EFFECTIVENESS REPORT - 2010

20TH STREET GROUNDWATER TREATMENT FACILITY

52ND STREET SUPERFUND SITE
OPERABLE UNIT 2 AREA
PHOENIX, ARIZONA

REGISTERED GEOLOGIST
CERTIFICATE NO.
30135
MANFRED
PLASCHKE
Date Signed 4/15/11
ARIZONA U.S.A.
EXPIRES 03/31/14

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EXECUTIVE SUMMARY

The 52nd Street Superfund Site Operable Unit (OU) 2 Area remediation system located in Phoenix, Arizona consists of three groundwater extraction wells and a centralized treatment facility (the 20th Street groundwater treatment facility) for removing volatile organic compounds (VOCs) (primarily trichloroethylene [TCE], tetrachloroethylene [PCE], 1,1,1-trichloroethane [1,1,1-TCA], and associated degradation products, including vinyl chloride) from the extracted groundwater. Remediation system startup activities commenced in September 2001 and routine operations began in December 2001. This report evaluates the effectiveness of the 2010 OU2 Area operations with respect to the September 2001 Baseline Conditions and September 2006 (Second Baseline) Conditions.

The objectives of the OU2 Area groundwater extraction system (GES) are: 1) to contain the north-south width and depth of the observed VOC plume in groundwater in the area of Interstate 10 (I-10); 2) to treat the extracted groundwater prior to its beneficial end use; and 3) to reduce the VOC concentrations in the groundwater.

The containment evaluation presented herein indicates that the OU2 Area GES is containing the full width of the groundwater plume in all three Alluvial Aquifer Subunits in the OU2 Area. Evidence of hydraulic containment is provided by multiple lines of evidence using both water level and water quality data. Continued monitoring will be performed to verify that containment continues to be achieved.

Using information obtained from the expanded monitoring network (monitoring wells installed in 2007), potentiometric surface maps prepared for Subunits "A and B," and Subunit "D" for September 2010, plus groundwater elevation contours plotted in cross-sections, demonstrate that the OU2 Area GES effectively contains the entire width and depth of the plume in the area of I-10. Statistically significant decreasing VOC contaminant concentration trends are observed in monitoring wells completed in Subunit "A," Subunit "B," and Subunit "D," downgradient of the OU2 Area GES, supporting the conclusion that the plume is effectively captured. Additionally, decreasing concentration trends are observed in monitoring wells completed in all three subunits located immediately downgradient of the OU2 Area GES, indicating that the interim OU2 remedy is having a beneficial effect on Alluvial Aquifer water quality. Finally, a comparison of the Baseline and Second Baseline (September 2006) and 2010 groundwater concentrations shows VOC concentrations are declining in the OU2 Area groundwater monitor well network, and that the TCE plume width continues to decrease, to the north and south of the OU2 Area GES.

Approximately 1.1 billion gallons (3,259 acre-feet) of water were treated in 2010 at OU2. From startup through 2010, over 9.98 billion gallons (30,627 acre-feet) of water have been treated at OU2 and put to beneficial use for irrigation purposes by the Salt River Project (SRP). All of the treated water met all of the discharge water quality standards for VOCs during 2010. The OU2 Area GES removed approximately 812 pounds of VOCs in 2010 and an estimated total of 12,480 pounds from startup in 2001.

The 2010 Operation & Maintenance (O&M) of the 20th Street groundwater treatment facility proceeded with no significant problems. The discharged water has always met all discharge standards for VOCs; the system is operating as intended and is expected to continue to perform as required by the Unilateral Administrative Order (UAO) and the Consent Decree (CD). Monthly operational efficiencies of the OU2 Area GES have consistently been in the upper 90th percentile range from startup of the system in September 2001.

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LIST OF ACRONYMS

ADEQ	Arizona Department of Environmental Quality
Agencies	ADEQ and EPA
AZPDES	Arizona Pollution Discharge Elimination System
BF	Basin Fill
bgs	below ground surface
BWWW	backwash wastewater
CCA	Clear Creek Associates
CD	Consent Decree
cis 1,2-DCE	cis 1,2-Dichloroethene
COC	Contaminant of concern
Companies	Honeywell International Inc. and Freescale Semiconductor, Inc.
CRA	Conestoga-Rovers & Associates
CSM	Conceptual Site Model
D&M	Dames & Moore
EMA	Errol L. Montgomery & Associates Inc.
EPA	United States Environmental Protection Agency
EWM	middle extraction well
EWN	north extraction well
EWS	south extraction well
ft	feet or foot
ft/ft	feet per foot
ft^2	square feet
GAC	granular activated carbon
GES	Groundwater Extraction System
gpd	gallon(s) per day
gpm	gallon(s) per minute
HSU	Hydrostratigraphic Unit
K	Hydraulic conductivity
LAU	lower conglomerate unit (or lower alluvial unit)
LFR	Levine Fricke Recon
MAU	Middle Alluvial Unit
MCL	Maximum Contaminant Level
μg/L	micrograms per liter
OU	Operable Unit
O&M	Operation and Maintenance
PCE	Tetrachloroethylene
PLC	Programmable Logic Controller
SCADA	Supervisory Control and Data Acquisition
Shaw	Shaw Environmental, Inc. (EPA's oversight contractor)
SOW	Statement of Work
SRG	Salt River Gravel
SRP	Salt River Project
TCE	Trichloroethylene
TCZ	target capture zone
TWG	Technical Work Group
UAO	Unilateral Administrative Order

LIST OF ACRONYMS

UAU	upper alluvial unit
UV	ultraviolet
VOCs	Volatile Organic Compounds
WSRV	West Salt River Valley
1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,1,1-TCA	1,1,1-trichloroethane

1.0 INTRODUCTION

1.1 PURPOSE AND REPORT ORGANIZATION

The Effectiveness Report for 2010 documents the operation, maintenance, and monitoring activities for the period from January 1, 2010 to December 31, 2010 for the Operable Unit (OU) 2 Area Groundwater Extraction System (GES) of the 52nd Street Superfund Site interim OU2 Area remedy in Phoenix, Arizona. This report has been prepared by Conestoga-Rovers & Associates (CRA) on behalf of Honeywell International, Inc. and Freescale Semiconductor, Inc. (the Companies), in accordance with the requirements of Article 11 Paragraph 23 to the Consent Decree (CD) (filed July 13, 2010 in Federal District Court) and Paragraph 5 of the Statement of Work (SOW) included as Appendix B of the CD for the Interim Remedial Action between the Arizona Department of Environmental Quality (ADEQ) and the Companies for the continued operation of the OU2 GES.

This is the ninth annual effectiveness report prepared during the OU2 Area GES operation and maintenance (O&M) period. The purpose of the report is to document the effectiveness of the OU2 Area groundwater extraction and treatment system, and to demonstrate, based on available data, the achievement of plume containment. Previous operation and/or effectiveness reports were submitted to the United States Environmental Protection Agency (EPA) as follows:

- The startup period from September 2001 to December 2001 is documented in the Startup Report (CRA, 2002a)
- The eight previous annual effectiveness evaluations for 2002 through 2009 are documented in the Effectiveness Reports (CRA, 2003, 2004b, 2005a, 2006b, 2007a, 2008b, 2009a, and 2010b)

The 2010 Effectiveness Report is organized as follows:

1. Section 1.0 presents the purpose and organization of the report, the background of the project, a brief description of the OU2 Area groundwater extraction and treatment system, a summary of the 20th Street groundwater treatment facility construction, commissioning and startup activities, and the requirements for the annual effectiveness reporting
2. Section 2.0 presents an overview of the OU2 Area conceptual site model (CSM) including geology and hydrogeology and GES layout

3. Section 3.0 presents a groundwater evaluation comparing Baseline Conditions (September 2001) to September 2010, and September 2006 (Second Baseline) to September 2010 in the OU2 Area GES, including a containment analysis
4. Section 4.0 presents a summary of the 20th Street groundwater treatment facility operational assessment and evaluation
5. Section 5.0 presents a summary of the maintenance work and repairs related to the OU2 Area groundwater extraction and treatment system
6. Section 6.0 presents the summary and conclusions for the continued operation of the OU2 Area groundwater extraction and treatment system
7. Section 7.0 presents the recommendations for the proposed activities for the following year
8. Section 8.0 presents a list of references used in this report

1.2 SYSTEM OBJECTIVES

The OU2 Area GES is designed to fully contain the north-south width and depth of groundwater volatile organic compound (VOC) contamination observed in the area of Interstate 10 (I-10). A secondary objective is to reduce contaminant concentrations in the alluvial aquifer upgradient of the extraction wells. Hydraulic containment is maintained by pumping three extraction wells that lower the groundwater table to create a "cone-of-depression." This cone-of-depression creates a north-south oriented parabolic shaped capture zone. All groundwater located upgradient of and within the capture zone will, eventually, be captured by the extraction wells. The extracted groundwater is treated to remove VOCs and to meet the discharge standards specified in Section 1.3.2 of the O&M Manual (2004e, 2011b) prior to discharge to the Grand Canal (see Section 4.4).

1.3 BACKGROUND

The interim OU2 Area remedy consists of three groundwater extraction wells and a central treatment facility (the 20th Street groundwater treatment facility) for removing VOCs, primarily trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), and associated degradation products, including vinyl chloride, from the extracted groundwater. The treated groundwater is provided to the Salt River Project (SRP) for beneficial re-use.

The OU2 Area is bounded approximately by Roosevelt Street on the north, on the south by Buckeye Road, the OU1 Area groundwater capture zone (approximately 46th Street) on the east, and 18th Street on the west, as shown on **Figure 1.1**. The EPA-approved groundwater monitor well network for demonstrating capture is shown on **Figure 1.2** (EPA, 2004b) and is discussed in more detail in Section 3.0.

1.3.1 SYSTEM STARTUP

After completion of construction and commissioning activities, the startup period for the 20th Street groundwater treatment facility commenced on September 26, 2001 with the initiation of 24-hour operation of the entire system (including the ultraviolet [UV] oxidation system and all nine pairs of granular activated carbon [GAC] adsorbers) by CRA, on behalf of the Companies. The completion of startup activities and initiation of routine operations commenced on December 13, 2001. The Companies submitted notification of completion of startup activities and initiation of routine operations to the EPA in a letter dated December 13, 2001. Details of the startup activities are provided in the January 11, 2002 Startup Report (CRA, 2002a).

1.3.2 OPERATION AND MAINTENANCE

In a letter to the EPA dated November 13, 2001, the Companies selected CRA as the supervising contractor for the O&M of the 20th Street groundwater treatment facility. Routine operations commenced on December 13, 2001, after completion of the startup period.

CRA prepared and submitted the O&M Manual to the EPA on January 25, 2002, in accordance with the Amended Unilateral Administrative Order (UAO), which was approved by the EPA in 2003 (EPA, 2003). The O&M Manual was revised in July 2004 to reflect the operational and monitoring changes, and the updated O&M Manual (CRA, 2004e) was approved by the EPA in August 2004 (EPA, 2004b). The O&M Manual was revised in February 2011 to be consistent with the ADEQ CD and to reflect the operational and monitoring changes since 2004 (CRA, 2011b).

1.3.3 DESCRIPTION OF GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

The 20th Street groundwater treatment facility was constructed with the following major components:

1. Three groundwater extraction wells identified as:
   - North extraction well (EWN)
   - Middle extraction well (EWM)
   - South extraction well (EWS)
2. Below-ground extracted groundwater force main from the extraction wells to the treatment facility
3. Central treatment facility with granular aqueous phase carbon adsorption (and UV oxidation, if required)
4. Below-ground treated water force main from the treatment facility to the surface water discharge into the SRP Grand Canal

The extraction well pumps are sized to pump the groundwater from the extraction wells, through the treatment facility, and then to the SRP Grand Canal discharge point, without the need for interim storage and pumping facilities.

The operation of the extraction, treatment, and discharge systems is controlled by programmable logic controllers (PLCs) to allow automation of the system under normal operating conditions, to shut down the system or portions of the system based on predetermined operational parameters, and to start up the system based on predetermined operational parameters.

The treatment system is designed with fail-safe features including high water level sensors, motor overload sensors, and a high force main pressure switch that shuts down the treatment system, if required. A local alarm system indicates unusual system conditions to operations personnel. During unstaffed shifts, an automatic telephone dialer system provides a remote indication of conditions that require immediate attention.

The main PLC is housed in the electrical room of the treatment building, and is connected to a Supervisory Control and Data Acquisition (SCADA) system in the office of the treatment building. The purpose of the main PLC is to provide a visual control interface and for trending and automatic logging of data at the treatment building. All control status, system monitoring, and alarms are displayed on the SCADA system. In addition, operational data are logged on the SCADA system to allow evaluation of system performance, and to generate data for reporting requirements. In case of a PLC failure, hardwired interlocks of major alarms will shut down the treatment system.

Details of the OU2 Area groundwater extraction and treatment system are provided in the O&M Manual (CRA, 2004e), revised in 2011 (CRA, 2011b).

1.4 EFFECTIVENESS EVALUATION REQUIREMENTS

This report was prepared to meet the requirements of both the Second Amended UAO and the CD. The CD was filed in Federal Court on July 13, 2010, and became effective on January 14, 2011 when EPA terminated the UAO (EPA, 2011).

The Second Amended UAO requires annual effectiveness reports be prepared for each year of operation of the 20th Street groundwater treatment facility. Paragraph 69 of Section XV of the UAO states:

"69 Effectiveness Report

> *Respondents shall annually submit an Effectiveness Report, no later than April 15 of each year, beginning April 15, 2004. The report shall: (1) define the zone of capture for the treatment system; (2) assess hydraulic effects of the system operation; (3) evaluate effects of the system on concentrations of VOCs in groundwater; (4) review the system performance including such estimates as total volume of water treated and mass of VOCs removed; (5) document all data collected and associated trends; (6) document regular maintenance work and repair work; (7) document any problems encountered with the system; (8) define the sampling and data collection methods which are used to determine that the contaminant mass is being fully captured along its entire width and depth; and (9) offer recommendations to the adjustment of the treatment system to ensure optimum performance and remedy requirements."*

Section 7.4.2 of the revised O&M Manual states:

"7.4.2 LONG TERM EFFECTIVENESS REPORTS

Section 1.3.2 presents the treated water discharge criteria for the Site. The groundwater remediation performance standards for the OU2 Area are summarized in Section 7.1. The groundwater remediation performance standards and the treated water discharge criteria form the basis for evaluating the performance of the groundwater remediation program.

There are three specific effectiveness evaluations to be performed during the operation of the groundwater remediation system to verify that the specified performance standards are being achieved. These evaluations are as follows.

i) Monitoring Well and Extraction Well Sampling and Analysis Program: Monitoring and evaluating the quality of groundwater in the plume to determine the effectiveness of the groundwater remediation system in reducing the concentration of Site-specific contaminants;

ii) Hydraulic Monitoring Program: Monitoring the groundwater flow pattern to verify the containment of the groundwater plume; and

iii) Discharge System Sampling Program: Monitoring the treated water discharged to the Grand Canal to verify compliance with the discharge criteria at the point of compliance

An annual effectiveness report will be submitted to USEPA as required by the 2nd UAO. The annual effectiveness report will include the elements specified in Paragraph XV 69 of the 2nd UAO, and will be submitted to USEPA no later than April 15 of each year."

The CD states the following:

"Article XI. Paragraph 23. States that on or before March 31st of each year, Settling Defendants shall submit an Effectiveness Report for the period October 1 through September 30 in accordance with Section 5 of the SOW. Settling Defendants shall review the adequacy of the monitoring well network in the Annual Effectiveness Report and the need, if any, for new groundwater monitoring wells for demonstrating containment. ADEQ may request the installation of additional monitoring wells in the event that it is determined that new groundwater monitor wells are necessary to achieve the objectives of this Consent Decree. If Settling Defendants object to any request for additional 16 groundwater monitor wells made by ADEQ pursuant to this Paragraph, they may seek dispute resolution pursuant to Section XIX [Dispute Resolution]."

"Appendix B: SOW: Item 2. Operations and Maintenance, C. Groundwater Containment Performance Standard

Except as provided for in Section XXI (Force Majeure) of the Consent Decree, Settling Defendants shall establish and maintain a capture zone across the entire width and depth of the contaminant plume in the area of Interstate 10.

On an annual basis, as set forth in Section 5 of this SOW, Settling Defendants shall perform a hydraulic capture analysis to demonstrate groundwater containment using water elevation and *water quality data, including data trends for both, collected from, at a minimum, the monitoring well network (the "OU2 Monitoring Well Network") identified in Section 7.1.1 of the O&M Manual [Monitoring Well Network]. Settling Defendants may utilize additional evaluations, including analytical and/or numeric modeling, to support the demonstration of hydraulic capture."*

"Appendix B: SOW: Item 5 Effectiveness Reporting

On or before March 31st of each year, Settling Defendants shall submit an Effectiveness Report that includes an evaluation of the analytical and hydraulic monitoring data collected the previous year, beginning October 1st through September 30th, in order to demonstrate compliance with the Performance Standards for groundwater treatment and groundwater containment. The Effectiveness Reports shall include:

- i. *a summary of the treatment system performance during the prior calendar year including total volume of water treated and estimated mass of VOCs removed for the year and since operations started;*
- ii. *a summary of major maintenance and repair work conducted on the treatment system;*
- iii. *water elevation and TCE concentration contour maps in plan view overlain by interpreted flow paths;*
- iv. *water elevation and TCE concentration data in cross section view;*
- v. *a comparison of the September water elevations and TCE concentrations to the September 2001 baseline groundwater conditions set forth in the Baseline Groundwater Monitoring Report, July to November, 2001 – Operable Unit 2 Area;*
- vi. *a comparison of the September water elevations and TCE concentrations to September 2006 water elevations and TCE concentrations;*
- vii. *a comparison of the water elevations and TCE concentrations collected in September of the current reporting year to the same data collected in the prior year;*
- viii. *an evaluation of hydraulic capture utilizing water elevation and water quality data including data trends for both, collected from the OU2 Monitoring Well Network;*
- ix. *hydrographs and VOC time series graphs for each monitoring well in the OU2 Monitoring Well Network; and*
- x. *recommendations, if any, for modifying the OU2 Treatment Facility operations or the OU2 Monitoring Well Network or the groundwater monitoring program.*

The Effectiveness Report will also include the results of any additional evaluations used by Settling Defendants to support the demonstration of hydraulic containment."

Since the CD was not effective until January 14, 2011, ADEQ wrote a February 7, 2011 letter, maintaining the schedule for the 2010 Effectiveness Report submittal to be due on April 15, 2011 (ADEQ, 2011).

2.0 OU2 AREA CONCEPTUAL SITE MODEL

A brief discussion of the geologic, hydrogeologic, and groundwater conditions of the entire OU2 Area is presented in this section. Descriptions of the geology and hydrogeology of the OU2 Area GES are provided in Sections 2.1 and 2.2, respectively.

The OU2 Area GES is located at the western (downgradient) extent of the OU2 Area. The OU2 Area contains a complex unconfined (water table) aquifer system termed the Alluvial Aquifer. ADEQ developed a system to locally subdivide the Alluvial Aquifer into three subunits identified as Subunit "A," Subunit "B," and Subunit "D." Subunit "C" is the bedrock underlying the Alluvial Aquifer. Depending on the locale within OU2, the Alluvial Aquifer may include one or more of these subunits. Groundwater quality and hydrostratigraphic data collected from 2007 to 2010 associated with the installation of five additional groundwater monitor wells, three piezometers, and one soil boring in the OU2 Area in 2007 have been incorporated into the CSM, and the classification of Alluvial Aquifer subunits is discussed in Sections 2.1 and 2.2. The schematic CSM is presented on **Figure 2.1**.

2.1 OU2 AREA GEOLOGY

The OU2 Area extraction wells are installed into Late Tertiary and Quaternary alluvial sediments. These deposits comprise approximately the upper 50 to 240 feet (from east to west) of geologic material above the sedimentary/igneous bedrock in this area of the Salt River Valley. The unconsolidated deposits of the Salt River Valley have been stratigraphically and/or hydrostratigraphically classified by several entities over the years. The classification has been refined and updated as more subsurface information became available. Reeter and Remick (1986) subdivided the unconsolidated deposits into three stratigraphic units (from oldest to youngest) - the lower conglomerate unit (or, lower alluvial unit [LAU]), the middle alluvial unit (MAU), and the upper alluvial unit (UAU). Anderson, Freethey and Tucci (1990) informally redefined these deposits from a hydrostratigraphic standpoint (from oldest to youngest) - pre-Basin and Range sediments, lower Basin Fill, upper Basin Fill, and stream alluvium. Hammett and Herther (1995) further refined the classification of these deposits into three stratigraphic units (from oldest to youngest) - lower Basin Fill, upper Basin Fill, and alluvium. Most recently, the deposits in the vicinity of the OU2 Area were subdivided into three stratigraphic units (from oldest to youngest using ADEQ's subunit nomenclature) - Subunits "B and D" (Basin Fill), Subunit "A" (Salt River Gravels [SRG]), and uppermost alluvium (Reynolds and Bartlett, 2002).

Figure 2.2 shows the locations of four geologic cross-sections that were constructed to provide a depiction of the vertical and horizontal changes in subsurface geology in the OU2 Area. **Figures 2.3** through **2.6** present geologic cross-sections in north-south and east-west orientations.

There are three primary mid-Tertiary bedrock units underlying the alluvial fill sediments: the Camels Head Formation, Tempe Formation (also called the Tempe Beds), and unnamed volcanic rocks (Bales, et al., 1986). Aquifer testing of wells completed in bedrock does not show any difference in permeability between the crystalline plutonic rocks and the cemented sedimentary rocks, indicating that the permeability of both is provided primarily by fractures. The Camels Head Formation is composed of coarse sedimentary breccia and conglomerate, with thin interbeds of conglomeratic sandstone (Reynolds and Bartlett, 2002). Most sedimentary breccias are debris-flow deposits, but some represent huge landslides and rock-avalanche deposits. The overlying Tempe Formation is finer grained, consisting mostly of siltstone and sandstone.

The Phoenix area lies within the Basin and Range Province, which is typified by gently sloping regional normal faults (Reynolds and Bartlett, 2002). Along the regional normal fault, smaller imbricate faults occur, forming stacked half-graben style topography, typical of the Basin and Range Province. Locally, the half-graben topography can be seen in the OU2 Area in rows of semi-parallel bedrock ridges. The bedrock ridges that have formed in the OU2 Area have been named the Airport Ridge, the Honeywell Ridge, and further to the east, the Papago Buttes.

Review of cores from the OU2 borings show that soils described as clayey gravels generally consist of angular gravel- and cobble-size clasts with a clay and silt matrix. These soils are interpreted as either being the result of a mudflow or debris-flow, or could represent locally-derived colluvium, both of which are close to the source area. In many cases, the lithology of these clayey gravels is very similar to the underlying consolidated Camels Head Formation, and has been described in some logs as weathered bedrock. The relatively steep slopes of the bedrock areas preclude the development of a thick residuum or weathered bedrock layer. Instead, as bedrock weathers, a thin layer of colluvium develops and is transported downslope. Finally, soils described as clay, sandy clay, or gravelly clay most likely represent the result of mudflows, based on their color (red and brown) and proximity to bedrock rises.

Locally, at OU2 monitoring well NW17-S, colluvium is encountered at a higher elevation and is thicker then elsewhere at the OU2 Area GES. The genesis of the colluvium around monitoring well NW17-S likely occurred due to Basin and Range faulting in the area. The thick colluvium in the area of NW17-S is likely the result of a mass slump or mudflow, or a series of slump/mudflows that collected in or near the half-graben. Following deposition, the area was likely faulted, dropping the surrounding area hundreds of feet. This idea is supported by the location of the Airport Ridge and the adjacent much deeper basin (10,000 + feet) (Brown and Poole, 1989) to the west (in OU3). The proximity of NW17-S to the edge of the basin suggests that near NW17-S, a blind normal fault may exist with NW17-S located at or very near the edge of the fault block.

The oldest unconsolidated sedimentary deposits in the OU2 Area are Subunits "B" and "D" which are also referred to in OU2-Area documents as the Basin Fill Subunit. Subunits "B" and "D" are characterized by the presence of abundant silt and sand with lesser amounts of clay and gravel. These deposits are more compacted than the overlying Subunit "A" (Hammett and Herther, 1995). In the vicinity of the OU2 Area GES, Subunits "B" and "D" range in combined thickness from 50 to 190 feet.

Subunit "A," also referred to in OU2 Area documents as the Salt River Gravels Subunit, is described as well-rounded gravel, cobbles, and boulders in a sandy matrix. Subunit "A" is considered to be a fluvial deposit associated with the ancient Salt River (Reynolds and Bartlett, 2002). In the vicinity of the OU2 Area GES, Subunit "A" ranges in thickness from 110 to 170 feet.

The uppermost unit is the Quaternary alluvium. This unit is a mixture of sand, silt, and clay with varying amounts of gravels. Locally, above this unit is artificial fill material. Overall, this material ranges in thickness from 2 to 20 feet, and does not affect the hydraulic characteristics of the OU2 Area groundwater because it is well above the groundwater table.

2.2 OU2 AREA HYDROGEOLOGY

The Site is within the West Salt River Valley (WSRV) and is a structural basin within the Basin and Range province of Arizona, formed during the early to mid-Tertiary period. The WSRV Sub-Basin was then filled with mid-Tertiary sedimentary units, including the Camels Head Formation and Tempe Formation. During mid- to late-Tertiary time, rapid uplift and erosion of Precambrian rocks and mid-Tertiary sedimentary units resulted in a series of tilted fault blocks, bounded by northwest-trending faults. In the Tempe Buttes area, a pediment called the Papago Park Pediment was formed on the up-thrown fault block that had been cut by several smaller faults and has been eroded to a number of islands protruding above a relatively gently sloping surface (Bales, et al., 1986). Mid-Tertiary Camels Head and Tempe Formations that comprise the fault blocks have an average dip of 45 degrees to the southwest, with evidence of decreasing dips upward across the Camels Head – Tempe Formation interval (Bales, et al., 1986). Based on subsurface investigations in the OU1 and OU2 areas, the Papago Park Pediment extends to the west to the vicinity of the OU2 GES. Depth to bedrock data collected in the OU2 area indicate that remnants of the tilted fault blocks, similar to the islands described above, exist on the pediment surface and are now buried by Quaternary sediments of the UAU. The bedrock ridges, referred to herein as the Honeywell Ridge and Airport Ridge, exist as eroded remnants of the tilted fault blocks of Camels Head Formation on the pediment. Between these bedrock rises, broad northwest-trending troughs were cut into the Tempe Formation and Camels Head Formation. These broad troughs were subsequently in-filled with the late-Tertiary UAU sediments. The older and deeper portion of the UAU, referred to as the Basin Fill Subunit, was probably largely derived in place or was transported very locally. The Basin Fill Subunit was deposited across much of the eastern part of the WSRV. It predominantly contains angular to subrounded clasts that were derived from the local bedrock exposures. In some locations in the OU2 area, the Basin Fill Subunit contains exotic sand-size to cobble-size clasts. Concurrently, and subsequent to the deposition of the Basin Fill Subunit, the surface of the locally derived Basin Fill Subunit sediments was locally eroded by the Salt River.

