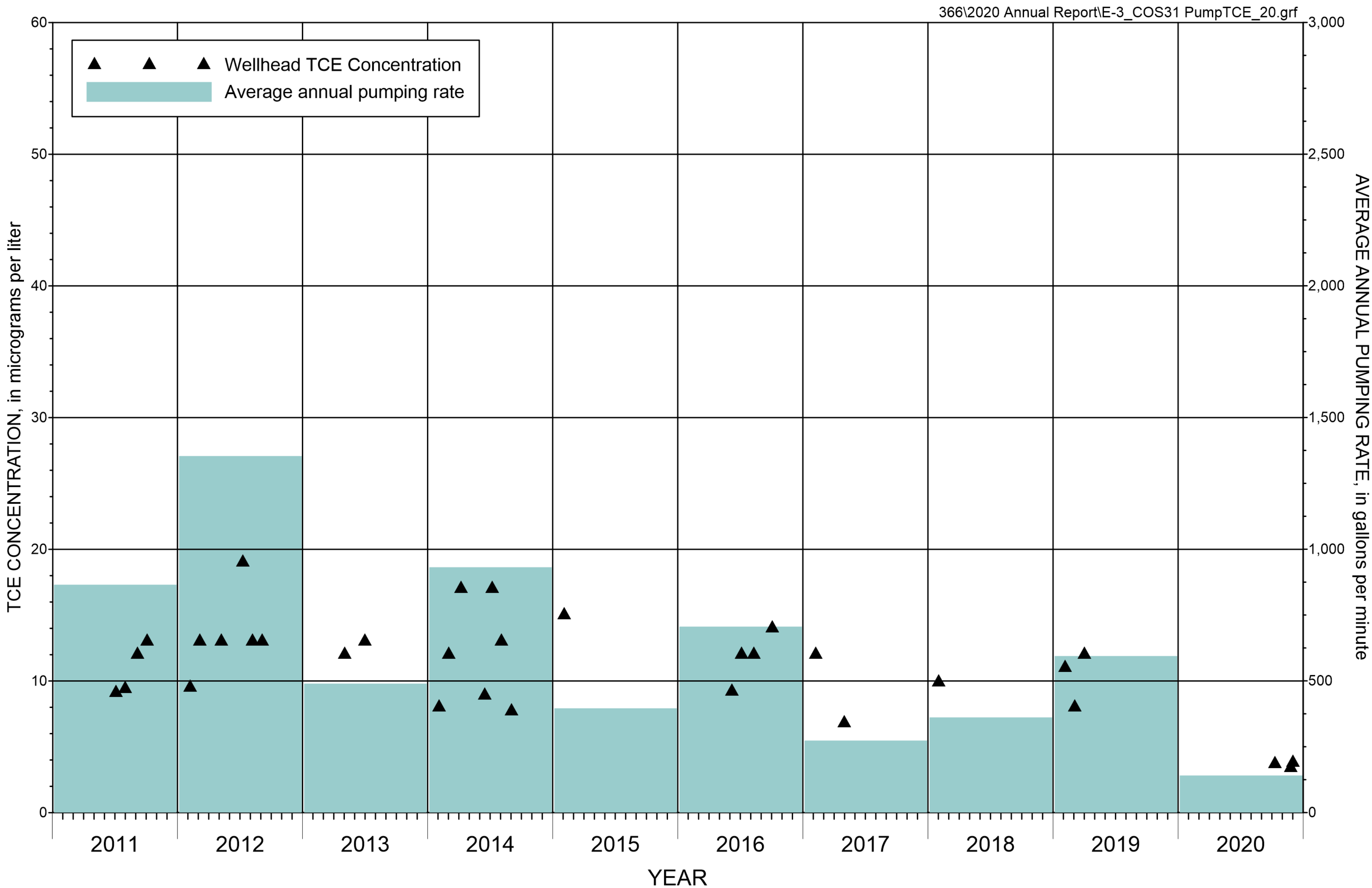


FIGURE E-3. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-31 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

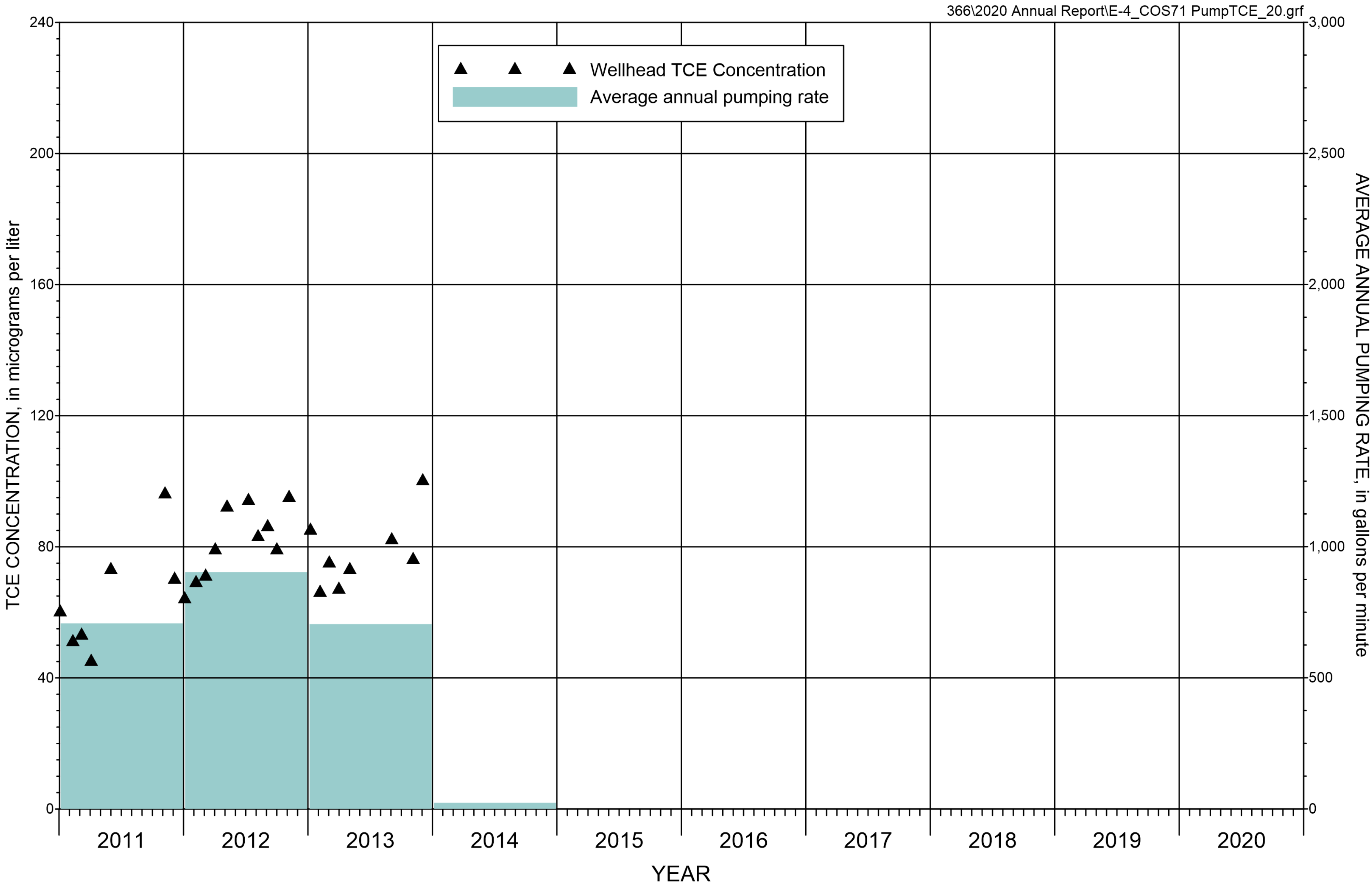


FIGURE E-4. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-71 2011 THROUGH 2020

Note: Well COS-71A replaced Well COS-71 April 2014.

North Indian Bend Wash Superfund Site

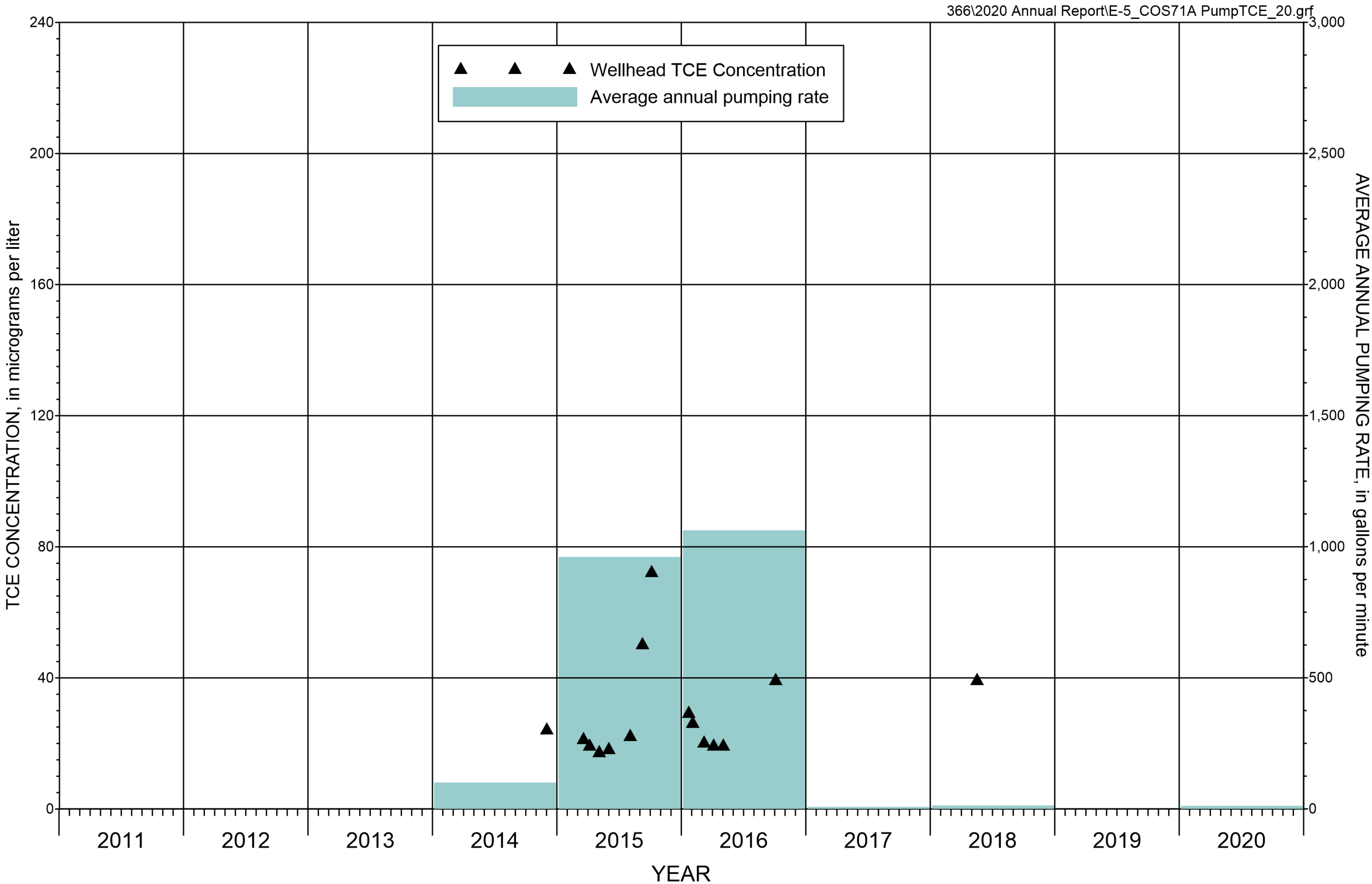


FIGURE E-5. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-71A 2011 THROUGH 2020

Note: Well COS-71A replaced Well COS-71 April 2014.

North Indian Bend Wash Superfund Site

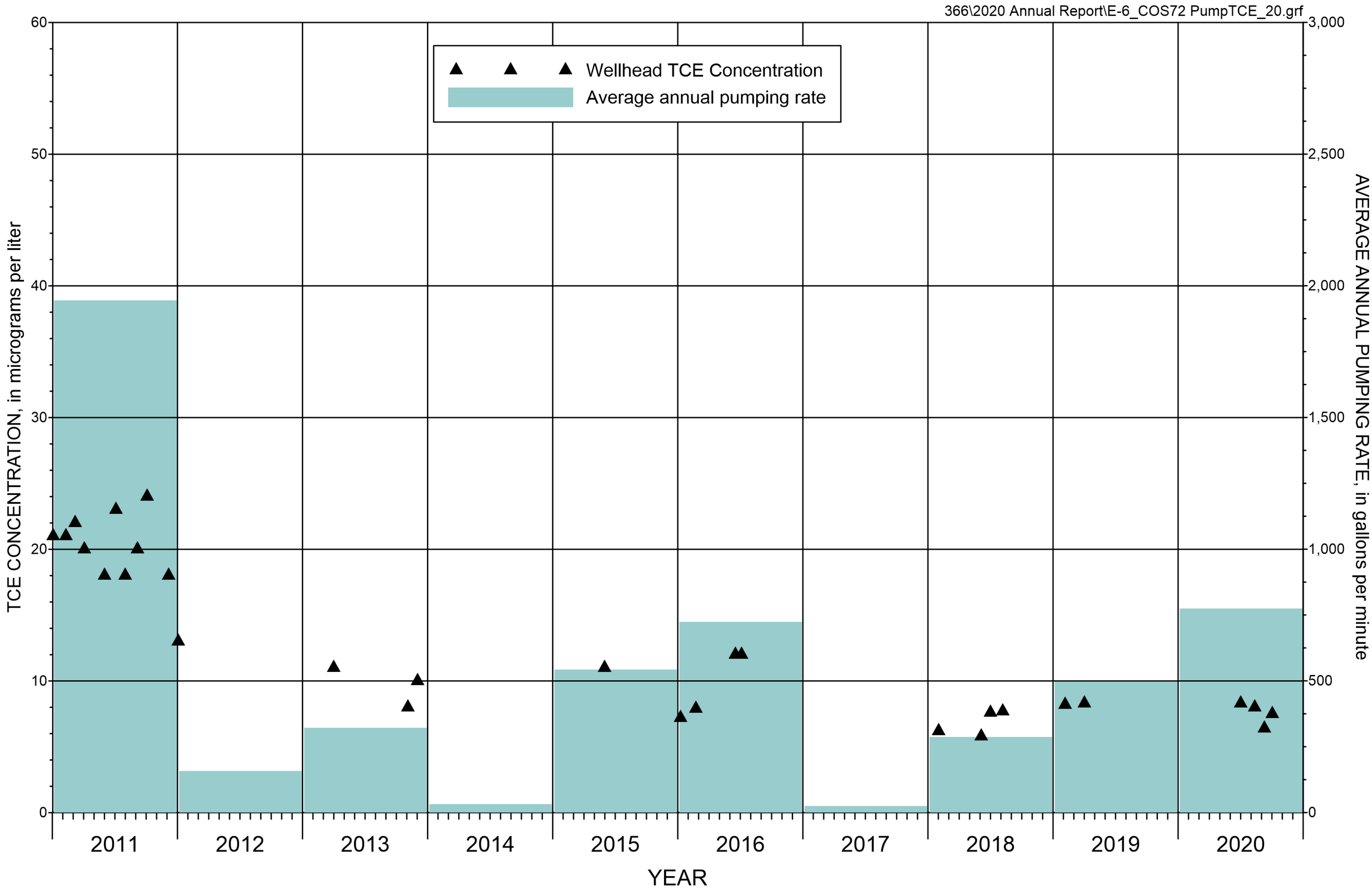


FIGURE E-6. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-72 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

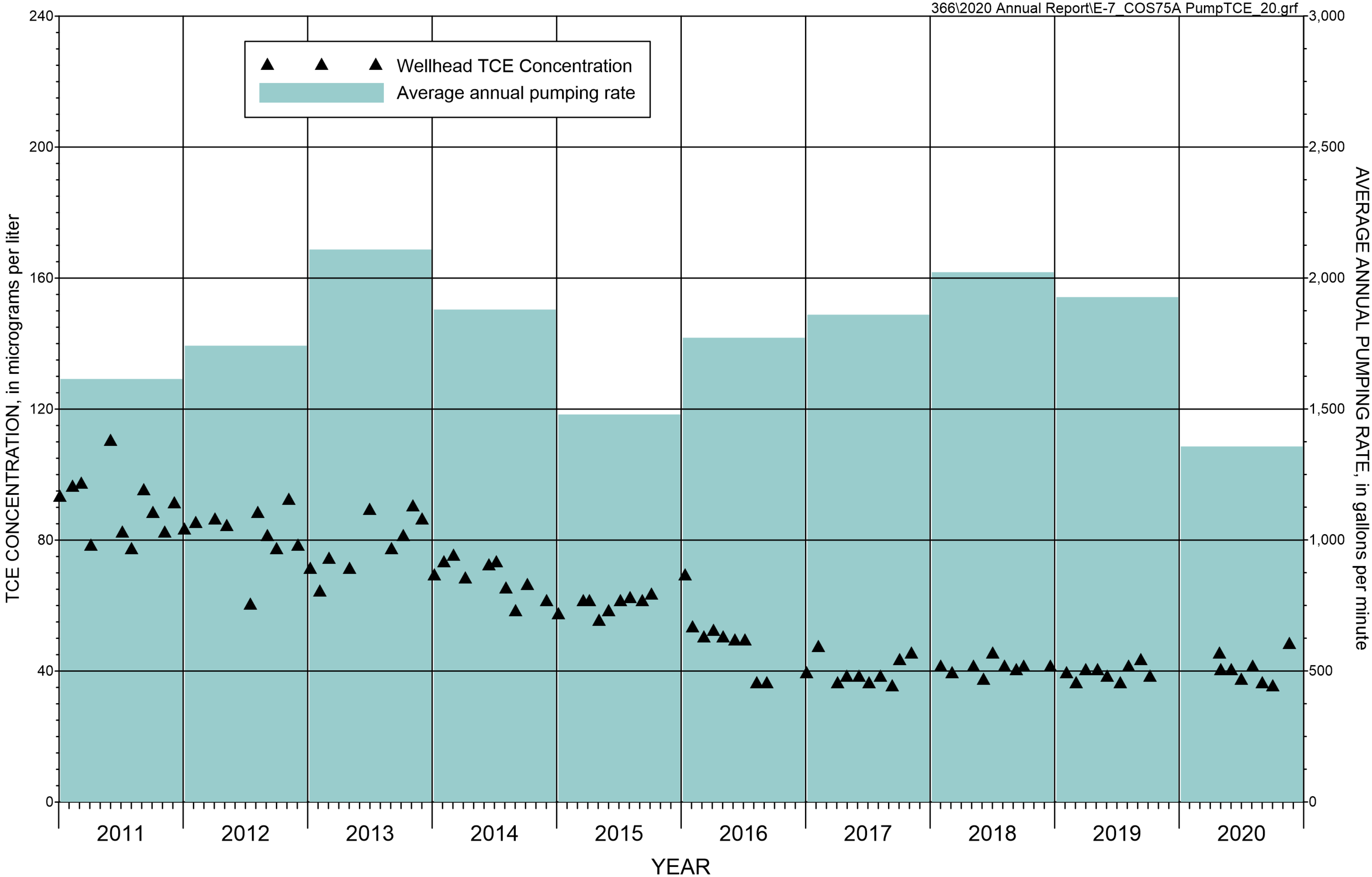


FIGURE E-7. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL COS-75A 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

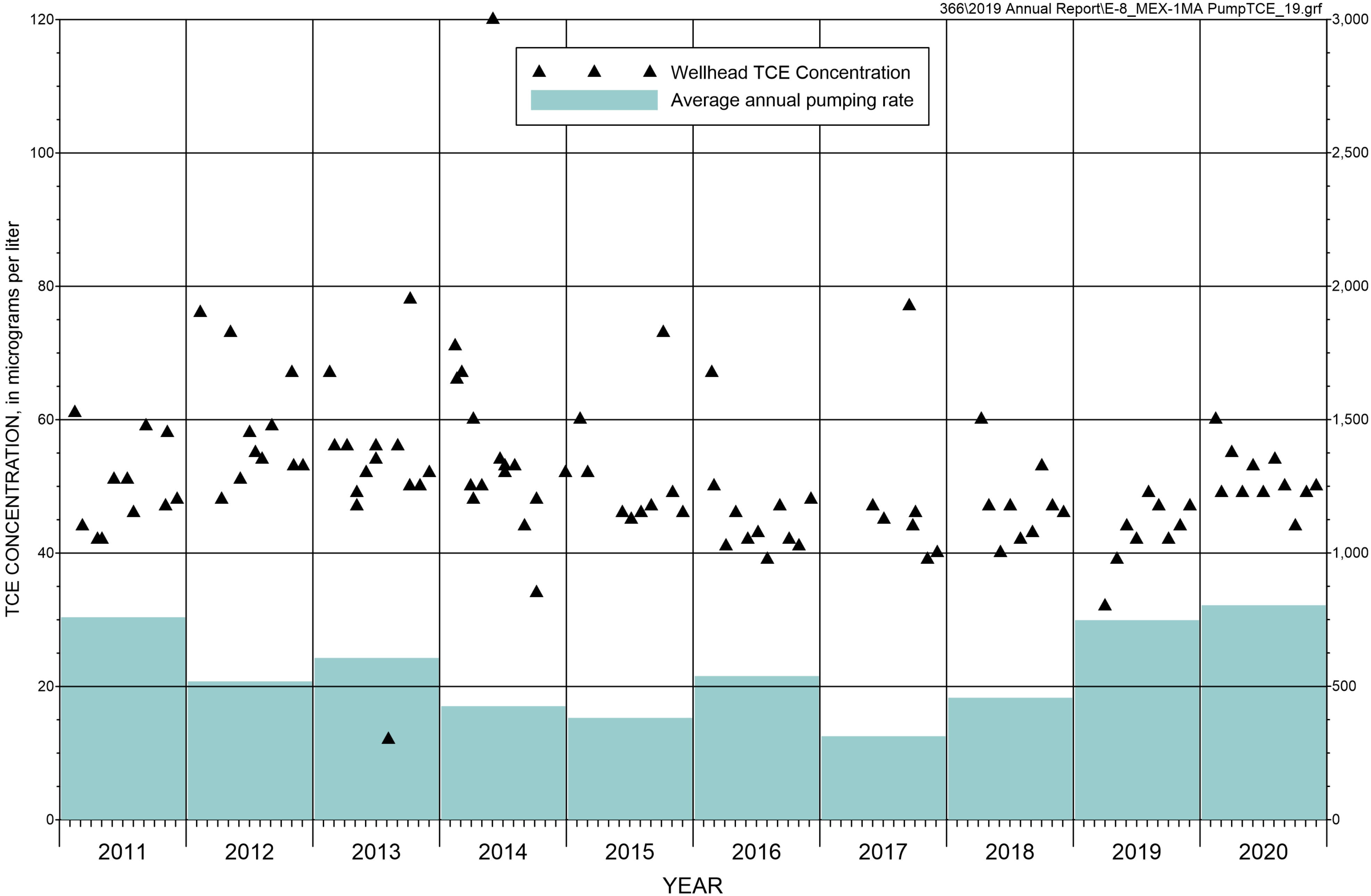


FIGURE E-8. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL MEX-1MA 2010 THROUGH 2019