There are three primary hydrostratigraphic units (HSUs) in the OU2 Area: Subunits "A," "B," and "D" (collectively, the Alluvial Aquifer). As described above, Subunit "A" (Salt River Gravels Subunit) is a coarse-grained sand and gravel unit deposited by the ancestral Salt River, and exhibits high permeability. Because of their finer-grained composition, Subunits "B" and "D" (Basin Fill Subunit) are inherently less permeable than Subunit "A." All of the Subunits are hydraulically connected in the OU2 Area GES.

On September 1, 2005, a Technical Work Group (TWG) meeting with the EPA and ADEQ (collectively, the Agencies), Levine Fricke Recon (LFR), Shaw Environmental, Inc. (Shaw), the Companies, CH2MHILL, Clear Creek Associates (CCA), and CRA was held regarding the ADEQ HSU determinations and their use in future groundwater reports, and potential data gaps in the OU2 groundwater monitoring well network. During the 2005 meeting, extensive discussions were held between the Agencies and the Companies regarding ADEQ's revisions to the HSUs (subdivided into Subunits "A," "B," and "D") that comprise the Alluvial Aquifer system in the OU2 Area. The Companies agreed to utilize the three Subunits, as presented herein, and they have been incorporated into the CSM, based on LFR's verbal descriptions and the revised ADEQ HSU table (email from Shaw dated August 22, 2007, table updated March 30, 2007).[1] Subunit "D" is limited in

[1] On January 27, 2011, a follow-up TWG meeting was held in Phoenix to discuss reverting to the original HSU nomenclature for the Alluvial Aquifer units (Salt River Gravels Subunit and Basin Fill Subunit) from the "A," "B,"

its extent and is present only in the southern and western portions of the OU2 Area. As discussed in more detail in Section 3.0, the Subunits are hydraulically connected and there is little difference in the water elevations between the units in the OU2 Area. Based on the September 1, 2005 meeting, the Agencies asked the Companies to prepare future OU2 groundwater reports with new figures as follows: water level maps for Subunits "A" and "B" combined and Subunit "D," and water quality maps for each of Subunits "A," "B," and "D."

The contour maps created in this report are in agreement with ADEQ's site-wide hydrostratigraphic Alluvial Aquifer unit classification discussions held in 2005, 2006, and 2007. For purposes of this report and the CSM, the general hydrostratigraphy classifications, as outlined in the table below and from the individual ADEQ/LFR well screen database, were used to generate maps in this report.

ADEQ Hydrostratigraphic Subunit	*Hydrostratigraphic Subunit Name*	*Description*	*Relative Hydraulic Properties*
A	SRG	Coarse grained sands, gravels, cobbles, and occasional boulders	Highest K
B	BF	Interbedded sands, gravels, and silts/clays	Intermediate K
D	BF	Interbedded sands and silts/clays with a fine grained silt/clay marker bed at top of unit	Intermediate K
C	Bedrock/ Colluvium	Camels Head and Tempe Formation	Low K, except if fractured

Notes: K = hydraulic conductivity
SRG = Salt River Gravels
BF = Basin Fill

A subsequent TWG meeting was held in 2006 with ADEQ, LFR, Shaw, Army Corps of Engineers, the Companies, CH2MHILL, CCA, and CRA regarding the ADEQ HSU determinations and geology and hydrogeology issues, aquifer tests, and capture evaluation. The conclusions reached from the TWG meeting were as follows regarding the use of the site-wide HSU system of Subunits "A," "B," "D," and Subunit "C":

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and "D" nomenclature, beginning with the 2011 Effectiveness Report. This classification is currently under review.

- The TWG noted that vertical gradients in Subunit "D" are generally small southeast of the OU2 extraction wells. Vertical gradients in Subunit "D" are generally significant north and northeast of the OU2 extraction wells. Some upward vertical gradients are observed west and southwest of the OU2 system. The horizontal gradients in this area are small.
- Subunit "D" is not fully defined to the northeast.
- Due to the presence of groundwater contamination in Subunit "D" to the south, emphasis should be placed on the southern areas of Subunit "D."

For each HSU, there is a wide range of hydraulic properties. Subunits "B" and "D" have a hydraulic conductivity (K) ranging from 1 to 60 feet per day (ft/day) due to the fine grained composition of these Subunits (Reynolds and Bartlett, 2002). Subunit "A" has a higher hydraulic conductivity, ranging from 200 to 450 ft/day (Reynolds and Bartlett, 2002).

Under non-pumping conditions, vertical gradients between Subunits "A," "B," and "D" are negligible in most areas in the vicinity of the OU2 Area GES. In some places, particularly west of the OU2 system and in the OU3 area, hydraulic heads observed in Subunit "D" can differ from heads measured in Subunits "A" and "B." The influence of the OU2 system on hydraulic heads in Subunit "D" does not appear to extend as far west as does the effect on hydraulic heads in Subunits "A" and "B." This head difference in Subunit "D" probably derives from the fact that Subunit "D" has considerable silt and clay, making the unit semi-confined instead of unconfined as with Subunits "A" and "B."

Additionally, the two bedrock ridges described above, the Honeywell Ridge and the Airport Ridge, have a hydraulic influence and transect the OU2 Area in a southeast/northwest direction. The Honeywell Ridge is located approximately 0.5-mile east of the OU2 Area GES, and the Airport Ridge extends through the OU2 Area GES near EWS. These ridges affect groundwater movement within the Alluvial Aquifer. A thin veneer of colluvium is present on the margins of these ridges. From a hydraulic perspective, the colluvium materials are not like the Alluvial Aquifer Subunits.

The occurrence of colluvium around monitoring wells NW15, NW17, and NW18 appears to be different than other colluvium occurrences. At these locations, groundwater flow in the colluvium behaves like flow in bedrock (i.e., groundwater moves through discrete zones or fractures, rather than as a porous media). A semi-qualitative short-term pumping test and falling head tests were conducted in March 2010, at monitoring well NW18-M, and falling head tests at monitoring well

NW17-S, to determine if an aquifer connection existed between Alluvial Aquifer Subunits "A," "B," and "D," and the "Colluvium". The tests are discussed further in Section 2.4 of this report.

2.3 OU2 AREA GES LAYOUT

As mentioned in Section 1.3, the groundwater remediation system has three extraction wells (EWN, EWM, and EWS) located in a north-south alignment (**Figure 1.1**), and a groundwater monitor well network (**Figure 1.2**). The alignment and location for installation of these three extraction wells were selected based, in part, on modeling by Dames & Moore (D&M) as outlined in the Final (100%) Design Report (CRA, 1999) and, in part, on consideration of access issues. The three wells are constructed of 20-inch diameter casing, and are screened across Subunits "A," "B," and "D" (see **Figure 2.3**), with the following screened intervals:

- 100 to 220 feet below ground surface (bgs) in EWN
- 86 to 206 feet bgs in EWM
- 94 to 194 feet bgs in EWS

All extraction wells were drilled to the bedrock contact. Lithologically, the proportions of the three principal alluvial units at the extraction well locations are as follows:

- EWN has 145 feet of Subunit "A," underlain by 60 feet of Subunit "B," and 35 feet of Subunit "D"
- EWM has 145 feet of Subunit "A," underlain by 50 feet of Subunit "B," and 35 feet of Subunit "D"
- EWS has 140 feet of Subunit "A," underlain by 55 feet of Subunit "B "

During the installation of EWS, it was noted by Errol L. Montgomery & Associates Inc. (EMA) that formation plugging by bentonite from the drilling fluid may have occurred, and that this may have caused the lower well efficiency observed during initial testing of the well. EWS was redeveloped to remove as much of the drilling mud as possible to improve its hydraulic efficiency. However, no significant improvement was observed (EMA, 2002), indicating that the low efficiency of the well is primarily a function of the formation rather than the construction of the well.

Following installation of each extraction well, EMA conducted aquifer testing consisting of step-discharge and constant discharge rate tests. The test data were evaluated by EMA using the extraction wells and observation wells. The test results give a range of bulk operative transmissivities from 280,000 gallons per day per foot (gpd/ft) (37,400 square feet [ft^2]/day) for well EWS, to 300,000 gpd/ft (40,000 ft^2/day) for wells EWN and EWM (EMA, 2002). Based on an average saturated aquifer thickness of 150 feet (calculated during the 2000 aquifer tests), the hydraulic conductivities calculated ranged from 1,900 gpd/ft^2) (254 ft/day) for well EWS to 2,000 gpd/ft^2 (267 ft/day) for wells EWM and EWN. The 7-day aquifer test conducted by D&M (D&M, 1993) at well DM518 (approximately 1 mile upgradient of the OU2 Area GES), yielded a hydraulic conductivity of 1,550 gpd/ft^2 (207 ft/day), slightly less than the values obtained by EMA for the OU2 Area GES.

2.4 NEW DATA COLLECTED IN 2010

CRA conducted a semi-quantitative short-term pumping test as well as falling head tests at monitoring well NW18-M, and falling head tests at monitoring well NW17-S, at the request of the Agencies. The scope of these activities were defined in the October 30, 2009 Response to the EPA August 31, 2009 Comments to the 2008 Effectiveness Report (dated April 15, 2009), and the February 18, 2010 Response to EPA December 22, 2009 Comments to the June through August 2009 Groundwater Monitoring Report (CRA, 2009g). The purpose of the semi-quantitative short-term pumping test was to determine if a hydraulic connection exists between Alluvial Aquifer Subunits "A," "B," and "D," and the "Colluvium". Additionally, the short-term pumping test results, along with the single well response tests from monitor wells NW17-S and NW18-M, were used to approximate the hydraulic conductivity of the "Colluvium". Based on the results from the falling head tests, monitoring well NW17-S has an approximate hydraulic conductivity range of $2.1E10^{-3}$ to $2.7E10^{-3}$ feet per minute (ft/min) (3.0 to 3.9 ft/day), and monitor well NW18-M has an approximate hydraulic conductivity range of $1.6E10^{-3}$ to $1.8E10^{-3}$ ft/min (2.3 to 2.6 ft/day). Additionally, based on the aquifer tests, no conclusions could be drawn about a hydraulic connection between the Colluvium and the Alluvial Aquifer (CRA, 2010c).

3.0 GROUNDWATER EVALUATION - OU2 AREA GES

This section presents an evaluation of the OU2 Area GES' effect on the containment of the groundwater plume at approximately 20th Street. The purpose of this evaluation is to verify the containment of the groundwater plume by the OU2 Area GES.

The 2010 OU2 Area GES monitoring well network is presented on **Figure 1.2** and summarized in **Table 3.1**. Screened intervals for the OU2 Area GES monitor wells, piezometers, and extraction wells are provided in **Table 3.2**. The groundwater monitor well network, detailed in **Table 3.1**, was established in the O&M Manual (CRA, 2002b), revised based on comments from the EPA in 2003 and 2004, and to be consistent with the CD, and is presented in the Revised O&M Manual (CRA, 2004e; CRA, 2011b). Five monitor wells (NW09-D2, NW10-D, NW11-M, NW11-D, and NW12-D) were installed in early 2005 (CRA, 2005b) at locations approved by EPA (EPA, 2004a). Two monitor wells (NW07-M and NW09-M) and two nested piezometers (NW13-M/D and NW14-M/D) were installed in late 2005 (CRA, 2006a) at locations approved by EPA, (EPA, 2005), and were added to the OU2 Area GES monitoring well network (EPA, 2006). In addition, five groundwater monitor wells (NW17-S, NW18-S/M, NW19-M/D), three piezometers (NW15-S and NW16-M/D), and one soil boring (NW20) were installed in 2008 with locations approved by EPA (EPA, 2007), and were also added to the OU2 Area GES monitoring well network. The screen intervals of each of the wells installed since 2004 (NW07-M and NW09 through NW20) were agreed upon in the field by the Agencies, their technical consultants (Shaw and/or LFR) and the Companies representatives (CRA, CCA, CH2MHILL, and Hargis & Associates). An agreement was reached after the above group reviewed each soil core (at total depth), and all depth-discrete groundwater quality sample analytical results. The final screen intervals and locations were detailed in various addendum well construction completion reports (CRA, 2004d, 2005b, 2006a, and 2008a) approved by EPA in various comment/response letters (2005, 2006, and 2008). These additional wells are also detailed on **Figure 1.2** and in **Tables 3.1** and **3.2**.

3.1 GROUNDWATER ELEVATIONS

This section presents the hydrogeologic conditions, namely groundwater elevation data for September 2001 (Baseline), September 2006 (a second comparison period added to meet the requirements of Paragraph 5 of the SOW and Section IX, Paragraph 23, in the State of Arizona CD due to the significant expansion of the monitoring well network in 2005), and September 2010. Groundwater elevation data for these three periods for wells located in the OU2 Area are presented in **Table 3.3**. The change in water elevations from Baseline to September 2010 and the change in water elevations from

September 2006 to September 2010 are also presented in **Table 3.3**. Groundwater elevation data for the entire OU2 Area for September 2001 and September 2010 are presented on figures in **Appendix B**.

3.1.1 SEPTEMBER 2001 (BASELINE) GROUNDWATER ELEVATION DATA

OU2 Area groundwater elevations for September 2001 are presented on **Figure 3.1** (Subunits "A and B"), **Figure 3.2** (Subunit "D"), and **Figure 3.3** (Subunit "C"), and are summarized in **Table 3.3**. These groundwater elevations represent baseline conditions prior to initiating routine operations of the OU2 Area GES. Groundwater flow directions in Subunits "A, B, and D" are generally westerly in the vicinity of the OU2 Area GES.

In September 2001, groundwater was encountered within Subunit "A" at a depth of approximately 80 feet bgs in the vicinity of the OU2 Area GES and monitor well network (CRA, 2002a, 2002c). The horizontal hydraulic gradients (for September 2001) ranged from 2.2×10^{-3} to 4.9×10^{-3} feet per foot (ft/ft) (see **Table 3.4**). Refer to the monitoring well hydrographs and VOC concentration trending charts in **Appendix A** for details.

The initial depths to groundwater in the OU2 Area GES extraction wells, shortly after installation in June 2000, were 87 feet below top of casing for EWN, and 78 feet below top of casing for both EWM and EWS.

3.1.2 SEPTEMBER 2006 GROUNDWATER ELEVATION DATA

Groundwater elevations for the OU2 Area for September 2006 are presented on **Figure 3.4** (Subunits "A and B"), **Figure 3.5** (Subunit "D"), and **Figure 3.6** (Subunit "C"), and summarized in **Table 3.3**. The horizontal hydraulic gradients (for September 2006) ranged from 1.9×10^{-3} to 7.4×10^{-3} feet per foot (ft/ft) (see **Table 3.4**). The September 2006 period is presented in accordance with the OU2 Consent Decree. Although the September 2006 data represent groundwater conditions after 5 years of operations, additional water elevation data are available for the period from the expanded OU2 groundwater monitoring network. The September 2006 water elevation contour maps depict a cone-of-depression in all three hydrostratigraphic subunits centered around the extraction well field, with the resulting capture zone extending across the width of the observed plume in Subunits "A, B, and D."

3.1.3 SEPTEMBER 2010 GROUNDWATER ELEVATION DATA

Groundwater elevations for the OU2 Area for September 2010 are presented on **Figure 3.7** (Subunits "A and B"), **Figure 3.8** (Subunit "D"), and **Figure 3.9** (Subunit "C"), and summarized in **Table 3.3**. The horizontal hydraulic gradient (September 2010) ranged from 1.9×10^{-3} to 6.1×10^{-3} ft/ft (see **Table 3.4**) in the vicinity of the OU2 Area GES. Away from the OU2 Area GES, both upgradient and downgradient, the magnitude and direction of the hydraulic gradient is similar to baseline conditions. In the immediate vicinity of the GES, hydraulic gradients have been increased and have been locally reversed to the west of the OU2 Area GES.

3.2 WATER LEVEL TRENDS

Groundwater monitor well hydrographs, precipitation data, and a tabulated listing of water level measurements are presented in **Appendix A** (Table A.1). The hydrographs show a small increase in the groundwater elevations, in general, for wells throughout the OU2 Area up to June 2010. The regional recharge is likely from extended surface water releases into the Salt River channel in 2010, with a smaller amount from infiltration of precipitation. The increase in water levels can be seen in wells that have historically reacted strongly to the OU2 Area GES, and wells normally unaffected by the OU2 Area GES (PZ01-S [**Appendix A**, page A-35] and EW19-S [**Appendix A**, page A-11], respectively). Following October 2010, a regional decline in water levels was noted through the end of the reporting period. Water levels observed in wells EW19-D and EW22-S, located outside and downgradient of the OU2 Area GES area capture zone, showed little evidence of influence by the OU2 Area GES during either operation or shutdown. Instead, water level changes monitored in these wells appear to have been affected more by localized or regional pumping and/or recharge than by the OU2 Area GES. When the OU2 Area GES is restarted after the Grand Canal maintenance period (typically in January each year), groundwater elevations in wells in the vicinity of the OU2 Area GES generally return to pre-shutdown water levels in less than 30 days, indicating a quick return to hydraulic containment. This is consistent with the evaluation of the 2002 through 2009 OU2 Area GES SRP Grand Canal maintenance shutdowns.

Water level trends for 2001 (Baseline) to September 2010 and for September 2006 (Second Baseline) to September 2010 are discussed below.

3.2.1 BASELINE TO SEPTEMBER 2010

Since September 2001 (Baseline), water levels declined on average by 5.1 feet in monitoring wells in the OU2 Area due to operations of the OU2 Area GES and the extended regional drought. Greater declines, up to 8.8 feet, are seen in select OU2 monitor wells (PZ01-S/D, PZ02-S/D, and TEW01) located in close proximity to the OU2 Area extraction wells. Although there is a regional decline in groundwater elevations from 2001 to 2010, the regional groundwater flow direction remains unchanged in the OU2 Area away from the GES, with groundwater generally flowing from east to west with localized variations due to local hydrogeologic conditions. In the vicinity of I-10, groundwater flow directions have been altered by operation of the OU2 Area GES with groundwater flow directed towards the OU2 Area extraction wells, including a reversal of the groundwater flow direction immediately downgradient of the three extraction wells. **Figure 3.10A** shows the apparent change in groundwater elevation from September 2001 to September 2010. The September 2010 groundwater elevation contour maps depict a cone-of-depression in all three HSUs centered around the extraction well field, with the resulting capture zone extending across the width of the observed plume in Subunits "A" and "B" and the width of the observed plume in Subunit "D" in the vicinity of I-10.

Geologic cross-sections A-A′ through D-D′ (**Figures 2.3** through **2.6**) illustrate the decline in groundwater levels between the 2001 and 2010 monitoring periods. The influence of groundwater extraction is observed along a line that extends from north of monitor well CRA01 to south of NW09-D and NW09-D2. Cross-section contours are depicted on **Figures 3.12** and **3.13**.

3.2.2 SEPTEMBER 2006 TO SEPTEMBER 2010

Between September 2006 and September 2010, water levels increased an average of 2 feet in monitoring wells in the OU2 Area. The majority of the increase in groundwater elevation throughout the OU2 Area occurred in early 2010, due to the extended surface water releases into the Salt River channel throughout the first half of the year. **Figures 2.3** through **2.6** show the water level changes from September 2006 to September 2010. **Figure 3.10B** shows the apparent change in groundwater elevation from September 2006 to September 2010.

3.2.3 VERTICAL GRADIENTS

The vertical effects of groundwater extraction in the immediate area surrounding EWN and EWM can be observed by review of data collected from the two nested monitor well locations (PZ01-S/D and PZ02-S/D). These nested pairs each consist of a Subunit "A" and Subunit "C" well. The nested pairs are located between extraction wells EWN and EWM, and measure the vertical gradient caused by operation of the extraction system. In September 2001, prior to the start of pumping, the groundwater elevations were similar, with both of the PZ01-S/D and PZ02-S/D well nests exhibiting a slight upward and slight downward vertical gradient of 3.4 x 10^{-4} ft/ft and 1.6 x 10^{-4} ft/ft, respectively (**Table 3.4**). These very low vertical gradients are indicative of a predominately horizontal flow regime, as they are at least an order of magnitude lower than the horizontal gradient. For the September 2010 water levels, the PZ01-S/D well nest exhibited a slight upward vertical gradient of 5.1 x 10^{-4} ft/ft, and the PZ02-S/D well nest exhibited a slight upward vertical gradient of 1.6 x 10^{-4} ft/ft. The vertical gradients observed between Subunits "A" and "C" at PZ01 and PZ02 are so small that any differences between them (or potentially the direction and magnitude of gradients measured at these sites themselves) may be attributable to measurement error in water level elevations.

Further away from the extraction wells, vertical gradients between groundwater in Subunit "D" and Subunit "B" vary with location. **Figure 3.11** presents the September 2010 spatial distribution of vertical gradients surrounding the OU2 Area GES in Subunits "A/B" and "D," respectively. Vertical gradients to the southeast of the extraction wells are downward in direction and range from 1.7 x 10^{-3} ft/ft (ASE76-A/B) to 6.7 x 10^{-3} ft/ft (ASE77-A/B). Vertical gradients to the south and southwest of the extraction wells are upward in direction and range from 2.3 x 10^{-3} ft/ft (NW13-M/D to 7.5 x 10^{-3} ft/ft (NW14-M/D). Vertical gradients to the west of the extraction system are upward in direction and range from 9.6x10^{-3} ft/ft (NW04-S/D) to 1.1 x 10^{-1} ft/ft (OU314-M/D). As expected, the effect of the OU2 Area GES on vertical gradient direction and magnitude declines with distance from the extraction wells. Vertical gradients reverse direction from slightly downward to slightly upward, and then to a strong upward direction as the observed location moves from east to west. The OU2 Area GES may have some effect on the change in vertical gradient direction for areas where the magnitude is slight. This is most likely not the case for the strong gradients found to the west and southwest of the OU2 Area GES, which appear to be geologically controlled.

Furthermore, based on review of the hydrographs prepared for monitoring wells EW19-D, EW22-D, OU312-D, and OU313-D (**Appendix A**), there appear to be seasonal impacts on the monitoring wells in OU3 from deep well pumping to the west. The existence of significant vertical gradients between Subunit "D" and Subunit "B" within OU3 have been documented and discussed by EPA/Shaw, in their Groundwater Investigation Report Phase I/Phase II Well Installation (Shaw, 2005). The Companies believe that the origin of these gradients is due to regional pumping. Hydrographs presented herein show that Subunit "D" wells located west of the OU2 system show water level responses that are not associated with the operation of the OU2 GES. Therefore, due to the presence of these vertical gradients, wells EW19-D, EW22-D, OU312-D, and OU313-D were not used in contouring, wells and OU314-D and NW12-D were only qualitatively used in contouring **Figure 3.8**. Whether these gradients arise from seasonal extraction of groundwater to the west of OU3 does not affect their existence, and it is not the seasonality but rather the large difference between the magnitude of vertical gradients that makes it technically incorrect to use the listed high vertical gradient wells as part of a horizontal gradient map relative to the OU2 Area GES.

3.2.4 EXTRACTION WELL DATA

In February 2010, after a month-long OU2 Area GES shutdown for SRP Grand Canal maintenance, the depth to groundwater was 98.9 feet below top of casing for EWN, 91.9 feet below top of casing for EWM, and 89.6 feet below top of casing for EWS (refer to **Appendix C** hydrographs and trending charts for details). A comparison of the 2001, 2006, and 2010 saturated thicknesses at the extraction wells is as follows:

Extraction Well	*Saturated Aquifer Thickness (feet)*		
	2001	***2006***	***2010***
EWN	158	140	141
EWM	148	137	138
EWS	115	103	105

The average saturated thickness of the Alluvial Aquifer (Subunits "A," "B," and "D") has been reduced at wells EWN, EWM, and EWS by an average of approximately 12 feet from 2001 to early 2010 (during GES shutdown for SRP Grand Canal maintenance). There was no 2011 SRP Grand Canal shutdown.

3.3 GROUNDWATER CHEMISTRY

Groundwater monitoring and sampling after system startup was performed at the frequency specified in Section 7.0 of the O&M Manual, and was reported to the Agencies for 2010 through quarterly groundwater monitoring reports as follows:

1. December 2009 through February 2010 in a letter report dated April 15, 2010 (a)
2. March 2010 through May 2010 in a letter report dated July 15, 2010 (c)
3. June 2010 through August 2010 in a letter report dated October 15, 2010 (d)
4. September 2010 through November 2010 in a letter report dated January 15, 2011 (a)
5. December 2010 through February 2011 in a letter report dated April 15, 2011 (c)

Tabulated summaries of the groundwater analytical data for Baseline (September 2001), September 2006, and September 2010 are provided in **Table 3.5** (Subunit "A"), **Table 3.6** (Subunit "B"), **Table 3.7** (Subunit "D"), and **Table 3.8** (Subunit "C" and Colluvium).

3.3.1 BASELINE (SEPTEMBER 2001) CHEMICAL CONCENTRATION DATA

TCE concentration data for the OU2 Area GES for September 2001 are presented on **Figure 3.14** (Subunit "A"), **Figure 3.15** (Subunit "B"), **Figure 3.16** (Subunit "D"), and **Figure 3.17** (Subunit "C"), including the TCE plume boundary interpretation for 2001. The 2001 groundwater plume boundaries represent baseline conditions prior to startup of the OU2 Area GES. Plots of baseline concentrations for the individual constituents of concern are included in **Appendix B**.

3.3.2 SEPTEMBER 2006 CHEMICAL CONCENTRATION DATA

TCE concentration data for the September 2006 sampling event in the OU2 Area are presented on **Figure 3.18** (Subunit "A"), **Figure 3.19** (Subunit "B"), and **Figure 3.20** (Subunit "D"), and have been used to create a contoured TCE plume boundary interpretation for 2006. TCE concentration data for Subunit "C" are posted on **Figure 3.21**. The September 2006 period is presented in accordance with the OU2 Consent Decree. Although the September 2006 data represent groundwater conditions after 5 years of operations, additional water quality data are available for the period from the expanded OU2 groundwater monitoring network.

3.3.3 SEPTEMBER 2010 CHEMICAL CONCENTRATION DATA

TCE concentration data for the September 2010 sampling event in the OU2 Area are presented on **Figure 3.22** (Subunit "A"), **Figure 3.23** (Subunit "B"), and **Figure 3.24** (Subunit "D"). These data have been used to create a contoured TCE plume boundary interpretation for 2010. TCE concentration data for Subunit "C" are posted on **Figure 3.25**.

Cross-sections with TCE concentration data for 2001, 2006, and 2010 are provided on **Figure 3.26** (Cross-section A-A′), **Figure 3.27** (Cross-section B-B′), **Figure 3.28** (Cross-section C-C′), and **Figure 3.29** (Cross-section D-D′).

Tabulated listings of the groundwater analytical data for the compounds included on **Figures 3.14** through **3.29** are provided in **Table 3.5** (Subunit "A"), **Table 3.6** (Subunit "B"), **Table 3.7** (Subunit "D"), and **Table 3.8** (Subunit "C" and Colluvium). In addition, 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), cis 1,2-dichloroethene (cis 1,2-DCE), and TCE analytical data for 2001 and 2010 have been posted on figures in **Appendix B** for Subunits "A," "B," "D," and "C," for the entire OU2 Area. The figures for Subunits "A," "B," and "D" include the TCE plume boundary interpretation for 2001 and 2010.

The TCE distributions in the monitoring wells screened within the colluvium (NW15-S, NW17-S, and NW18-M) are not posted on figures. These results are presented in **Table 3.8**. TCE distributions in the colluvium-screened wells (NW15-S, NW17-S, and NW18-M) are separate from the Alluvial Aquifer contaminant distributions, and are discussed in Section 2.2.

3.4 CONTAMINANT TRENDS

Although changes in water quality occur more slowly and over a longer timeframe than water elevation responses in the OU2 Area, water quality changes have been observed since the 2001 Baseline period. Decreasing concentration trends are observed in the OU2 extraction wells. Decreasing concentration trends are also observed in monitoring wells located both upgradient and downgradient of the OU2 Area GES. The width of the plume (north and south) has decreased in the vicinity of the OU2 Area GES in Subunits "A" and "B." The changes in TCE concentrations from Baseline to September 2010, and from September 2006 to September 2010, are calculated in **Table 3.5** (Subunit "A"), **Table 3.6** (Subunit "B"), **Table 3.7** (Subunit "D"), and **Table 3.8** (Subunit "C" and "Colluvium"). The change in TCE concentrations from Baseline conditions in

September 2001 to September 2010 are presented on **Figures 3.30, 3.31, 3.32,** and **3.33** for Subunits "A," "B," "D," and "C," respectively. The change in TCE concentrations from September 2006 conditions to September 2010 are presented on **Figures 3.34, 3.35, 3.36,** and **3.37** for Subunits "A," "B," "D," and "C," respectively.

The evaluation of trends consists of a qualitative discussion of the variation in the monitoring and extraction wells for Baseline to September 2010, and September 2006 to September 2010. In addition, a quantitative statistical trend analysis of the data from Baseline to 2010 was completed (Section 3.4.4).

3.4.1 BASELINE TO SEPTEMBER 2010

The changes in TCE concentrations from Baseline to September 2010, and from September 2006 to September 2010 are calculated in **Table 3.5** (Subunit "A"), **Table 3.6** (Subunit "B"), **Table 3.7** (Subunit "D"), and **Table 3.8** (Subunit "C"). The change in TCE concentrations from baseline conditions in September 2001 to September 2010 are presented on **Figures 3.30, 3.31, 3.32,** and **3.33** for the Subunits "A," "B," "D," and "C," respectively. Cross-sections with TCE concentration data for 2001 and 2010 are provided on **Figure 3.26** (Cross-section A-A′), **Figure 3.27** (Cross-section B-B′), **Figure 3.28** (Cross-section C-C′), and **Figure 3.29** (Cross-section D-D′). TCE concentration hydrographs for selected monitor wells are provided in **Appendix A**. Additional figures showing analytical data for 1,1-DCE, 1,1-DCA, cis 1,2-DCE, and TCE are presented in **Appendix B.**

The expected trend in concentrations varies by location. As expected, a temporary increase in VOC concentrations, attributable to additional mass of VOC moving past the well location, is observed in a number of wells in the OU2 Area. Also, as expected, a reduction in TCE concentrations is observed in monitoring wells in all three alluvial subunits downgradient of the OU2 Area GES due to the establishment of the hydraulic capture zone by the OU2 Area GES pumping. Finally, a reduction in plume width is observed in the vicinity of the OU2 Area GES. The reduction in the width of the TCE plume after the startup of the OU2 Area GES has been expected due to the localized groundwater flow direction changes in response to the OU2 Area GES pumping.

In 2010, the general trend of the 1,1-DCE, 1,1-DCA, and cis 1,2-DCE graphs are similar to the TCE trend and indicate a reduction in the concentrations of VOCs for most groundwater monitor wells, both upgradient and downgradient of the OU2 Area GES. A graphical summary is provided in **Appendix A**.

3.4.2 SEPTEMBER 2006 TO SEPTEMBER 2010

The changes in TCE concentrations from September 2006 to September 2010 are calculated in **Table 3.5** (Subunit "A"), **Table 3.6** (Subunit "B"), **Table 3.7** (Subunit "D"), and **Table 3.8** (Subunit "C"). Cross-sections with TCE concentration data for 2006 and 2010 are provided on **Figure 3.26** (Cross-section A-A′), **Figure 3.27** (Cross-section B-B′), **Figure 3.28** (Cross-section C-C′), and **Figure 3.29** (Cross-section D-D′). TCE concentration hydrographs for selected monitor wells are provided in **Appendix A**. The changes in TCE concentrations from September 2006 conditions to September 2010 are presented on **Figures 3.34, 3.35, 3.36,** and **3.37** for Subunits "A," "B," "D," and "C," respectively.

3.4.2.1 COLLUVIUM-SCREENED WELLS – TRENDS (2007 TO 2010)

The TCE distributions in the monitoring wells screened within the colluvium (NW15-S, NW17-S, and NW18-M) are not posted on figures. These results are presented in **Table 3.8**. TCE distributions in the colluvium screened wells (NW15-S, NW17-S, and NW18-M) are separate from the Alluvial Aquifer contaminant distributions. The trend hydrographs are shown in **Appendix A**. From 2007 to 2010, the general trend of the TCE, 1,1-DCE, 1,1-DCA, and cis 1,2-DCE graphs indicates a reduction in the concentrations of VOCs for the three colluvium-screened groundwater monitor wells.

3.4.3 EXTRACTION WELL DATA

The TCE concentrations have decreased in groundwater samples collected from each of the three extraction wells since startup in 2001. TCE concentrations for each of the three extraction wells from the September 2001, September 2006, and September 2010 sampling events are as follows:

Extraction Well	*TCE Concentration (µg/L)*		
	2001	***2006***	***2010***
EWN	98	14	59
EWM	320	170	71
EWS	320	33	14

Note: µg/L = micrograms per liter

Similarly, reductions in the other individual contaminants of concern are observed in each of the three extraction wells. Extraction well hydrographs and VOC concentration trend figures are presented in **Appendix C**.

As indicated in the above table, although the concentration is reduced overall from 2001, the concentration of TCE in 2010 was higher than the concentration in 2006 in extraction well EWN. Variations in VOC concentrations, both increasing and decreasing trends, are expected to be observed in individual wells in the OU2 Area as mass is moved through the Alluvial Aquifer by the operation of the GES, as the groundwater levels fluctuate in response to changing pumping conditions, and in response to significant groundwater recharge events such as those experienced in the winters of 2004/2005, 2008/2009, and 2009/2010.

3.4.4 STATISTICAL ANALYSIS

This section summarizes statistical analyses performed to quantitatively evaluate trends in chemical concentrations over time at monitoring wells within OU2. Trend analyses were conducted for each of the five primary VOCs (PCE, TCE, cis 1,2-DCE, 1,1-DCE, and 1,1-DCA). The trend analysis was performed utilizing the Mann-Kendall trend test, which is commonly applied to environmental monitoring data (Helsel and Hirsch, 1992; EPA, 2006). The test identifies whether there is an increasing or decreasing trend, or if a statistically significant trend cannot be determined for each of the tested parameters. Because some of the compounds evaluated are degradation by-products of other constituents, it may be possible to observe no detectable or declining concentrations in the parent compound and also an increasing or decreasing concentration in the daughter compound. The full details of the trend analysis are presented in a memorandum in **Appendix D-1**.

In implementing the Mann-Kendall trend test, a significance level of 0.05 (95 percent confidence) was used for data sets with more than four samples. A significance level of 0.10 (90 percent confidence) was applied for data sets with four samples, because it is not mathematically possible to achieve 0.05 significance with only four samples. No test was performed with three or fewer data points. For the purposes of performing the Mann-Kendall trend test, non-detects were considered to be tied (i.e., equal) values with lower concentrations than the detected observations.

Data generated from groundwater samples and analyzed for 1,1-DCA, 1,1-DCE, cis 1,2-DCE, PCE, and TCE were used for the evaluation. A total of 468 wells monitored within the OU2 Area and the eastern portion of OU3 (just downgradient of the OU2

GES) were analyzed for data feasibility for trend tests, based on the number of samples (four or more samples) collected and detection of more then 50 percent for at least one analyte, provided that they were sampled in 2010. Fifty wells were selected based on the criteria described. The date of commencement of monitoring, as well as sampling frequency, has varied by well, with data collected between 2001 and 2010 being considered when carrying out the trend tests. The number of samples available by well varied between 5 and 30 (shown in Table D.1 of **Appendix D-1**). A detailed discussion of the results of the statistical trend analysis is presented in Section 3.5.3.1.

3.5 CAPTURE ZONE EVALUATION

This section presents the evaluation of the effectiveness of the OU2 Area GES in achieving hydraulic containment of the VOC contaminant plume at the Site. The demonstration of hydraulic containment is best evaluated using converging lines of evidence. For this evaluation, a "Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems" (EPA, 2008) was utilized. This EPA guidance highlights six key steps for systematically performing a capture zone evaluation. The steps identified are listed below:

Step 1 Review site data, CSM, and remedy objectives

Step 2 Define site-specific target capture zone(s) (TCZ[s])

Step 3 Interpret water levels:

- Potentiometric surface maps (horizontal) and water level difference maps (vertical)
- Water level pairs (gradient control points)

Step 4 Perform calculations:

- Estimate flow rate calculation
- Capture zone width calculation (can include drawdown calculation)
- Modeling (analytical or numerical) to simulate water levels, in conjunction with particle tracking and/or transport modeling

Step 5 Evaluate concentration trends

Step 6 Interpret actual capture based on Steps 1-5, compare to TCZ(s), and assess uncertainties and data gaps

This evaluation is based on the assessment of the lines of evidence outlined in Steps 1, 2, 3, and 5, above. The other lines of evidence are not appropriate for use at the Site for various reasons presented in the following paragraphs and previously stated in the 2006 Effectiveness Report (CRA, 2007a).

The calculation of hydraulic capture width or required pumping to achieve hydraulic capture can be estimated using a water balance approach. This approach uses a form of Darcy's Law to determine the natural groundwater flow through the TCZ. The natural flow is compared to the actual OU2 Area GES pumping rate to ensure that the pumping rate is greater than the calculated flow. This calculation was performed as part of the Final (100%) Design Report (CRA, 1999) and updated in 2004 (CRA, 2004c). However, since the submission of the Final (100%) Design Report, additional information has been obtained and the CSM has been refined. The water balance calculations (CRA, 2004a) were not used in this evaluation because this approach is best applied in simple hydrogeologic systems that approach the principal assumptions of homogeneous and isotropic conditions. Additional information obtained from monitoring and operations data shows that the hydrogeologic system at the Site is too complex for the application of this line of evidence given the variation in texture and thickness of the hydrogeologic subunits that results in lateral and vertical variability in aquifer parameters. In addition, there is some dispute as to the applicable aquifer parameters of the hydrogeologic subunits. As a result, this line of evidence was not applied in the evaluation.

The use of groundwater elevation pairs is suggested by the EPA as a potential method for the evaluation of hydraulic containment. In complex hydrogeologic settings, it may not be possible to evaluate groundwater flow directions and gradients with a well pair and the use of three or more wells may be necessary (Methods for Monitoring Pump-and-Treat Performance; EPA/600/R-94/123, June 1994). The monitoring well network was not designed for evaluating well pairs and, due to the hydrogeologic complexity of the setting near the extraction wells, it is not appropriate for such an evaluation.

While a numerical groundwater flow model can be used to assess horizontal and vertical capture, the 3-dimensional numerical model from the design has not been updated and approved for additional uses at the Site. Due to the complexity of the geologic conditions, a numeric model is necessarily a simplification of site conditions and, therefore, subject to interpretation. The Companies' preference is to demonstrate capture with the available field data so particle tracking using a model was not performed. Previous models of the area, including both numeric and analytical groundwater flow models, have shown that the geologic structure and variability in aquifer properties cannot be adequately simulated using simple 2-dimensional methods. Because sufficient information exists to determine containment using the remaining lines of evidence, the time and resource intensive exercise of completing a 3-dimensional groundwater flow model has not been undertaken. Following a similar line of logic, tracer tests have also not been performed at the Site.

As a result, the following steps were relied on in the evaluation of the effectiveness of the OU2 Area GES: CSM and Remedy Objectives (Step 1), Define site-specific TCZ(s) (Step 2), Groundwater Levels (Step 3), and Concentration Trends (Step 5).

As stated in Section 1.3, the interim remedy objective of the OU2 GES and the TCZ is to contain the entire north-south width and depth of the VOC plume (namely TCE-primary contaminant of concern [COC]) above the Maximum Contaminant Level (MCL) within the Alluvial Aquifer in the area of I-10.

3.5.1 POTENTIOMETRIC SURFACE MAPS

Groundwater level measurements were used to create groundwater contour maps for Subunits "A," "B," and "D." The manually drawn contour maps are presented on **Figures 3.7** and **3.8** for September 2010. Consistent with EPA guidance, the extraction well water levels were only considered qualitatively and were not used quantitatively in the preparation of the plan view contours. Consistent with previous reports, the September water levels are evaluated as they are the most complete data set that is collected annually. For this capture evaluation, the September 2010 contours were used and groundwater flow lines were manually drawn and overlain on the contour maps.

Subunits "A and B"

Examination of **Figure 3.7** supports the conclusion that hydraulic containment has been achieved in the TCZ in Subunits "A" and "B." To the north, hydraulic containment is achieved as far as monitoring well CRA01. At first glance, it would appear that excess water is being pumped in the northern portion of the OU2 Area GES. However, historical attempts to reduce pumping in EWN resulted in reduced capture to the south. Therefore, the current pumping rate in EWN has been maintained. To the south, capture of the full width of the plume in Subunits "A" and "B" is indicated south of monitoring wells EW06 and NW11-M. Downgradient of the OU2 Area GES, hydraulic containment is shown to extend to a maximum of approximately 1,100 feet west of 20th Street.

Subunit "D"

The groundwater flow lines and estimated capture zone for Subunit "D" are shown on **Figure 3.8**. Examination of **Figure 3.8** shows that capture of the full width of the TCE plume in Subunit "D" is indicated east-southeast of monitoring well NW09-D/D2. Using the configuration of groundwater movement in Subunit "B" as a guide because there is no hydraulic separation between Subunits "B" and "D", groundwater will move towards EWS bounded by a flow divide in Subunit "D" that replicates a similar flow divide (limit of capture) in Subunit "B." Hydraulic containment, as estimated on **Figure 3.8**, extends to a maximum of approximately 800 feet west of 20th Street.

3.5.2 CROSS-SECTION CONTOURS

The use of plan view groundwater contours limits the evaluation of capture to 2 dimensions. Per the Second Amended UAO and the CD, however, hydraulic containment of the entire thickness of the affected hydrogeologic units is required, thereby necessitating the evaluation of hydraulic containment in 3 dimensions. To evaluate vertical containment, groundwater contours were prepared for two existing geologic cross-sections. These cross-sections were previously presented on **Figures 2.3** and **2.4** of the report. The cross-section locations are shown on **Figure 2.2**.

Cross-section A-A′ is a north-south cross-section through the line of extraction wells. Manual groundwater elevation contours were prepared using the water level measurements for September 2010. The resulting contours are shown on **Figure 3.12**. Groundwater flow lines were not drawn on the contours because of the vertical exaggeration (in a vertically exaggerated cross-section, the flow lines do not cross the contours at right angles). Instead, the contours were examined to assess flow directions and the variability in flow direction with depth. The groundwater contours on **Figure 3.12** show that the direction and magnitude of horizontal gradients along the cross-section are consistent with depth to the north, central and southern portions of the cross section; and therefore, are consistent with the conclusions with respect to containment as previously discussed using the groundwater potentiometric surface maps. South-southwesterly groundwater flow from monitoring well CRA01 occurs in Subunits "A and B" and "D" and the horizontal hydraulic gradients are very large. To the south of EWS, groundwater flow is to the north from as far south as monitoring well NW10-D. The projected horizontal flow within the cross-sectional area bounded by the TCZ north and south limits is consistent with depth and is towards the extraction wells. This finding is consistent with the results of the plan view groundwater contours for Subunits "A and B" and "D."

Modified cross-section B-B′ (**Figure 3.13**) is an east-west trending section. East of the OU2 Area GES, the line of section parallels groundwater. However, west of the OU2 Area GES, the line of section does not directly follow the groundwater flow lines as the effect of pumping causes flow lines to bend and even reverse themselves. Examination of **Figure 3.13** shows that groundwater flow is from the east towards the OU2 Area GES. Based on this cross-section, the direction and magnitude of horizontal gradients is consistent with depth to the east and towards the extraction wells; and, therefore, support the conclusions with respect to containment as previously discussed using the groundwater potentiometric surface maps. This is consistent with the capture zone defined by the plan view groundwater contours. To the west of the OU2 Area GES, the groundwater contours indicate that the direction and magnitude of horizontal gradients in Subunits "A and B" and "D" is consistent with depth between EWS and the

NW07 monitoring well nest, but show that the direction of flow is largely away from the extraction wells. This result is not inconsistent with the plan view contours for Subunits "A and B" and "D," as the planar approximate limit to capture is only slightly to the west of the extraction wells.

What is of particular interest on the western side of this cross-section is that west of well nest NW07, there is no longer consistency in the horizontal gradients between Subunits "A and B" and Subunit "D." As previously discussed in Section 3.2 concerning water level trends, vertical gradients between Subunits "D" and "A and B" change dramatically in a westward direction. **Figure 3.11** shows that further west from the OU2 Area GES, vertical gradients increased in magnitude and were upward in direction. While this result does not affect the containment analysis of the OU2 Area GES, it does have implications on the movement of groundwater west of the OU2 Area GES. West of the OU2 Area GES, vertical gradients will rapidly move groundwater from Subunit "D" upward into Subunit "B," while, at the same time, not allowing groundwater to move from Subunit "B" downward into Subunit "D."

3.5.3 GROUNDWATER CHEMISTRY TRENDS

Trends in groundwater chemistry can be used to assess the effectiveness of the OU2 Area GES in achieving hydraulic containment. Monitoring wells located downgradient of the OU2 Area GES, that were previously impacted, should respond differently over time than monitoring wells located upgradient and within the zone of capture. The timing and occurrence for this response are variable because of a number of contributing factors. These contributing factors include the original contaminant concentration, the aquifer parameters at the specific monitoring location, and the location of the monitoring point along the groundwater flow path. All of these factors can affect water quality over time. If the remediation system is containing groundwater, then concentrations in groundwater from monitoring wells located downgradient of the GES will only reflect localized contaminants and processes, and will not be impacted by additional contaminant mass moving into the area from upgradient sources. Conversely, monitoring wells located upgradient and within the capture zone may possibly reflect impacts of upgradient sources, depending entirely on the flow path on which they were located. However, even if an upgradient well showed increasing concentrations over time, it is within the capture zone and so the endpoint on its flow path would always be an extraction well. The OU2 Area GES has been in operation since 2001, and this is sufficient time to show changes in groundwater quality that can be attributed to the operation of the OU2 Area GES.

Chemistry (contaminant) trends were evaluated based on observed data (as discussed in Section 3.4) and statistical analysis (as discussed in Section 3.4.4), and an evaluation of the chemistry trends along several flow paths. The results from these analyses are briefly summarized in Sections 3.5.3.1 (statistical analysis) and 3.5.3.2 (trends along flow paths) below.

3.5.3.1 STATISTICAL ANALYSIS

The results of the trend tests are shown in Table D.1 (**Appendix D**). From a total of 250 data sets (50 wells x five analytes) considered, 77 cases consisted of data not suitable for trend tests due to low percentages of detected results. A total of 29 of the remaining data sets did not have statistically significant trends observed. Statistically significant trends ($P<0.05$, i.e., greater than 95 percent confidence; or $P<0.10$, i.e., 90 percent confidence) were observed for 144 data sets representing 50 wells, including all five chemicals. Decreasing trends were observed for 119 of the 144 data sets encompassing 41 wells. Increasing trends were observed for 25 of the 144 data sets at the following 12 wells:

- 1,1-DCA at wells ASE76-B, BC11-A, NW05-S, NW08-M, NW11-D, PL201-A, PL202-N, and PL2101
- 1,1-DCE at wells ASE76-B, BC11-A, EW22S, NW08-M, NW11-D, NW19-D, and PZ01-B
- cis-1,2-DCE at wells ASE76-B, BC11-A, DM515-210, NW11-D, NW19-D, and PL202-N
- TCE at wells ASE76-B, BC11-A, NW11-D, and NW19-D

Comparing the current trend results to those found in the last evaluation (CRA, 2010b), shown in the final column of Table D.1 (Appendix D), the vast majority of trend test conclusions are identical. Six data sets were newly identified as having significant decreasing trends where no statistically significant trend was present during the previous evaluation. Two data sets were found to have significant increasing trends (1,1-DCE at wells EW22S and NW19-D) that were previously not statistically significant. Two cases occurred where a previously statistically significant decreasing trend (cis-1,2-DCE at NW06-D and 1,1-DCA at NW13-D) was not repeated in 2010, and two additional cases were noted where previously statistically significant increasing trends were not significant during the current evaluation (1,1-DCA at wells ASE86-A and NW07-D).

A series of trend tests performed evaluating patterns in concentrations over time for five chemicals in groundwater samples collected at 50 monitoring wells at the Site indicated that in the majority of cases (119 data sets in 41 wells), statistically significant evidence (with 95 percent confidence) of decreasing trends over time was seen. For most of the remaining data sets considered, either no significant trends were observed (29 data sets), or analyte detection frequencies were below 50 percent and therefore no trend tests were performed (77 data sets). However, occasional observation of significant increasing trends occurred for 25 data sets across 12 wells. For eight of the 12 wells, the increasing trends were for breakdown by-products of TCE, which may occur for short periods during natural degradation of this compound. For the remaining four wells (ASE76-B, BC11-A, NW11-D, and NW19-D), concentrations of both parent and breakdown by-products increased over the monitoring period evaluated (2001-2010).

Subunits "A and B"

The results of the statistical trend analysis are shown in Table D.1 (**Appendix D**) and depicted areally on Figure D.1 (**Appendix D**). Throughout the OU2 Area, both upgradient and downgradient of the OU2 Area GES, decreasing trends are observed in all wells with statistically significant trends for parent product contaminants (TCE). An increase in daughter products of 1,1,1-TCA (1,1-DCE and 1,1-DCA) can be seen in select wells (ASE86-A, NW08-M, and NW05-S) within the heart of the plume, upgradient of the OU2 Area GES. EW22-S is the only well downgradient of the TCZ with an increasing VOC trend (1,1-DCE). Historical 1,1-DCE concentrations at EW22-S have ranged from a high of 104 micrograms per liter (µg/L) in April 1997 (prior to 2001 OU2 Area GES startup), to 0.9 to 3.1 µg/L from 2002 to 2009, and 4.0 µg/L in September 2010 (1,1-DCE MCL is 7 µg/L/ However, TCE has a general overall decreasing trend at EW22-S, indicating that the VOC plume has been cut off and no new VOCs are being contributed from upgradient of the TCZ. The decreasing TCE concentrations combined with an increase in break-down compounds in the heart of the regional plume suggest that, in general, the TCE source areas have been cut off, and the remaining mass is degrading. These decreasing trends confirm that hydraulic containment of Subunits "A and B" is achieved by the OU2 Area GES at the TCZ, and that operation of the OU2 Area GES is having a beneficial effect on water quality.

Subunit "D"

The results of the statistical trend analysis for Subunit "D" are shown in Table D.1 **(Appendix D-1)** and depicted areally on Figure D.2 **(Appendix D-1)**. In wells that exhibit statistically significant trends, an increase in TCE is observed in wells upgradient of the OU2 Area GES. All wells located downgradient of the TCZ display decreasing trends for TCE and, in general, for all other statistically analyzed VOCs. The decreasing concentration trends downgradient of the OU2 Area TCZ confirm that hydraulic containment of Subunit "D" is achieved by the OU2 Area GES, and that operation of the OU2 Area GES is having a beneficial effect on water quality.

3.5.3.2 TRENDS ALONG FLOW PATHS

In addition to the statistical trend analysis, graphs of TCE concentrations of wells along or near three specific groundwater flow paths were prepared to illustrate the TCE contaminant trends for wells upgradient and downgradient of the OU2 Area GES. The locations of the three groundwater flow paths are shown on Figure D.3 (Subunits "A and B") and Figure D.4 (Subunit "D") (**Appendix D-2)**. The flow path locations are all in the southern portion of the OU2 Area GES to provide additional evidence of hydraulic containment in the area where containment has been historically questioned. The flow paths include wells in the southern portion of the regional plume (flow path 3), along the southern boundary of the plume (flow path 2), and outside the VOC plume (flow path 1). Wells were selected to illustrate capture in each of the Subunits in the southern portion of the OU2 Area GES. TCE trend graphs are presented as Figures D.5 through D.10 (**Appendix D-2**).

Based on **Figures D.5** through **D.10** (**Appendix D-2**), the selected wells in Subunit "D" that are upgradient of the OU2 Area GES generally have an increasing trend in TCE, while wells that are downgradient from the OU2 Area GES have a decreasing trend in TCE. This can be illustrated using flow path 2 from **Figures D.4** and **D.8** (**Appendix D-2**). Starting near well ASE76-B and moving down the flow path to the west, one can see an increasing trend in TCE concentration in ASE76-B, and to a lesser degree in wells NW11-D and NW19-D. All three of these wells are upgradient of the OU2 Area GES and show a continued increase in TCE mass moving through the area. As the OU2 Area GES captures this increased mass, downgradient well NW07-D responds as predicted with a decreasing TCE trend. A decreasing TCE trend in well NW07-D is expected if the OU2 Area GES is functioning as designed and the contaminant mass is captured.

Selected wells within Subunits "A and B" have a decreasing trend for wells both upgradient and downgradient from the OU2 Area GES. The results support the statistical analysis described above, although due to a large number of non-detects or lack of statistical significance, a trend was not always identified. The TCE graphs are another tool to help visually illustrate the trends identified in the statistical analysis and support the containment evaluation.