North Indian Bend Wash Superfund Site

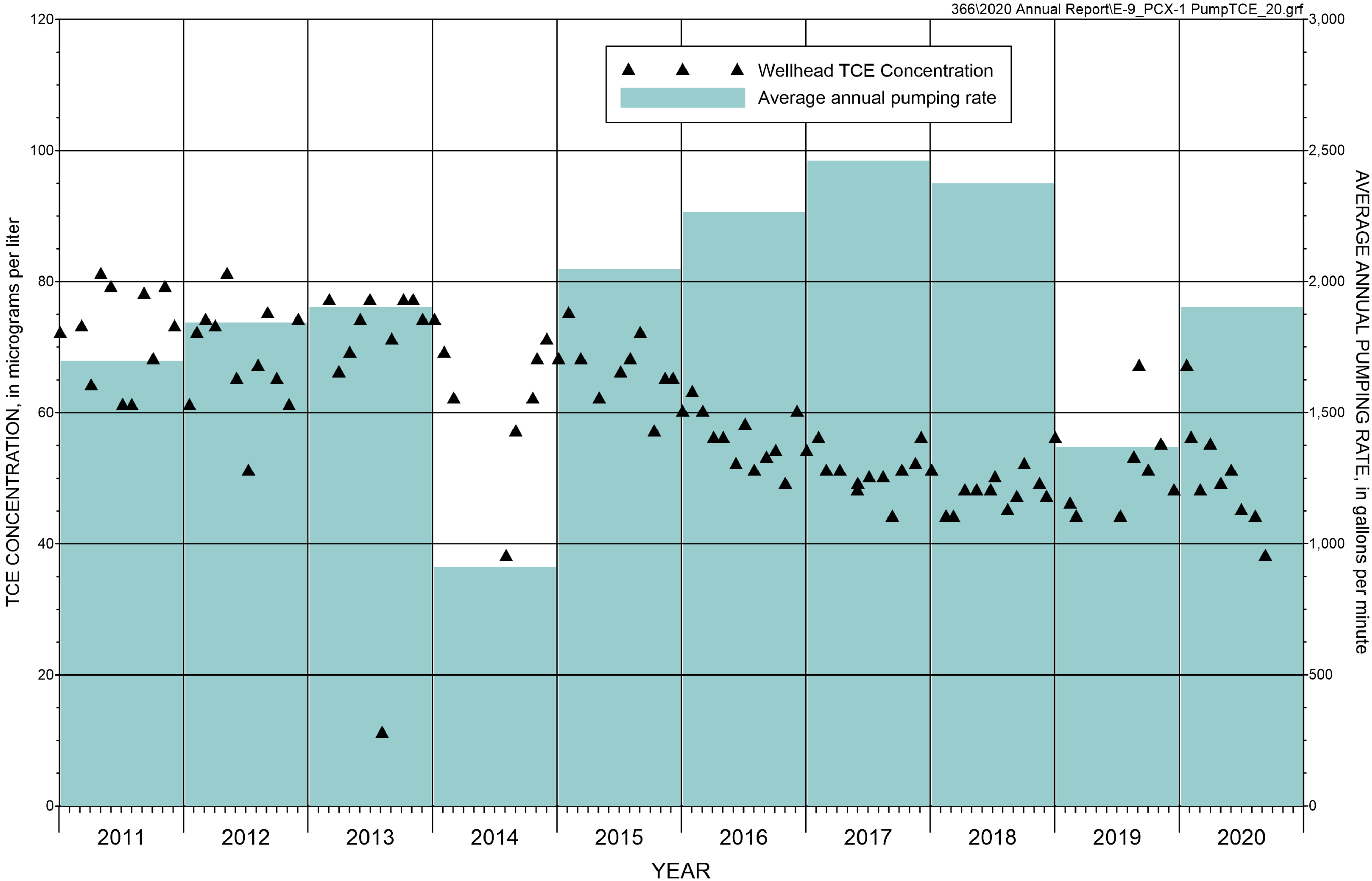


FIGURE E-9. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL PCX-1 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

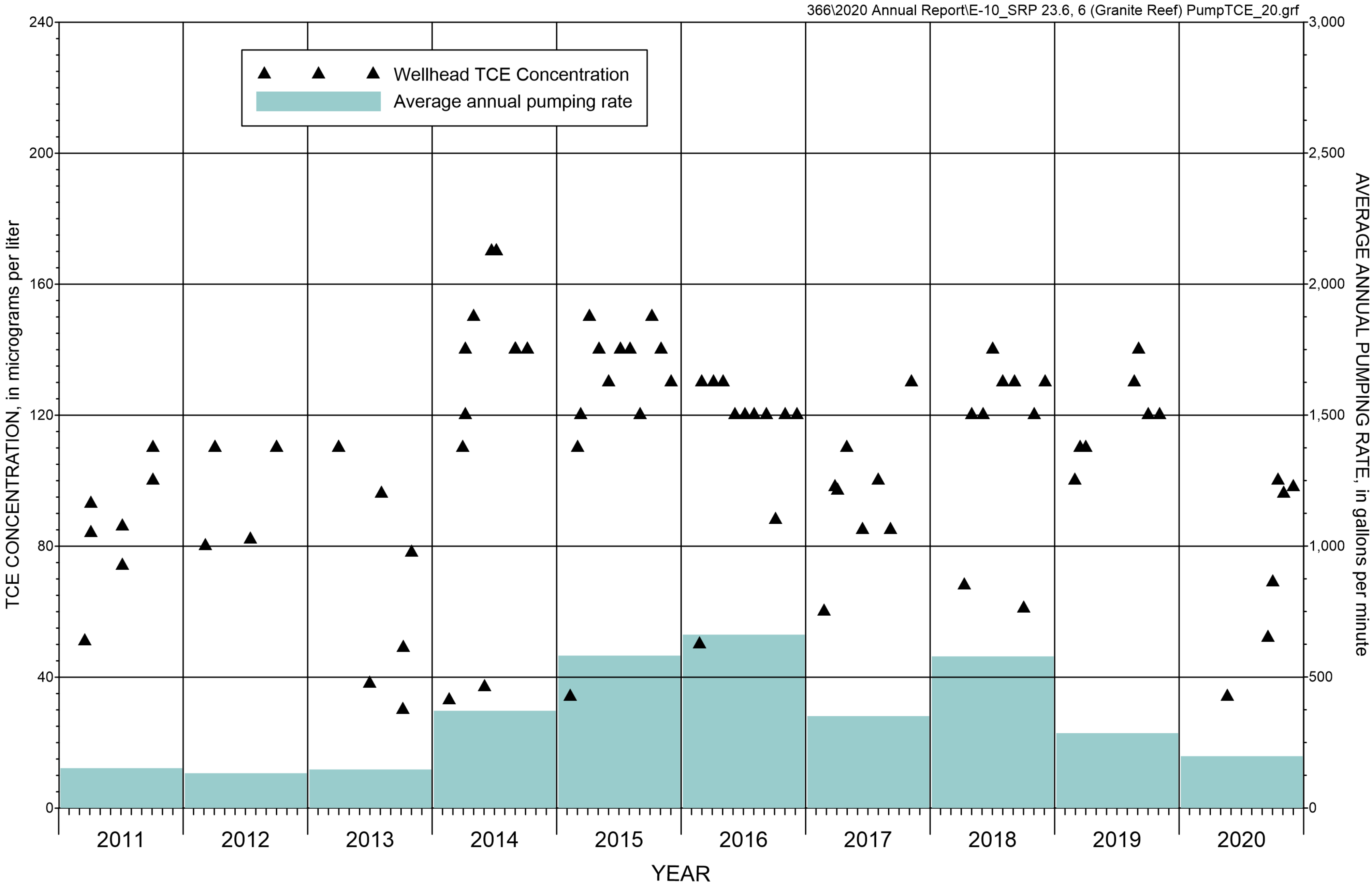


FIGURE E-10. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL SRP 23.6E, 6N (GRANITE REEF), 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

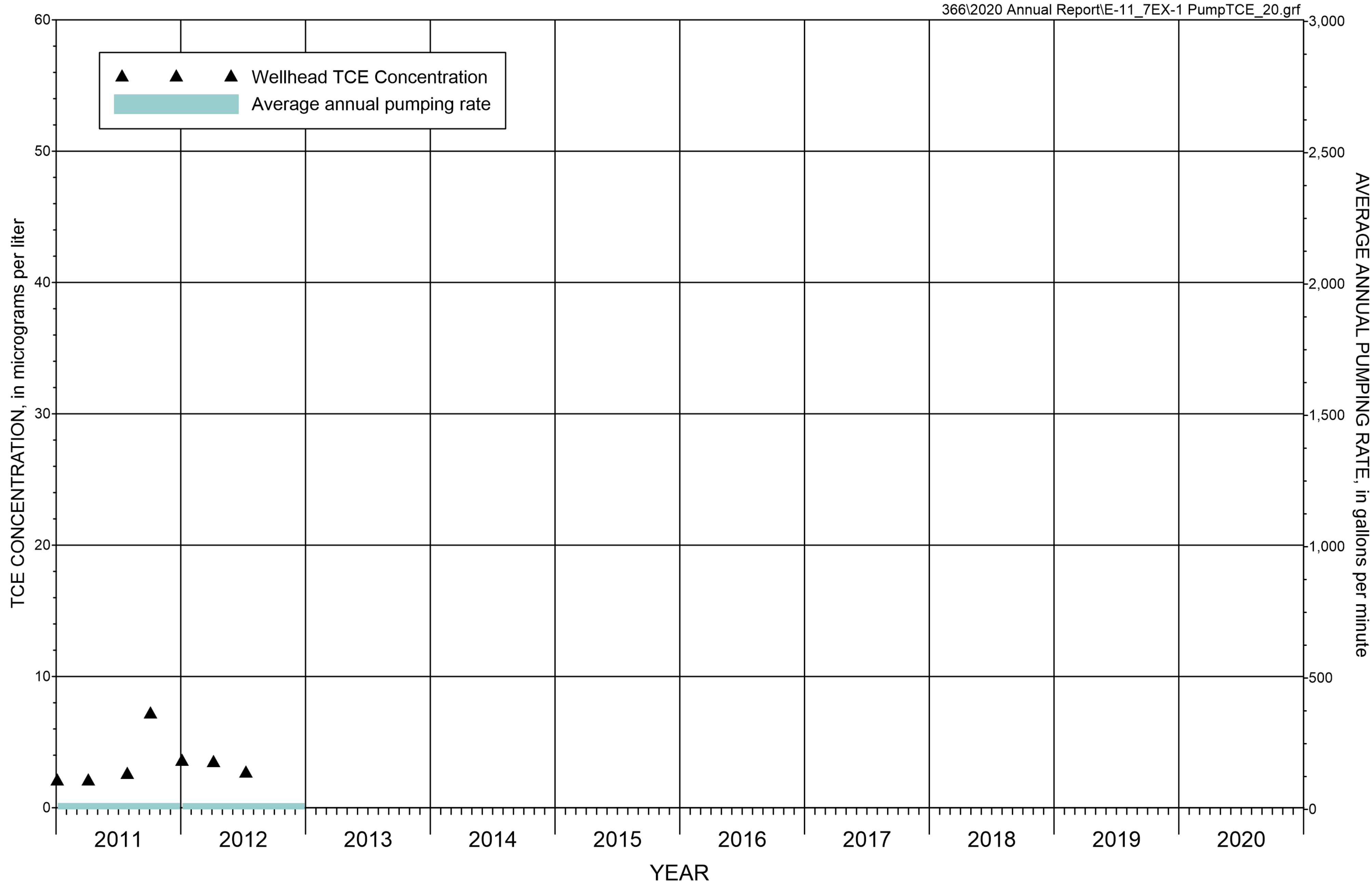


FIGURE E-11. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-1UA 2011 THROUGH 2020

Note: Well was abandoned in 2015.

North Indian Bend Wash Superfund Site

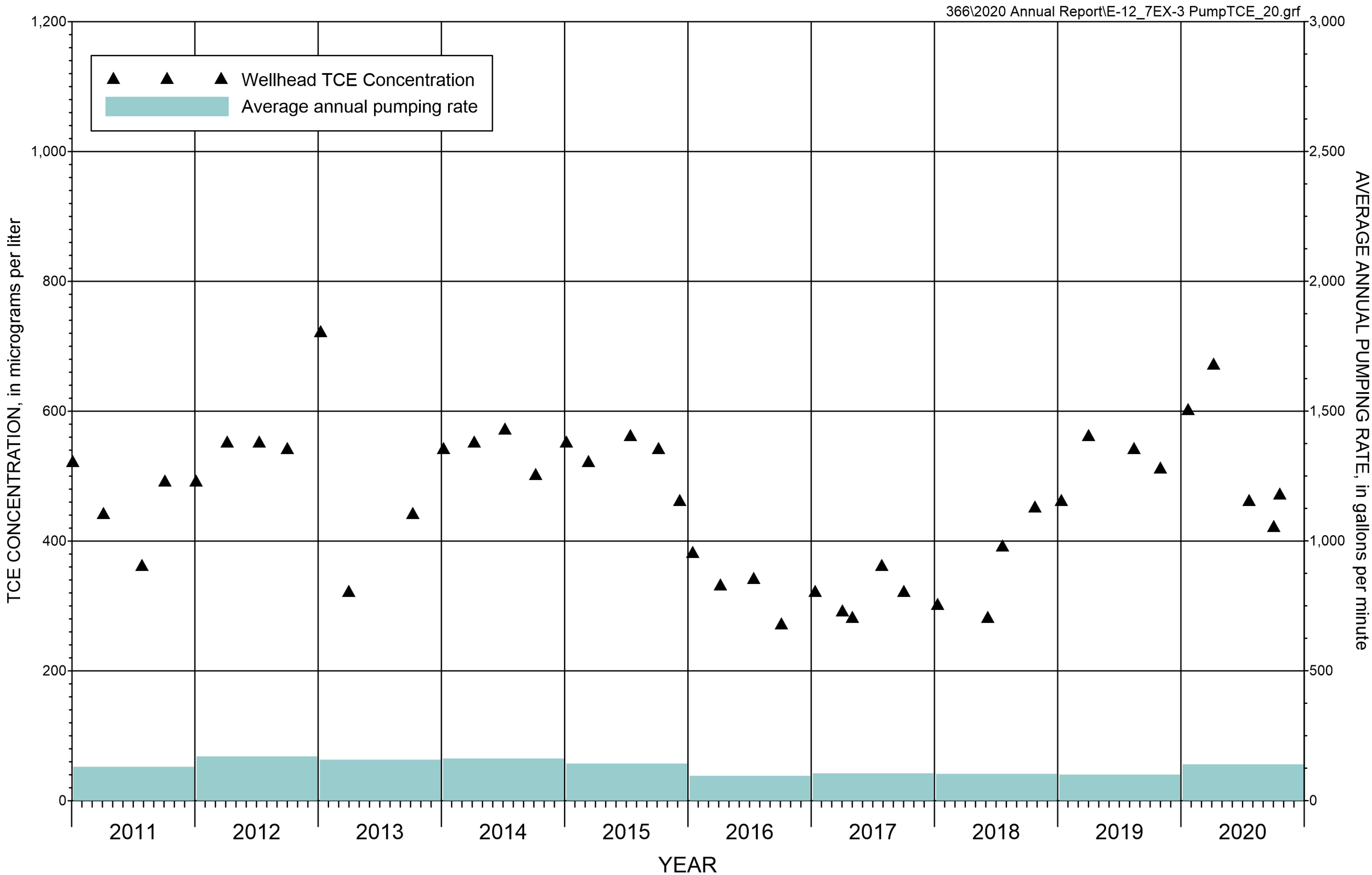


FIGURE E-12. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-3aMA 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

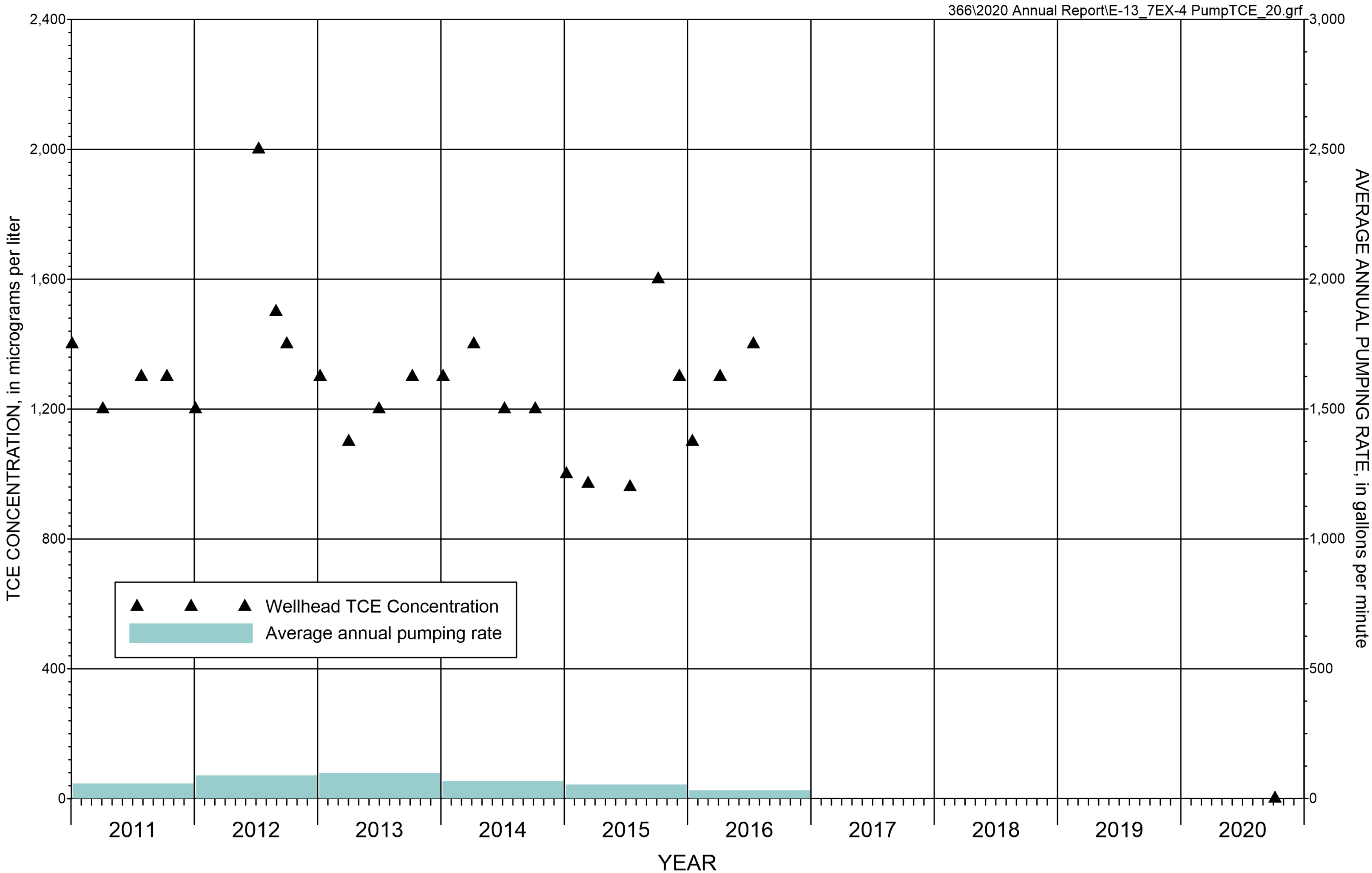


FIGURE E-13. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-4MA 2011 THROUGH 2020

North Indian Bend Wash Superfund Site

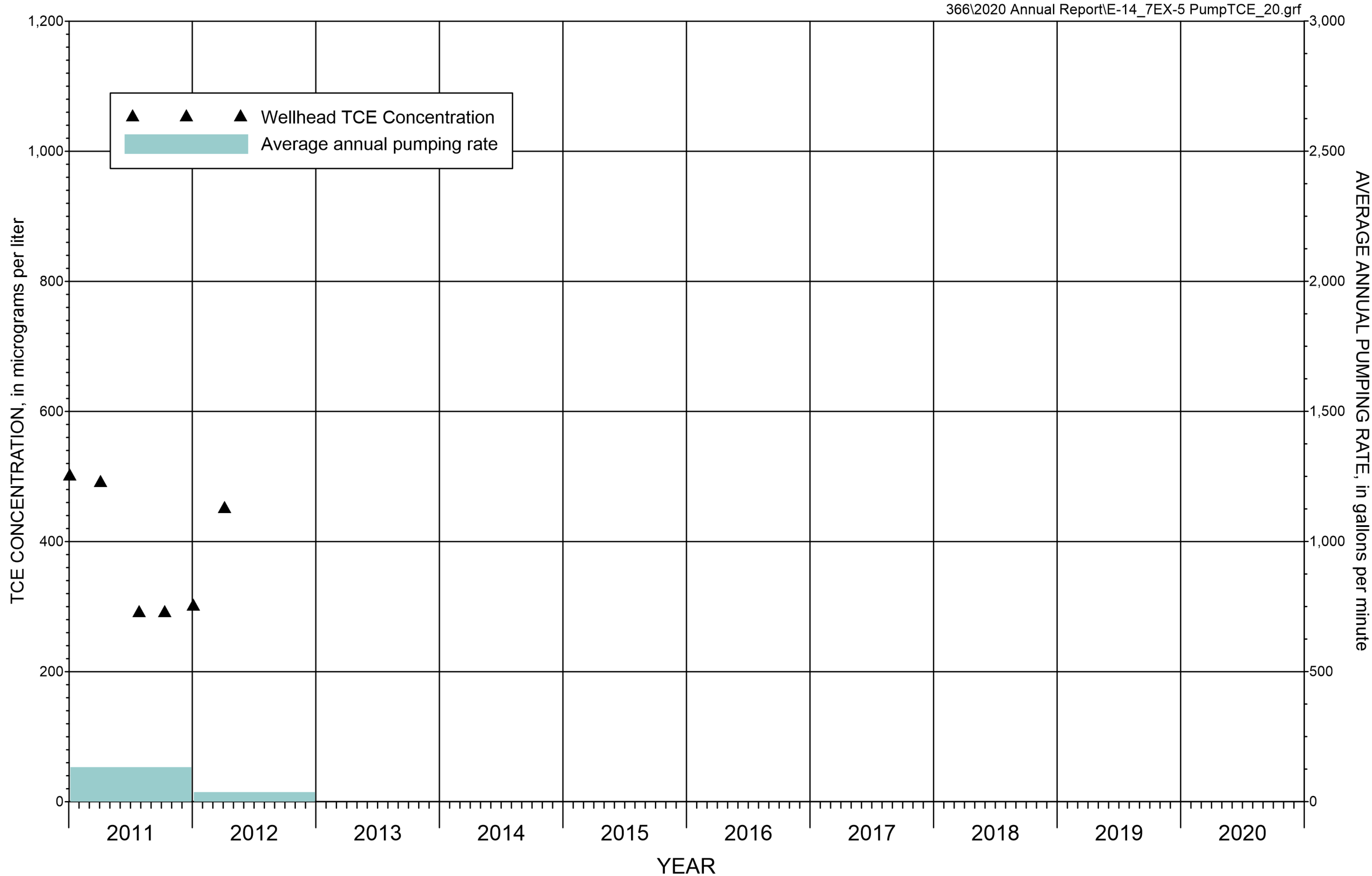


FIGURE E-14. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-5MA 2011 THROUGH 2020

Note: Well 7EX-6MA replaced Well 7EX-5MA August 2015.
Well 7EX-5MA was abandoned August 4, 2016.

North Indian Bend Wash Superfund Site

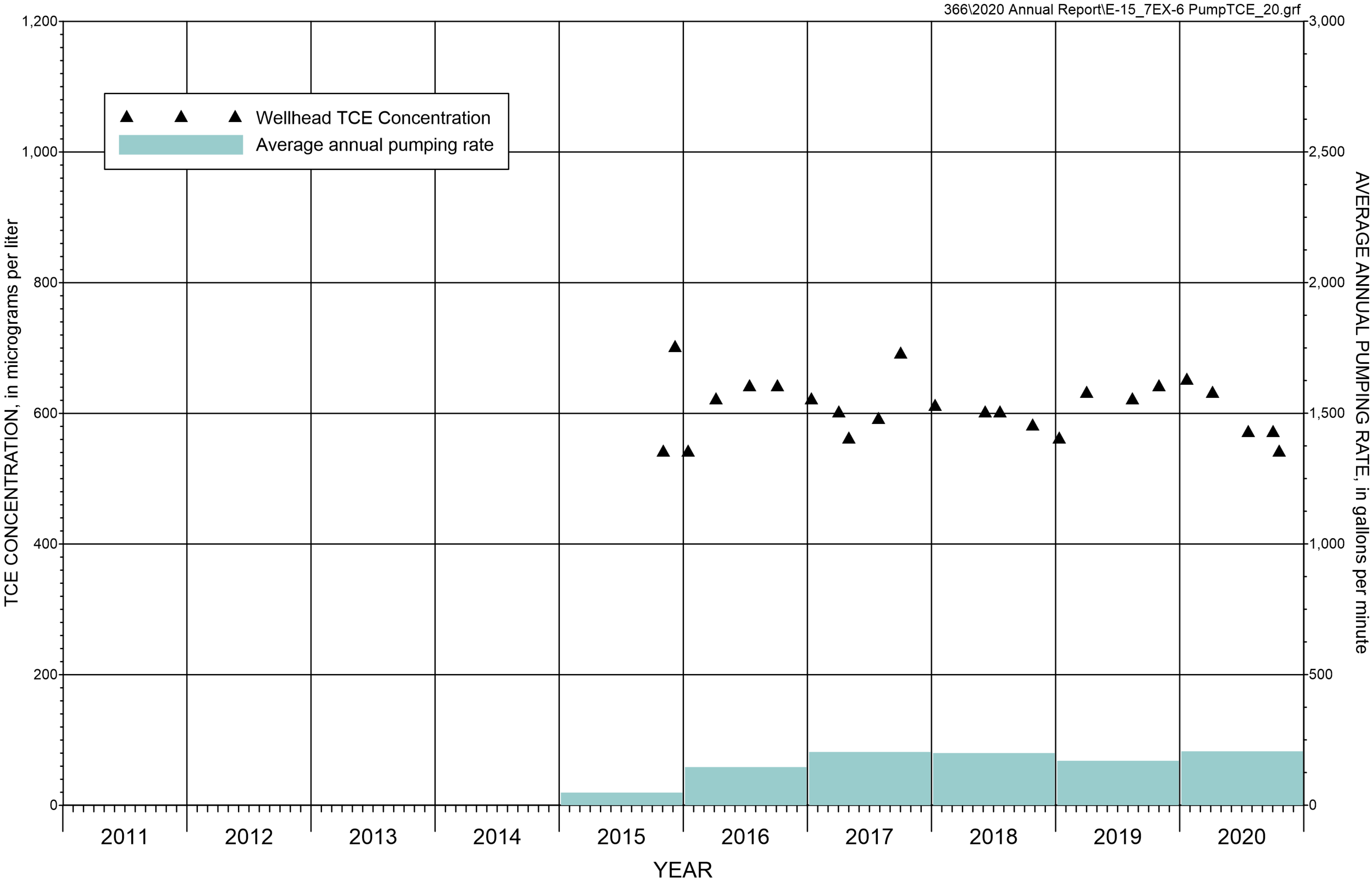


FIGURE E-15. CONCENTRATION OF TCE AND AVERAGE ANNUAL PUMPING RATE AT EXTRACTION WELL 7EX-6MA 2011 THROUGH 2020

Note: Well 7EX-6MA replaced Well 7EX-5MA August 2015.

North Indian Bend Wash Superfund Site

APPENDIX F
MANAGEMENT OF UNTREATED GROUNDWATER

APPENDIX F. MANAGEMENT OF UNTREATED GROUNDWATER

Section VI.B.4.n of the SOW requires COS, SRP, and the NIBW PCs to provide a report describing the creation and maintenance of records to document compliance with Section VI.B.4.a through VI.B.4.m of the SOW. Section VI.B.4 specifies provisions for managing untreated groundwater extracted from NIBW wells as part of the remedy and requires that groundwater be managed as if it were a hazardous waste by following the requirements set forth in Sections VI.B.4.a through VI.B.4.m. The NIBW PCs, SRP, and COS are submitting the following information to fulfill the requirements for annual reporting of compliance with Section VI.B.4 of the SOW. For ease of reference, information regarding COS, SRP, and the NIBW PCs management practices pertaining to applicable requirements of Section VI.B.4 are referenced in the order listed in the SOW.

Section VI.B.4.a – normal operation, maintenance, and monitoring activities:

The NIBW PCs have specified procedures for management of untreated groundwater associated with sampling activities at the MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS and well equipment maintenance in O&M Plans and Responses to Comments that were submitted to EPA and ADEQ, as follows:

- MRTF on June 19, 2020
- NGTF on June 19, 2020
- Area 7 GWETS on June 19, 2020
- Area 12 GWETS on June 19, 2020

The NIBW PCs followed procedures described in the Phase I SAP for managing untreated groundwater during monitor well sampling. In 2020, access was restricted at times during maintenance activities conducted at SRP NIBW extraction well sites. During the reporting period, both the Granite Reef and PCX-1 wells were taken offline for maintenance and repair activities:

The Granite Reef well was off-line from November 2019 to September 2020. In November 2019, SRP removed the pump from the Granite Reef Well following the annual 2019 October monitoring event due to decreased pumping capacity. SRP performed well rehabilitation activities through April 2020 and later replaced the pumping equipment in the well in September 2020. The Granite Reef well also resumed operation in September. The Granite Reef well is operated as part of the Area 12 Source Control Program to remediate the middle alluvial unit (MAU). The well is connected to the Area 12 Groundwater Extraction and Treatment System (GWETS) via underground pipeline.

The PCX-1 well was off-line from September through December 2020 due to a pump failure. SRP replaced the pump and PCX-1 resumed operation in January 2021. PCX-1 feeds the PCX-1 pipeline, which is an underground conveyance that follows the Arizona Canal right-of-way and connects to the NIBW Granular Activated Treatment Facility (NGTF). The PCX-1 well operates as an extraction well as part of the NIBW Superfund Remediation Project and is part of the regional lower alluvial unit aquifer plume containment remedy.

There were no accidental releases of untreated groundwater from SRP extraction wells PCX-1, COS-31, or Granite Reef well, tied into treatment at the Site in 2020.

One minor incidental release of untreated groundwater pumped from Granite Reef well occurred in 2020 at a location several hundred feet downstream from the well site. On April 20, 2020, untreated groundwater leaked from the raw water pipeline from the Granite Reef well to the Area 12 GWETS. Total estimated release is up to 900 gallons. Samples of water and soil samples in the impacted area were obtained as soon as practical, following termination of pumping activities. Notifications and corrective action were taken immediately, and a summary report was prepared by the NIBW PCs and submitted to the EPA and other parties on April 27, 2020.

COS has specified procedures for management of untreated groundwater associated with sampling activities at the CGTF and well equipment maintenance in the most-recent O&M Plan (submitted on June 19, 2020).

One minor incidental release of untreated groundwater from well COS-75A occurred in 2020. On April 8, 2020 Air Relief Valve (ARV) #10 was found to be leaking. Soil testing was performed in the area of the impacted soil, and all results were non-detect for TCE. Water sampling was not possible, as water had absorbed into the ground before sampling staff arrived. The leak was estimated at 2,000 – 3,000 gallons and impacted a drainage channel near Hayden Road and Earll Drive. A summary report was prepared by the city and submitted to the EPA and other parties on April 20, 2020.

Section VI.B.4.c – well access:

The Final Remedial Design/Remedial Action (RD/RA) Work Plan, prepared by the NIBW PCs, dated July 11, 2007, provides information concerning access at the extraction well sites.

Section VI.B.4.d – annual treatment facility inspections:

As part of normal O&M procedures, each NIBW groundwater treatment facility is inspected on a routine basis for equipment malfunction and deterioration that could result in the release of untreated groundwater.

As explained in Section 2 and **Appendix H** of this SMR, the NIBW PCs coordinated inspections of the CGTF and NGTF on September 23, 2020 and MRTF, Area 7, and Area 12 on October 6, 2020, in accordance with Section VI.B.4.d of the SOW. Representatives of EPA and ADEQ participated in the inspections virtually and the treatment system operators and the NIBW PCs participated locally for the annual inspections at each of the treatment facilities. The treatment facilities were inspected for malfunctions, deterioration, and operator practices or errors that could result in a release of untreated groundwater. At each facility, the major system components were identified and examined for operability, condition of operating equipment, and management of untreated groundwater and residual materials. Additionally, data related to routine operation, system startup and shutdown, routine and non-routine maintenance, and sampling were available for review.

The inspections indicate that the facilities are in good working condition and are operated proficiently. Based on these findings, the NIBW PCs conclude the facility operations comply with the Amended CD/SOW. No hazardous waste is generated, handled, or stored at the NIBW groundwater treatment plants. A summary report documenting the site inspection for each facility is provided in **Appendix H**.

Section VI.B.4.e – training for responding to releases of untreated groundwater:

The NIBW PCs submitted a plan for health and safety training of GWETS Operators and Emergency Coordinators to EPA as part of materials included in an August 1, 2003, "Submittal of Information Required, Section VI of the Statement of Work" provided to EPA and ADEQ. The plan specified steps to be conducted for personnel at all groundwater treatment facilities to assure that they will have appropriate health and safety training to respond to releases of untreated groundwater in a manner to protect public health and the environment.

In 2020, COS provided on-line emergency response and incident management training for an untreated groundwater release for CGTF, NGTF, and Area 7 GWETS raw water pipelines. The training sessions are performed online, and the training is tracked within the COS training management program.

The Contingency and Emergency Response Plan (CERP) for Accidental Releases of Untreated Groundwater from SRP North Indian Bend Wash Site Extraction Wells, prepared by SRP, dated January 2007, and updated most recently in November 2019, describes the training to be conducted for personnel responding to an accidental release of untreated groundwater from an SRP facility. SRP employee training records are maintained on site.

Section VI.B.4.f and g – land disposal of untreated groundwater:

The NIBW PCs, SRP, and COS have not placed untreated groundwater in any salt dome formation, salt bed formation, underground mine or cave, surface impoundments, waste piles, land treatment units, incinerators, or landfills.

Section VI.B.4.h – emergency and contingency response plans:

The NIBW PCs prepared updated CERPs and Responses to Comments for the NGTF, MRTF, Area 7 GWETS and Area 12 GWETS on December 31, 2020. COS updated the CGTF

CERP in August 2020; and SRP prepared an updated CERP for SRP extraction wells used in the NIBW Site remedial actions in November 2019.

The CERPs describe the procedures for handling an accidental release of untreated groundwater from an extraction well in the NIBW site.

Section VI.B.4.i – emergency coordinators:

The NIBW PCs, COS, and SRP list designated emergency response coordinators for the groundwater treatment facilities and the extraction well network. Currently identified personnel responsible for emergency response at the NIBW groundwater treatment facilities and extraction well sites are listed in each O&M Plan and CERP, as well as the NIBW Contact List in **Appendix J**.

Section VI.B.4.j – evidence of Holocene faults:

The NIBW PCs and SRP provided written verification in submittals dated August 1, 2003 and September 3, 2003, respectively, to EPA and ADEQ indicating the existing NIBW extraction wells and treatment facilities are not located within 200 feet of a fault, which has exhibited displacement in Holocene time. There are no recognized Holocene faults in the metropolitan Phoenix area. COS also provided this verification in July 2003.

Section VI.B.4.k – floodplains:

COS, NIBW PCs, and SRP provided information in submittals dated July, August, and September 2003, respectively, to EPA and ADEQ to confirm that four NIBW extraction wells are in locations that would be inundated by a 100-year flood. According to maps produced by the Maricopa County Flood Control District, the following remedial extraction wells are located within 100-year floodplains:

- COS-72 and COS-75A - Indian Bend Wash,
- Granite Reef well - Granite Reef Wash, and
- PV-14 - unnamed wash.

The NIBW PCs described measures for operating the wells in the draft Groundwater Extraction Well Network O&M Plan to ensure that there will not be a release of untreated groundwater during a 100-year storm.

Section VI.B.4.l – closure:

NIBW PCs, SRP and COS did not abandon any extraction or production wells associated with the NIBW project in 2020. There were no facility closure activities in 2020.

Section VI.B.4.m – containment:

The Remedial Design/Remedial Action (RD/RA) Work Plan provides information concerning containment at the extraction well sites.

APPENDIX G
DOCUMENTS SUBMITTED IN 2020

APPENDIX G. DOCUMENTS SUBMITTED IN 2020

During the period January through December 2020, the NIBW PCs provided the following documents to EPA and ADEQ:

NIBW Groundwater Model Overview Meeting Presentation, submitted by electronic mail on February 4, 2020.

Groundwater Flow Model Update Work Plan, submitted by electronic mail on February 23, 2020.

2019 Site Monitoring Report, North Indian Bend Wash Superfund Site, Volume I: Text, Tables, and Illustrations and Volume II: Appendix A-F, submitted by electronic mail on February 28, 2020.

Groundwater Monitoring Program Supplemental Data, North Indian Bend Wash Superfund Site, submittal by electronic mail on February 28, 2020.

Groundwater Extraction and Treatment System Supplemental Data, North Indian Bend Wash Superfund Site, submitted by electronic mail on February 28, 2020.

Summary of 2019 Air Sampling Data, North Indian Bend Wash Superfund Site, submitted by electronic mail on February 28, 2020.

Draft NIBW Area 7 Groundwater Extraction and Treatment System Operation and Maintenance Plan, submitted by electronic mail via Box.com link on February 29, 2020.

Draft NIBW Area 12 Groundwater Extraction and Treatment System Operation and Maintenance Plan, submitted by electronic mail via Box.com link on February 29, 2020.

Draft NIBW Miller Road Treatment Facility Operation and Maintenance Plan, submitted by electronic mail via Box.com link on February 29, 2020.

Draft NIBW North Indian Bend Wash Granular Activated Carbon Treatment Facility Operation and Maintenance Plan, submitted by electronic mail via Box.com link on February 29, 2020.

Draft Work Plan – Groundwater Flow Model Update, North Indian Bend Wash, Scottsdale, Arizona, submitted by electronic mail on March 23, 2020.

NIBW MAU and LAU Plume Animation Updates Through 2019, submitted by electronic mail on April 2, 2020.

Notices re: Postponement and Rescheduling of April 2020 Groundwater Monitoring Event, submitted by electronic mail on April 2 and May 13, 2020.

NIBW 2019 SMR Overview Presentation, submitted by electronic mail on April 2, 2020.

NIBW MAU Plume Animation – 2019, submitted by electronic mail on April 2, 2020.

NIBW LAU Plume Animation – 2019, submitted by electronic mail on April 2, 2020.

Notice of Water Line Release from Granite Reef Pipeline, submitted by electronic mail on April 22, 2020.

Incident Report – NIBW Granite Reef Pipeline Minor Release 2020-04-20, submitted by electronic mail on April 27, 2020.

Responses to EPA Comments on NIBW Modeling Work Plan and 2019 Model Files, submitted by electronic mail on April 28, 2020.

NIBW Discussion of AROD Remedial Action Objectives vs ACD Performance Standards Presentation, submitted by electronic mail on May 14, 2020.

PCs' Responses to Comments on 2019 Site Monitoring Report, submitted by electronic mail on May 29, 2020.

NIBW Model Update Hydrogeologic Conceptual Model Overview Presentation, submitted by electronic mail on May 28, 2020.

NIBW Quarterly Report – January through March 2020, submitted by electronic mail on May 29, 2020.

General Discussion of Technical Committee Comments on 2019 Site Monitoring Report Presentation, submitted by electronic mail on June 1, 2020.

Draft GMEP Presentation – June 17, 2020 Meeting, submitted by electronic mail on June 16, 2020.

Revised Operation and Maintenance Plan, Area 7 Groundwater Extraction and Treatment System, submitted by electronic mail on June 19, 2020.

Revised Operation and Maintenance Plan, Area 12 Groundwater Extraction and Treatment System, submitted by electronic mail on June 19, 2020.

Revised Operation and Maintenance Plan, Miller Road Treatment Facility, submitted by electronic mail on June 19, 2020.

Revised Operation and Maintenance Plan, North Indian Bend Wash Granular Activated Carbon Treatment Facility, submitted by electronic mail on June 19, 2020.

July NIBW Modeling Update Presentation and Summary, submitted by electronic mail on July 14, 2020.

NIBW Groundwater Monitor Network Evaluation Presentation (Part 1), submitted by electronic mail on August 4, 2020.

NIBW Groundwater Monitor Network Evaluation Presentation (Part 2), submitted by electronic mail on August 24, 2020.

NIBW Quarterly Report – April through June 2020, submitted by electronic mail on August 28, 2020.

Draft Contingency and Emergency Response Plan, Area 7 Groundwater Extraction and Treatment System, submitted by electronic mail on August 31, 2020.

Draft Contingency and Emergency Response Plan, Area 12 Groundwater Extraction and Treatment System, submitted by electronic mail on August 31, 2020.

Draft Contingency and Emergency Response Plan, Miller Road Treatment Facility, submitted by electronic mail on August 31, 2020.

Draft Contingency and Emergency Response Plan, North Indian Bend Wash Granular Activated Carbon Treatment Facility, submitted by electronic mail on August 31, 2020.

Updated Groundwater Monitoring Well Network Operation & Maintenance Plan, submitted by electronic mail on September 2, 2020.

NIBW Well Modification Request, submitted by electronic mail on September 29, 2020.

NIBW Potential Opportunity Remedy Optimization Presentation, submitted by electronic mail on October 30, 2020.

Quarterly Report - July through September 2020, North Indian Bend Wash Superfund Site, submitted by electronic mail on November 25, 2020.

Results for October 2020 Water Quality Sampling at Arcadia Water Company Wells, submitted by electronic mail on December 2, 2020.