3.5.4 CONCLUSIONS

Based upon the evaluation of the converging lines of evidence, the following conclusions are made:

- Potentiometric surface maps and groundwater flow lines for September 2010 demonstrate that hydraulic containment of the entire width of the plume is achieved in Subunits ″A and B.″
- Potentiometric surface maps and groundwater flow lines for September 2010 demonstrate that hydraulic containment of the entire width of the plume is achieved in Subunit ″D.″ Two monitoring wells installed in 2007 (NW16-D and NW19-D) provide water level information in areas of previously identified data gaps that confirm southern containment of the plume in Subunit ″D.″
- Groundwater contours in cross-sections demonstrate that the entire depth of the plume is contained by operation of the OU2 Area GES.
- Statistically significant decreasing contaminant concentration trends are observed in monitor wells completed in each of the Subunits downgradient of the OU2 Area GES. These decreasing concentration trends indicate that operation of the OU2 Area GES effectively contains the plume in the area of I-10.
- Statistically significant decreasing contaminant concentration trends are observed in monitor wells completed in each of the Subunits upgradient of the OU2 Area GES. The decreasing trends in wells upgradient of the GES indicate that overall the regional VOC plume is being naturally degraded prior to being captured by the GES.
- The flow path analysis of the TCE trends upgradient and downgradient support the interpretation of capture in the southern portion of the OU2 Area GES in Subunits "A," "B," and "D".
- Maps of plotted TCE concentrations demonstrate that the observed plume is narrowing in each of the Subunits in the vicinity of the OU2 Area GES. These data indicate that the OU2 Area GES effectively contains the plume and is having a beneficial effect on Alluvial Aquifer water quality.

The lines of evidence presented in this Effectiveness Report show plume containment by the OU2 Area GES. Continued monitoring will be performed to verify containment continues to be achieved.

4.0 OU2 AREA GES OPERATIONAL ASSESSMENT

Routine O&M activities commenced on December 13, 2001, at the completion of the startup period. During 2010, the sampling and analytical schedule detailed in the O&M Manual (CRA, 2004e) was implemented. Approximately 1.1 billion gallons (3,259 acre-feet) of water were treated in 2010 at the OU2 Area GES. From startup through 2010, over 9.98 billion gallons (30,627 acre-feet) of water have been treated by the OU2 Area GES and put to beneficial use for irrigation purposes by SRP. All of the treated water met all of the discharge water quality standards for VOCs during 2010. The OU2 Area GES removed approximately 812 pounds of VOCs in 2010, and has removed an estimated total of 12,480 pounds from startup in 2001. Included in **Appendix H** is a chart showing the monthly and cumulative trends in the VOC mass removed from the extracted groundwater, as well as the monthly and cumulative volume of groundwater treated. Also included in **Appendix H** is a table summarizing the total cumulative volume of groundwater treated and total cumulative VOC mass removed from the extracted groundwater.

The sections below summarize the performance parameters and trends for the period of January 1 to December 31, 2010.

4.1 GROUNDWATER EXTRACTION

Groundwater extraction and treatment volumes and run times for the reporting period are summarized in **Tables 4.1** and **4.2**, respectively. A summary of the monthly uptime percentages is provided in **Table 4.3**, and a summary of the extraction well/treatment system shutdowns greater than 30 minutes in duration is provided in **Appendix E**.

Extraction well flow rate set points changed for EWN, EWM, and EWS during the 2010 reporting period. At the beginning of every year, SRP suspends operation of the Grand Canal for approximately 1 month for maintenance and cleaning of the canal. The flow rate set points for all three extraction wells were reduced to 0 gallons per minute (gpm) from January 11 to February 8, 2010, during the annual SRP Grand Canal Maintenance Shutdown, and were returned to the previous set points (600 gpm for EWN, 1,350 gpm for EWM and 240 gpm for EWS) at system startup. During this shutdown period, preventative maintenance of the OU2 Area GES is performed to maximize runtime during the remainder of the year. On August 4, 2010, EWS was shut down to replace the pump and rehabilitate the well. A new 300-gpm pump was installed in EWS, and on August 24, 2010, the system was restarted with EWN, EWM, and EWS flow rates set at 600 gpm, 1,290 gpm, and 300 gpm, respectively. The flow rate set points for EWM and

EWS were changed to maintain capture in the southern part of the VOC contaminant plume. On November 15, 2010, the flow rate set point for EWN was increased to 800 gpm to increase capture in the northern part of the VOC contaminant plume. Groundwater extraction well flow rate set point changes are summarized in **Table 4.4**. The OU2 Area GES has sufficient capacity and flexibility to extract and treat the required amount of groundwater to maintain groundwater containment.

Included in **Appendix C** are charts of the daily average system flow rates superimposed on the extraction well hydrographs and concentration trends of select VOCs for each extraction well. **Appendix F** includes a table summarizing the combined influent concentrations for 2010, and charts showing the trend in the combined influent VOC concentrations since startup. Analytical data for the extraction wells and the combined influent for 2010 were provided in the monthly progress reports submitted to the Agencies.

4.2 UV OXIDATION TREATMENT

The UV oxidation system was not required to operate during the reporting period, as vinyl chloride has not been detected in the influent groundwater, in upgradient groundwater monitoring wells, nor was it necessary to adjust VOC concentrations to control carbon utilization rates. The Startup Report (CRA, 2002a) provided an assessment of the UV oxidation system for treatment of the VOCs in the influent groundwater.

The combined influent to the treatment system comes from the three extraction wells, allowing blending of the extracted groundwater in the combined influent. Vinyl chloride is not expected to reach 2 μg/L in 1 month in all three extraction wells at the same time; rather, it is anticipated that vinyl chloride concentrations would gradually increase over a period of time. Therefore, the semi-annual sampling of the individual extraction wells and the monthly sampling of the combined influent should provide sufficient warning for the need to start up the UV oxidation system to treat vinyl chloride in the extracted groundwater. It should be noted that vinyl chloride has not been detected in the influent groundwater since system startup.

The UV oxidation system operated temporarily on November 16 and 17, 2010, as a routine preventative maintenance measure to test the operability of the system. No hydrogen peroxide was stored on Site during 2010. Typically, hydrogen peroxide can be delivered within a week of placing the order if it is needed.

4.3 GRANULAR ACTIVATED CARBON TREATMENT

Four pairs of GAC adsorbers (primary and secondary) were in operation during most of 2010 to maintain an optimum flow rate (5 to 7 gpm/ft^2) through each GAC pair, with a fifth pair available as a spare for regular rotation. On November 19, 2010, Siemens delivered 36,000 pounds total of regenerated carbon that were added to GAC vessels #2A and #2B (18,000 pounds each). GAC vessels #2A and #2B became operational on November 23, 2010, and a fifth set of vessels was placed in operation to accommodate for the increase in influent flow (see Section 4.1). A sixth set of GAC vessels was placed on standby and are rotated in and out of operation to maximize the life/use of carbon in all of the operating vessels. Included in **Appendix G** are charts showing the trends in the VOC concentrations after treatment by the primary GAC adsorber and prior to final treatment in the secondary GAC adsorber. The VOC results after the secondary GAC treatment are provided in **Table 4.7** and discussed in Section 4.4. Carbon changeouts of GAC units in 2010 are summarized in **Table 4.5**. Analytical data for the GAC treatment system is provided in the monthly progress reports submitted to the Agencies. Carbon changeouts are scheduled when the concentration of a VOC in the groundwater exceeds the allowable discharge concentration after treatment by the primary carbon adsorber, and prior to final treatment in the secondary carbon adsorber.

Based on evaluation of the influent and effluent data, a "roll over" effect is occurring for the compound 1,1-DCE. This phenomenon is caused by the TCE preferentially adsorbing to the carbon and pushing any adsorbed 1,1-DCE off the carbon and through the carbon bed. The 1,1-DCE accumulates in the carbon as it is pushed through by the TCE, and eventually exits the carbon at a concentration higher than the influent concentration. This requires more frequent carbon changeouts to treat the 1,1-DCE buildup in the carbon beds. The Companies are now using a mixture of coconut based carbon from Siemens Water Technologies (Siemens), and reaglomerated carbon from Calgon Carbon Corporation (Calgon). These carbons function more efficiently with the compounds that roll over, when compared to the coal based carbon.

Siemens regenerated the GAC at their Parker, Arizona regeneration facility following carbon changeouts during 2010. After a carbon changeout, the secondary GAC units are switched to primary units, and the GAC units with the regenerated carbon become the secondary GAC units. The status of the GAC units at the end of 2010 is provided in **Table 4.5**. Based on the treatment facility discharge concentrations presented in Section 4.4, the GAC is providing effective treatment of the extracted groundwater.

Entrained air collecting in the carbon of the primary GAC adsorbers, causing the GAC to become "blinded" by the air as discussed in previous annual reports, was not a significant problem in 2010, and backwashing of the primary GAC units decreased (in frequency and amount of water) in 2010 when compared to 2008 or 2009. There was no evidence of an increase in entrained air in the groundwater from the extraction wells or in the combined influent samples.

The backwashed water was discharged to the backwash wastewater (BWWW) tank and subsequently discharged to the City of Phoenix (COP) sanitary sewer. In addition, after each carbon changeout, the new carbon was backwashed to remove the carbon fines from the new carbon prior to placing the new carbon into service. The backwash water was also discharged to the BWWW tank and subsequently discharged to the COP sanitary sewer. Backwash water volumes discharged to the COP sanitary sewer for the reporting period are summarized in **Table 4.1**. Quarterly analytical results of the backwash water discharged to the COP sanitary sewer during the reporting period are summarized in **Table 4.6**. The discharges to the COP sanitary sewer met all of the COP sanitary sewer discharge standards during the 2010 reporting period.

4.4 FACILITY DISCHARGE

As required by Section B1.4.1 of the OU2 Remedial Design CD SOW (UAO), Section 2.B. of the OU2 Interim Remedial Action CD SOW, and confirmed in the Final (100%) Design Report (CRA, 1999) approved by the Agencies, the CD SOW requires the extracted water to be treated so that the effluent water meets the applicable standards at the point of compliance. The applicable standards at the point of compliance and a summary of the analytical results for the treatment facility discharge are provided in **Table 4.7**. The results of discharge monitoring indicate that the OU2 treatment facility treated all of the extracted groundwater to below the treated groundwater discharge standards for VOCs prior to discharge to the Grand Canal.

4.5 GRAND CANAL

In accordance with the agreement between the Companies and the Salt River Valley Water Users' Association relating to the discharge of treated groundwater from the OU2 treatment facility into the Grand Canal, the treated groundwater discharged to the Grand Canal was sampled monthly in 2010. A summary of the monthly VOC analytical results for the treated groundwater discharged to the Grand Canal is provided in **Table 4.8**, and indicates treatment of the extracted groundwater to below the treated groundwater discharge standards for VOCs (see Section 4.4). Also, in accordance with the agreement, the treated groundwater discharged to the Grand Canal is required to be analyzed once a year for select metals and general chemistry parameters. The sampling of the groundwater discharge to the Grand Canal for these parameters was performed on September 2, 2010, and analytical results are provided in **Tables 4.9** and **4.10**, respectively.

As mentioned in the 2008 and 2009 Effectiveness Reports, the groundwater pump and treatment operation is being conducted as a response action at a federal Superfund site and no Arizona Pollution Discharge Elimination System (AZPDES) permit is required; however, the substantive provisions of the AZPDES program must be met. The OU2 interim groundwater remedy extraction wells have what the Companies believe to be naturally occurring levels of boron in excess of ADEQ's surface water quality standard for agricultural irrigation.

In a letter dated July 2, 2009, the Companies indicated that they would implement a monitoring program (as discussed below) to demonstrate that the discharge of the treated OU2 water does not cause the water quality within the SRP Grand Canal to exceed the applicable irrigation standard for boron, in light of the public concerns that have been raised. Included with the letter was an AZPDES Mixing Zone Application and a mixing zone calculation technical memorandum which presented data used to calculate the minimum mixing zone length at which the boron concentration will be below the regulatory standard of 1 milligram per liter (mg/L) (CRA, 2009b). The mixing zone calculations and analytical results clearly indicate that there is adequate mixing in the Grand Canal within 500 meters of the OU2 treatment system discharge point for the concentration of boron to be in compliance with the applicable regulatory standards.

The Companies proposed to collect quarterly samples for 1 year at the OU2 Discharge Point to the Grand Canal, upstream (470 feet upgradient) of the OU2 Discharge Point, and downstream (approximately 800 feet downgradient) of the OU2 Discharge Point as boron compliance sampling points, and analyze the samples for boron. Thereafter, since the boron results have been below the action limit (1 mg/L) in the downstream sampling point (ranging from 0.24 to 0.57 mg/L for 2010), the Companies propose future sampling for boron at semi-annual intervals for 2011. Analytical results for the quarterly boron samples conducted in 2010 are provided in **Table 4.11**.

ADEQ conditionally approved the Companies' Mixing Zone Application in a letter dated September 2, 2009, and requested a contingency plan. In a letter dated October 2, 2009, the Companies submitted a proposed contingency plan addendum to the mixing zone calculations and monitoring plan in the event that the treated groundwater discharging to the Grand Canal exceeds the discharge criteria beyond the mixing zone (CRA, 2009c). The contingency plan was added in Section 8.0 of the revised O&M Manual (CRA, 2011b).

4.6 EVALUATION OF SCALING TENDENCY OF EXTRACTED GROUNDWATER

During the OU2 design phase, evaluation of the groundwater chemistry indicated that the groundwater is over-saturated with respect to calcium carbonate, and that formation of calcium scale may occur in the pipelines and treatment system. To mitigate the potential for scale precipitation, the Final (100%) Design Report included an acid injection system at the treatment facility to adjust the pH of the extracted groundwater prior to treatment. During construction of the treatment facility in 2000, a Technical Memorandum (CRA, 2000) recommending delaying the installation of a pH control system, was submitted to and approved by the EPA. The acid storage tank and all below-grade piping were installed during the construction phase to facilitate future use, if required, based on future evaluation of the treatment system performance.

The requirement to install the acid feed system is based on an evaluation of the influent groundwater chemistry for scaling tendency and on the need for frequent GAC backwashing, as determined during the operation of the treatment system.

The general chemistry and inorganic constituents in the influent groundwater for 2010, as presented in **Table 4.12**, are similar to that reported in the Final (100%) Design Report (CRA, 1999). The relatively high concentrations of calcium and alkalinity, together with elevated pH, indicate that scale in the treatment system is likely to occur. Potential scaling was evaluated from the following 2010 groundwater analytical data (**Table 4.12**):

Analytical Parameters	*September 2010*
Total Alkalinity (as $CaCO_3$)	290 mg/L
Calcium (as $CaCO_3$)	300 mg/L
Temperature	25.8 ^{0}C
Total Dissolved Solids	1,200 mg/L
pH	6.98
Calculated Langelier Index	0.21

Notes: mg/L - milligrams per liter
C - Celsius

The calculated Langelier Index indicates that the influent groundwater is not scale producing.

During the January/February 2010 annual shutdown of the groundwater extraction and treatment system, CRA inspected some of the treatment system piping for scale formation. CRA did not detect extensive scale precipitation/buildup on the treatment facility piping. Therefore, CRA concludes that treatment of the extracted groundwater to minimize scale formation is not required at this stage, and recommends that the influent groundwater chemistry continue to be evaluated annually along with annual visual inspections of the treatment facility piping to confirm that additional treatment to mitigate scale precipitation is not required.

5.0 MAINTENANCE WORK AND REPAIR SUMMARY

A summary of the inspections, minor maintenance work, and repairs completed during the reporting period is provided in **Appendix I**. Major maintenance activities completed in 2010 are discussed below.

5.1 TREATMENT FACILITY MAINTENANCE

During the Annual 2010 SRP Grand Canal Maintenance Shutdown, the discharge piping check valves on #1 and #2 BWWW pumps were replaced. Leaking air/vacuum valves on the force main discharge piping, EWS, EWM, and on GAC Vessel #6B were repaired. A leaking isolation ball valve on the force main discharge piping was repaired. The solenoid valve on the EWN flow control valve (FCV) was repaired and the solenoid valve on the EWM FCV was replaced.

In March 2010, a leaking air/vacuum valve on EWM and a leaking sample port valve on GAC Vessel #1A were repaired.

In April 2010, leaking air/vacuum valves on GAC Vessel #4B, GAC Vessel #8B, and on the force main discharge piping on Van Buren Street were repaired.

In May 2010, a leaking sample port on GAC Vessel #7B was repaired.

In June 2010, a cracked outer glass tube for lamp #3 on the UV system was replaced. A small leak in the air/vacuum valve at EWM was repaired.

In July 2010, a leaking air/vacuum valve on the force main near the discharge to the SRP Grand Canal and a leaking check valve on EWM were repaired

In August 2010, a leaking air/vacuum valve on GAC Vessel #1A was repaired. The discharge piping for EWS was retrofitted with 4-inch diameter piping and a 4-inch FCV to accommodate a new 300 gpm pump.

In September 2010, leaking air/vacuum valves of the force main near the corner of 24th Street and Roosevelt Street and on GAC Vessel #8B were repaired.

In October 2010, a leaking air/vacuum valve on GAC Vessel #1B and a leaking sample port on GAC Vessel #6B were repaired. A faulty water level transducer in EWM was replaced.

In November 2010, a 6-inch nipple on GAC Vessels #2B and #4A air/vacuum valves were replaced, and a new float ("High High" alarm) on the GAC pad sump was installed.

In December 2010, a leaking air/vacuum valve on GAC Vessel #2B was repaired.

5.2 EXTRACTION WELL MAINTENANCE

EWN: No major maintenance was required at EWN in 2010.

EWM: No major maintenance was required at EWM in 2010.

EWS: In August 2010, EWS was shut down due to a significant decrease in flow capacity, which was caused by a hole in the discharge piping. The well casing was video logged. The discharge piping was replaced, the well casing for EWS was brushed, swabbed, and bailed, and a new 300 gpm capacity submersible pump was installed.

5.3 MONITORING WELL MAINTENANCE

Monitoring wells NW04-S, NW04-D, NW05-S, NW07-S, NW07-M, NW07-D, NW08-S, NW08-M, MW08-D, and NW12-D were rehabilitated in March 2010 due to scale buildup on the well screens. The rehabilitation was accomplished by adding Aqua Clear ® MGA sulfamic acid solution with acid enhancer in each monitoring well, swabbing to distribute the acid in the water column, allowing the acid to sit in the wells for 24 hours, and then brushing, swabbing, and bailing each monitoring well. All of the acid solution in the wells was then pumped out using a 3-inch Grundfos groundwater sampling pump. Prior to treatment of the removed acid solution by the treatment system, the pH of the removed acid solution was increased to an acceptable pH by adding groundwater from the well purging activities.

Well vaults were repaired and well casing J-plugs were replaced in monitoring wells NW03, NW04-S, NW04-D, NW05-S, NW06-S, NW06-D, NW07-S, NW07-M, NW07-D, NW08-S, NW08-M, NW08-D, and NW12-D.

6.0 SUMMARY AND CONCLUSIONS

Based on the Companies' evaluation of the available water level and water quality data, it is concluded that the OU2 Area GES is capturing the full width and depth of the groundwater plume in the OU2 Area. All lines of evidence, outlined in the capture zone evaluation, support the conclusion that hydraulic containment is being provided by the OU2 Area GES well beyond the plume boundary to the north. The September 2010 water elevation data and converging lines of evidence, including water elevation changes and VOC concentration trends at monitor wells in the vicinity and downgradient of the OU2 Area GES, support the conclusion that the capture zone extends across the southern plume boundary in Subunits "A," "B," and "D."

The 2010 O&M of the 20th Street groundwater treatment facility proceeded with no significant problems. The discharged water has always met all discharge standards for VOCs and the system is operating as intended, and is expected to continue to perform as required by the UAO and CD.

In addition to maintaining capture of the OU2 Area groundwater plume, indicators of the effectiveness of the OU2 Area GES, as detailed earlier in this report, are summarized as follows:

- A comparison of TCE concentrations and other VOCs between the Baseline period and September 2010 and between September 2006 (Second Baseline) and September 2010 clearly show an overall decrease in concentrations of TCE and other VOCs in the groundwater in each of the subunits downgradient of the OU2 Area GES
- A comparison of TCE concentrations from Baseline to September 2010 show a decreasing TCE plume width in the vicinity of the OU2 Area extraction well locations
- The OU2 Area GES is effectively removing VOCs from the groundwater, as documented by the groundwater analytical results for the combined influent to the treatment system and the declining VOC concentrations in monitor wells in the vicinity of the OU2 Area GES
- The OU2 Area treatment system is effectively treating the extracted groundwater to the specified discharge standards for VOCs, as documented by the groundwater analytical results for the treatment facility discharge and the discharge to the SRP Grand Canal

Based on a comparison of the groundwater level recovery (from Baseline to 2010) at extraction wells EWN, EWM, and EWS, and regionally collected lithologic and hydrostratigraphic data, a northwest-southeast trending bedrock ridge (the Airport Ridge) was identified that traverses through the OU2 Area GES at EWS. Information on the subsurface geology of the southern area collected in 2007, specifically from wells NW15-S, NW16-D, and boring NW20, show that the Airport Ridge continues from the GES area to the southeast, and that flow within the Alluvial Aquifer is channelized across this structure. The Airport Ridge has a significant effect on groundwater movement in the southern area and may act as a partial barrier to groundwater movement flowing towards the west.

Overall, the available data from multiple lines of evidence support the conclusion that the OU2 Area GES is functioning effectively and is affecting the entire width of the OU2 Area groundwater plume. Continued water level and water quality monitoring will be performed to verify that containment continues to be achieved.

7.0 RECOMMENDATIONS

Recommendations for the next year of O&M are as follows:

- Maintain the semi-annual groundwater sampling frequency (in March and September to coincide with the ADEQ regional sampling). However, beginning with the March 2011 round, modify the total number of wells as outlined in **Table 7.1** and add several wells (6) to the OU2 monitor well network previously monitored by Honeywell or Freescale.
- Maintain hydraulic monitoring on a quarterly basis for the OU2 Area GES monitor wells for 2011.
- Based on the over one-year (six quarters total dating back to September 2009) of boron sampling results from the Grand Canal (800 foot downstream sampling point of the facility discharge point), the sampling frequency for boron is proposed to be changed to semi-annual (March and September) for 2011.
- Continue to have operational flexibility of the system and allow adjustments as needed. CRA recommends that such adjustments continue to optimize the system performance.

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FIGURES

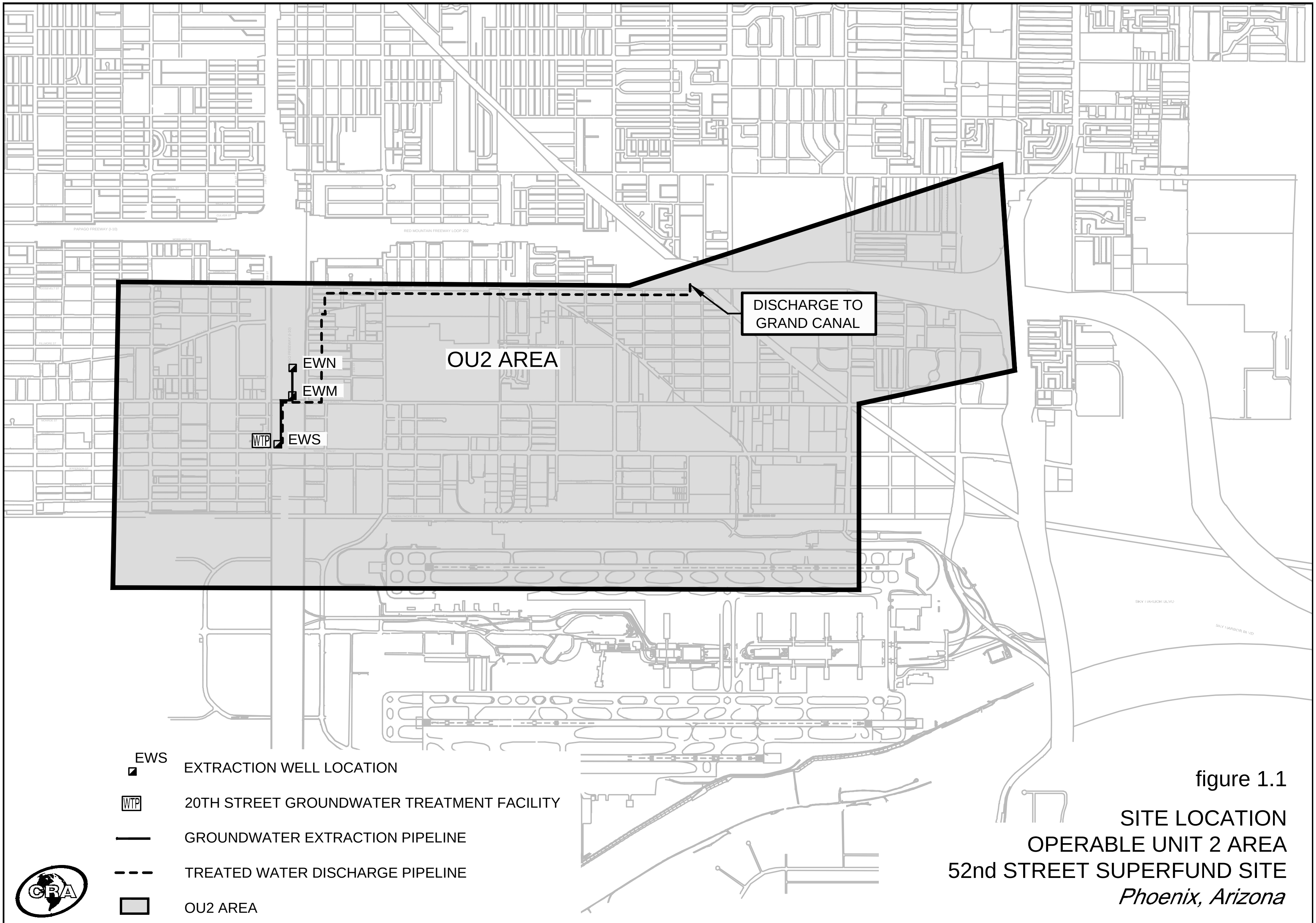


figure 1.1

SITE LOCATION
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX055 FIGURE 1.1 FEB 23/2011

LEGEND

- MONITOR WELL - SUBUNIT "A"
- MONITOR WELL - SUBUNIT "B" OR "D"
- MONITOR WELL - SUBUNIT "C"
- EXTRACTION WELL
- COLLUVIUM WELL
- SOIL BORING
- MONITOR WELL (SUPPLEMENTAL TO OU2 GES WELL NETWORK)
- MONITORING WELL (NO LONGER PART OF NETWORK)
- DRY

1. DATA COLLECTED BY CH2MHILL/HARGIS
2. DATA COLLECTED BY CLEAR CREEK AND ASSOCIATES
3. WELLS PART OF OU3 MONITORING WELL NETWORK (DATA COLLECTED BY SHAW ENVIRONMENTAL INC.)
4. DATA COLLECTED BY ARCADIS

figure 1.2

GES MONITORING WELL NETWORK
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX054 FIGURE 1.2 APR 07/2011