NIBW Site Overview Presentation - December 10, 2020, submitted by electronic mail on December 15, 2020.

Revised Contingency and Emergency Response Plan and Responses to Agency Comments, Area 7 Groundwater Extraction and Treatment System, submitted by electronic mail on December 31, 2020.

Revised Contingency and Emergency Response Plan and Responses to Agency Comments, Area 12 Groundwater Extraction and Treatment System, submitted by electronic mail on December 31, 2020.

Revised Contingency and Emergency Response Plan and Responses to Agency Comments, Miller Road Treatment Facility, submitted by electronic mail on December 31, 2020.

Revised Contingency and Emergency Response Plan and Responses to Agency Comments, North Indian Bend Wash Granular Activated Carbon Treatment Facility, submitted by electronic mail on December 31, 2020.

2020 NIBW Technical Committee Meeting Minutes

NIBW Technical Committee Meeting Minutes – December 21, 2019, submitted by electronic mail on January 23, 2020.

NIBW Technical Committee Meeting Minutes – February 3, 2020, submitted by electronic mail on March 17, 2020.

NIBW Technical Committee Meeting Minutes – March 24, 2020, submitted by electronic on April 2, 2020.

NIBW Technical Committee Meeting Minutes – April 20, 2020, submitted by electronic on May 14, 2020.

NIBW Technical Committee Meeting Minutes – May 18, 2020, submitted by electronic mail on May 29, 2020.

NIBW Technical Committee Meeting Minutes – June 17, 2020, submitted by electronic mail on July 7, 2020.

NIBW Technical Committee Meeting Minutes – July 17, 2020, submitted by electronic mail on August 4, 2020.

NIBW Technical Committee Meeting Minutes – August 12, 2020, submitted by electronic mail on August 24, 2020.

NIBW Technical Committee Meeting Minutes – September 16, 2020, submitted by electronic mail on October 30, 2020.

NIBW Technical Committee Meeting Minutes – October 28, 2020, submitted by electronic mail on November 17, 2020.

NIBW Technical Committee Meeting Minutes – December 10, 2020, submitted by electronic mail on December 15, 2020.

APPENDIX H
2020 SITE INSPECTION REPORT
GROUNDWATER TREATMENT FACILITIES

2020 INSPECTION REPORT
GROUNDWATER TREATMENT FACILITIES

North
Indian Bend Wash
Superfund Site

Prepared for:

U.S. Environmental Protection Agency
Region IX

Prepared by:

NIBW Participating Companies

February 26, 2021

2020 ANNUAL INSPECTION REPORT
Groundwater Treatment Facilities
North Indian Bend Wash Superfund Site
Scottsdale, Arizona

1.0 INTRODUCTION

This report documents the activities and findings for the North Indian Bend Wash (NIBW) groundwater treatment plant inspections conducted in accordance with Section VI.B.4.d of the NIBW Statement of Work (SOW). The purpose of the inspections, as described in the SOW, is to identify malfunctions, deterioration, operator practices or errors, and discharges that may be causing or could result in a release of untreated groundwater. The inspections were coordinated and conducted by the NIBW Participating Companies (PCs) and attended by representatives of the U.S. Environmental Protection Agency (EPA) and Arizona Department of Environmental Quality (ADEQ).

2.0 OVERVIEW

The groundwater remedy for the NIBW Superfund Site addresses aquifer restoration by monitoring, extracting, and treating groundwater affected by volatile organic compounds (VOCs), including the following five NIBW contaminants of concern (COCs): trichloroethene (TCE), tetrachloroethene (PCE), 1,1-dichloroethene (DCE), 1,1,1-trichloroethane (TCA), and chloroform. The NIBW COCs are treated to levels set forth in the Amended Consent Decree (ACD). Five separate groundwater extraction and treatment systems are used to extract and treat NIBW COC-affected groundwater at the Site. These systems are referred to as the Central Groundwater Treatment Facility (CGTF), Miller Road Treatment Facility (MRTF), North Indian Bend Wash GAC Treatment Facility (NGTF), Area 7 Groundwater Extraction and Treatment System (GWETS), and Area 12 GWETS.

Complete descriptions of the CGTF, MRTF, Area 7 GWETS and Area 12 GWETS and associated operation and maintenance (O&M) activities are presented in the following documents:

"*Feasibility Study Addendum, North Indian Bend Wash Superfund Site*", dated November 15, 2000 (FSA),

"*Record of Decision Amendment – Final Operable Unit, Indian Bend Wash Area*", dated September 27, 2002 (AROD), and

"*Sitewide Operation and Maintenance Plan*", dated June 5, 2006 (Sitewide O&M Plan), with individual treatment plant O&M plan updates prepared in 2012, 2014, and 2020.

Detailed design and operational information for NGTF is included in:

"*Design Report, PCX-1 Granular Activated Carbon Treatment Facility*", dated August 2012, and "*Operation and Maintenance Plan, North Indian Bend Wash GAC Treatment Facility*", dated March 31, 2016.

All five groundwater treatment systems were designed to reduce NIBW COCs to below concentrations specified in Table 3 of the AROD (Treatment Standards).

3.0 INSPECTION PROCEDURES

3.1 Routine Inspections

The operators routinely inspect the treatment facilities, either daily (CGTF, MRTF, and NGTF) or weekly (Area 7 GWETS and Area 12 GWETS). General operating parameters, such as totalized flow, local pressures and equipment state is logged manually during periodic site visits. Logging of more critical parameters, such as air and water flow rates, is performed by the computer control system at each facility on an hourly basis, at a minimum. The operators review the data for trends and anomalies to evaluate the overall operation of the treatment systems.

Due to the size of the treatment plants and the drinking water end-use, the NIBW PCs coordinate and conduct regular operational review meetings on an approximate monthly basis with the operators for the CGTF and NGTF. The NIBW PCs also visit all the treatment facilities frequently to conduct walk-throughs and to meet with the operators. These meetings include discussions of current operations issues, routine maintenance, planning for upcoming non-routine maintenance such as column cleaning, and equipment and/or systems upgrades.

Weekly, monthly, and/or quarterly data and operating reports are submitted by the facility operators. These reports are reviewed by the NIBW PCs to document O&M issues and confirm treatment effectiveness of each plant. Updates are provided during monthly meetings of the NIBW Technical Committee.

The project team routinely reviews treatment system discharge monitoring data and laboratory reports as they become available to verify the treatment systems are operating effectively. This process ensures that the treatment systems comply with applicable discharge requirements and the ACD.

3.2 Annual Inspections

Inspections are conducted annually in accordance with the SOW and ACD. The field inspections for CGTF and NGTF were conducted on September 23, 2020, and the field inspections for MRTF, Area 7 GWETS, and Area 12 GWETS were conducted on October 6, 2020.

The schedule of site inspections was coordinated in advance with EPA and ADEQ to provide an opportunity for regulatory agency participation. The treatment system operators and managers as well as the NIBW PCs participated locally at the individual treatment systems. EPA and its contractor, Gilbane, Inc., as well as ADEQ participated virtually during the 2020 inspections. The inspections included a facility walk-through, an interview with the primary operator, visual inspections of the treatment equipment and groundwater containment systems, and review of operating and maintenance data. Detailed operating data and maintenance logs for routine operation and non-routine projects are maintained and available for review at each treatment facility in accordance with the SOW. Additionally, documents such as the facility O&M Plans, O&M Manuals, Contingency and Emergency Response Plans (CERPs), and Health and Safety Plan are maintained at each respective facility. Many photographs of the treatment systems, including the groundwater extraction well heads, were collected and made available to EPA and ADEQ. Additionally, a video tour of each facility was provided to the remote participants. A description of each facility inspection and associated results are provided in the following section.

4.0 FACILITY INSPECTIONS

4.1 Area 7 Groundwater Extraction and Treatment System

NIBW Area 7 is located at the southeast corner of 75th Street and 2nd Street in Scottsdale. The groundwater treatment system is located in the southeast corner of Area 7 in an area approximately 56 feet by 75 feet. The facility includes the treatment system and control equipment. Groundwater extraction is performed using two remote MAU groundwater extraction wells (7EX-3aMA and 7EX-6MA).

The major components of the Area 7 GWETS include submersible groundwater pumps, wellhead equipment, piping from the wellheads to the treatment plant, a 5,000-gallon equalization tank, an ultraviolet oxidation (UV/Ox) system, a low-profile air stripper, and a vapor-phase granular activated carbon (GAC) treatment system.

The groundwater treatment plant includes a building, which houses the UV/Ox and air stripper systems. A control room is integral with the building and is equipped with the motor control center (MCC) and human machine interface (HMI), main control center, including programmable logic controller (PLC), and motor drives.

The equalization tank and GAC adsorbers are located outside the building on the north side of the treatment plant area.

Chemical systems in use at Area 7 include hydrogen peroxide storage and injection for the UV/Ox and storage and injection of poly-phosphate scale inhibitor for the air stripper. A double-contained 1,800-gallon crosslink polyethylene storage tank located outside the south side of the treatment building in a recessed area with six-inch berm is used to store approximately 27% hydrogen peroxide solution prior to injection immediately upstream of the UV/Ox system. The poly-phosphate chemical is food-grade scale inhibitor stored in a 50-gallon polyethylene tank located inside the treatment room at the Area 7 GWETS.

The entire treatment plant area is paved with concrete and surrounded by a two-inch berm for containment. The treatment plant is surrounded by a block wall for security. Access to the plant is provided through three steel gates, two located on the west wall and one on the south wall.

In its current configuration, the groundwater treatment system is capable of treating up to approximately 450 gallons per minute (gpm) of NIBW COC-affected groundwater. Treated water is delivered to one of two remote groundwater injection wells (7IN-1UA and 7IN-2UA) for recharge to the Upper Alluvium Unit (UAU).

In 2012, well 7EX-5MA became unusable during a rehabilitation project to increase production at that location. Well 7EX-5MA was abandoned in early 2016. At the same time, production from well 7EX-4MA was declining due to well conditions. In 2015, well 7EX-6MA was installed to replace both wells 7EX-4MA and 7EX-5MA while still capturing the highest concentrations of NIBW COCs in the vicinity of Area 7.

In October 2016, the water level in well 7EX-4MA had decreased to a point that the pump began to stall. The pump already had been lowered to near the bottom of the well prior to that time. Well rehabilitation was performed in 2012 with limited results. Well 7EX-4MA is currently offline.

In 2020, the typical water flow rate to the Area 7 GWETS was approximately 375-400 gpm. The typical air flow rate through the shallow-tray air stripper at Area 7 was approximately 2,700 cubic feet per minute (cfm).

During normal operation, treated groundwater is injected into the UAU via wells 7IN-1UA and 7IN-2UA. The GWETS is equipped to discharge treated groundwater either to the UAU aquifer upgradient of Area 7 through the injection wells or, under limited circumstances, to the City of Scottsdale sanitary sewer during maintenance on the system. Combined, the injection wells accept more than 450 gpm.

4.1.1 Notable Events at Area 7 in 2020

The NIBW PCs performed a rehabilitation of well 7EX-4MA in 2019. The rehabilitation effort included scrubbing, swabbing, and water jetting. Several holes were discovered in the casing following the rehabilitation activities. Other parts of the casing appeared to be in poor condition, as well. The PCs are evaluating options for liners or casing repair. No work was performed on the well in 2020 due to limitations from the pandemic. Further work on well 7EX-4MA is anticipated in 2021.

No significant events occurred at Area 7 during 2020.

4.1.2 Area 7 Maintenance and Condition

The Area 7 GWETS is operated and maintained by Arcadis, Inc. (Arcadis), an engineering consultant working on behalf of the NIBW PCs. Arcadis makes daily remote checks on the system via computer link and makes weekly site inspections of the equipment and grounds at Area 7. The operator also maintains operations logs and data spreadsheets at Area 7. The logs and spreadsheets were presented for review during the site inspection. Equipment maintenance records, including task and date, are kept on a separate log. Other site and operational information kept in a log book includes daily inspection observations and any other data collected by the operator. Treatment system data is also automatically logged by the control system and accessed through the HMI. Arcadis made operation and maintenance records available for review during the inspection.

In general at the time of the inspection, the facility appeared clean with no apparent leaks or significant deterioration during the inspection. The equipment was clean, labeled, and well maintained.

During the inspection, the process pumps in the plant appeared to be operating smoothly and without abnormal noises or vibrations. The process pumps are inspected weekly and serviced monthly. No significant maintenance or replacement was required on the process pumps at Area 7 in 2020.

The UV/Ox system appeared to be operating normally during the inspection. Both lamps and the quartz sleeves in UV/Ox system were replaced in late May 2020.

The blower appeared to be running smoothly during the inspection. The blower is direct drive and operated via a variable frequency drive which maintains fan speed. The operator indicated that the blower has performed well, and no service has been required. All dampers are checked quarterly for operability.

The internal air stripper trays were descaled in February 2019. Visual inspections through the viewports of the trays are performed monthly. With the use of the scale inhibitor, only minor amounts of calcium carbonate scale accumulate on the air stripper trays. Descaling is typically performed every few years, as needed.

The exterior of the building and outdoor equipment such as the equalization tank and GAC system appeared in order without significant deterioration.

Treated water from Area 7 is injected into the underlying UAU aquifer using wells 7IN-1UA and 7IN-2UA. The injection wells are equipped with monitoring devices that will shut down discharge to the injection wells in the event water in the wells rises to pre-determined levels. At the time of the inspection, no operational issues were apparent with either injection well 7IN-1UA or 7IN-2UA.

All instruments, alarms, and interlocks for the main control system were tested and validated during a testing program in July and August of 2020. No programming changes to the control system were made in 2020.

Other miscellaneous equipment service or replacements include replacement of the control room air conditioner in August 2020, testing of the fire suppression system in August 2020, and replacement of the solenoid valve actuator on the injection well discharge line in December 2020. The solenoid on the pneumatic valve actuator was responsible for a number of shutdowns that were attributed to low pressure in the compressed air system, and ground fault at the process pump P-2 VFD.

Other downtime was attributed to issues associated with intense lightning and monsoon weather in the area. These events typically cause alarms on the UV/Ox system due to the sensitive electrical nature of the high voltage equipment.

Overall, the Area 7 GWETS was available for treatment of extracted groundwater over 85% of the time during 2020. Downtime of the Area 7 GWETS is attributed to repair work, routine equipment maintenance, and multiple periodic power outages which are attributed primarily to local weather.

4.1.3 Results

Based on the 2020 inspection of the Area 7 GWETS, no treatment performance issues, hazards, or significant deterioration were apparent.

4.2 Area 12 Groundwater Extraction and Treatment System

The Area 12 GWETS is located at the General Dynamics facility at 8201 East McDowell Road in Scottsdale, Arizona. At this site, the air stripping tower is located just west of the Chemical Operations Building. The Area 12 GWETS is designed to treat up to 1,850 gpm of groundwater. Groundwater is extracted from two wells: MEX-1MA (MEX-1) and SRP well 23.6E-6.0N, also known as the Granite Reef well. MEX-1 is owned by Motorola Solutions and the Granite Reef well is owned by SRP. Both wells are operated by SRP. The treated groundwater from both wells is delivered to SRP's irrigation distribution system through a connection to an SRP lateral pipeline, located along Granite Reef Road.

The Area 12 GWETS consists of an air stripping GAC treatment system. Groundwater is pumped from the extraction wells in individual pipes to a common manifold near the air stripper. The air stripper is a counter-current forced-draft, packed column through which the NIBW COCs are removed from the groundwater.

The treated groundwater is discharged to SRP's irrigation distribution system at McKellips Lake under an agreement between SRP and Motorola Solutions, Inc.

The main control panel containing the system PLC is located at the Area 12 treatment plant. Each well pump system is connected to the PLC using an Ethernet connection with signals traveling via a fiber optic pathway. Each well site also contains a PLC to control the individual remote well operation. The remote well pump PLCs also interface with SRP systems to monitor and control well operation.

A small control room located at the treatment plant houses the HMI and various plant-specific records. The HMI consists of a computer that supports a graphical user interface, logs operational data, and allows remote operation and data transfer using a telephone modem.

Typical groundwater extraction rate at well MEX-1 in 2020 was approximately 975-1,050 gpm. In September 2019, the production at the Granite Reef well began to decrease. Subsequent testing indicated that the pump was failing and a new pump was required and production from the well was stopped.

In 2020, the typical air flow rate through the air stripper was approximately 5,400 cfm.

The Area 12 system is typically shutdown for the annual SRP Dry-Up in December and restarted in February, once the discharge is allowed by SRP. The 2020 scheduled maintenance and blower service was performed during that time. Additionally, the main PLC was upgraded and tested in 2020 during the scheduled downtime. The system was restarted on February 10, 2020 treating water from well MEX-1MA.

4.2.1 Notable Events at Area 12 in 2020

In March 2020, SRP performed rehabilitation activities at the Granite Reef well. In April 2020, the NIBW PCs conducted a pumping test at the Granite Reef well. During the testing activities on April 20, 2020, a short steel pipe branch between the main pipeline and an air valve leaked. The leak site was located between the sidewalk and the General Dynamics Fence on the west side of Granite Reef Drive approximately 350 feet south of the intersection with McDowell Road. Approximately 900 gallons of untreated groundwater was released before the testing activities and production at well MEX-1MA were stopped. Most the released water soaked into the ground near the leak site or flowed into the gutter on the west side of Granite Reef Drive down to a storm sewer inlet approximately 2,200 feet south of the leak site. Laboratory analyses of water collected at the leak site indicated a TCE concentration of 24 micrograms per liter (μg/L). Laboratory results of all other water samples collected from the released water indicated that TCE was not detected or the concentration was below 5 μg/L. Laboratory analyses of all soil samples collected as part of the response indicated that TCE was not detected above the reporting limit. The release and response was thoroughly documented in a letter to EPA dated April 27, 2020. The short branch was repaired on April 30, 2020 with copper pipe. The air valve was configured so that it can be removed and inspected easily. Well MEX-1MA resumed operation following completion of the repairs. Once the testing activities were completed, SRP outfitted the well with a new pump. The Granite Reef well was returned to service on September 11, 2020.

Once back online, the flow rate from the Granite Reef well was between 900 gpm and 950 gpm.

4.2.2 Area 12 Maintenance and Condition

The Area 12 GWETS is operated and maintained by EnSolutions, an engineering consultant working on behalf of the NIBW PCs. When in operation, EnSolutions makes daily remote checks on the system via computer and approximately twice weekly visits to the GWETS. During the visits, the operator conducts inspections of the equipment and grounds at Area 12. A safety coordinator for the General Dynamics facility makes daily walk-throughs at the Area 12 GWETS. The operator also maintains operations logs and data spreadsheets at the facility. The logs and spreadsheets were presented for review by the inspection team during the site inspection.

In general, the facility appeared clean, with no apparent leaks or significant deterioration during the inspection. The equipment was clean, labeled, and well maintained. At the time of the inspection, the blowers appeared to run smoothly. The operator indicated that the blowers have performed well since installation, and no other non-routine service has been required.

Normally, column cleaning activities are performed during the scheduled maintenance at the beginning of the year. Due to the failure of the acid recirculation pump, the column cleaning activities were performed over 10 days in August 2020.

The process control system is monitored continuously by computer. The system must be in auto-mode for start-up and operation. The system cannot start with an active shutdown alarm. The primary control system alarms are tested annually during the SRP dry-up maintenance period. The control system primary alarms were tested and validated with the upgrades to the PLC in January 2020. The results of the testing were presented for review during the inspection. The testing data indicated that all systems were operable. The operator indicated that the alarms are routinely tested when the system is shut down. All equipment, control device elements, transmitters, alarms, and interlocks are tested at least once per year.

Excluding the scheduled maintenance in January and into February for the annual SRP dry-up and the column cleaning activities during August, the Area 12 GWETS was available for treatment of extracted groundwater greater than approximately 90% of the time in 2020.

4.2.3 Results

Based on operating and monitoring data, the Area 12 GWETS has consistently met performance criteria set forth in the ACD.

Exclusive of the small release from the Granite Reef pipeline during the pumping testing activities, no treatment performance problems, hazards, significant deterioration, or equipment malfunctions were apparent at the Area 12 GWETS.

4.3 Miller Road Treatment Facility

MRTF is located at 5975 Cattletrack Road, south of the intersection of Cattletrack Road and McDonald Drive in Scottsdale, Arizona. The facility is owned and operated by, and the responsibility of, EPCOR Water USA (EPCOR). MRTF is used to treat water from EPCOR production wells PV-14 and PV-15.

MRTF consists of three individual air stripping treatment trains. Each treatment train includes a counter-current, forced-draft air stripper with appurtenant equipment, such as an air blower. The off-gas from each air stripper passes through a mist eliminator, then through ducting to one of three GAC adsorbers before discharge to the atmosphere. Each air stripper column treats groundwater at flow rates up to approximately 2,150 gpm, with an air flow rate of approximately 5,650 cfm.

Water produced from wells PV-14 and PV-15 is treated by EPCOR and delivered to the clearwell at MRTF, where it is then pumped to EPCOR's Paradise Valley Arsenic Removal Facility. If not required for use in EPCOR's system, treated water may be delivered to SRP via the Arizona Canal outfall. The treatment system is configured such that water from one well is treated through a specific column. Each well produces between approximately 2,100 gpm and 2,150 gpm. Wells PV-14 and PV-15 are operated based on demand from EPCOR's system. The treatment piping allows water from well PV-14 to be treated through Towers 2 or 3 and water from well PV-15 to be treated through Tower 1 or 2. EPCOR switches treatment of water from the wells between the towers periodically. During low demand periods, EPCOR prioritizes pumping of well PV-15. During the low demand period in winter months typically between December and March, well 14 is used between 12 and 20 hours a day to make up production for demand, as necessary.

At the time of the inspection, water from both wells PV-14 and PV-15 was being treated at MRTF.

All MRTF treatment equipment, except the GAC adsorbers and acid feed system, is located inside the treatment building. The treatment building consists of several rooms including the air stripper room, which houses the air stripper columns, blowers, and distribution pumps; the electrical room, which supports the MCCs, starters, Remote Terminal Units (RTUs), Remote Input/Output (RIO) cabinets, transformers, and other electrical equipment; and the control room, where the HMI, laboratory, and records are located.

For security and aesthetics, the facility is surrounded by a masonry wall with locking access gates.

4.3.1 Notable Events at MRTF in 2020

On November 30, 2020, well PV-14 was removed from service for conversion from a submersible pump to a vertical turbine pump. Well PV-14 was not operated the rest of 2020.

4.3.2 MRTF Maintenance and Condition

EPCOR made relevant operating, monitoring, and safety documents, as well as operating data and maintenance logs for MRTF, available during the inspection. Additionally, the operator was interviewed and a walk-through of the facility was conducted.

EPCOR has an operator onsite at MRTF for several hours a day, seven days a week. The operator makes daily inspections of the equipment and grounds at MRTF. The operator also maintains operations logs and data spreadsheets at the facility.

Well PV-15 was offline from February 21 to March 10 for pump inspection and video logging the well. During this time, well PV-14 operated continuously. Well PV-15 was offline for approximately 8 days in November 2020 for pump service due to movement of the shaft.

Column cleaning to remove calcium carbonate scale at MRTF was performed in April and May 2020. Column cleaning consists of circulating a low pH solution through the packing to remove the accumulated scale. The treatment system is operated during column cleaning activities since a third column is available and the column being cleaned can be isolated from the system.

The blowers and treatment area are inspected daily by the operator. Maintenance, such as balancing and belt alignment on the blowers, is performed by EPCOR technicians on an as needed basis in accordance with the O&M instructions provided by the manufacturer. EPCOR uses a system-wide preventative maintenance program that automatically schedules the appropriate maintenance on each piece of equipment in accordance with manufacturers' instructions. On May 23, 2020, Blower 1 was replaced with a spare due to noisy bearings. The removed blower was shipped to a service contractor, inspected, refurbished, and returned to MRTF for use as a spare. Blowers 1 and 3 were operating at the time of the inspection and appeared to run smoothly without excessive vibration and unusual noises.

In July 2020, the venturi flow meters before each of the air strippers were replaced with magnetic flow meters for more precise measurements and consistency with other flow meters at the facility.

The equipment and work areas at MRTF appeared clean and well maintained during the inspection. The piping, valves, and instruments were labeled and appeared in good condition.

EPCOR indicated that the automated valves are tested and calibrated once per year. The manual valves are exercised approximately three to four times a year. Process instruments are checked and calibrated and/or tested once per year by EPCOR.

The air handling system appeared tight and in good condition during the inspection. EPCOR indicated that the dampers are exercised periodically.

The MRTF was available for treatment of extracted groundwater greater than 95% of the time in 2020. The facility was idle only during system maintenance.

4.3.3 Results

Based on operating data, MRTF has consistently met performance criteria set forth in the ACD.

Based on the 2020 inspection of MRTF, no treatment performance issues, hazards, significant deterioration, or equipment malfunctions were apparent.

4.4 Central Groundwater Treatment Facility

The CGTF is located at 8650 E. Thomas Road in Scottsdale, Arizona at the northeast corner of Pima Park, a municipal park. Other related facilities include the CGTF extraction wells and Reservoir 80, into which treated water from the CGTF is discharged for beneficial use as a supply to City of Scottsdale's potable water system.

Background and details of the CGTF are provided in the O&M Plan developed for this facility. EPA approved the CGTF O&M Plan, dated March 2006, including several updates; the most recent in June 2020. The O&M Plan describes the facility, major pieces of equipment, control strategies, and performance monitoring of the treatment plant. Design parameters and performance of CGTF have been validated and documented in the O&M Plan, quarterly Compliance Monitoring Reports, and annual data reports for the NIBW Site.

The CGTF uses air stripping to remove NIBW COCs, primarily TCE, from groundwater. The CGTF is comprised of three separate, parallel treatment trains. Each treatment train consists of a packed column, a process air fan, and an off-gas vapor treatment system that removes NIBW COCs prior to discharge to the atmosphere. Each column has a design capacity of 3,150 gpm. The overall capacity of the CGTF is approximately 9,450 gpm. The separate treatment trains allow for one or more columns to be removed from service while the other column(s) continue to operate.

Groundwater can be pumped from City of Scottsdale wells 75A, 71A, 72, and 31 through transmission pipelines to the CGTF. Currently, only well 75A is routinely pumped to and treated at CGTF. Water from well 31 may be used as back-up if water from other sources is not available. Well 72 is typically operated infrequently. In 2020, well 72 was operated a fair amount to make up for demand. Due to inorganic water quality, City of Scottsdale has removed well 71A from service. Typical flow rates range from approximately 2,250 gpm at well 72 to 2,300 gpm at well 75A to 2,575 gpm at well 31.

Influent water combines in a common raw water header and is evenly distributed into the available columns, where it flows top to bottom through the column packing while airflow is pulled through the tower in a counter-current direction.

The blower air flow rates range from approximately 11,500 cfm to 14,000 cfm per column depending on the magnitude of calcium carbonate scaling in the packing and the amount of water treated in each column.

Since water from the wells is delivered to CGTF in a common header, the flow rate through each column can vary depending on the number of wells and columns in service at any given time. Typically, the flow rate through the columns ranges between approximately 1,500 and 3,000 gpm depending on the number of wells operating.

The treated water gravity flows to Scottsdale's potable water system or is pumped to the SRP irrigation system. The capacity of the connection to the SRP irrigation system varies based on several factors, with a current maximum of approximately 4,000 gpm. Blending of CGTF treated water with other water supplies occurs in the potable water storage facility, Reservoir 80, just south of the site.

A process air fan is used to pull air through an intake filter then upward through the packed column, counter-current to the water flow. The off-gas is directed through a mist eliminator, a natural gas-fired duct heater, and then to a GAC contactor prior to discharge to the atmosphere. The duct heater heats the air which reduces relative humidity prior to VOC adsorption in the GAC contactors.

The majority of the treatment equipment, except the duct heaters, GAC contactors, and disinfection equipment, is located inside the CGTF treatment building. The treatment building consists of several rooms, including: the air stripper room, which houses the packed columns and process air fans; the electrical equipment room, which supports the MCCs, starters, RTUs, RIO cabinets, transformers, and other electrical equipment; and the laboratory. Disinfection equipment is located in a separate building at the Reservoir 80 booster station and is part of the drinking water system operated by City of Scottsdale. For security and aesthetics, the facility is surrounded by a masonry wall with locking access gates.

4.4.1 Notable Events at CGTF in 2020

The CGTF was offline between November 4, 2019 and April 16, 2020 for a rehabilitation project on the air strippers and other maintenance work around the facility. Primary rehabilitation activities include the following tasks.

- Remove and replace the air stripper internal packing
- Recoat the interior walls of the air stripper columns
- Descale other air stripper internal equipment
- Upgrade, refurbish, or replace column internals including the acid, water and air distributors, mist eliminators, packing support plates, wall wipers, and other systems associated with the air strippers
- Descale and refurbish the SRP bypass pumps and piping systems
- Upgrade, refurbish, or replace external pipe, valves, and fittings associated with the acid cleaning system
- Install new CGTF isolation valve on discharge line to Site 80
- Upgrade facility lighting
- Touch up facility and building exterior coatings, as necessary
- Repair blower room roof.

On April 8, 2020, an air relief valve located on the west side of Hayden Road just south of Earll Drive, leaked a small amount of untreated groundwater. The released groundwater entered an adjacent parking lot and a drainage channel. The local isolation valve was immediately turned off, stopping the flow of water until repairs could be completed. The air valve is located on a pipeline branch for wells 71A and 72, however, only well 75A was pumping at the time of the release. As such the pipe network was pressurized with the flow from well 75A at the time of the release.

Water was observed in the landscaped area near the air relief valve(ARV), in the parking lot and along the gravel-lined drainage channel. Water flowed west about 150 feet and absorbed into the ground. Approximately 2,000 to 3,000 gallons of untreated groundwater was released. No water samples were collected, however, four soil samples were collected in the vicinity of the release and the drainage area. Laboratory analytical results indicated that no NIBW COCs were detected above the respective reporting limits. The release was thoroughly documented by City of Scottsdale in a letter to EPA dated April 20, 2020.

4.4.2 CGTF Maintenance and Condition

CGTF is operated and maintained by a City of Scottsdale water treatment operator. City of Scottsdale operations personnel also monitor the status of CGTF remotely. Operators make minimum daily inspections of the equipment and grounds at CGTF. The operator maintains operations logs and data spreadsheets at the facility. The logs and spreadsheets were presented for review by the inspection team during the site inspection. Technical staff from City of Scottsdale Water Operations such as mechanics, electricians, and instrumentation technicians also provide maintenance support, as needed.

The City of Scottsdale Water Resources Department uses a city-wide preventative maintenance program for all equipment operated by the water operations staff. This program maintains a service record database for each piece of equipment and prompts the technicians to perform routine preventative maintenance in accordance with manufacturers' instructions or as necessary.

At the time of the inspection, the facility appeared clean with no apparent leaks or significant deterioration. The equipment is clean, labeled, and well maintained. All piping appeared in good condition without leaks or corrosion during the inspection. All valves in the plant are turned at least once per year to verify proper working order.

All blowers appeared to run smoothly. Service is performed on the blowers as needed but, at least during each GAC service event on the associated treatment train, or at a minimum on a quarterly basis. Service activities may include alignment, bearing repacking, and inspection and tightening of the drive belts. The air handling and treatment system appeared tight and in good condition during the inspection.

Visual inspection through the viewports on the air stripper column during the inspection indicated light scaling of packing material. This was expected since the internal packing was replaced during the rehabilitation project. The trays at the top of each column are visually inspected by the operator on a monthly basis for even water distribution and for accumulation of debris produced from the wells.

Column cleaning was performed in late November and early December 2020. The column cleaning activities required only a few weeks of downtime of the facility since the rehabilitation project was just completed in April.

The process control system is monitored continuously. City of Scottsdale has implemented a program to test all switches and alarms on a routine basis when a treatment train is offline for GAC service. Results of the control tests are maintained in a notebook at CGTF. Additionally, instruments are checked and calibrated during the GAC service events by City of Scottsdale instrument technicians.

The CGTF was available for treatment of extracted groundwater greater than 90% of the time between April and December 2020.

4.4.3 Results

Based on operating data, CGTF has consistently met performance criteria set forth in the ACD.

Based on the 2020 inspection at CGTF, no treatment performance problems, hazards, or significant deterioration were apparent.

4.5 NIBW GAC Treatment Facility

The NGTF is located at 5985 North Cattletrack Road in Scottsdale, Arizona at the southwest corner of Cattletrack Road and McDonald Drive. NGTF is owned by Motorola Solutions, Inc. and is operated under contract by City of Scottsdale Water Resources. Treated water from NGTF is delivered to City of Scottsdale's Chaparral Water Treatment Plant (CWTP) located approximately one-half mile east of NGTF or to SRP's Arizona Canal through a dedicated outfall immediately east of the facility.

NGTF treats water from extraction well PCX-1. The typical production rate from well PCX-1 in 2020 was approximately 2,650 gpm. Treatment of water from well PCX-1 at NGTF is accomplished using liquid-phase GAC. A pre-filter located upstream of the GAC system removes entrained solids to prevent accumulation of sediment in the media bed. The GAC system is comprised of four separate, parallel treatment trains. Each treatment train consists of two contactors, each containing approximately 20,000 pounds of GAC with interconnecting piping and valves. Each treatment train has a design capacity of approximately 1,050 gpm. All treatment trains are used for treatment of groundwater from well PCX-1. The flow of water from well PCX-1 is typically split across three treatment trains, while the remaining treatment train is in standby mode. Service rotates among the four treatment trains. This arrangement allows the system to remain operating while GAC media is serviced.

GAC service is accomplished on the standby treatment train while the other three trains remain in service treating groundwater. Currently, the service life of the carbon in the LEAD contactors is approximately six weeks.

Groundwater enters the treatment train through the LEAD contactor, which provides the required NIBW COC treatment. Treated groundwater then flows through the LAG contactor. The configuration of the treatment train allows for each of the two GAC contactors in the treatment train to operate in either LEAD or LAG position and also supports reverse flow through the contactors for backwashing the media.

Following GAC treatment, water is disinfected by City of Scottsdale and delivered to the CWTP finished water reservoir through a dedicated 16-inch pipeline between the facilities. Chlorination is required by City of Scottsdale to meet drinking water standards associated with the CWTP. The disinfection system at NGTF is not considered part of the treatment system for NIBW COCs in groundwater.

After GAC replacement or during normal operation, the media may require backwashing to remove fines and sediment build-up in the bed. Backwash water is collected in the backwash storage tank, and discharged to the sanitary sewer.

The control building at NGTF supports the control console with HMI, appurtenant mechanical equipment, electrical equipment, and the RTU containing the main PLC. The system is linked with City of Scottsdale's city-wide SCADA system. The program logic associated with the SCADA system is secure and only accessible by authorized personnel. Changes to the program can only be made after review and acceptance by City of Scottsdale and the NIBW PCs.

The City of Scottsdale Water Resources Department uses a city-wide preventative maintenance program for all equipment operated by the water operations staff. This program maintains a service record database for each piece of equipment and alerts the technicians when routine preventative maintenance is necessary. Service records for all the primary equipment at NGTF were available for review at the time of the inspection.

The treatment facility site comprises approximately one and a half acres surrounded by a masonry block wall, with a main vehicle entry gate and two walk-through gates. NGTF has a maximum hydraulic capacity of approximately 4,400 gpm.

4.5.1 Notable Events at NGTF in 2020

During a routine inspection of the facility on September 10, 2020, the operator discovered a small leak in one of the GAC tanks at NGTF. Upon further inspection, the interior coating of the tank had been compromised and water in contact with the steel had corroded a small hole through the wall. The leak amounted to a very slow weep of water to the exterior of the tank. Since the weather was still hot in September, most of the weeping water evaporated before it reached the ground. The leak was repaired and the tank recertified for pressure service.

As a result of the leak, a comprehensive inspection program was developed during each GAC service event when the tanks are empty to evaluate the condition of the interior coating and repairs will be made, as necessary.

On September 16, 2020, the pump in well PCX-1 failed. The well and treatment system were offline for the remainder of 2020. While the system was offline, the contactors containing GAC were backwashed approximately monthly to keep the media fresh and minimize bio-growth.

4.5.2 NGTF Maintenance and Condition

The NGTF is maintained by a City of Scottsdale water treatment operator. City of Scottsdale operations personnel also monitor the status of NGTF remotely. Operators make minimum daily inspections of the equipment and grounds at NGTF. The operator maintains operations logs and data spreadsheets at the facility. The logs and spreadsheets were presented for review by the inspection team during the site inspection.

During the inspection, the facility appeared clean and well maintained with no apparent leaks or deterioration during the inspection. The equipment was clean and in good condition. The piping, valves, and instrumentation labeling appeared complete and intact. All piping appeared in good condition without leaks or corrosion.

The process control system is monitored continuously. Instruments are checked and calibrated in accordance with the manufacturers' instructions by City of Scottsdale instrument technicians. Maintenance is scheduled and performed through City of Scottsdale's city-wide preventive maintenance system.

In mid-February 2020, City of Scottsdale performed preventative maintenance on the electrical systems at NGTF and also upgraded the radio communication system between NGTF, the well site, and the city's control center.

NGTF was available for treatment of extracted groundwater greater than 95% of the time in 2020.

4.5.3 Results

Based on operating data, NGTF has consistently met performance criteria set forth in the ACD.

Based on the 2019 inspection at NGTF, no treatment performance problems, hazards, or significant deterioration were apparent.

5.0 O&M Document Revisions

Previous inspections recommended updates to the treatment system O&M Plans and CERPs prior to the upcoming EPA Five Year Review.

The NIBW PCs updated and submitted the treatment system O&M Plans for Area 7 GWETS, Area 12 GWETS, MRTF, and NGTF on February 28, 2020. EPA provided comments on the NIBW PCs' O&M Plans and City of Scottsdale's 2018 CGTF O&M Plan on April 30, 2020. Revisions to the O&M Plans were made based on EPA comments. Based on EPA comments, the NIBW PCs and City of Scottsdale revised and resubmitted its treatment system O&M Plans on June 19, 2020.

The NIBW Groundwater Extraction Well O&M Plan was submitted to EPA on August 28, 2020. Revisions were made to the document based on EPA's comments and the document will be resubmitted to EPA in early 2021.

The NIBW PCs updated and submitted the treatment system CERPS for Area 7 GWETS, Area 12 GWETS, MRTF, and NGTF on August 31, 2020. City of Scottsdale submitted its updated CGTF CERP on September 3, 2020. EPA provided its comments on the treatment system CERPs on October 5, 2020. The NIBW PCs revised the CERPs for Area 7 GWETS, Area 12 GWETS, MRTF, and NGTF on December 31, 2020. City of Scottsdale plans to update the CGTF CERP in 2021.

6.0 RECOMMENDATIONS

In January 2021 EPA provided additional comments on the Area 7 and Area 12 treatment system O&M Plans. The additional comments for the Area 7 and Area 12 O&M Plans are under review.

APPENDIX I
4TH QUARTER DATA REPORT

QUARTERLY REPORT
October through December 2020

North Indian Bend Wash Superfund Site

Prepared for:
U.S. Environmental Protection Agency
Region IX

Prepared by:
NIBW Participating Companies

February 26, 2021

QUARTERLY REPORT
October – December 2020

North Indian Bend Wash Superfund Site
Scottsdale, Arizona

This Quarterly Report (Report) summarizes the remedial activities performed and data collected at the North Indian Bend Wash (NIBW) Superfund Site (Site) during October through December 2020 (the reporting period) by the NIBW Participating Companies (PCs) pursuant to the Amended Consent Decree, CV-91-1835-PHX-FJM (ACD), entered by the U.S. District Court on June 5, 2003. A detailed summary of the components and work requirements of the remedial action program can be found in the Record of Decision Amendment (AROD) – Final Operable Unit, Indian Bend Wash Area, dated September 27, 2001, and the Statement of Work (SOW), Appendix A to the ACD. Remedial activities are conducted to address contaminants of concern (COCs) in groundwater at the Site.

GROUNDWATER MONITORING AND EVALUATION PROGRAM

During the reporting period, the NIBW PCs conducted sampling and analysis of monitoring and extraction wells according to requirements specified in the Groundwater Monitoring and Evaluation Plan (GMEP), dated October 8, 2002. The U.S. Environmental Protection Agency (EPA) approved the GMEP on the same date. The GMEP and associated Phase I Sampling and Analysis Plan supersede all previous groundwater monitoring requirements in the Operable Unit-1 (OU-1) and OU-2 Consent Decrees. The NIBW PCs are currently working with EPA and other Technical Committee members to prepare an updated GMEP to ensure that monitoring, analysis, and reporting requirements are protective and relevant.

During the reporting period, NIBW PCs' contractors collected groundwater samples from monitoring wells and remedial extraction wells, as shown in the following table. Wells that were sampled during the reporting period are shown on **Figure 1**. The NIBW COCs are: trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethene (DCE), and chloroform. Results for all COCs are included in the attached tables. TCE is the principal COC for NIBW; results for TCE are given in in-text tables.

Groundwater Monitoring Summary

Number of Wells Sampled	Well Type	Hydrologic Unit	Treatment System	Contractor
22	Monitoring Well	UAU	---	Verdad
39 [A,B]	Monitoring Well	MAU	---	Verdad
27 [A,C]	Monitoring Well	LAU	---	Verdad
4 [D]	Monitoring Well	MAU/LAU	---	Verdad
2	Extraction Well	---	Area 7 GWETS	EnSolutions
2	Extraction Well	---	Area 12 GWETS	EnSolutions
2	Extraction Well	---	MRTF	EnSolutions
0 [E]	Extraction Well	---	NGTF	EnSolutions
4	Extraction Well	---	CGTF	EnSolutions
102 [F]	All Wells			

Notes:

(A) Samplers were unable to collect PA-18LA, PG-55MA and PG-56MA samples in Q4 of 2020 due to pump failure. Samples for wells PG-55MA and PG-56MA were obtained in 2021-Q1, rather than 2020, and will appear in the 2021 SMR. Owner of PA-18LA has not responded to request for access to remove the failed pump and sample the well.

(B) Six non-compliance MAU wells were sampled for plume delineation (B-1MA, M-1MA, M-14MA, PA-14MA, PA-17MA2, PG-47MA) and are included in the total shown.

(C) Four non-compliance LAU wells were sampled for plume delineation (E-1LA, E-14LA, M-9LA, PA-22LA) and are included in the total shown.

(D) One non-compliance MAU/LAU well was sampled for plume delineation (PG-41MA/LA) and is included in the total shown.

(E) The NGTF did not operate in the fourth quarter; thus, no samples were obtained.

(F) Total includes 11 non-compliance wells sampled for plume delineation.

CGTF = Central Groundwater Treatment Facility
GWETS = Groundwater Extraction and Treatment System
LAU = Lower Alluvium Unit
MAU = Middle Alluvium Unit
MRTF = Miller Road Treatment Facility
NGTF = NIBW Granular Activated Carbon (GAC) Treatment Facility
UAU = Upper Alluvium Unit

Sampling details for the reporting period are summarized in **Table 1**. **Table 1** lists all wells scheduled for sampling during the reporting period as part of the NIBW monitoring program, and indicates which aquifer unit(s) the wells are designed to monitor, the sampling frequency for each well, and comments regarding why any specific wells were not sampled as planned. A summary of results for groundwater samples collected from monitor wells, pursuant to the GMEP, during the reporting period is provided in **Table 2**. A summary of results for groundwater samples collected from extraction wells, pursuant to the GMEP, during the reporting period is provided in **Table 3**.