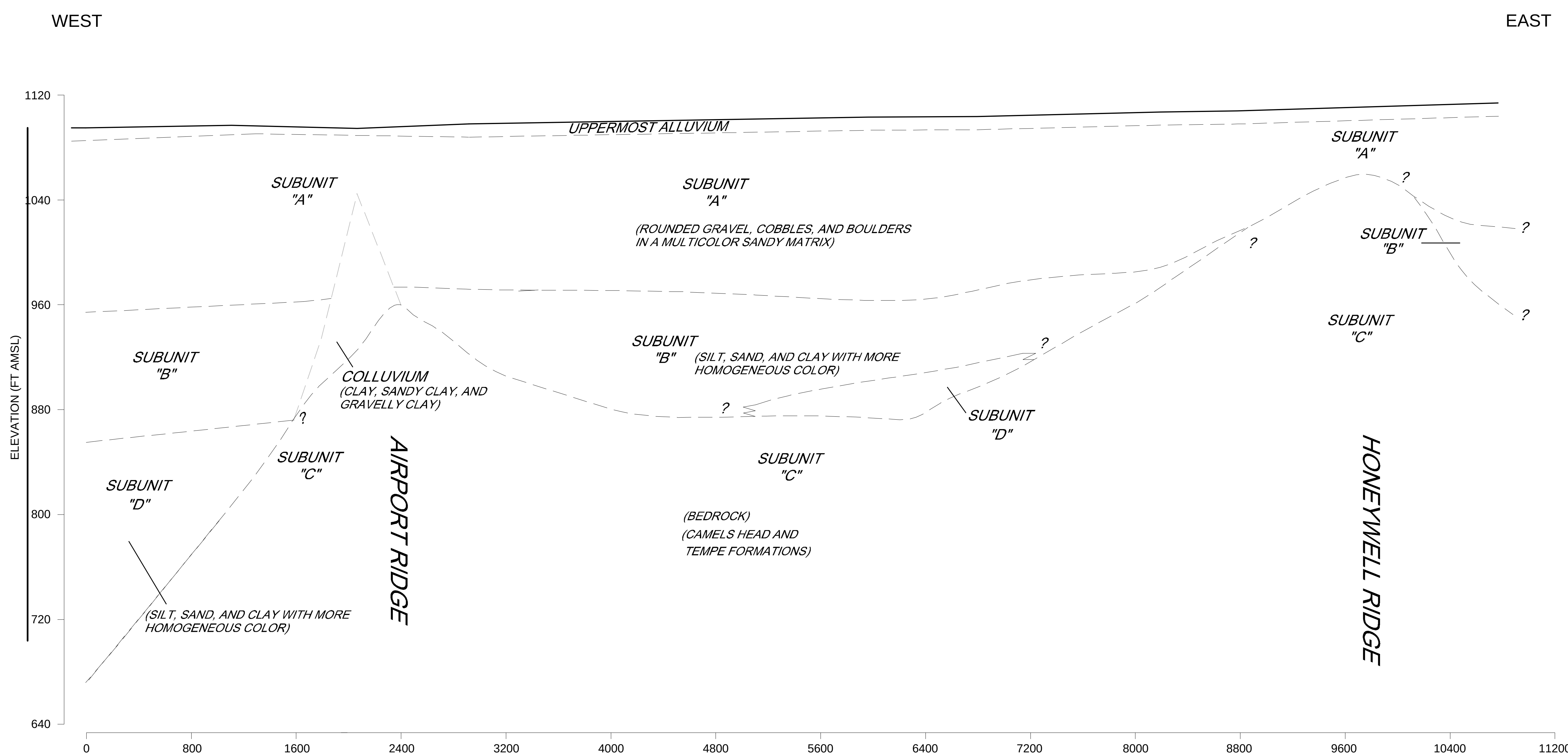


figure 2.1

SCHEMATIC CONCEPTUAL SITE MODEL
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX048 FIGURE 2.1 FEB 23/2011

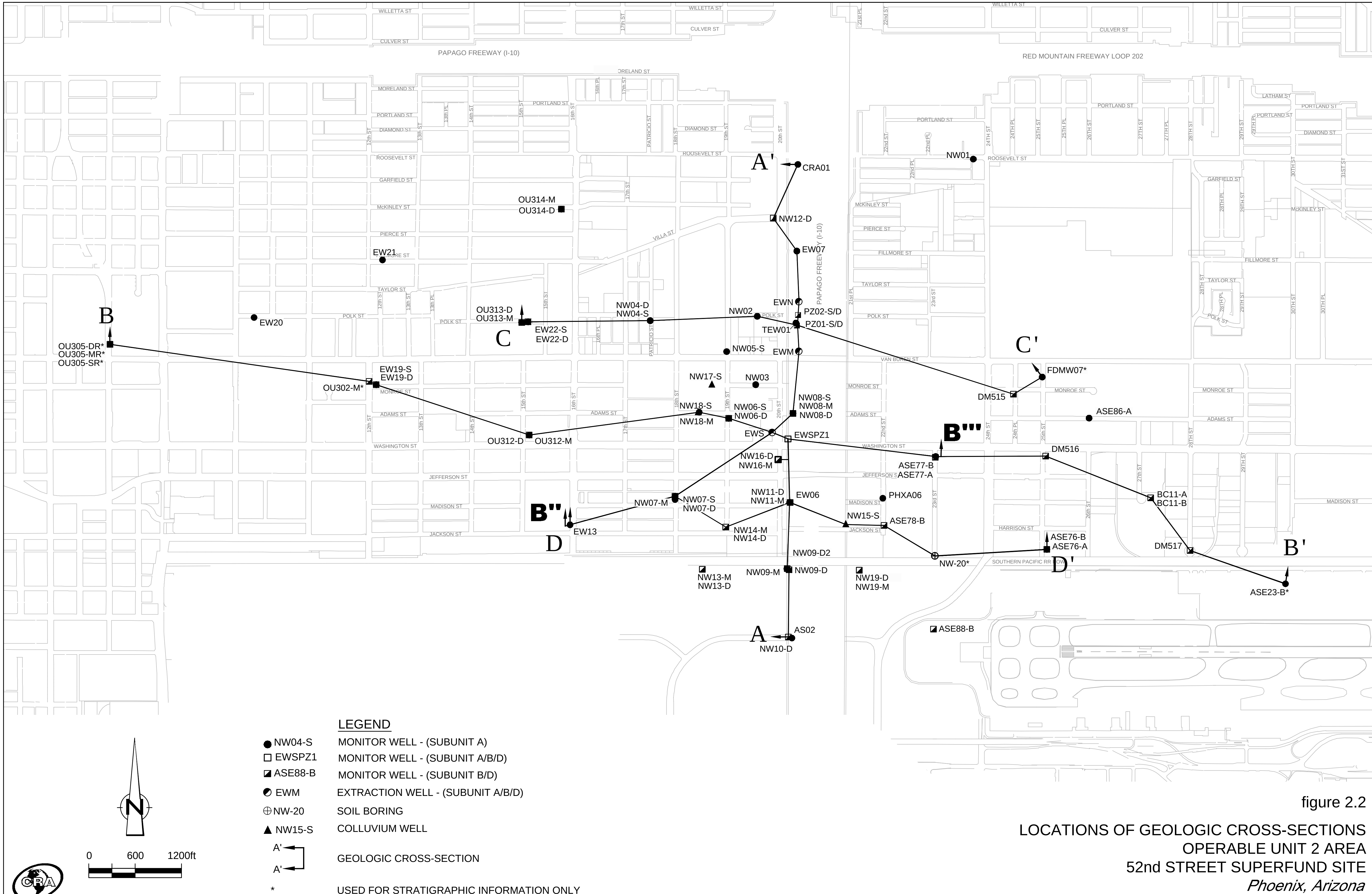


figure 2.2

LOCATIONS OF GEOLOGIC CROSS-SECTIONS
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX047 FIGURE 2.2 FEB 23/2011

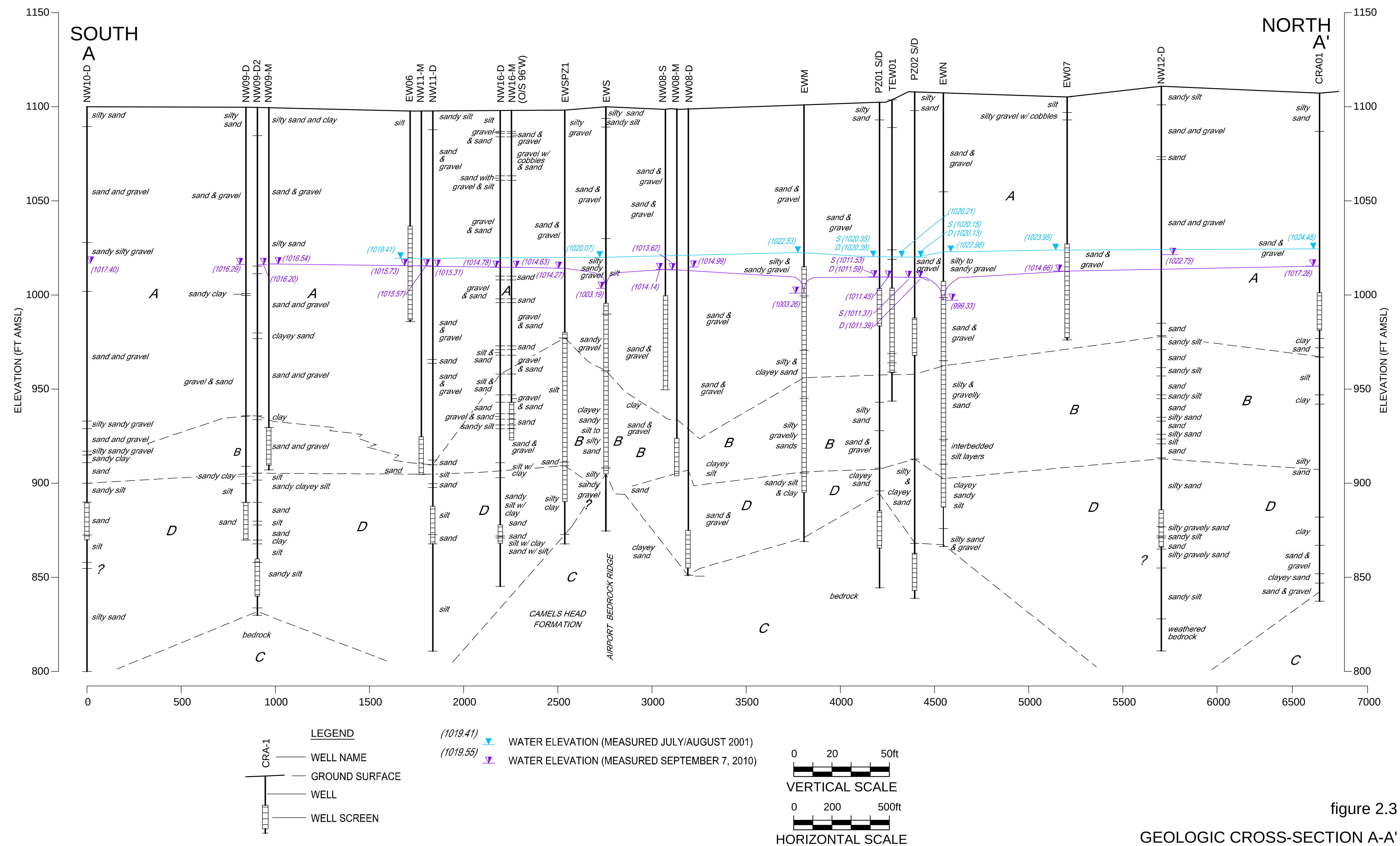


figure 2.3

GEOLOGIC CROSS-SECTION A-A'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX038 FIGURE 2.3 FEB 23/2011

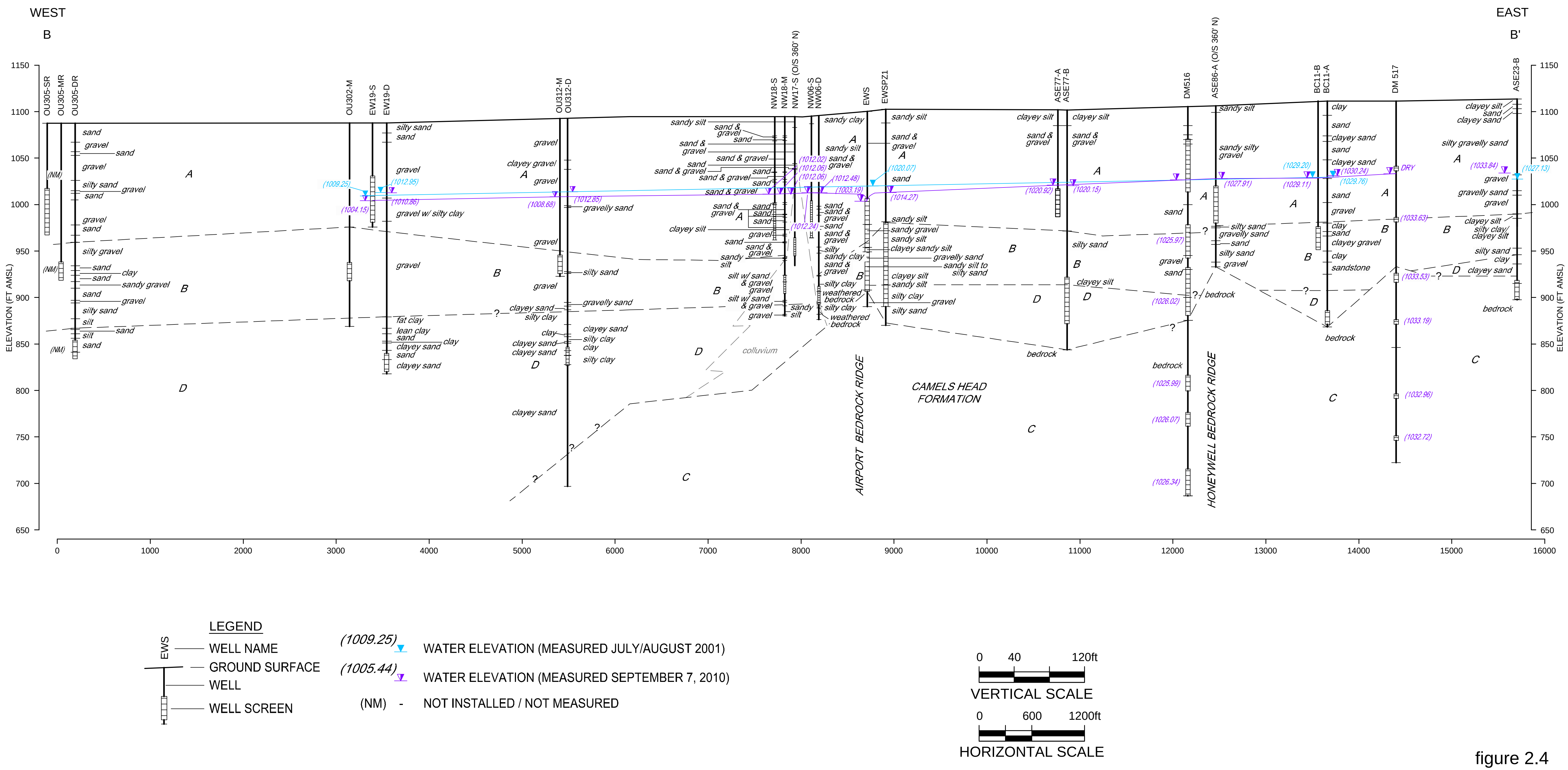
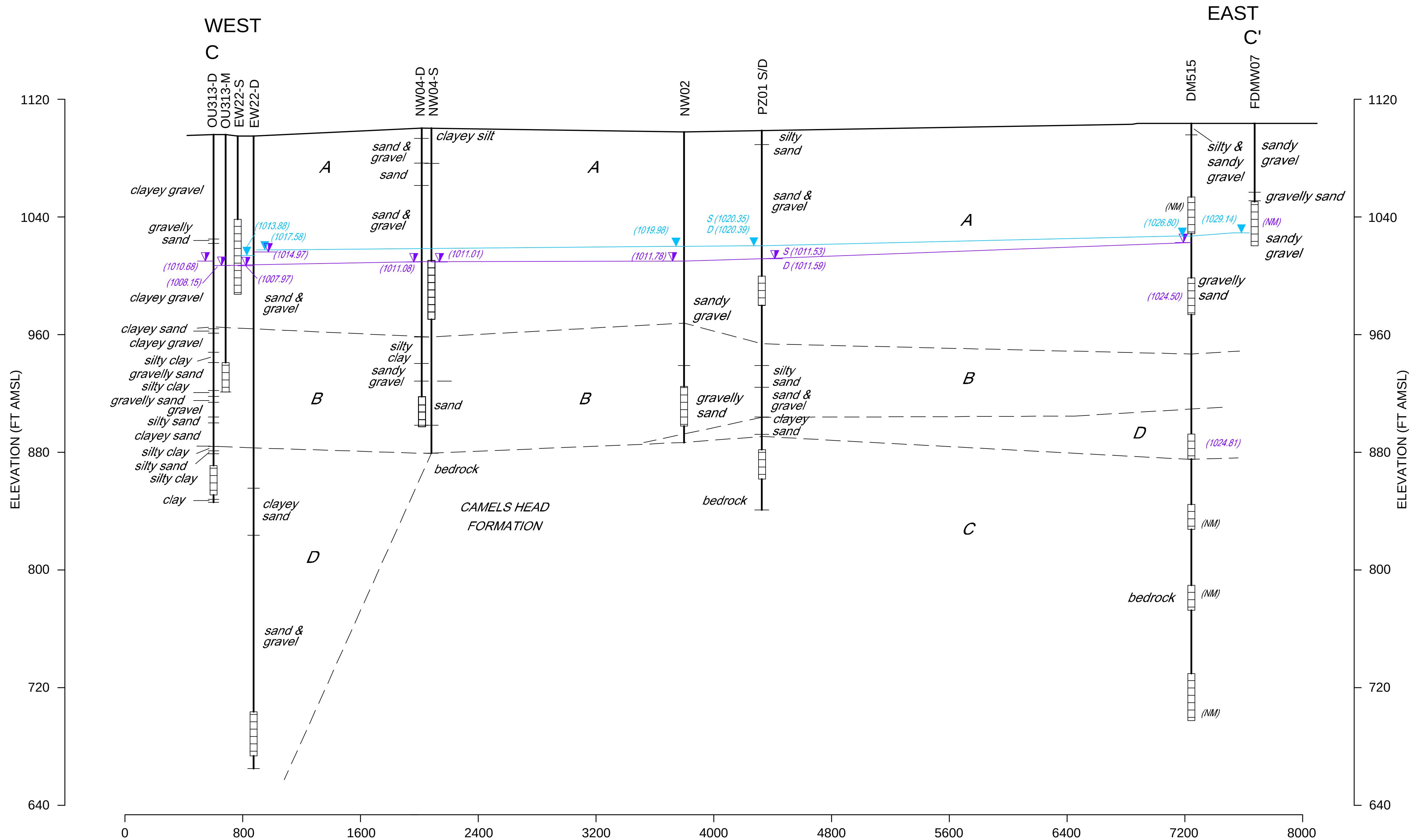


figure 2.4

GEOLOGIC CROSS-SECTION B-B'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

CRA

013932-151(026)GN-PX039 FIGURE 2.4 FEB 23/2011



LEGEND

CRA-1 — WELL NAME

— GROUND SURFACE

— WELL

— WELL SCREEN

(1013.88) ▼ WATER ELEVATION (MEASURED JULY/AUGUST 2001)

(1004.89) ▼ WATER ELEVATION (MEASURED SEPTEMBER 7, 2010)

(NM) - NOT INSTALLED / NOT MEASURED

0 40 80ft

VERTICAL SCALE

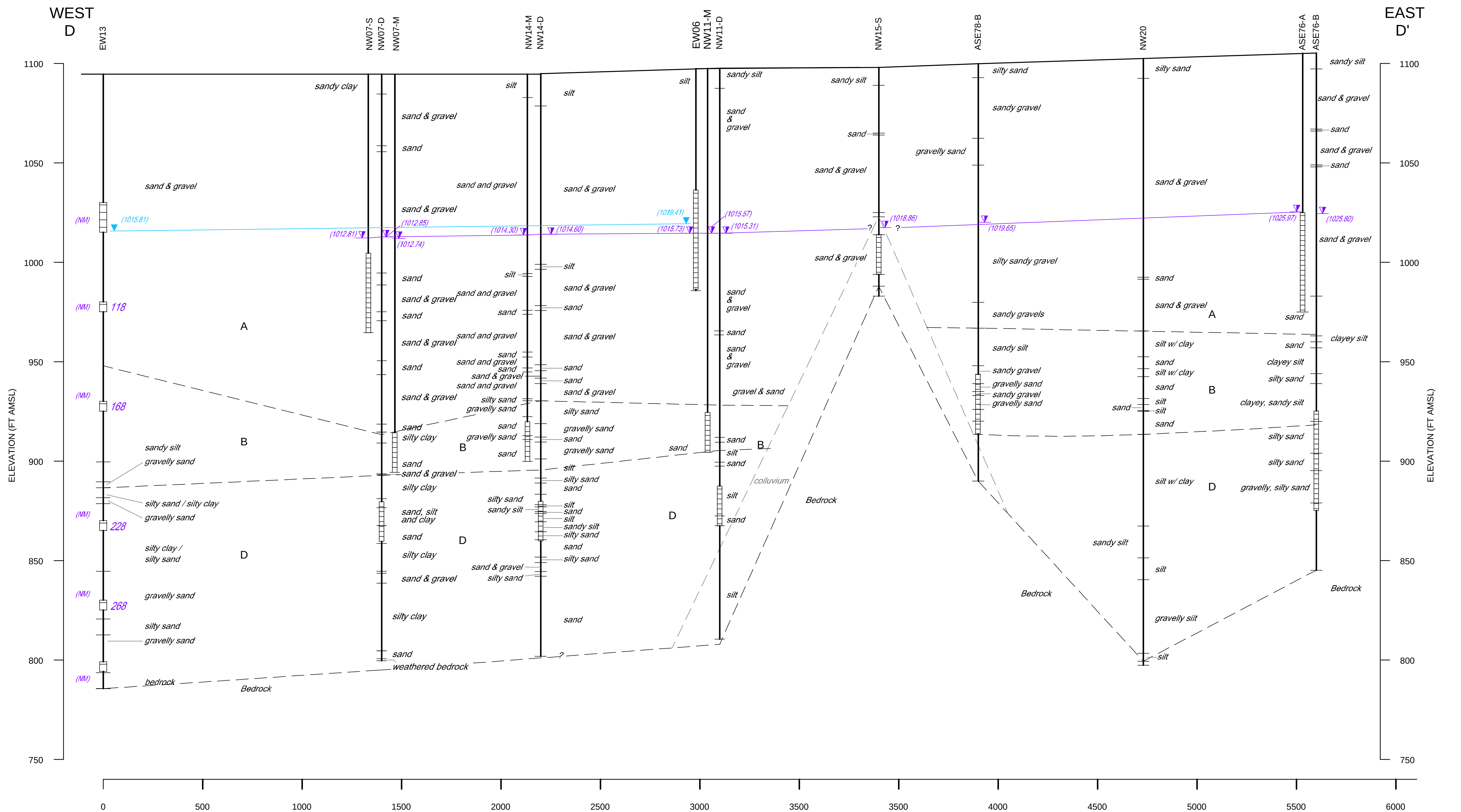
0 400 800ft

HORIZONTAL SCALE

figure 2.5

GEOLOGIC CROSS-SECTION C-C'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX040 FIGURE 2.5 FEB 23/2011



LEGEND

EWS — WELL NAME

GROUND SURFACE

WELL

WELL SCREEN

(1015.81) WATER ELEVATION (MEASURED JULY/AUGUST 2001)

(1004.89) WATER ELEVATION (MEASURED SEPTEMBER 7, 2010)

(NM) - NOT INSTALLED / NOT MEASURED

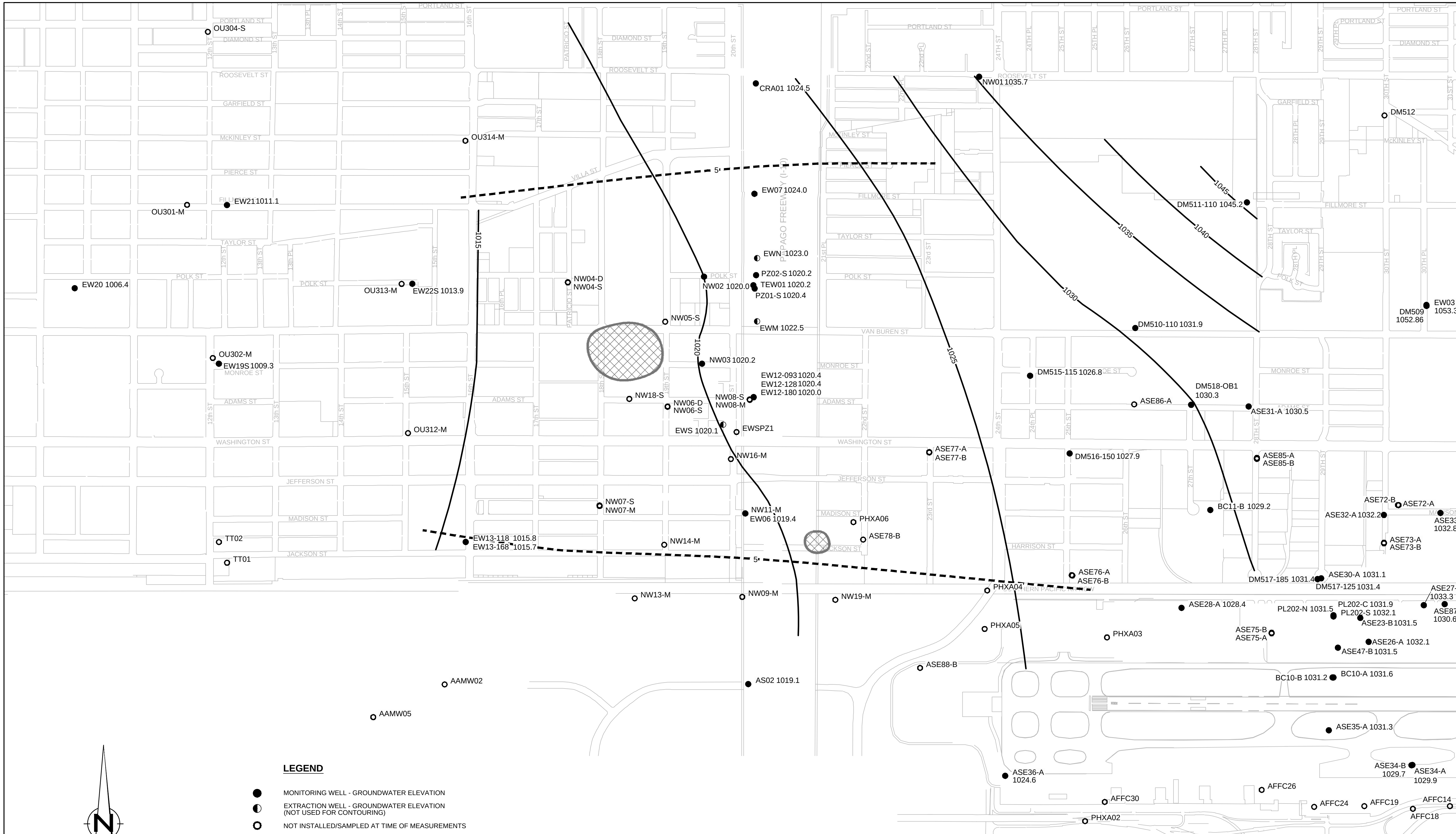
0 20 50ft
VERTICAL SCALE

0 200 500ft
HORIZONTAL SCALE

figure 2.6

GEOLOGIC CROSS-SECTION D-D'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX041 FIGURE 2.6 FEB 23/2011