GROUNDWATER REMEDIATION PROGRAM

The NIBW remedy provides for containment of the Middle Alluvial Unit (MAU) / Lower Alluvial Unit (LAU) plumes through a groundwater extraction and treatment program. Treatment occurs at the MRTF, NGTF, CGTF, and Area 7 and Area 12 GWETSs. Locations of the groundwater treatment facilities and their corresponding extraction wells are shown on **Figure 1**. The NIBW PCs are responsible for compliance monitoring and reporting for the MRTF, NGTF, Area 7 GWETS, and Area 12 GWETS. This Report provides a summary of operations and data collected for these four facilities during the reporting period. The City of Scottsdale owns and operates the CGTF and reports the results of compliance testing and plant operations for this facility directly to EPA and the Arizona Department of Environmental Quality (ADEQ). EPCOR Water USA (EPCOR) owns and operates the MRTF. A summary of the treatment system monitoring data for the MRTF, NGTF, Area 7, and Area 12 facilities for October through December 2020 is provided in **Table 4**.

Groundwater Remediation at MRTF

The MRTF achieved performance standards specified in the SOW during the reporting period by consistently treating groundwater to reduce NIBW COC concentrations safely below Treatment Standards. During the reporting period, groundwater from wells PV-14 and PV-15 was treated at the MRTF by EPCOR and primarily delivered to the Paradise Valley Arsenic Removal Facility (PVARF) for subsequent distribution by EPCOR for drinking water use. If operating on the scheduled monitoring dates, monthly samples of groundwater from wells PV-14 and PV-15 were collected by the NIBW PCs and analyzed by TestAmerica. A summary of analytical results for extraction wells PV-14 and PV-15, in micrograms per liter (μg/L), is included in the following table.

MRTF Groundwater & Treatment System Monitoring
(TCE in μg/L)

Sample Date	PV-14	PV-15	Tower1 Effluent	Tower 2 Effluent	Tower 3 Effluent
10/1/2020	**0.60**	**5.6**	<0.50	---	<0.50
11/2/2020	**0.68**	**5.7**	<0.50	---	<0.50
12/1/2020	---	**5.2**	<0.50	---	---

Note:
All samples collected by EnSolutions

In addition to the routine monitoring of extraction wells conducted pursuant to the GMEP, the NIBW PCs conducted supplemental sampling at wells PV-11 and PV-12B (if operating on the scheduled monthly sampling date). During the quarter, results of laboratory analyses indicated no detectable concentrations of COCs in the samples obtained from well PV-11 on October 1, November 2, and December 1, 2020, or from well PV-12B on October 1, November 19, and December 1, 2020.

The total volume of groundwater extracted and treated at MRTF during the reporting period was approximately 456 million gallons (MG). Of this total, approximately 193 MG was produced from well PV-14 and approximately 263 MG was produced from well PV-15. No treated water was discharged to the Salt River Project (SRP) Arizona Canal during the reporting period. An estimated 13 pounds of TCE were removed from groundwater treated at the MRTF during the reporting period.

Groundwater Remediation at NGTF

The NGTF was not in operation during the reporting period due to replacement of the PCX-1 pump and other maintenance activities. Compliance monitoring could therefore not be conducted during the 4th quarter of 2020.

NGTF Groundwater Monitoring
(TCE in μg/L)

Date	PCX-1
October - December	**NGTF down for maintenance; no samples collected**

NGTF Treatment System Monitoring
(TCE in μg/L)

Week of:	Influent	Effluent
	NGTF-INF(1)	AZCO(2) or CHAP-CP(3)
October - December	**NGTF down for maintenance; no samples collected**	

Notes:

(1) Results for influent samples, if obtained, from NGTF are not compliance data; however, they are included here for completeness. Extraction well PCX-1 is not accessible for wellhead sampling. Samples for the well are obtained at the NGTF pipeline, just a few feet away from the sample port for the NGTF influent. These samples meet the compliance requirements for monitoring influent to the treatment plant; therefore, beginning in July 2018, the redundant NGTF influent samples are no longer obtained.
(2) AZCO = Discharge to Arizona Canal
(3) CHAP-CP = Discharge to City of Scottsdale Chaparral Water Treatment Plant

The total volume of groundwater extracted from well PCX-1 and treated at NGTF during the reporting period was approximately 0.094 MG, and an estimated 0.03 pounds of TCE were removed.

Groundwater Remediation at the Area 7 GWETS

The NIBW Area 7 GWETS achieved performance standards specified in the SOW during the reporting period by consistently treating groundwater to reduce NIBW COC concentrations safely below Treatment Standards prior to injection into the Upper Alluvium Unit near the GWETS. Compliance monitoring is performed to verify removal of VOCs from the extracted groundwater and assure groundwater treatment standards are achieved.

During the reporting period, samples were collected from Area 7 extraction wells 7EX-3aMA and 7EX-6MA by ARCADIS and analyzed for NIBW COCs by TestAmerica. Also during the reporting period, treatment system samples were collected each month and submitted to TestAmerica for analysis of NIBW COCs. Samples were collected from the combined influent to the GWETS at sample port SP-102, from the ultraviolet/oxidation (UV/Ox) reactor effluent at sample port SP-103, and from the air stripper effluent at sample port SP-105. Results of TCE analyses for groundwater monitoring and treatment system samples collected during the reporting period are included in the following tables.

Area 7 Groundwater Monitoring
(TCE in μg/L)

Date	7EX-3aMA	7EX-4MA	7EX-6MA
10/1/2020	**420**	---	**570**
10/20/2020	**470**	---	**540/580**

Note:
Well 7EX-4MA was not sampled during the fourth quarter because the well was offline on the scheduled sampling date; Area 7 GWETS is presently operating without well 7EX-4MA due to low production from the well.

Area 7 Treatment System Monitoring
(TCE in µg/L)

Date	GWETS Influent @ SP-102	UV/Ox Effluent @ SP-103	Air/Stripper Effluent @ SP-105
10/1/2020	**480/480**	**82**	<0.50
10/20/2020	**490/500**	**130**	<0.50
11/2/2020	**490/510**	**94**	<0.50
12/7/2020	**550/460/350REJ**	**76**	<0.50

Notes:
UV/Ox = Ultraviolet/Oxidation Reactor
REJ = Rejected. See Table 4 for rationale.

The Area 7 GWETS operated most of the reporting period, except during routine maintenance and minor equipment maintenance and repair. The total volume of groundwater extracted, treated, and injected during the reporting period was approximately 44 MG. Performance data provided by the Area 7 GWETS Operator indicates an estimated 186 pounds of TCE were removed from the extracted groundwater.

Groundwater Remediation at the Area 12 GWETS

The NIBW Area 12 GWETS achieved performance standards specified in the SOW during the reporting period by consistently treating groundwater to reduce NIBW COC concentrations below Treatment Standards prior to discharge to an SRP irrigation lateral. Compliance monitoring was performed to verify removal of VOCs from the extracted groundwater and assure groundwater treatment standards are achieved.

During the reporting period, treatment system samples were collected each month and submitted to TestAmerica for analysis of NIBW COCs. Treatment system samples included combined influent to the GWETS at sample port WSP-1 and effluent from the GWETS at sample port WSP-2. Area 12 extraction well samples were collected by the Operator, EnSolutions, on a monthly basis when the wells were operational, and submitted to TestAmerica for analysis. The results of TCE analyses of samples obtained by the NIBW PCs for groundwater and process water monitoring are included in the following table.

Area 12 Groundwater and Treatment System Monitoring
(TCE in μg/L)

Date	MEX-1MA (SRP 23.1E6N)	Granite Reef Well (SRP 23.6E6N)	GWETS Influent	GWETS Effluent
			WSP-1	WSP-2
10/1/2020	**44**	**69**	**60/59**	<0.50
10/16/2021	**---**	**100/130**	**---**	---
11/2/2020	**49**	**96/94**	**77/79**	<0.50
11/19/2020	**---**	**---**	**---**	<0.50
12/1/2020	**50**	**98**	**99/69**	<0.50

Treated groundwater from Area 12 discharges to the SRP distribution system for irrigation use and is regulated by an AZPDES permit. Samples were collected at the outfall to the irrigation lateral for analyses required by the permit. The results of the sample analyses were summarized in monthly DMRs, and submitted directly to the EPA and ADEQ under separate cover.

The Area 12 GWETS operated continuously for most of the reporting period, except during routine maintenance, short-term weather-related power outages. The total volume of groundwater extracted and treated at the Area 12 GWETS during the reporting period was approximately 237 MG. Performance data provided by the Area 12 GWETS Operator indicated an estimated 136 pounds of TCE were removed from the treated groundwater.

Groundwater Remediation Summary

The following table presents the volume of groundwater treated at each facility, as well as the estimated pounds of TCE removed from groundwater via treatment, both for the reporting period and cumulatively for the year (i.e., year-to-date).

Treatment System	Volume of Groundwater Treated (MG)	Estimated Pounds of TCE Removed (4Q20)	Cumulative Pounds of TCE Removed (YTD 2020)
MRTF	456	13	50
NGTF	0.094	0.03	387
Area 7 GWETS	44	186	881
Area 12 GWETS	237	136	277

Notes:
MG = million gallons
4Q20 = fourth quarter (October through December) 2020
YTD = year to date

MEETINGS AND OTHER EVENTS

Representatives of the NIBW Technical Committee held meetings by teleconference on October 28 and December 10 to coordinate on-going NIBW remedial action efforts.

DOCUMENTS SUBMITTED BY NIBW PCS DURING THE REPORTING PERIOD

During the reporting period, from October through December 2020, the NIBW PCs provided EPA with the following documents.

NIBW Technical Committee Meeting Minutes – September 16, 2020, submitted by electronic mail on October 30, 2020.

NIBW Potential Opportunity Remedy Optimization Presentation – October 2020, submitted by electronic mail on October 30, 2020.

NIBW Technical Committee Meeting Minutes – October 28, 2020, submitted by electronic mail on November 17, 2020.

Quarterly Report, July through September 2020, North Indian Bend Wash Superfund Site, report submitted by electronic mail on November 25, 2020.

Results for October 2020 Water Quality Sampling at Arcadia Water Company Wells, submitted by electronic mail on December 2, 2020.

NIBW Site Overview Presentation – December 10, 2020, presentation submitted by electronic mail on December 15, 2020.

NIBW Technical Committee Meeting Minutes – December 10, 2020, submitted by electronic mail on December 15, 2020.

Contingency and Emergency Response Plan, Area 7 Groundwater Extraction and Treatment System, submitted by electronic mail on December 31, 2020.

Contingency and Emergency Response Plan, Area 12 Groundwater Extraction and Treatment System, submitted by electronic mail on December 31, 2020.

Contingency and Emergency Response Plan, Miller Road Treatment Facility, submitted by electronic mail on December 31, 2020.

Contingency and Emergency Response Plan, North Indian Bend Wash Granular Activated Carbon Treatment Facility, submitted by electronic mail on December 31, 2020.

TABLES

TABLE 1. SAMPLING MATRIX - FOURTH QUARTER 2020
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

WELL IDENTIFICATION	AQUIFER UNIT	SAMPLING FREQUENCY	COMMENTS
COS-31	MAU/LAU	Monthly	---
COS-71A	MAU/LAU	Monthly	Not sampled during November or December 2020 because the well was offline on the scheduled sampling dates; COS has removed this well from the remedial pumping priority list due to inorganic water quality
COS-72	MAU/LAU	Monthly	Not sampled during November or December 2020 because the well was offline on the scheduled sampling dates
COS-75A	LAU	Monthly	Not sampled during December 2020 because the well was offline on the scheduled sampling date.
PCX-1	LAU	Monthly	Not sampled during Quarter because the well was offline on the scheduled sampling dates
PV-14	LAU	Monthly	Not sampled during December 2020 because the well was offline on the scheduled sampling date.
PV-15	MAU/LAU	Monthly	---
MEX-1MA	MAU	Quarterly	---
Granite Reef	MAU	Quarterly	---
7EX-3aMA	MAU	Quarterly	---
7EX-4MA	MAU	Quarterly	Area 7 GWETS presently operating without well 4MA
7EX-6MA	MAU	Quarterly	---
B-J	UAU	Annually	---
D-2MA	MAU	Quarterly	---
E-1MA	MAU	Quarterly	---
E-5MA	MAU	Quarterly	---
E-5UA	UAU	Annually	---
E-7LA	LAU	Annually	---
E-7UA	UAU	Annually	---
E-8MA	MAU	Annually	---
E-10MA	MAU	Quarterly	---
E-12UA	UAU	Annually	---
E-13UA	UAU	Annually	---
M-2MA	MAU	Annually	---
M-2UA	UAU	Annually	---
M-4MA	MAU	Quarterly	---
M-5LA	LAU	Annually	---
M-5MA	MAU	Quarterly	---
M-6MA	MAU	Quarterly	---
M-7MA	MAU	Annually	---
M-9MA	MAU	Annually	---
M-10LA2	LAU	Annually	---
M-10MA2	MAU	Quarterly	---
M-11MA	MAU	Annually	---
M-12MA2	MAU	Annually	---
M-14LA	LAU	Annually	---
M-15MA	MAU	Quarterly	---

TABLE 1. SAMPLING MATRIX - FOURTH QUARTER 2020
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

WELL IDENTIFICATION	AQUIFER UNIT	SAMPLING FREQUENCY	COMMENTS
M-16LA	LAU	Annually	---
M-16MA	MAU	Annually	---
M-17MA/LA	MAU/LAU	Quarterly	---
PA-2LA	LAU	Annually	---
PA-5LA	LAU	Quarterly	---
PA-6LA	LAU	Quarterly	---
PA-8LA2	LAU	Annually	---
PA-9LA	LAU	Annually	---
PA-10MA	MAU	Quarterly	---
PA-11LA	LAU	Annually	---
PA-12MA	MAU	Quarterly	---
PA-13LA	LAU	Quarterly	---
PA-15LA	LAU	Annually	---
PA-16MA	MAU	Annually	---
PA-18LA	LAU	Annually	Pump failed; well not sampled
PA-19LA	LAU	Annually	---
PA-20MA	MAU	Annually	---
PA-21MA	MAU	Annually	---
PG-1LA	LAU	Quarterly	---
PG-2LA	LAU	Semi-Annually	---
PG-4MA	MAU	Annually	---
PG-4UA	UAU	Annually	---
PG-5MA	MAU	Annually	---
PG-5UA	UAU	Annually	---
PG-6MA	MAU	Annually	---
PG-6UA	UAU	Annually	---
PG-7MA	MAU	Annually	---
PG-8UA	UAU	Annually	---
PG-10UA	UAU	Annually	---
PG-11UA	UAU	Annually	---
PG-16UA	UAU	Annually	---
PG-18UA	UAU	Annually	---
PG-19UA	UAU	Annually	---
PG-22UA	UAU	Annually	---
PG-23MA/LA	MAU/LAU	Annually	---
PG-23UA	UAU	Annually	---
PG-24UA	UAU	Annually	---
PG-25UA	UAU	Annually	---
PG-28UA	UAU	Annually	---
PG-29UA	UAU	Annually	---

TABLE 1. SAMPLING MATRIX - FOURTH QUARTER 2020
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

WELL IDENTIFICATION	AQUIFER UNIT	SAMPLING FREQUENCY	COMMENTS
PG-31UA	UAU	Annually	---
PG-38MA/LA	MAU/LAU	Annually	---
PG-39LA	LAU	Annually	---
PG-40LA	LAU	Quarterly	---
PG-42LA	LAU	Quarterly	---
PG-43LA	LAU	Quarterly	---
PG-44LA	LAU	Quarterly	---
PG-48MA	MAU - Lower	Quarterly	---
PG-49MA	MAU - Lower	Annually	---
PG-50MA	MAU - Lower	Annually	---
PG-54MA	MAU - Lower	Annually	---
PG-55MA	MAU - Lower	Annually	Pump failed; well not sampled
PG-56MA	MAU - Lower	Annually	Pump failed; well not sampled
S-1LA	LAU	Annually	---
S-1MA	MAU	Annually	---
S-2LA	LAU	Quarterly	---
S-2MA	MAU	Annually	---
W-1MA	MAU	Quarterly	---
W-2MA	MAU	Quarterly	---

EXPLANATION:

UAU = Upper Alluvium Unit
MAU = Middle Alluvium Unit
LAU = Lower Alluvium Unit

TABLE 2. 2020 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA 200	DCE 6	TCM 6	PCE 5	TCE 5	REPORT
Monitoring	B-J	B-J	10/8/2020	Original	TA	<0.50	<0.50	0.84	<0.50	1.1	550-150572
Monitoring	B-1MA [A]	B-1MA HS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150453
Monitoring	D-2MA	D-2MA	10/15/2020	Original	TA	<0.50	<0.50	0.59	<0.50	**42**	550-151098
Monitoring	E-1LA [A]	E-1LA	10/15/2020	Original	TA	<0.50	<0.50	1.9	<0.50	0.76	550-151096
Monitoring	E-1LA [A]	Z	10/15/2020	Duplicate	TA	<0.50	<0.50	1.9	<0.50	0.79	550-151096
Monitoring	E-1MA [B]	E-1MA	10/13/2020	Original	TA	<0.50$_{REJ}$	<0.50$_{REJ}$	<0.50$_{REJ}$	1.3$_{REJ}$	**12**$_{REJ}$	550-150906
				Lab dup	TA	<0.50 [1][B]	<0.50 [1][B]	0.96 [1][B]	0.57 [1][B]	**18** [1][B]	
				Lab dup		<0.50 [1]	<0.50 [1]	0.80 [1]	<0.50 [1]	**12** [1]	
Monitoring	E-1MA	X	10/13/2020	Duplicate	TA	<0.50	<0.50	1.0	0.56	**19**	550-150906
				Lab dup		<0.50 [1]	<0.50 [1]	0.88 [1]	0.61 [1]	**18** [1]	
Monitoring	E-5MA	E-5MA	10/9/2020	Original	TA	<0.50	<0.50	1.5	0.74	**33**	550-150667
Monitoring	E-5UA	E-5UAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	4.8	550-150466-1
Monitoring	E-7LA	E-7LA	10/8/2020	Original	TA	<0.50	<0.50	1.1	1.4	**20**	550-150572
Monitoring	E-7UA	E-7UAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150466-1
Monitoring	E-8MA	E-8MA	10/9/2020	Original	TA	<0.50	<0.50	0.93	<0.50	**21**	550-150667
Monitoring	E-10MA	E-10MAHS	10/7/2020	Original	TA	<0.50	<0.50	0.68	2.8	4.2	550-150466-1
Monitoring	E-12UA	E-12UAHS	10/7/2020	Original	TA	<0.50	<0.50	0.60	<0.50	2.0	550-150466-1
Monitoring	E-12UA	S	10/7/2020	Duplicate	TA	<0.50	<0.50	0.53	<0.50	2.0	550-150466-1
Monitoring	E-13UA	E-13UA	10/9/2020	Original	TA	<0.50	<0.50	0.76	<0.50	2.1	550-150667
Monitoring	E-14LA [A]	E-14LAHS	10/8/2020	Original	TA	<0.50	<0.50	1.0	<0.50	<0.50	550-150571-1
Monitoring	M-1MA [A]	M-1MAHS	10/16/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151258
Monitoring	M-2MA	M-2MAHS	10/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	4.8	550-150438-1
Monitoring	M-2MA	Q	10/6/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	5.0	550-150438-1
Monitoring	M-2UA	M-2UA	10/8/2020	Original	TA	<0.50	<0.50	1.0	<0.50	0.75	550-150572
Monitoring	M-4MA	M-4MAHS	10/7/2020	Original	TA	<0.50	0.95	1.0	2.0	**46**	550-150466-1
Monitoring	M-5LA	M-5LA	10/14/2020	Original	TA	<0.50	<0.50	1.8	<0.50	1.6	550-151002
Monitoring	M-5MA	M-5MA	10/13/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**6.3**	550-150906
Monitoring	M-6MA	M-6MA	10/13/2020	Original	TA	<0.50	<0.50	0.68	<0.50	**13**	550-150906
				Lab dup		<0.50 [1]	<0.50 [1]	1.1 [1]	<0.50 [1]	**18** [1]	
Monitoring	M-7MA	M-7MA	10/27/2020	Original	TA	<0.50	<0.50	1.5	<0.50	<0.50	550-151827
Monitoring	M-7MA	AB	10/27/2020	Duplicate	TA	<0.50	<0.50	1.5	<0.50	<0.50	550-151827
Monitoring	M-9LA [A]	M-9LA	10/15/2020	Original	TA	<0.50	<0.50	1.2	<0.50	0.62	550-151096
Monitoring	M-9MA	M-9MA	10/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.8**	550-151098
Monitoring	M-10LA2	M-10LA2HS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	2.8	550-150438-1
Monitoring	M-10MA2	M-10MA2	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**16**	550-150572
Monitoring	M-11MA	M-11MA	10/13/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150906
				Lab dup		<0.50 [1]	<0.50 [1]	<0.50 [1]	<0.50 [1]	<0.50 [1]	
Monitoring	M-12MA2	M-12MA2	10/14/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**16**	550-151002
Monitoring	M-14LA	M-14LA	10/9/2020	Original	TA	<0.50	<0.50	1.1	4.9	**22**	550-150667
Monitoring	M-14LA	V	10/9/2020	Duplicate	TA	<0.50	<0.50	1.2	4.7	**21**	550-150667
Monitoring	M-14MA [A]	M-14MA	10/9/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150668
Monitoring	M-15MA	M-15MA	10/14/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.0	550-151002
Monitoring	M-16LA	M-16LAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	1.1	**14**	550-150572