LEGEND

- MONITORING WELL - GROUNDWATER ELEVATION
- EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- GROUNDWATER ELEVATION COUNTOUR
- INTERPRETED TCE PLUME BOUNDARY ABOVE AWQS (SEPT. 2009). DASHED WHERE APPROXIMATE
- COLLUVIUM

figure 3.1

BASELINE GROUNDWATER ELEVATIONS - SEPTEMBER 2001
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX059 FIGURE 3.1 FEB 22/2011

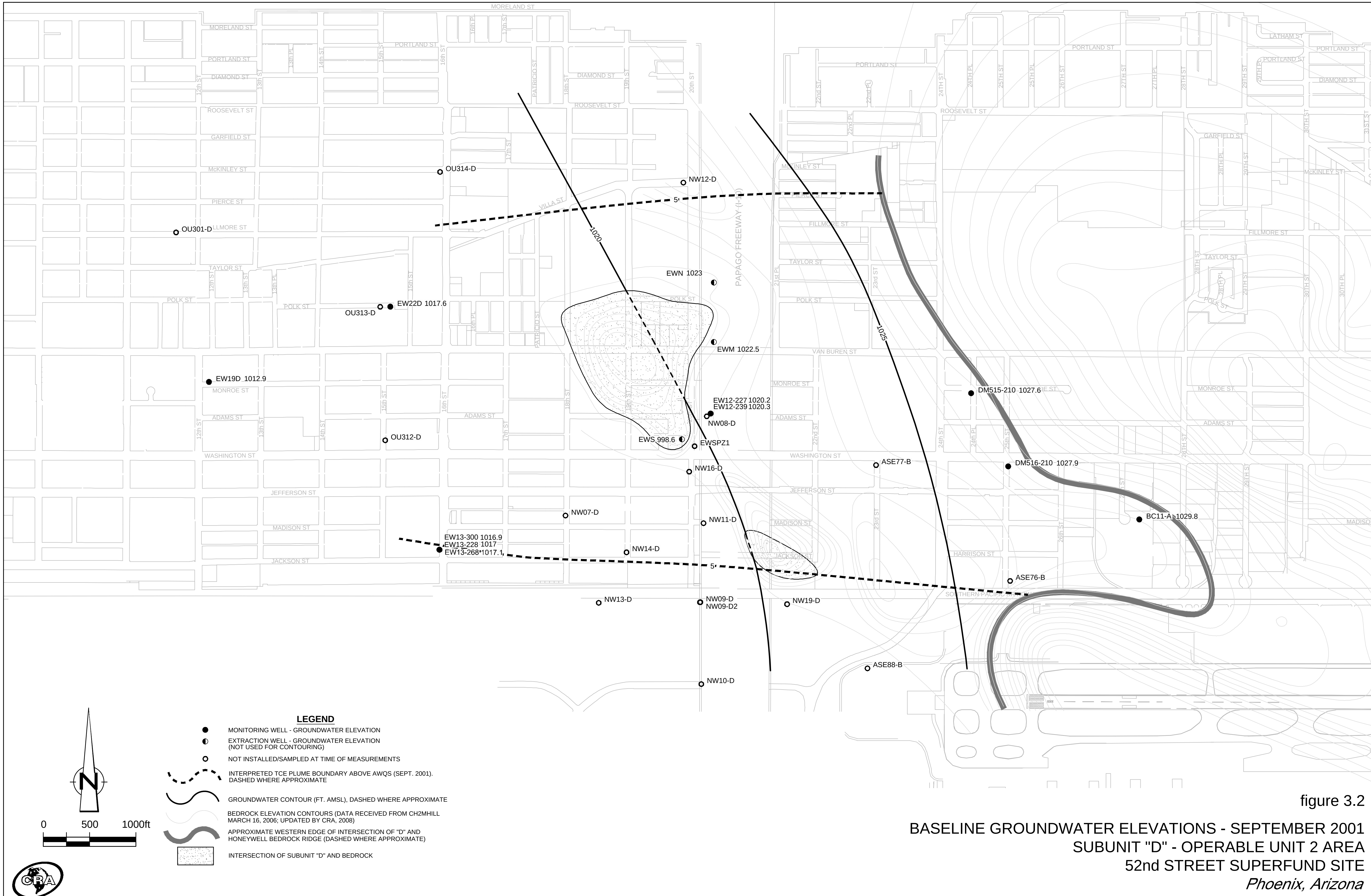


figure 3.2

BASELINE GROUNDWATER ELEVATIONS - SEPTEMBER 2001
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX060 FIGURE 3.2 APR 05/2011

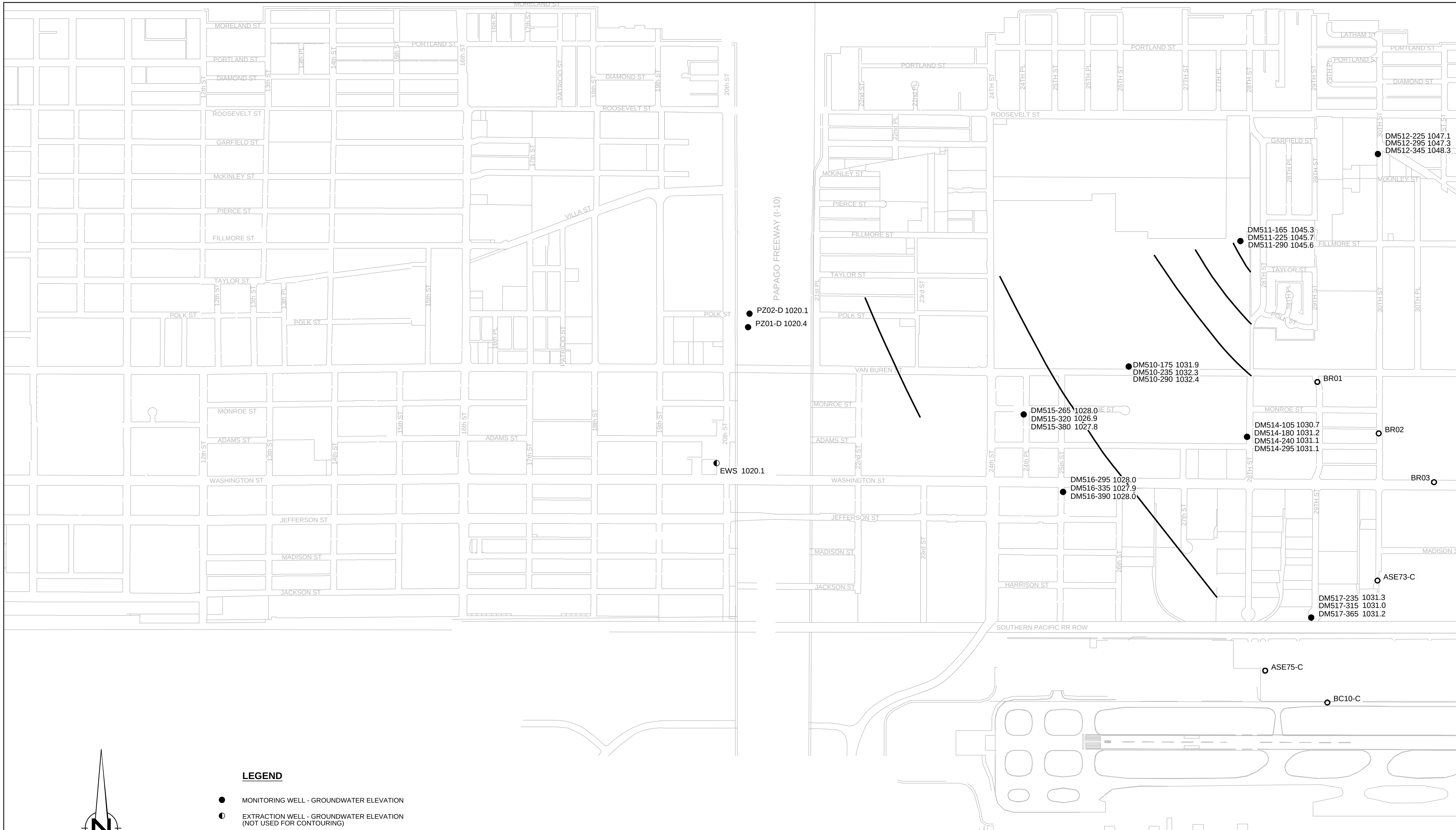


figure 3.3

BASELINE GROUNDWATER ELEVATIONS - SEPTEMBER 2001
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX061 FIGURE 3.3 FEB 23/2011

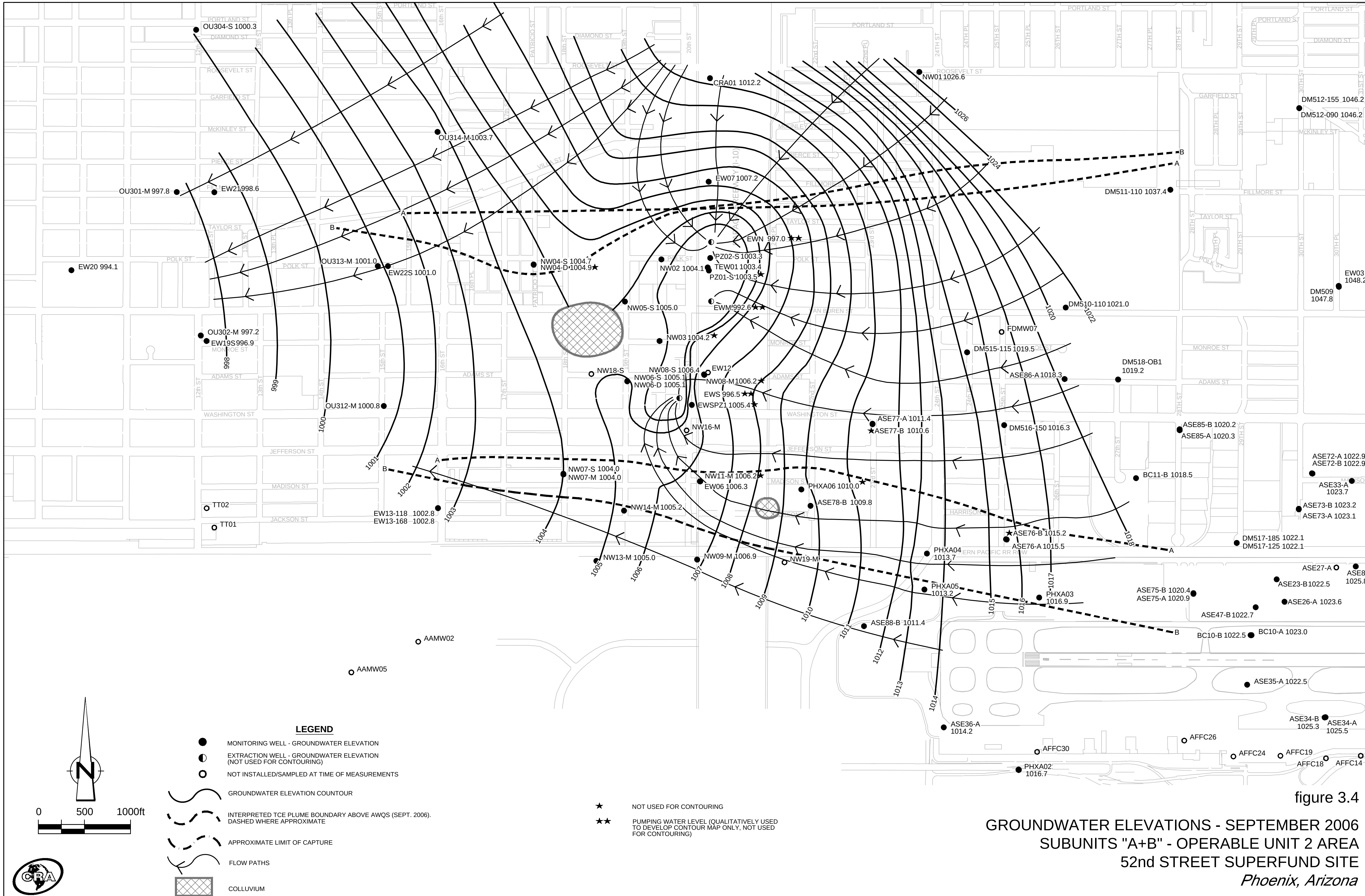


figure 3.4

GROUNDWATER ELEVATIONS - SEPTEMBER 2006
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX062 FIGURE 3.4 FEB 22/2011

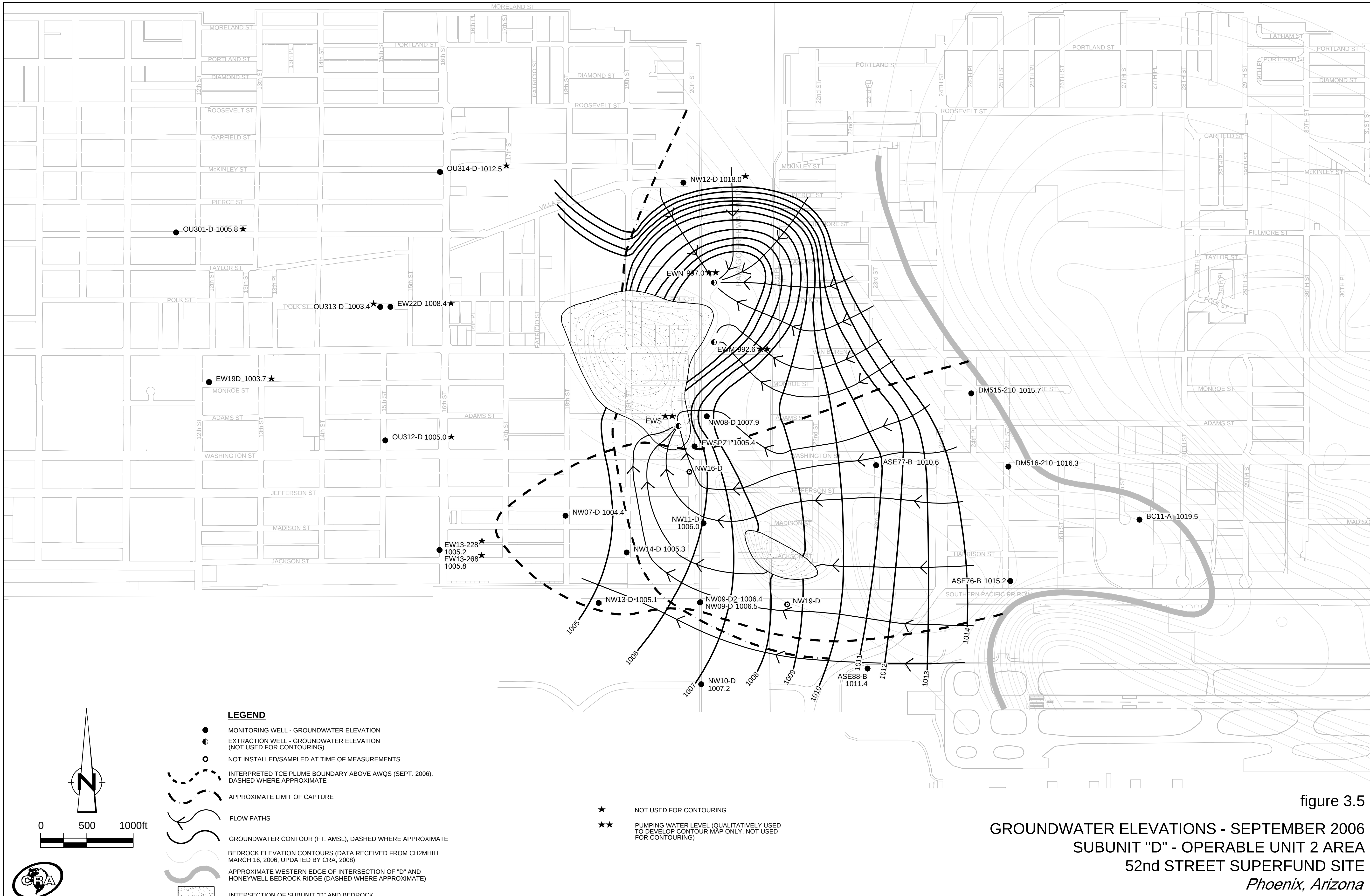
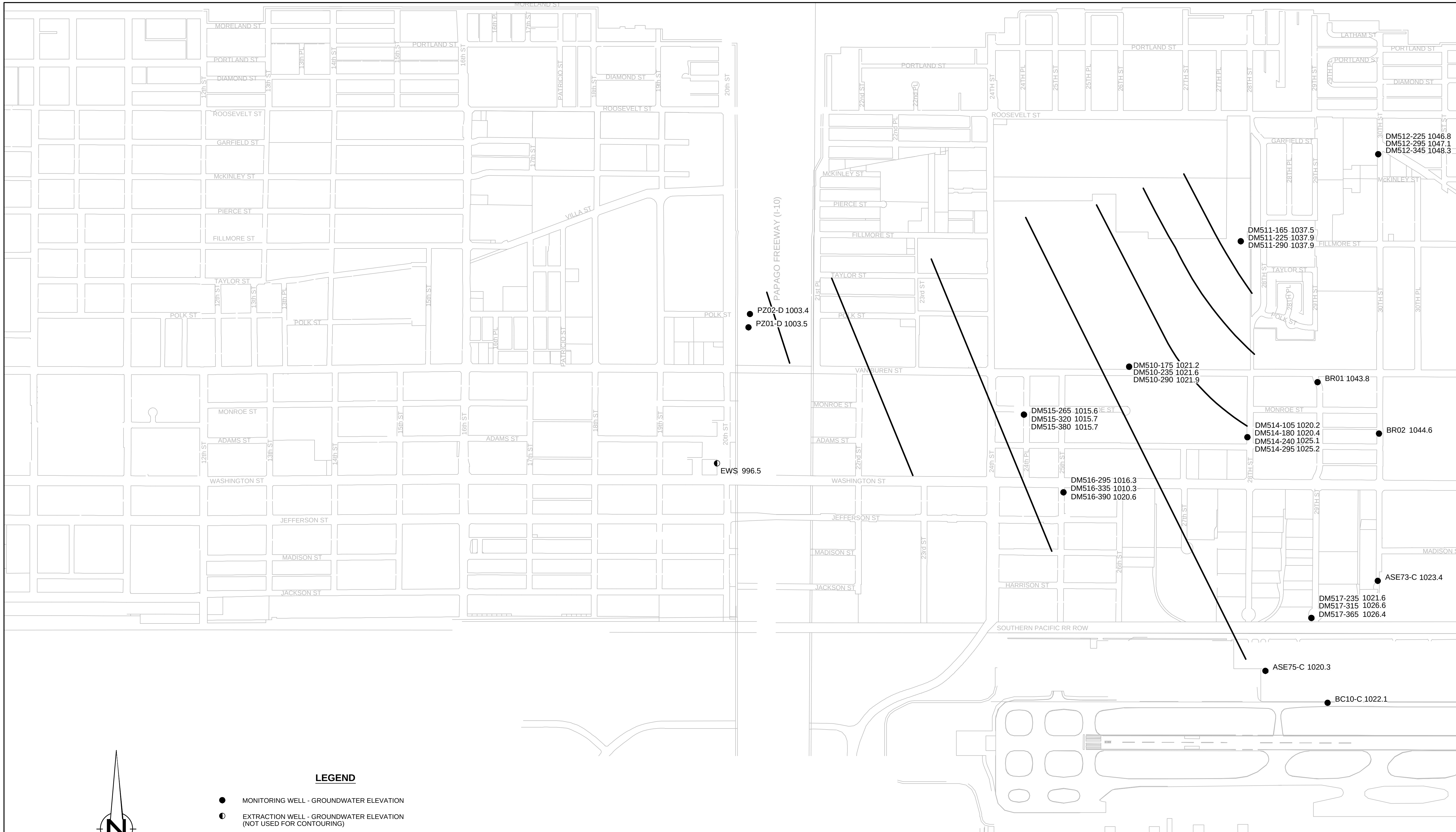


figure 3.5

GROUNDWATER ELEVATIONS - SEPTEMBER 2006
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona



0 500 1000ft

LEGEND

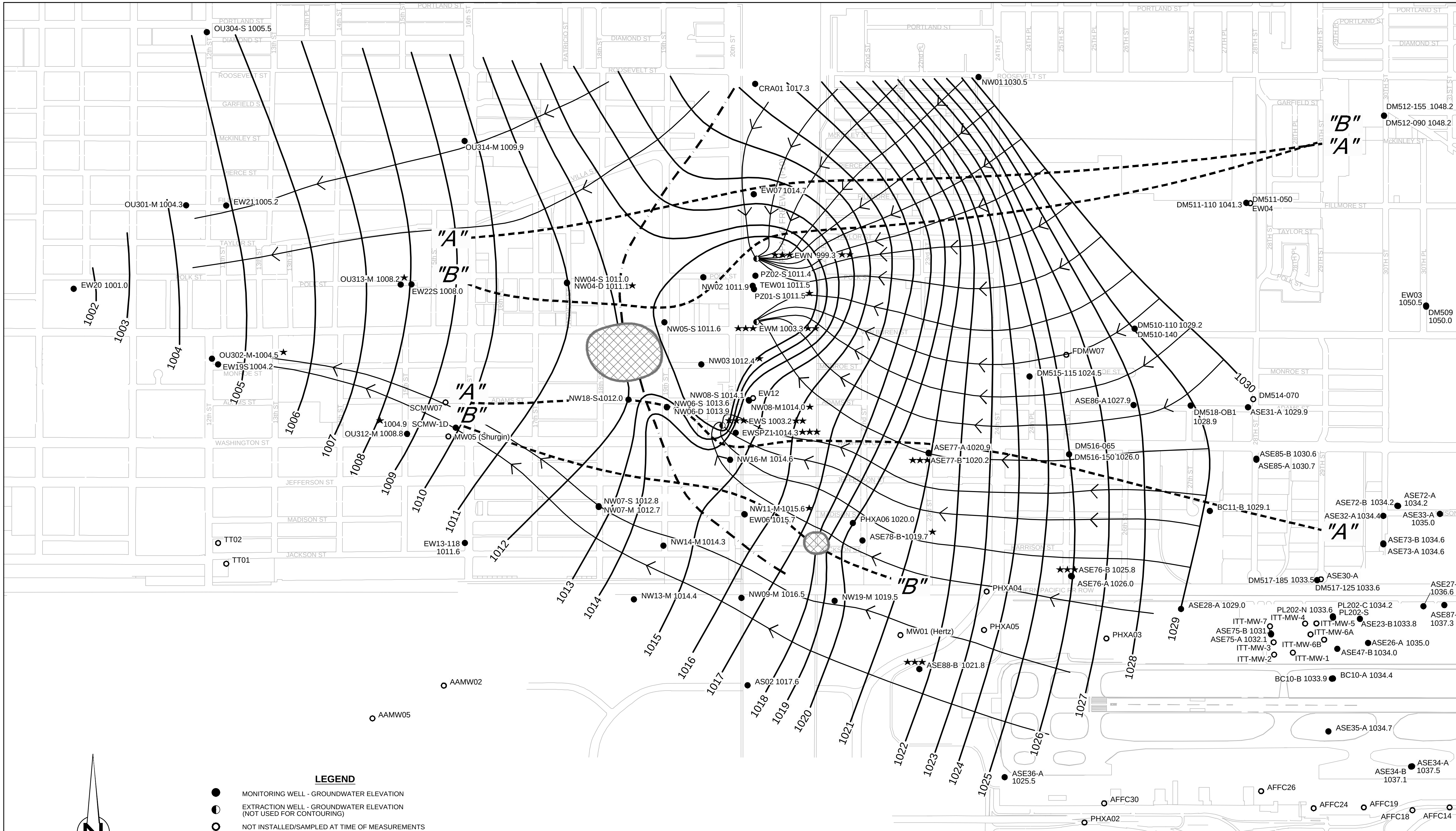
- ● MONITORING WELL - GROUNDWATER ELEVATION
- ◐ EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)
- ○ NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- ∿ GROUNDWATER ELEVATION CONTOUR