TABLE 2. 2020 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	6	6	5	5	
Monitoring	M-16MA	M-16MA	10/12/2020	Original	TA	<0.50 (1)	<0.50 (1)	<0.50 (1)	<0.50 (1)	3.7 (1)	550-150825
Monitoring	M-16MA	W	10/12/2020	Duplicate	TA	<2.5	<2.5	<2.5	<2.5	4.6	550-150825
Monitoring	M-17MA/LA	M-17MA/LAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150466-1
Monitoring	PA-2LA	PA-2LA	10/15/2020	Original	TA	<0.50	<0.50	1.1	<0.50	<0.50	550-151097
Monitoring	PA-5LA	PA-5LA	10/6/2020	Original	TA	<0.50	0.50	3.0	2.5	**51**	550-150321
Monitoring	PA-5LA	P	10/6/2020	Duplicate	TA	<0.50	0.53	3.0	2.5	**52**	550-150321
Monitoring	PA-6LA	PA-6LA	10/6/2020	Original	TA	<0.50	3.4	3.1	**17**	**140** (2)	550-150321
Monitoring	PA-8LA2	PA-8LA2	10/14/2020	Original	TA	<0.50 (3)	<0.50 (3)	0.80 (3)	1.1 (3)	**5.3** (3)	550-151002
Monitoring	PA-9LA	PA-9LAHS	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.63	550-150466-1
Monitoring	PA-10MA	PA-10MAHS	10/15/2020	Original	TA	<0.50	<0.50	<0.50	1.6	**87**	550-151098
Monitoring	PA-11LA	PA-11LA	10/14/2020	Original	TA	<0.50	<0.50	1.6	0.76	<0.50	550-151002
Monitoring	PA-12MA	PA-12MA	10/14/2020	Original	TA	<0.50 (4)	<0.50 (4)	0.71 (4)	2.8 (4)	**240**	550-151002
Monitoring	PA-13LA	PA-13LA	10/14/2020	Original	TA	<0.50	<0.50	1.9	1.1	**88**	550-151003
Monitoring	PA-13LA	Y	10/14/2020	Duplicate	TA	<0.50	<0.50	2.4	1.3	**51** (5) REJ	550-151003
				Lab dup		---	---	---	---	**47** (5)(6) REJ	
Monitoring	PA-14MA (A)	PA-14MAHS	10/7/2020	Original	TA	<0.50	<0.50	0.96	<0.50	<0.50	550-150466-2
Monitoring	PA-15LA	PA-15LAHS	10/29/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986
Monitoring	PA-15LA	AD	10/29/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986
Monitoring	PA-16MA	PA-16MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.61	550-150572
Monitoring	PA-17MA2 (A)	PA-17MA2HS	10/6/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150438-4
Monitoring	PA-19LA	PA-19LA	10/8/2020	Original	TA	<0.50	0.81	1.8	2.5	**52**	550-150572
Monitoring	PA-20MA	PA-20MA	10/8/2020	Original	TA	<0.50	<0.50	1.1	2.0	**41**	550-150572
Monitoring	PA-21MA	PA-21MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150571-2
Monitoring	PA-22LA (A)	PA-22LAHS	10/7/2020	Original	TA	<0.50 (7)	<0.50 (7)	1.1 (7)	<0.50 (7)	<0.50 (7)	550-150466-2
Monitoring	PG-1LA	PG-1LA	10/15/2020	Original	TA	<0.50	<0.50	1.2	<0.50	0.58	550-151097
Monitoring	PG-2LA	PG-2LA	10/6/2020	Original	TA	<0.50	<0.50	1.1	1.3	**74**	550-150321
Monitoring	PG-4MA	PG-4MA	10/14/2020	Original	TA	<0.50	<0.50	0.84	0.54	2.6	550-151002
Monitoring	PG-4UA	PG-4UAHS	10/8/2020	Original	TA	<0.50	<0.50	1.0	**5.1**	0.68	550-150572
Monitoring	PG-5MA	PG-5MA	10/13/2020	Original	TA	<0.50	<0.50	1.1	0.69	**18**	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	1.0 (1)	0.62 (1)	**18** (1)	
Monitoring	PG-5UA	PG-5UA	10/13/2020	Original	TA	<0.50	<0.50	0.66	<0.50	2.0	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	0.68 (1)	<0.50 (1)	2.5 (1)	
Monitoring	PG-6MA	PG-6MA	10/12/2020	Original	TA	<0.50 (1)	1.2 (1)	3.1 (1)	3.6 (1)	**100** (1)	550-150825
Monitoring	PG-6UA	PG-6UA	10/12/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150825
Monitoring	PG-7MA	PG-7MA	10/9/2020	Original	TA	<0.50	<0.50	0.86	<0.50	1.9	550-150667
Monitoring	PG-8UA	PG-8UA	10/12/2020	Original	TA	<0.50	<0.50	0.66	<0.50	<0.50	550-150825
Monitoring	PG-10UA	PG-10UA	10/16/2020	Original	TA	<0.50	<0.50	0.77	<0.50	1.0	550-151232
Monitoring	PG-11UA	PG-11UAHS	10/13/2020	Original	TA	<0.50	<0.50	0.84	<0.50	<0.50	550-150906
				Lab dup		<0.50 (1)	<0.50 (1)	0.93 (1)	<0.50 (1)	<0.50 (1)	
Monitoring	PG-16UA	PG-16UA	10/16/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	1.7	550-151232
Monitoring	PG-18UA	PG-18UA	10/12/2020	Original	TA	<0.50	<0.50	0.77	<0.50	0.71	550-150825
Monitoring	PG-19UA	PG-19UA	10/12/2020	Original	TA	<0.50	<0.50	0.85	<0.50	3.7	550-150825
Monitoring	PG-22UA	PG-22UAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	2.6	550-150572

TABLE 2. 2020 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	6	6	5	5	
Monitoring	PG-22UA	U	10/8/2020	Duplicate	TA	<0.50	<0.50	<0.50	0.71	2.8	550-150572
Monitoring	PG-23MA/LA	PG-23MA/LA	10/14/2020	Original	TA	<0.50	<0.50	1.4	1.1	**13**	550-151002
Monitoring	PG-23UA	PG-23UAHS	10/8/2020	Original	TA	<0.50	<0.50	0.82	<0.50	1.7	550-150572
Monitoring	PG-24UA	PG-24UAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150572
Monitoring	PG-25UA	PG-25UAHS	10/8/2020	Original	TA	<0.50	<0.50	0.73	<0.50	1.9	550-150572
Monitoring	PG-28UA	PG-28UA	10/15/2020	Original	TA	<0.50	<0.50	2.4	<0.50	2.2	550-151101
Monitoring	PG-29UA	PG-29UA	10/16/2020	Original	TA	<0.50	<0.50	0.53	<0.50	0.66	550-151232
Monitoring	PG-29UA	AA	10/16/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	0.62	550-151232
Monitoring	PG-31UA	PG-31UAHS	10/6/2020	Original	TA	<0.50	<0.50	2.6	<0.50	**20**	550-150438-1
Monitoring	PG-38MA/LA	PG-38MA/LAHS	10/8/2020	Original	TA	<0.50	<0.50	0.67	4.1	1.0	550-150572
Monitoring	PG-39LA	PG-39LA	10/8/2020	Original	TA	<0.50	<0.50	1.0	1.9	2.8	550-150572
Monitoring	PG-40LA	PG-40LA	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**11**	550-150464
Monitoring	PG-40LA	R	10/7/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**12**	550-150464
Monitoring	PG-41MA/LA (A)	PG-41 MA/LA	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.61	550-150453
Monitoring	PG-42LA	PG-42LA	10/15/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	1.7	550-151097
Monitoring	PG-43LA	PG-43LA	10/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150464
Monitoring	PG-44LA	PG-44LA	10/7/2020	Original	TA	<0.50	<0.50	4.0	<0.50	<0.50	550-150464
Monitoring	PG-47MA (A)	PG-47MA	10/13/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150908
Monitoring	PG-48MA	PG-48MA	10/13/2020	Original	TA	<0.50	<0.50	0.78	<0.50	**14**	550-150906
				Lab dup		<0.50 (1)(8)	<0.50 (1)	0.82 (1)(8)	<0.50 (1)	**12** (1)	
Monitoring	PG-49MA	PG-49MAHS	10/29/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986
Monitoring	PG-50MA	PG-50MAHS	10/29/2020	Original	TA	<0.50	<0.50	0.90	<0.50	2.1	550-151986
Monitoring	PG-54MA	PG-54MA	10/12/2020	Original	TA	<0.50	<0.50	1.3	0.80	**28**	550-150825
Monitoring	S-1LA	S-1LA	10/8/2020	Original	TA	<0.50	<0.50	1.4	**46**	<0.50	550-150572
Monitoring	S-1LA	T	10/8/2020	Duplicate	TA	<0.50	<0.50	1.4	**44**	<0.50	550-150572
Monitoring	S-1MA	S-1MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	**5.9**	<0.50	550-150572
Monitoring	S-2LA	S-2LA	10/28/2020	Original	TA	<0.50	<0.50	0.53	<0.50	**26**	550-151907
Monitoring	S-2LA	AC	10/28/2020	Duplicate	TA	<0.50	<0.50	<0.50	<0.50	**23**	550-151907
Monitoring	S-2MA	S-2MAHS	10/8/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150572
Monitoring	W-1MA	W-1MA	10/7/2020	Original	TA	<0.50	<0.50	1.1	1.7	**470**	550-150466-1
Monitoring	W-2MA	W-2 MA	10/6/2020	Original	TA	<0.50	<0.50	0.51	3.1	**1500** (2)	550-150320
--	QC	FRB (Trip)	10/6/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150320
--	QC	Trip Blank	10/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150438-1
--	QC	FRB (Trip)	10/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150464
--	QC	FRB (Trip)	10/8/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150572
--	QC	FRB (Trip)	10/9/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150667
--	QC	FRB (Trip)	10/12/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150825
--	QC	FRB (Trip)	10/13/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150906
--	QC	FRB (Trip)	10/14/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151002
--	QC	FRB (Trip)	10/15/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151098
--	QC	FRB (Trip)	10/16/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151232
--	QC	FRB (Trip)	10/27/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151827
--	QC	FRB (Trip)	10/28/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151907

TABLE 2. 2020 LABORATORY RESULTS FOR GROUNDWATER MONITORING WELLS NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA

(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	*6*	*6*	*5*	*5*	
--	QC	FRB (Trip)	10/29/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151986

*PG-55MA and PG-56-MA samples were obtained in 2021-Q1, rather than 2020-Q4 due to pump failure; results will be in 2021 SMR.

EXPLANATION:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene

ID = Identifier
TA = TestAmerica, Inc.
<0.50 = Analytical result is less than laboratory detection limit
QC = Quality Control
Lab dup = Laboratory duplicate
TB = Trip Blank
FRB = Field Reagent Blank

NOTES:

<0.50	Non-Detect
5	Cleanup Standards for Treated Water (µg/L)
5.1	Sample result exceeds Cleanup Standards for Treated Water

REJ Analysis result rejected due to relative percent difference (RPD) exceeding acceptable limit and re-analyses results not confirming initial value. Lab could not rectify discrepancies in data.

(A) Sample at this location was part of a supplemental sampling program to verify plume boundaries, and is not a compliance sample.

(B) Original sample data was rejected due to lab issues and inconsistency with duplicate sample. Lab re-analysis is used to represent water quality for the original sample at this well.

(1) H1 Flag: Sample analysis performed past holding time.

(2) N1 Flag: Sample was re-analyzed with headspace in the sample vial due to required dilution.

(3) N1 Flag: Reanalysis was performed outside of the analytical holding time due to the failure of Internal standard in the initial run. Reanalysis results for sample PA-8LA2 confirmed original results. Original results reported with N1 qualifier.

(4) N1 Flag: Sample reanalyzed due to TCE requiring dilution. Reanalysis confirmed original results. Original results reported with N1 qualifier.

(5) N1 Flag: Sample was re-analyzed with headspace in the sample vial. Results may be biased low. Reanalysis was performed outside of the analytical holding time due to a required dilution for Trichloroethene confirmation.

(6) H2 Flag: Initial analysis within holding time. Reanalysis for the required dilution was past holding time.

(7) N1 Flag: Sample was collected in a properly preserved vial; however, the pH(5) was outside the required criteria when verified by the laboratory. The sample was analyzed outside the 7-day holding time specified for unpreserved samples, but within the 14-day holding time specified for preserved samples.

(8) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

TABLE 3. 2020 LABORATORY RESULTS FOR GROUNDWATER EXTRACTION WELLS
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	6	6	5	5	
AREA 7 GWETS											
Extraction	7EX-3aMA	7EX-3aMA	10/1/2020	Original	TA	<0.50	<0.50	0.76	2.5	**420**	550-150111
Extraction	7EX-3aMA	7EX-3aMA	10/20/2020	Original	TA	<0.50	<0.50	0.85	2.6	**470**	550-151402
Extraction	7EX-6MA	7EX-6MA	10/1/2020	Original	TA	<0.50	<0.50	0.81	3.3	**570** (1)(A)	550-150111
Extraction	7EX-6MA	7EX-6MA	10/20/2020	Original	TA	<0.50	<0.50	0.97	3.6	**540**	550-151402
Extraction	7EX-6MA	EXT-1A-102020	10/20/2020	Duplicate	TA	<0.50	<0.50	0.95	3.7	**580**	550-151402
CGTF											
Extraction	COS-31	COS-31	10/9/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.7	550-150625
Extraction	COS-31	COS-31	11/25/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	3.4	550-153638
Extraction	COS-31	COS-31	12/1/2020	Original	TA	<0.50 (2)	<0.50	<0.50 (2)	<0.50	3.8	550-153818
Extraction	COS-31	EXT-1A-12012020	12/1/2020	Duplicate	TA	<0.50 (2)	<0.50	<0.50 (2)	<0.50	3.8	550-153818
Extraction	COS-71A	COS-71 A	10/7/2020	Original	TA	<0.50 REJ	<0.50 REJ	3.2 REJ	<0.50 REJ	<0.50 REJ	550-150463
				Lab dup	TA	<0.50 (3)(4) REJ	<0.50 (3) REJ	2.3 (3)(4) REJ	<0.50 (3) REJ	<0.50 (3) REJ	
Extraction	COS-72	COS-72	10/1/2020	Original	TA	<0.50	<0.50	0.72	1.0	**7.5**	550-150116
Extraction	COS-75A	COS-75 A	10/1/2020	Original	TA	<0.50	0.59	1.6	5.0	**35**	550-150116
Extraction	COS-75A	EXT-1A-10012020	10/1/2020	Duplicate	TA	<0.50	0.67	1.7	5.0	**36**	550-150116
Extraction	COS-75A	COS-75 A	11/19/2020	Original	TA	<0.50 (4)	0.72	2.1	**6.6**	**48**	550-153357
Extraction	COS-75A	EXT-1A-11192020	11/19/2020	Duplicate	TA	<0.50 (4)	0.84	2.1	**6.3**	**45**	550-153357
AREA 12 GWETS											
Extraction	MEX-1MA	MEX-1-1A-10012020	10/1/2020	Original	TA	<0.50	0.79	1.6	2.3	**44**	550-150113
Extraction	MEX-1MA	MEX-1-1A-11022020	11/2/2020	Original	TA	<0.50	1.1	1.7	2.6	**49**	550-152169
Extraction	MEX-1MA	MEX-1-1A-12012020	12/1/2020	Original	TA	<0.50 (2)	1.4	1.4	2.3	**50**	550-153817
Extraction	Granite Reef	GR-1-1A-10012020	10/1/2020	Original	TA	<0.50	<0.50	0.82	0.92	**69**	550-150113
Extraction	Granite Reef	GR-1-1A-10162020	10/16/2020	Original	TA	<0.50	1.1	4.4	2.3	**100** (5)	550-151257
Extraction	Granite Reef	EXT-1A-10162020	10/16/2020	Duplicate	TA	<0.50	1.1	3.9	2.3	**130**	550-151257
Extraction	Granite Reef	GR-1-1A-11022020	11/2/2020	Original	TA	<0.50	1.1	5.4	2.4	**96** (6)	550-152169
Extraction	Granite Reef	EXT-1A-11022020	11/2/2020	Duplicate	TA	<0.50	1.1	3.9	2.3	**94** (6)	550-152169
Extraction	Granite Reef	GR-1-1A-12012020	12/1/2020	Original	TA	<0.50	1.3	4.2	2.3	**98**	550-153817
NGTF											
NGTF Facility was down for maintenance in Quarter 4											
MRTF											
Extraction	PV-14	PV 14	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.60	550-150120
Extraction	PV-14	PV 14	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	0.68	550-152167
Extraction	PV-15	PV 15	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.6**	550-150120
Extraction	PV-15	PV 15	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	**5.7**	550-152167
Extraction	PV-15	PV 15	12/1/2020	Original	TA	<0.50 (2)	<0.50	<0.50	<0.50	**5.2**	550-153819

TABLE 3. 2020 LABORATORY RESULTS FOR GROUNDWATER EXTRACTION WELLS
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

WELL TYPE	SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
						200	*6*	*6*	*5*	*5*	
Trip/Field Blanks											
--	EX-QC [B]	FB	10/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150118
--	EX-QC [B]	FRB (TRIP)	10/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150118
--	EX-QC [B]	FRB (TRIP)	10/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150465
--	EX-QC [B]	FRB (TRIP)	10/9/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150626
--	EX-QC [B]	FRB(TRIP)	10/16/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151257
--	EX-QC [B]	FRB (TRIP)	10/20/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151405
--	EX-QC [B]	FRB (TRIP)	11/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152171
--	EX-QC [B]	FRB (TRIP)	11/19/2020	TB	TA	<0.50 [4]	<0.50	<0.50 [4]	<0.50	<0.50	550-153358
--	EX-QC [B]	FRB(Trip)	11/25/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-153638
--	EX-QC [B]	FRB (TRIP)	12/1/2020	TB	TA	<0.50 [2]	<0.50	<0.50 [2]	<0.50	<0.50	550-153821

EXPLANATION:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene

ID = Identifier
TA = TestAmerica, Inc.
<0.50 = Analytical result is less than laboratory detection limit
QC = Quality Control
Lap Dup = Laboratory duplicate
TB = Trip Blank
FRB = Field Reagent Blank

NOTES:

<0.50	Non-Detect
5	Cleanup Standards for Treated Water (µg/L)
5.1	Sample result exceeds Cleanup Standards for Treated Water

REJ COS-71A analysis results from Test America are inconsistent with historical values. Lab re-analyses confirmed the ND result and inconsistency could not be reconciled at the lab. City of Scottsdale (COS) collected a sample at COS-71A, 40 minutes prior to this sample, and had a detected TCE value of 31.4 µg/L; the COS result is consistent with historical values. Test America results were rejected based on the contradicting COS data. For analyses purposes, the COS value of 31.4 µg/L was used for statistical calculations and plume delineation.

(A) The TCE value for this sample was preliminarily reported with a dilution error. The value discrepancy was brought to the attention of the lab prior to issuance of a report. The lab re-analyzed the sample as part of the corrective action, but only an estimated result could be reported. The preliminary incorrect value prompted a resample of this location.

(B) EX-QC - Beginning in June 2020, a single field blank is collected for all extraction well samples, regardless of facility, when collected and shipped on the same day.

(1) E2 Flag: Concentration estimated. Analyte exceeded calibration range. Reanalysis not performed due to sample matrix.

(2) L5 Flag: The associated blank spike recovery was above laboratory/method acceptance limit. This analyte was not detected in the sample.

(3) H1 Flag: Sample analysis performed past holding time.

(4) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(5) N1 Flag: Sample was re-analyzed with headspace in the sample vial due to required dilution.

(6) H2 Flag: Initial analysis within holding time. Reanalysis for the required dilution was past holding time.