CRA

figure 3.6

GROUNDWATER ELEVATIONS - SEPTEMBER 2006
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX064 FIGURE 3.6 FEB 22/2011



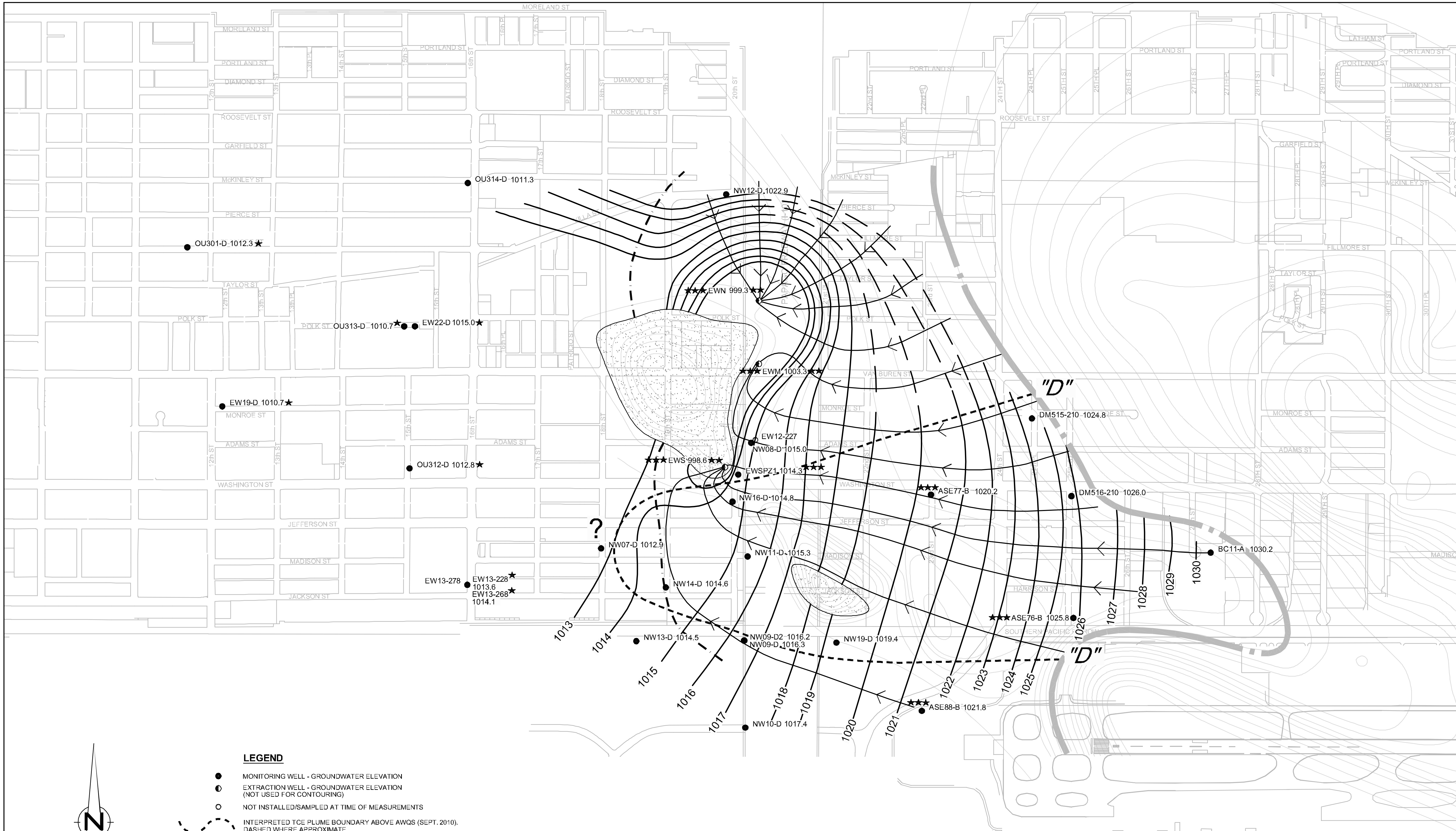
LEGEND

- ● MONITORING WELL - GROUNDWATER ELEVATION
- ◐ EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)
- ○ NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- GROUNDWATER ELEVATION COUNTOUR
- INTERPRETED TCE PLUME BOUNDARY ABOVE AWQS (SEPT. 2010). DASHED WHERE APPROXIMATE
- APPROXIMATE LIMIT OF CAPTURE
- FLOW PATHS
- COLLUVIUM
- ★ NOT USED FOR CONTOURING
- ★★ PUMPING WATER LEVEL (QUALITATIVELY USED TO DEVELOP CONTOUR MAP ONLY, NOT USED FOR CONTOURING)
- ★★★ WELL SCREENED ACROSS MULTIPLE HYDROSTRATIGRAPHIC UNITS

figure 3.7

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX005 FIGURE 3.7 MAR 29/2011



LEGEND

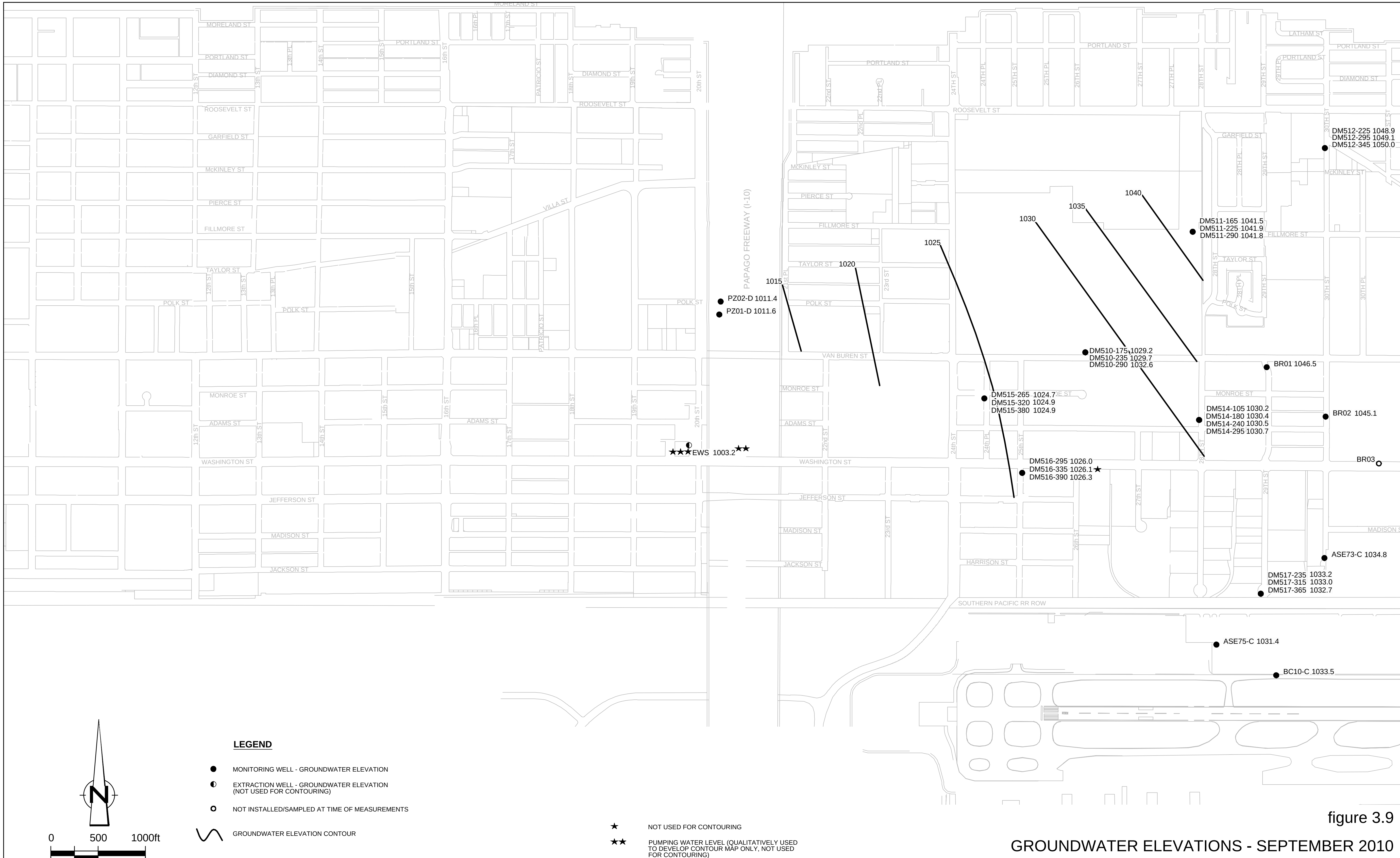
- ● MONITORING WELL - GROUNDWATER ELEVATION
- ◐ EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)
- ○ NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- INTERPRETED TCE PLUME BOUNDARY ABOVE AWQS (SEPT. 2010). DASHED WHERE APPROXIMATE
- APPROXIMATE LIMIT OF CAPTURE
- FLOW PATHS
- GROUNDWATER CONTOUR (FT. AMSL), DASHED WHERE APPROXIMATE
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK

- ★ NOT USED FOR CONTOURING
- ★★ PUMPING WATER LEVEL (QUALITATIVELY USED TO DEVELOP CONTOUR MAP ONLY, NOT USED FOR CONTOURING)
- ? UNCERTAINTY DUE TO LACK OF FIELD DATA
- ★★★ WELL SCREENED ACROSS MULTIPLE HYDROSTRATIGRAPHIC UNITS

0 500 1000ft

figure 3.8

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona



LEGEND

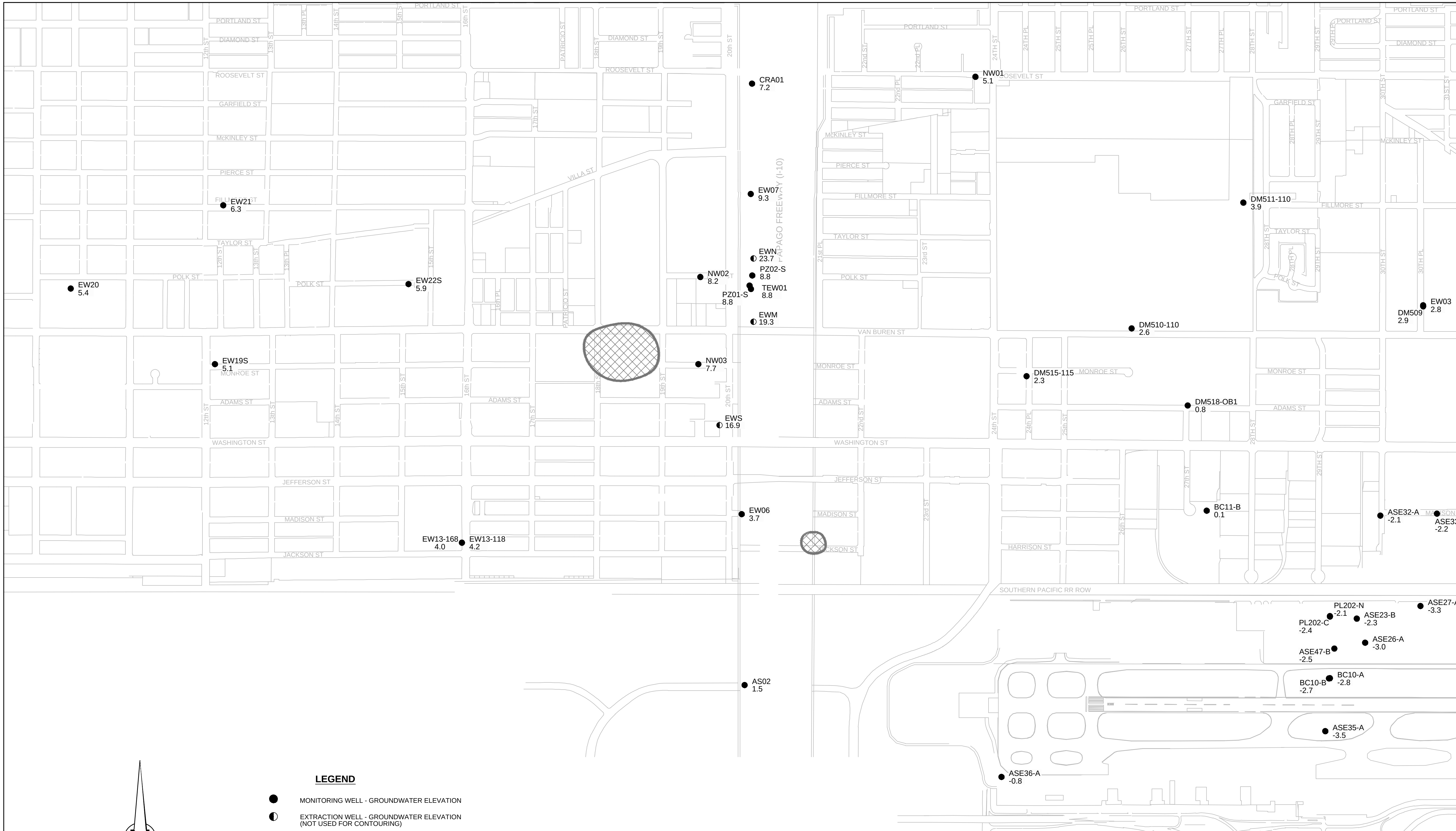
- ● MONITORING WELL - GROUNDWATER ELEVATION
- ◐ EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)
- ○ NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- GROUNDWATER ELEVATION CONTOUR
- ★ NOT USED FOR CONTOURING
- ★★ PUMPING WATER LEVEL (QUALITATIVELY USED TO DEVELOP CONTOUR MAP ONLY, NOT USED FOR CONTOURING)
- ★★★ WELL SCREENED ACROSS MULTIPLE HYDROSTRATIGRAPHIC UNITS

CRA

figure 3.9

GROUNDWATER ELEVATIONS - SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX007 FIGURE 3.9 FEB 23/2011



LEGEND

● MONITORING WELL - GROUNDWATER ELEVATION

◐ EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)

○ NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS

COLLUVIUM

NOTE: NEGATIVE VALUE REPRESENTS A DECREASE IN GROUNDWATER ELEVATION

N

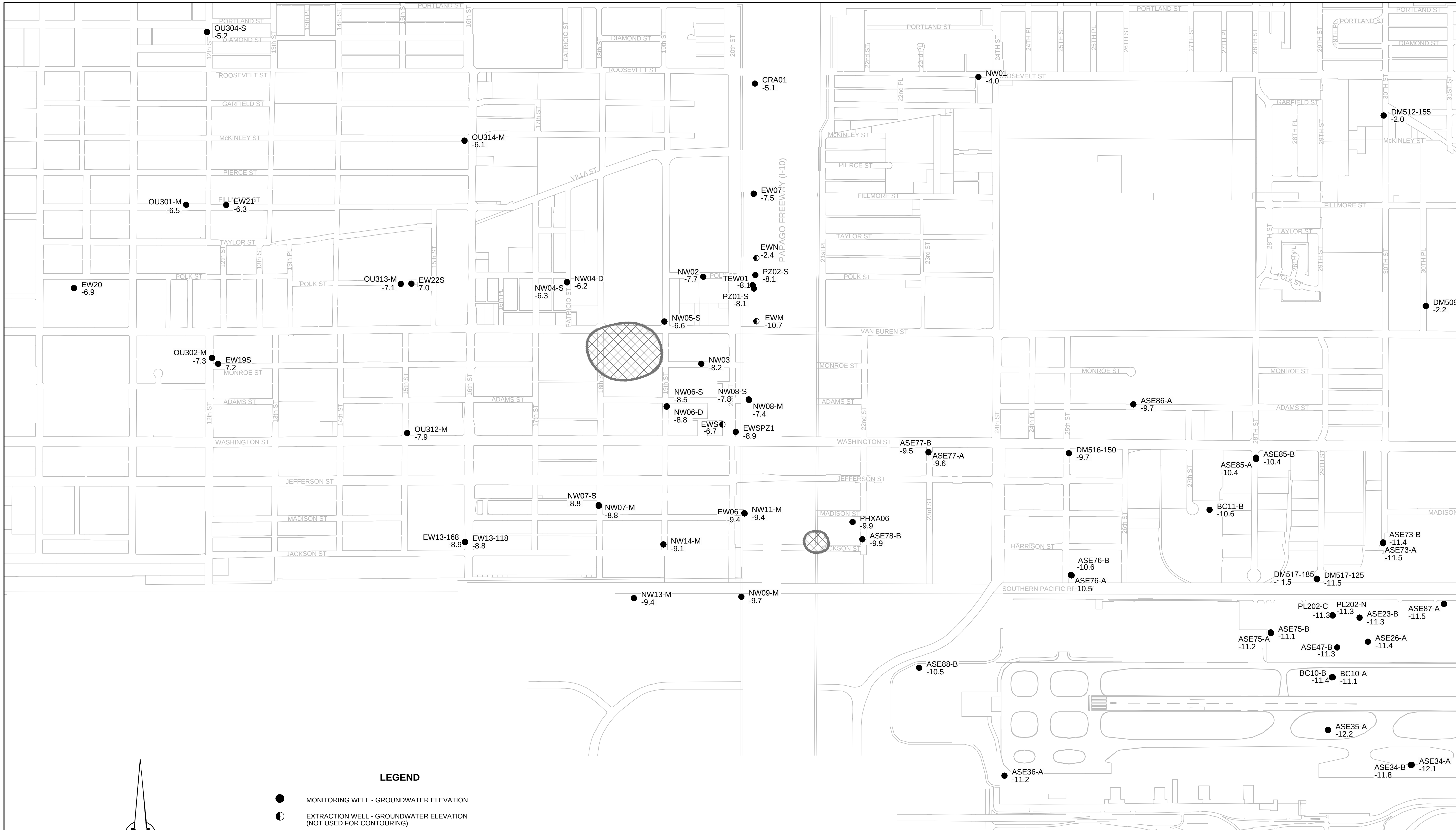
0 500 1000ft

figure 3.10A

APPARENT CHANGE IN GROUNDWATER ELEVATION - SEPTEMBER 2001 TO SEPTEMBER 2010
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

CRA

013932-151(026)GN-PX045 FIGURE 3.10A FEB 24/2011



N

0 500 1000ft

LEGEND

- MONITORING WELL - GROUNDWATER ELEVATION
- EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- COLLUVIUM

NOTE: NEGATIVE VALUE REPRESENTS AN DECREASE IN GROUNDWATER ELEVATION

figure 3.10B

APPARENT CHANGE IN GROUNDWATER ELEVATION - SEPTEMBER 2006 TO SEPTEMBER 2010
SUBUNITS "A+B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX046 FIGURE 3.10B FEB 22/2011

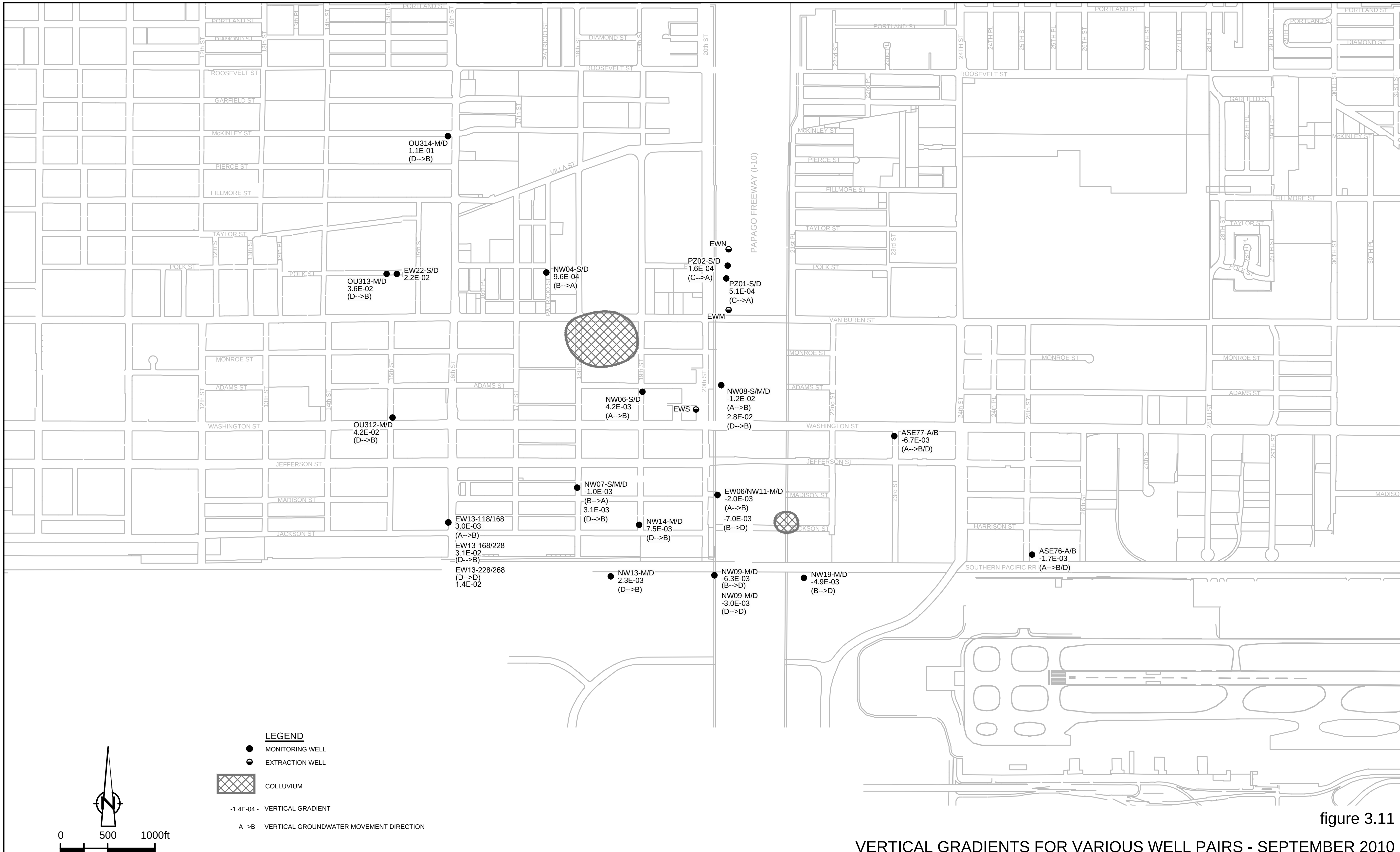
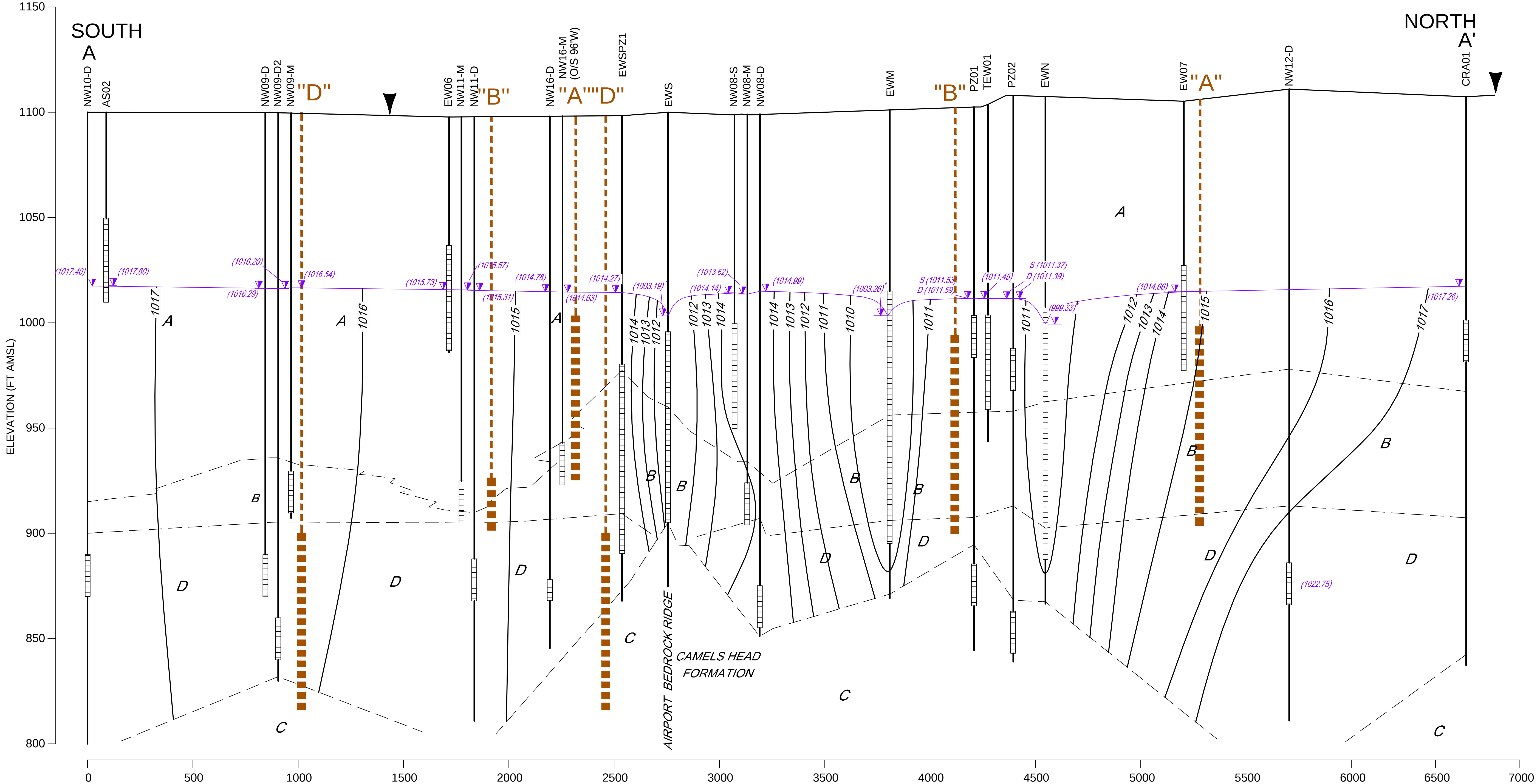


figure 3.11

VERTICAL GRADIENTS FOR VARIOUS WELL PAIRS - SEPTEMBER 2010
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX049 FIGURE 3.11 MAR 03/2011



LEGEND

CRA-1 — WELL NAME

GROUND SURFACE

WELL

WELL SCREEN

(1019.55) — WATER ELEVATION (MEASURED SEPTEMBER 2010)

WATER TABLE (MEASURED SEPTEMBER 2010)

GROUNDWATER ELEVATION CONTOUR

PUMPING WATER LEVEL (QUALITATIVELY USED TO DEVELOP CONTOUR MAP ONLY)

APPROXIMATE EXTENT OF CAPTURE

"A" "A" — PLAN VIEW OF 5 Õg/L TCE PLUME BOUNDARY IN "A" UNIT PRESENTED ON FIGURE 3.22 PROJECTED ONTO "A" UNIT ON THIS CROSS-SECTION (SEPTEMBER 2010)

"B" "B" — PLAN VIEW OF 5 Õg/L TCE PLUME BOUNDARY IN "B" UNIT PRESENTED ON FIGURE 3.23 PROJECTED ONTO "B" UNIT ON THIS CROSS-SECTION (SEPTEMBER 2010)

"D" "D" — PLAN VIEW OF 5 Õg/L TCE PLUME BOUNDARY IN "D" UNIT PRESENTED ON FIGURE 3.24 PROJECTED ONTO "D" UNIT ON THIS CROSS-SECTION (SEPTEMBER 2010)