TABLE 4. 2020 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
					200	6	6	5	5	
AREA 7 GWETS										
SP-102 (influent)	SP-102	10/1/2020	Original	TA	<0.50	<0.50	0.79	3.1	**480** (1)	550-150115
SP-102 (influent)	TS-2A-10012020	10/1/2020	Duplicate	TA	<0.50	<0.50	0.78	2.9	**480** (1)	550-150115
SP-102 (influent)	SP-102	10/20/2020	Original	TA	<0.50	<0.50	0.80	2.8	**490**	550-151400
SP-102 (influent)	TS-2A-10202020	10/20/2020	Duplicate	TA	<0.50	<0.50	0.76	2.7	**500**	550-151400
SP-102 (influent)	SP-102	11/2/2020	Original	TA	<0.50	<0.50	0.84	2.8	**490** (2)	550-152170
SP-102 (influent)	TS-2A-11022020	11/2/2020	Duplicate	TA	<0.50	<0.50	0.62	2.9	**510** (2)	550-152170
SP-102 (influent)	SP-102	12/7/2020	Original	TA	<0.50	<0.50	0.74	3.5	**550**	550-154117
			Lab dup		---	---	---	---	**460** (A)	
SP-102 (influent)	TS-2A-12072020	12/7/2020	Duplicate	TA	<0.50	<0.50	0.71	3.5	**350** (A) REJ	550-154117
SP-103 (UV/Ox effluent)	SP-103	10/1/2020	Original	TA	<0.50	<0.50	0.82	2.7	**82**	550-150115
SP-103 (UV/Ox effluent)	SP-103	10/20/2020	Original	TA	<0.50	<0.50	0.76	1.2	**130**	550-151400
SP-103 (UV/Ox effluent)	SP-103	11/2/2020	Original	TA	<0.50	<0.50	0.83	1.7	**94** (2)	550-152170
SP-103 (UV/Ox effluent)	SP-103	12/7/2020	Original	TA	<0.50	<0.50	0.78	1.2	**76**	550-154117
SP-105 (Air Stripper Effluent)	SP-105	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150115
SP-105 (Air Stripper Effluent)	SP-105	10/20/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151400
SP-105 (Air Stripper Effluent)	SP-105	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152164
SP-105 (Air Stripper Effluent)	SP-105	12/7/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-154114
AREA 12 GWETS										
WSP-1 (Influent)	WSP-1-1A-10012020	10/1/2020	Original	TA	<0.50	0.79	2.4	1.8	**60**	550-150127
WSP-1 (Influent)	TS-1-1A-10012020	10/1/2020	Duplicate	TA	<0.50	0.88	2.1	1.9	**59**	550-150127
WSP-1 (Influent)	WSP-1-1A-11022020	11/2/2020	Original	TA	<0.50	0.96	3.0	2.3	**77**	550-152166
WSP-1 (Influent)	TS-1-1A-11022020	11/2/2020	Duplicate	TA	<0.50	1.1	3.2	2.4	**79**	550-152166
WSP-1 (Influent)	WSP-1-1A-12012020	12/1/2020	Original	TA	<0.50 (3)	1.4	2.7	2.2	**99** (B)	550-153815
WSP-1 (Influent)	TS-1-1A-12012020	12/1/2020	Duplicate	TA	<0.50 (3)	1.6	3.0	2.3	**69** (B)	550-153815
WSP-2 (Air Stripper Effluent)	WSP-2-1A-10012020	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150093
WSP-2 (Air Stripper Effluent)	WSP-2-1A-11022020	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152155
WSP-2 (Air Stripper Effluent)	WSP-2-1A-11192020	11/19/2020	Original	TA	<0.50 (4)	<0.50	<0.50 (4)	<0.50	<0.50	550-153356
WSP-2 (Air Stripper Effluent)	WSP-2-1A-12012020	12/1/2020	Original	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153811
MRTF										
Tower 1 Effluent	Tower 1	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150112
Tower 1 Effluent	Tower 1	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152163
Tower 1 Effluent	Tower 1	12/1/2020	Original	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153813
Tower 3 Effluent	Tower 3	10/1/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150112
Tower 3 Effluent	Tower 3	11/2/2020	Original	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152163
NGTF										
NGTF Facility was down for maintenance in Quarter 4										
Trip/Field Blanks										
QC - Area 12	FB-1-1A-10012020	10/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150124
QC - Area 12	TB-1-1A-10012020	10/1/2020	TB	TA	<0.50 (5)	<0.50 (5)	1.7 (5)	<0.50 (5)	<0.50 (5)	550-150124
QC - Area 12	FB-1-1A-11022020	11/2/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152162
QC - Area 12	TB-1-1A-11022020	11/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152162
QC - Area 12	FB-1-1A 11192020	11/19/2020	FB	TA	<0.50 (4)	<0.50	<0.50 (4)	<0.50	<0.50	550-153356
QC - Area 12	TB-1-1A 11192020	11/19/2020	TB	TA	<0.50 (4)	<0.50	<0.50 (4)	<0.50	<0.50	550-153356
QC - Area 12	FB-1-1A-12012020	12/1/2020	FB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153812
QC - Area 12	TB-1-1A-12012020	12/1/2020	TB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153812

TABLE 4. 2020 LABORATORY RESULTS FOR TREATMENT SYSTEM SAMPLES
NORTH INDIAN BEND WASH SUPERFUND SITE, SCOTTSDALE, ARIZONA
(results presented in micrograms per liter, µg/L)

SAMPLE LOCATION	FIELD SAMPLE ID	SAMPLE DATE	SAMPLE TYPE	LAB	TCA	DCE	TCM	PCE	TCE	REPORT
					200	*6*	*6*	*5*	*5*	
QC-TS (C)	FB-2-1A-10012020	10/1/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150122
QC-TS (C)	TB-2-1A-10012020	10/1/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-150122
QC-TS (C)	FB-2-1A-10202020	10/20/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151403
QC-TS (C)	TB-2-1A-10202020	10/20/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-151403
QC-TS (C)	FB-2-1A-11022020	11/2/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152165
QC-TS (C)	TB-2-1A-11022020	11/2/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-152165
QC-TS (C)	FB-2-1A-12012020	12/1/2020	FB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153814
QC-TS (C)	TB-2-1A-12012020	12/1/2020	TB	TA	<0.50 (3)	<0.50	<0.50 (3)	<0.50	<0.50	550-153814
QC-TS (C)	FB-2-1A-12072020	12/7/2020	FB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-154116
QC-TS (C)	TB-2-1A-12072020	12/7/2020	TB	TA	<0.50	<0.50	<0.50	<0.50	<0.50	550-154116

EXPLANATION:

TCA = 1,1,1-Trichloroethane
DCE = 1,1-Dichloroethene
TCM = Chloroform
PCE = Tetrachloroethene
TCE = Trichloroethene

ID = Identifier
TA = TestAmerica, Inc.
<0.50 = Analytical result is less than laboratory detection limit
QC = Quality Control
Lab dup = Laboratory duplicate
TB = Trip Blank
FB = Field Blank

NOTES:

<0.50	Non-Detect
5	Cleanup Standards for Treated Water (µg/L)
5.1	Sample result exceeds Cleanup Standards for Treated Water

REJ SP-102 duplicate sample analysis result for TCE of 350 µg/L is inconsistent with recent values, and with the original sample results. Re-analyses of this sample yielded higher values of 420 and 480 µg/L, but the higher concentration data was not within calibration and therefore not reported by the lab. Since the lab could not achieve consistent or reliable results on this sample, we are rejecting the duplicate value of 350 µg/L.

(A) High Relative Percent Difference for TCE values between the original and duplicate sample could not be reconciled by the lab. Each sample was fully used by the lab, and no additional sample was available for re-analysis. For the original sample (SP-102) the lower 10x dilution value of 460 µg/L was reported, however it had a low surrogate recovery. The lab indicated that the 100x dilution of 550 µg/L is therefore more reliable. Both values are reported here, due to additional issues with the field duplicate, which was rejected.

(B) High Relative Percent Difference for TCE values between the original and duplicate sample could not be reconciled by the lab. Each sample was fully used by the lab while attempting to fix surrogate recovery issues on chloroform, and no additional sample was available for re-analysis of TCE. For the original sample (WSP-1-1A), the 1x dilution value of 99 µg/L was within calibration and therefore reported. Lab re-analyses of this sample yielded values of 87 µg/L and 65 µg/L with issues that prevented reporting. For the field duplicate sample (TS-1-1A-12012020), the original 1x dilution result of 100 µg/L failed calibration and was therefore not reported by the lab because the value was estimated. The second 1x dilution that was run as part of the surrogate recovery issue resolution passed calibration with a value of 69 µg/L, and was therefore reported by the lab. An additional re-analysis of this sample was run at a 2x dilution and yielded a result of 32 µg/L. The lab internally rejected this result for reporting.

(C) QC-TS - Beginning in June 2020, a single trip blank is collected for Area 7, MRTF, and NGTF samples, when collected and shipped on the same day.

(1) H1 Flag: Sample analysis performed past holding time.

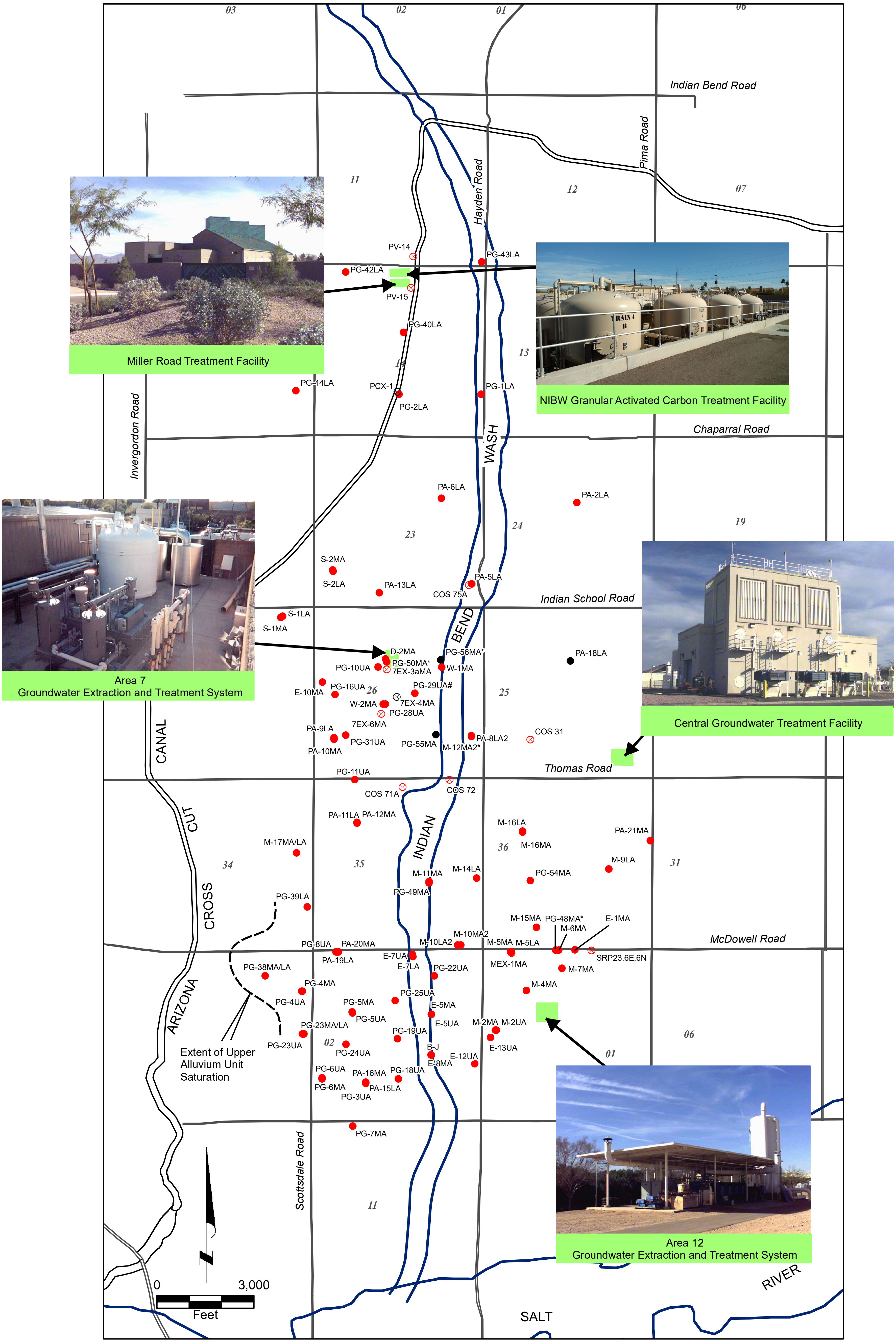
(2) H2 Flag: Initial analysis within holding time. Reanalysis for the required dilution was past holding time.

(3) L5 Flag: The associated blank spike recovery was above laboratory/method acceptance limit. This analyte was not detected in the sample.

(4) R6 Flag: Laboratory Fortified Blank / Laboratory Fortified Blank Duplicate (LFB / LFBD) relative percent difference (RPD) exceeded method control limit. Recovery met acceptance criteria.

(5) N1 Flag: The sample (trip blank) was re-analyzed due to out of 4-Bromofluorobenzene Surrogate (BFB) tune time in the original analysis and Internal Standard (ISTD) response was outside of acceptance limits, low in this run. The trip blanks could not be re-analyzed due insufficient sample volume.

FIGURE



EXPLANATION

M-15MA	●	Location and Identifier for Monitor Well Sampled
PA-18LA	●	Location and Identifier for Monitor Well Not Sampled
COS-31	⊗	Location and Identifier for Extraction Water Well Sampled
PCX-1	⊗	Location and Identifier for Extraction Water Well Not Sampled

NORTH INDIAN BEND WASH AREA
MARICOPA COUNTY, ARIZONA

LOCATIONS OF SAMPLE PROGRAM WELLS AND TREATMENT FACILITIES FOURTH QUARTER 2020

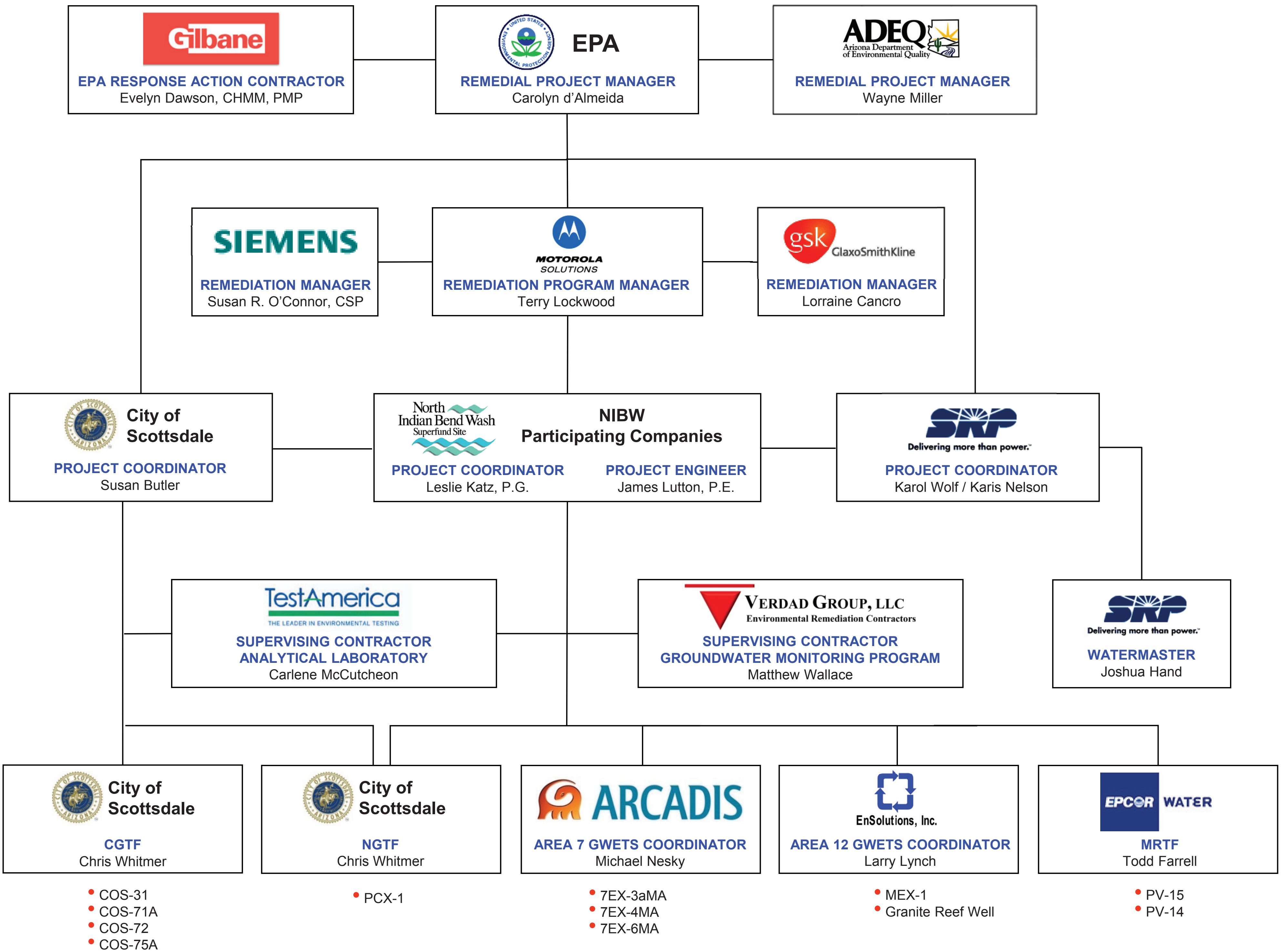
2021

North Indian Bend Wash Superfund Site

FIGURE 1

P\GISDATA\366.14\SampleWells_2020locmap_4Q.mxd\25Feb2021

APPENDIX J
CONTACT LIST FOR NIBW SUPERFUND SITE REMEDIAL ACTIONS



Gilbane
EPA RESPONSE ACTION CONTRACTOR
Evelyn Dawson, CHMM, PMP
EPA
REMEDIAL PROJECT MANAGER
Carolyn d'Almeida
ADEQ
Arizona Department of Environmental Quality
REMEDIAL PROJECT MANAGER
Wayne Miller
SIEMENS
REMEDIATION MANAGER
Susan R. O'Connor, CSP
MOTOROLA SOLUTIONS
REMEDIATION PROGRAM MANAGER
Terry Lockwood
gsk GlaxoSmithKline
REMEDIATION MANAGER
Lorraine Cancro
City of Scottsdale
PROJECT COORDINATOR
Susan Butler
North Indian Bend Wash Superfund Site
NIBW
Participating Companies
PROJECT COORDINATOR
Leslie Katz, P.G.
PROJECT ENGINEER
James Lutton, P.E.
SRP
Delivering more than power.
PROJECT COORDINATOR
Karol Wolf / Karis Nelson
TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
SUPERVISING CONTRACTOR
ANALYTICAL LABORATORY
Carlene McCutcheon
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Matthew Wallace
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WATERMASTER
Joshua Hand
City of Scottsdale
CGTF
Chris Whitmer
City of Scottsdale
NGTF
Chris Whitmer
ARCADIS
AREA 7 GWETS COORDINATOR
Michael Nesky
EnSolutions, Inc.
AREA 12 GWETS COORDINATOR
Larry Lynch
EPCOR WATER
MRTF
Todd Farrell
COS-31
COS-71A
COS-72
COS-75A
PCX-1
7EX-3aMA
7EX-4MA
7EX-6MA
MEX-1
Granite Reef Well
PV-15
PV-14

TABLE H-1. CONTACT LIST FOR NIBW SUPERFUND SITE REMEDIAL ACTIONS

NAME	ROLE	ORGANIZATION	ADDRESS	OFFICE TELEPHONE	MOBILE TELEPHONE	EMAIL
NIBW Participating Companies						
Terry Lockwood	NIBW Program Manager	Motorola Solutions, Inc.	3332 E. Broadway Road, Phoenix, AZ 85040	602-760-4763	602-617-8563	terry.lockwood@motorolasolutions.com
Leslie Katz	NIBW Project Coordinator	EL Montgomery and Associates, Inc.	4222 E. Thomas Road, Suite 315, Phoenix, AZ 85018	520-881-4912	520-245-4802	lkatz@elmontgomery.com
James Lutton	NIBW Project Engineer	NIBW Participating Companies	4222 E. Thomas Road, Suite 315, Phoenix, AZ 85018	480-442-9234	480-442-9234	james.lutton@jalpe.net
Lauren Candreva	NIBW Hydrogeologist, Field Services Coordinator	EL Montgomery and Associates, Inc.	4222 E. Thomas Road, Suite 315, Phoenix, AZ 85018	480-948-7747	602-920-3264	lcandreva@elmontgomery.com
Alyssa Kirk	NIBW Hydrogeologist	EL Montgomery and Associates, Inc.	4222 E. Thomas Road, Suite 315, Phoenix, AZ 85018	520-881-4912	928-699-6405	akirk@elmontgomery.com
Marla Odom	NIBW QC Coordinator	EL Montgomery and Associates, Inc.	4222 E. Thomas Road, Suite 315, Phoenix, AZ 85018	520-881-4912		modom@elmontgomery.com
Brady Nock	NIBW Modeler	EL Montgomery and Associates, Inc.	4222 E. Thomas Road, Suite 315, Phoenix, AZ 85018	520-881-4912	713-992-0452	bnock@elmontgomery.com
Oversight Agencies						
Carolyn D'Almeida	EPA Project Manager	U.S. Environmental Protection Agency	SFD-8-1, 75 Hawthorne Street, San Francisco, CA 94105	415-972-3150	707-980-1605	dalmeida.carolyn@epa.gov
Wayne Miller	ADEQ Project Manager	Arizona Department of Environmental Quality	1110 West Washington Street, Phoenix, AZ 85007	602-771-4121		miller.wayne@azdeq.gov
City of Scottsdale						
Suzanne Grendahl	Water Quality Director	City of Scottsdale	P.O. Box 25089, 8787 East Hualapai Drive, Scottsdale, AZ 85255	480-312-8719	623-640-1474	sgrendahl@scottsdaleaz.gov
Susan Butler	NIBW Project Coordinator	City of Scottsdale	P.O. Box 25089, 8787 East Hualapai Drive, Scottsdale, AZ 85255	480-312-8712	480-225-6557	sbutler@scottsdaleaz.gov
Salt River Project						
Karol Wolf	Aquifer Management	Salt River Project	P.O. Box 52025, Mail Station PAB 38W, Phoenix, AZ 85072-2025	602-236-5767	602-236-3407	karol.wolf@srpnet.com
Karis Nelson	Senior Environmental Compliance Scientist	Salt River Project	P.O. Box 52025, Mail Station PAB 359, Phoenix, AZ 85072-2025	602-236-2916	602-535-6358	karis.nelson@srpnet.com
Treatment Systems						
NGTF and CGTF						
Chris Whitmer	CGTF & NGTF Senior Operator and Incident Coordinator	City of Scottsdale	8650 East Thomas Road, Scottsdale, AZ 85251	480-312-0390	602-402-3223	cwhitmer@scottsdaleaz.gov
Jeff Kaylor	Treatment Manager	City of Scottsdale	8650 East Thomas Road, Scottsdale, AZ 85251	480-312-5664	623-910-9150	jkaylor@scottsdaleaz.gov
Water Operations Staff	Control Room Operator	City of Scottsdale		480-312-8708		
Area 7 GWETS						
Ryan O'Keefe	Area 7 GWETS and Incident Coordinator	Arcadis U.S., Inc.	410 N. 44th Street, Suite 1000, Phoenix, AZ 85008	480-535-1698	602-295-6708	ryan.okeefe@arcadis.com
Area 12 GWETS						
Larry Lynch	Area 12 GWETS and Incident Coordinator	EnSolutions, Inc.	7620 E. McKellips Road, Suite 4-71, Scottsdale, AZ 85257	561-762-7690	561-762-7690	larry@ensolutions.us
MRTF						
Todd Farrell	MRTF Operations Manager, Incident Coordinator	EPCOR	6215 North Cattletrack Road, Scottsdale, AZ 85250	623-445-2463	602-388-7170	tfarrell@epcor.com