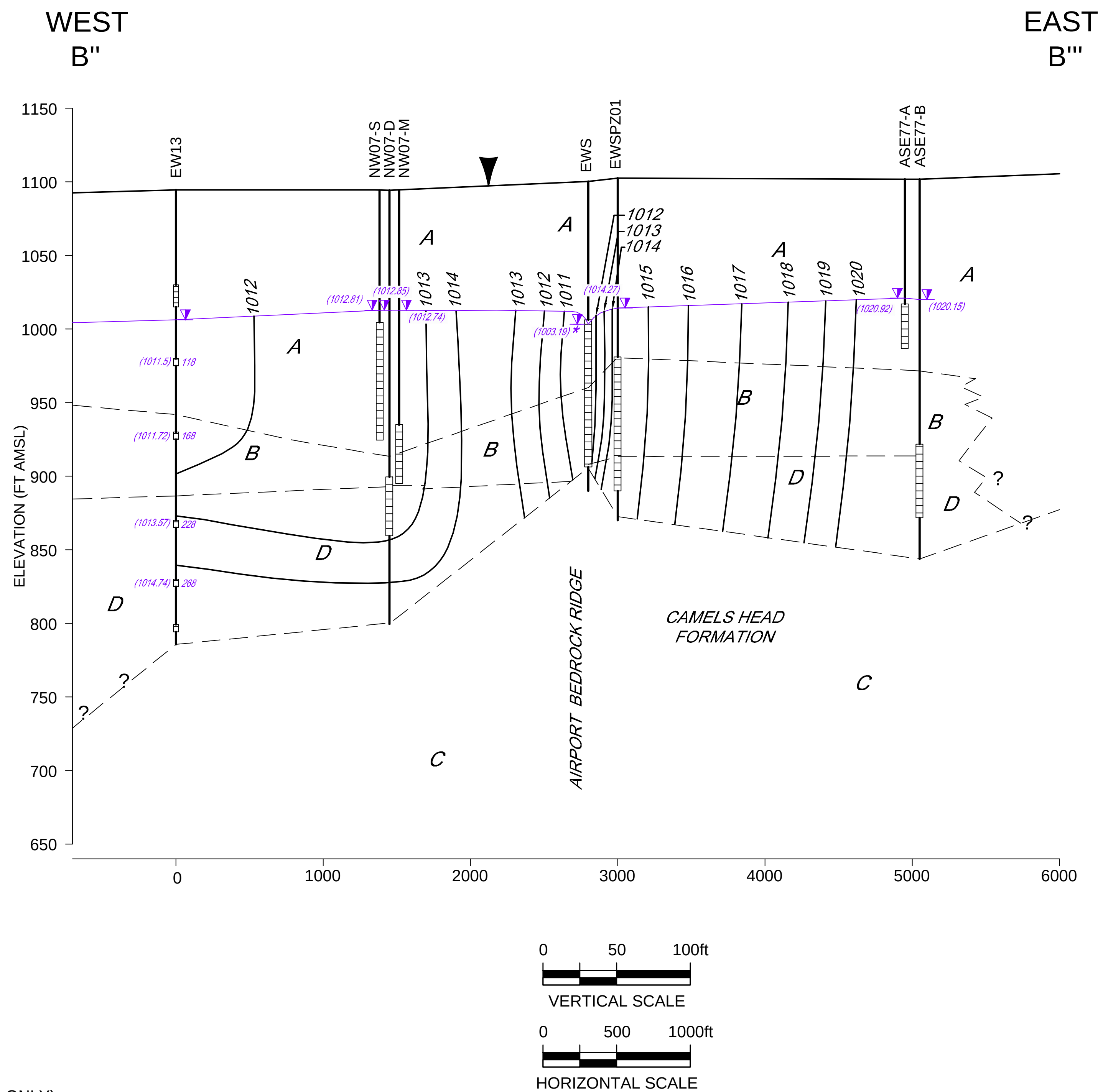
0 20 50ft
VERTICAL SCALE

0 200 500ft
HORIZONTAL SCALE

figure 3.12

GROUNDWATER CONTOURS - SEPTEMBER 2010
CROSS-SECTION A-A'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX029 FIGURE 3.12 APR 07/2011



LEGEND

CRA-1 — WELL NAME

GROUND SURFACE

WELL

WELL SCREEN (DEPTH ADJACENT TO EW-13)

(1019.55) — WATER ELEVATION (MEASURED SEPTEMBER 2010)

WATER TABLE (MEASURED SEPTEMBER 2010)

— 1006 — GROUNDWATER ELEVATION CONTOUR

* PUMPING WATER LEVEL (QUALITATIVELY USED TO DEVELOP CONTOUR MAP ONLY)

APPROXIMATE EXTENT OF CAPTURE

figure 3.13

GROUNDWATER CONTOURS - SEPTEMBER 2010
MODIFIED CROSS-SECTION B''-B'''
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX028 FIGURE 3.13 APR 08/2011

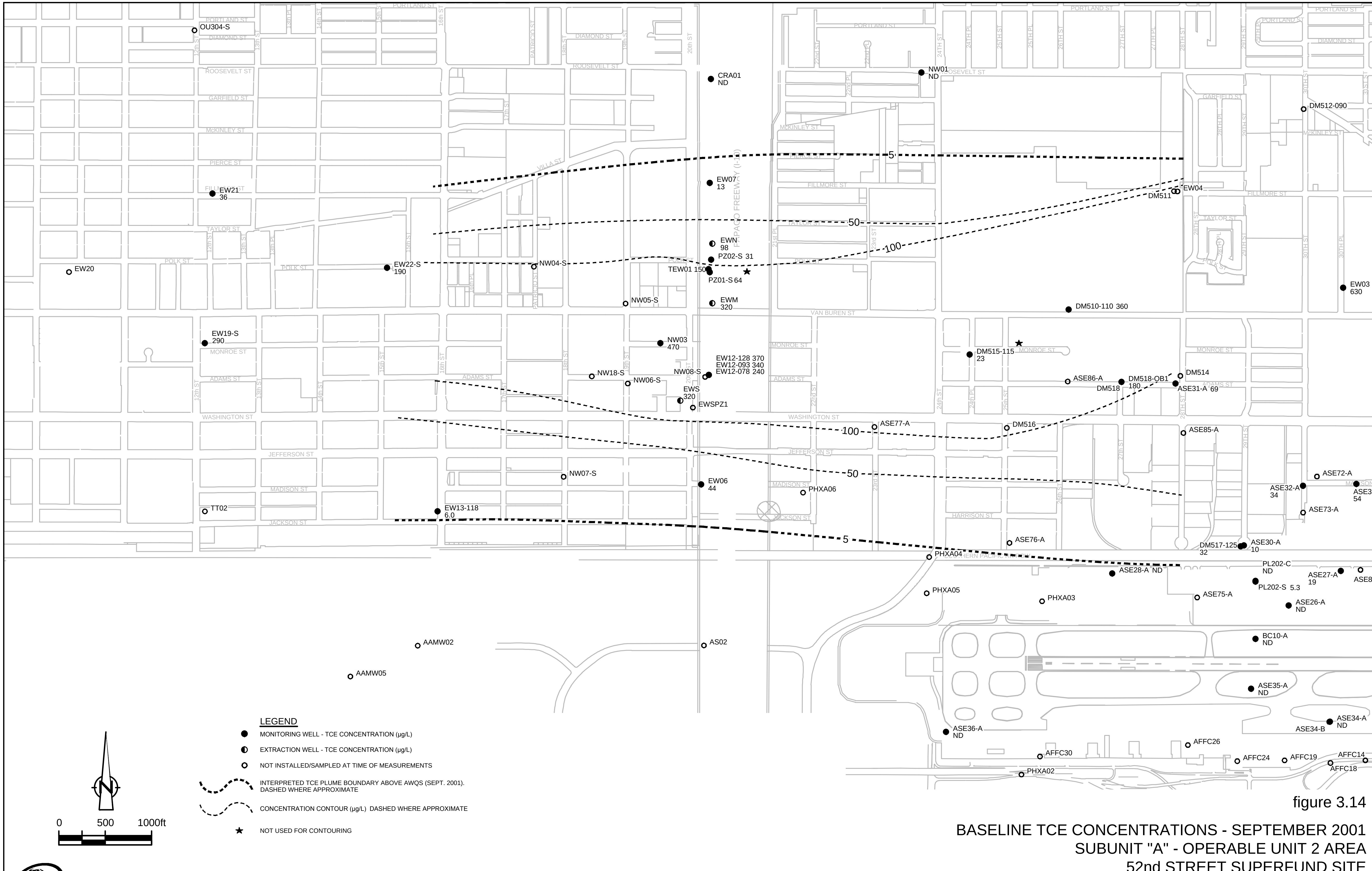


figure 3.14

BASELINE TCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX065 FIGURE 3.14 APR 07/2011

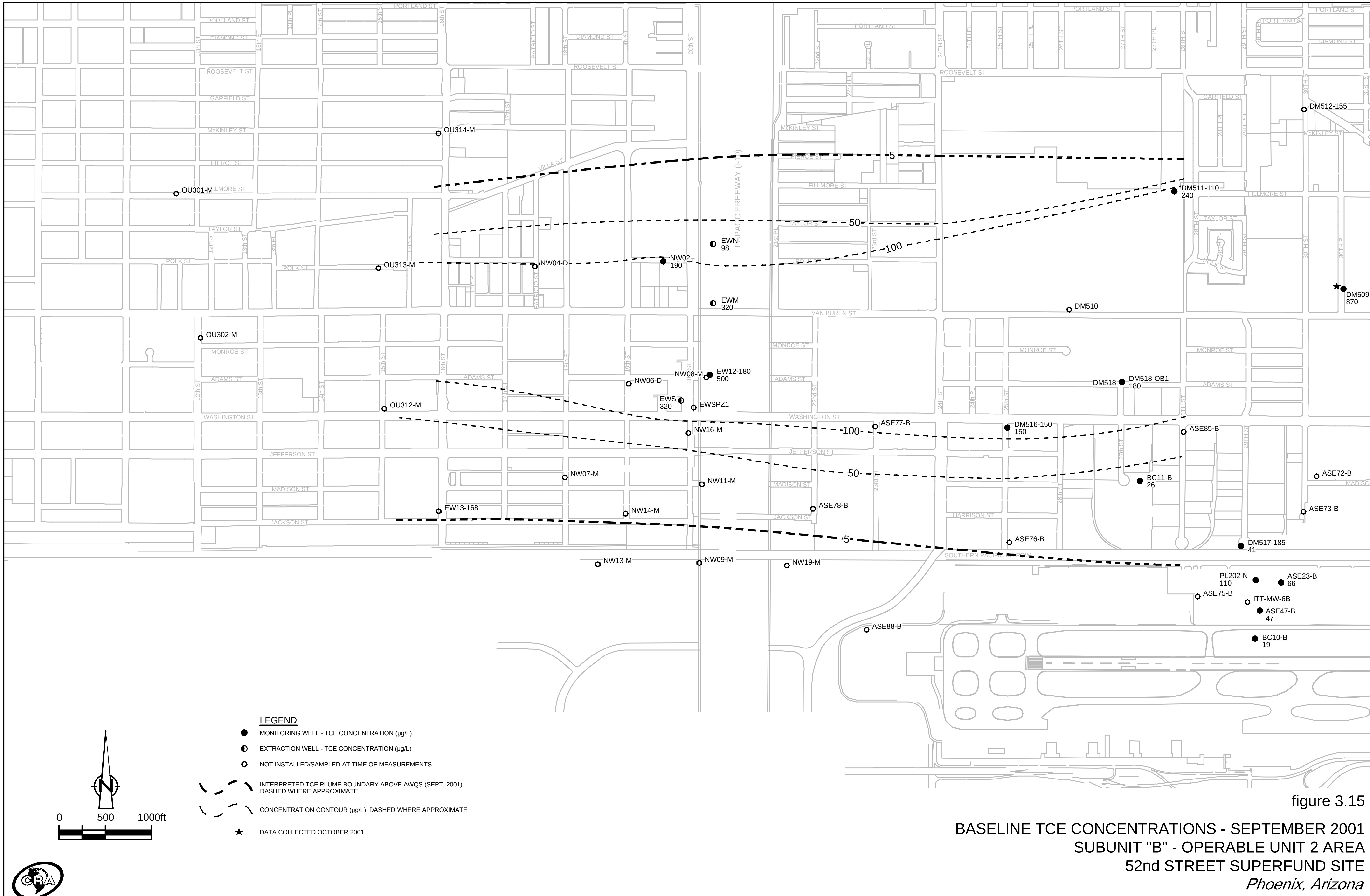


figure 3.15

BASELINE TCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX066 FIGURE 3.15 APR 07/2011

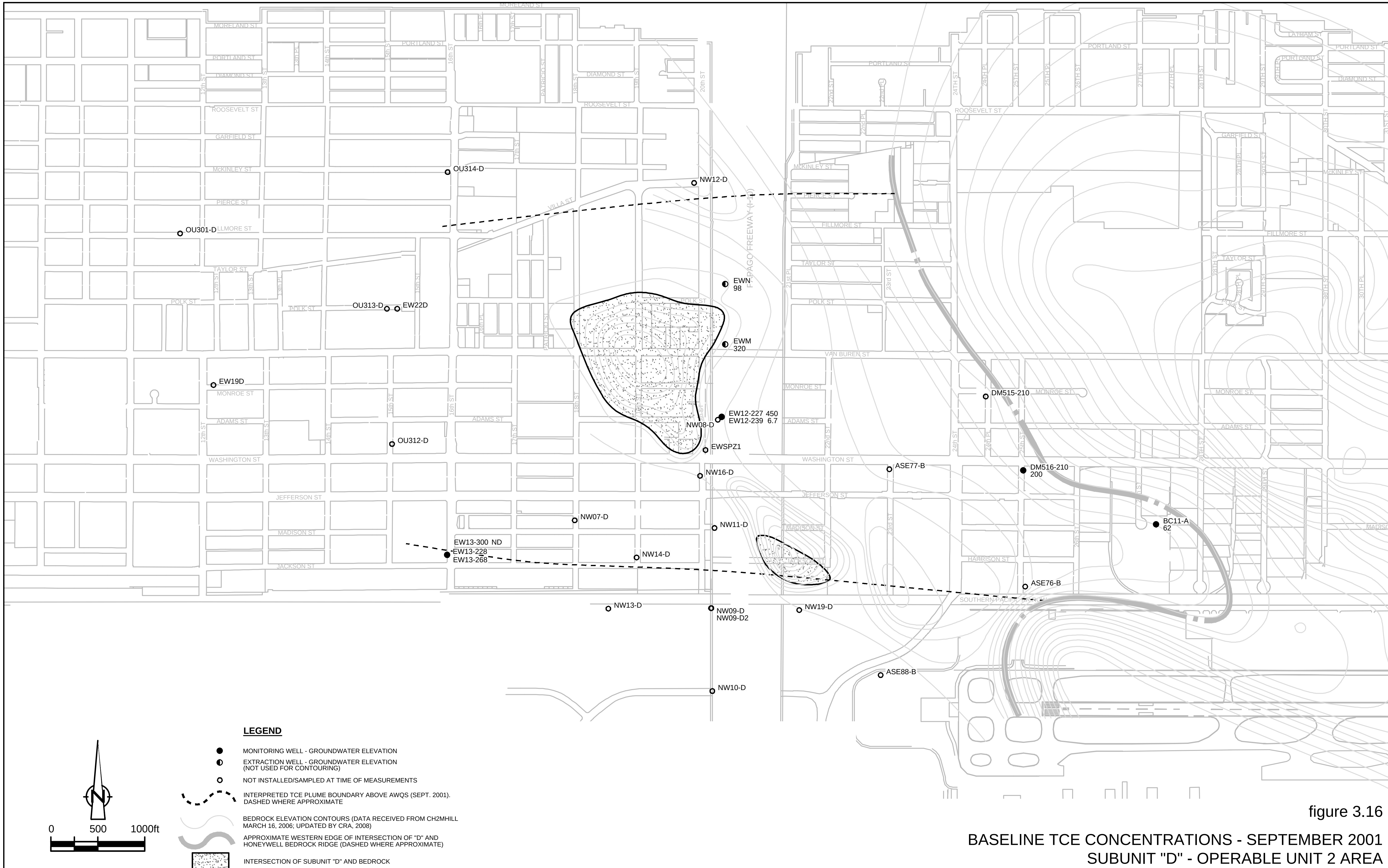


figure 3.16

BASELINE TCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX067 FIGURE 3.16 FEB 23/2011

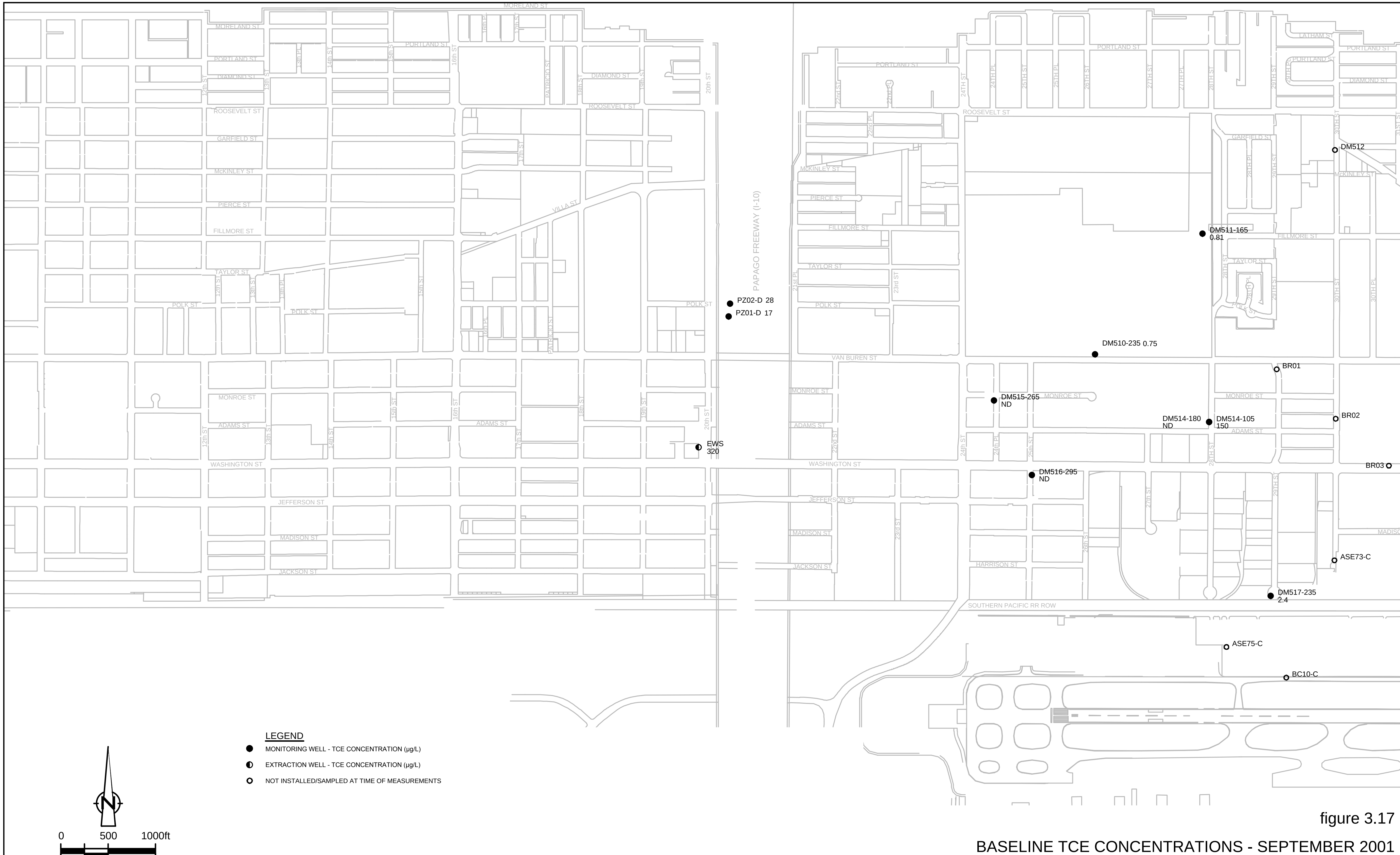


figure 3.17

BASELINE TCE CONCENTRATIONS - SEPTEMBER 2001
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

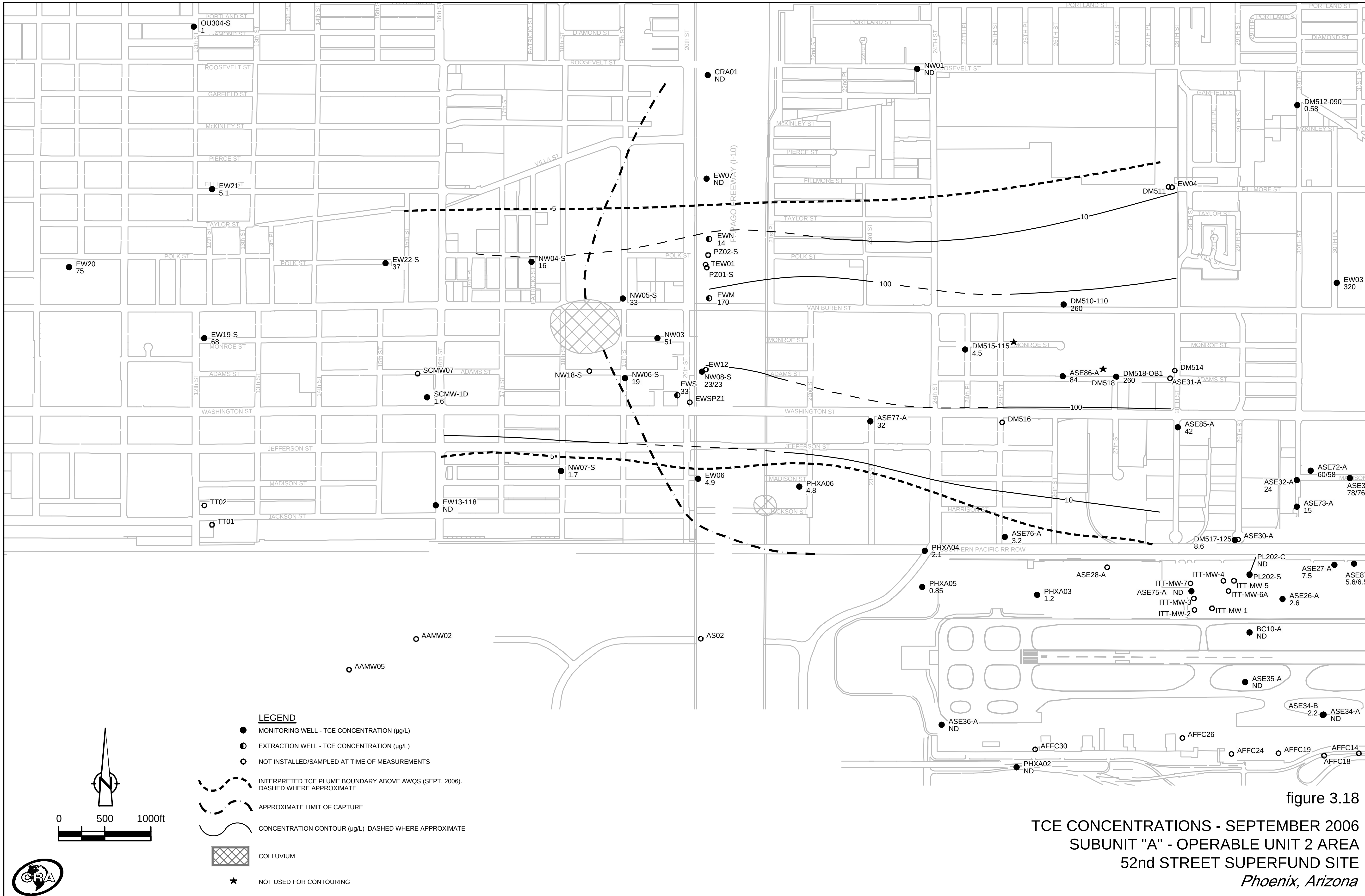
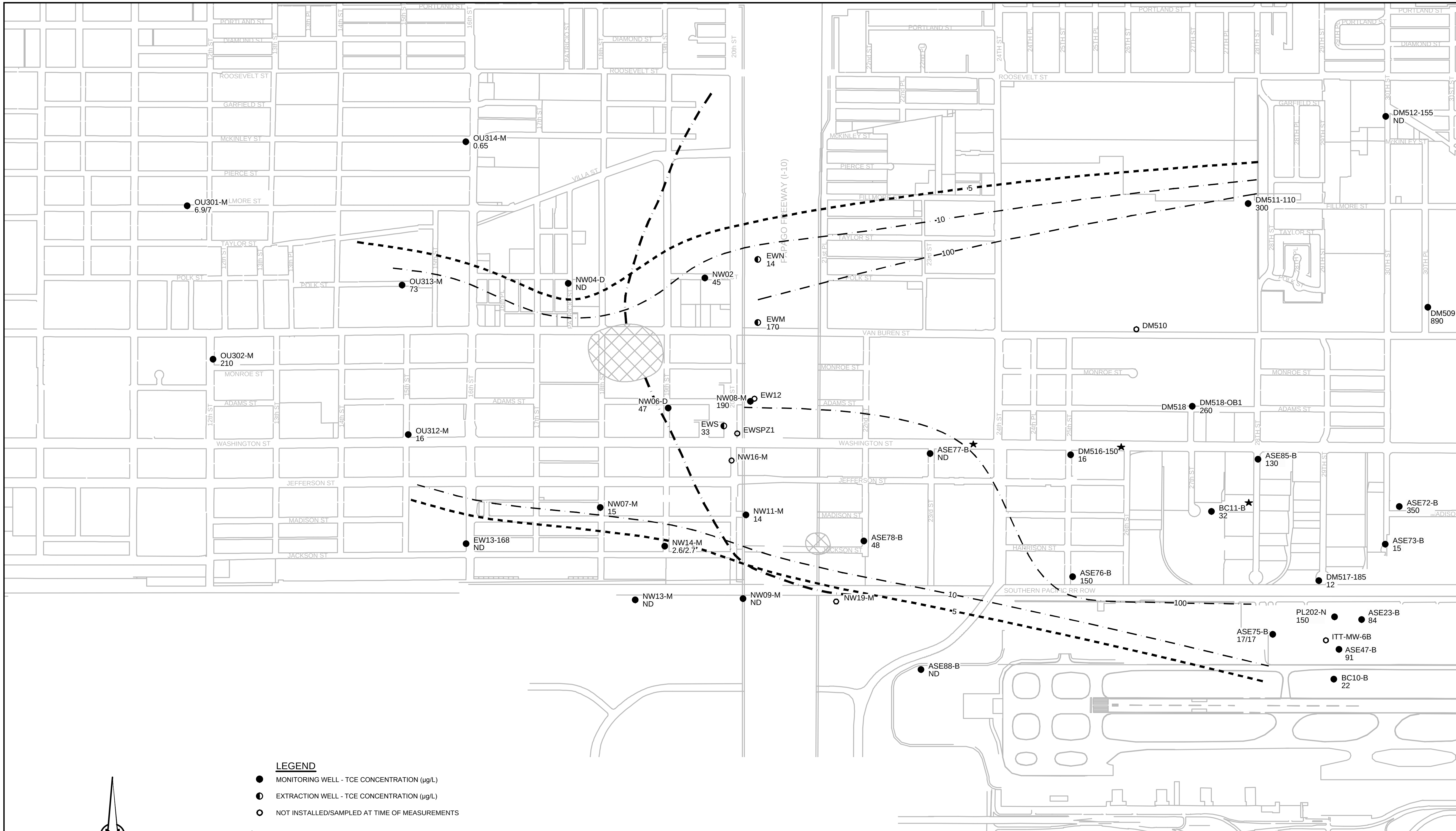


figure 3.18

TCE CONCENTRATIONS - SEPTEMBER 2006
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX053 FIGURE 3.18 APR 07/2011



LEGEND

- ● MONITORING WELL - TCE CONCENTRATION (µg/L)
- ◐ EXTRACTION WELL - TCE CONCENTRATION (µg/L)
- ○ NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- APPROXIMATE LIMIT OF CAPTURE
- INTERPRTED TCE PLUME BOUNDRY ABOVE AWQS (SEPT 2006) DASHED WHERE APPROXIMATE
- CONCENTRATION CONTOUR (µg/L) DASHED WHERE APPROXIMATE
- COLLUVIUM
- ★ NOT USED FOR CONTOURING

0 500 1000ft

figure 3.19

TCE CONCENTRATIONS - SEPTEMBER 2006
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX056 FIGURE 3.19 APR 07/2011

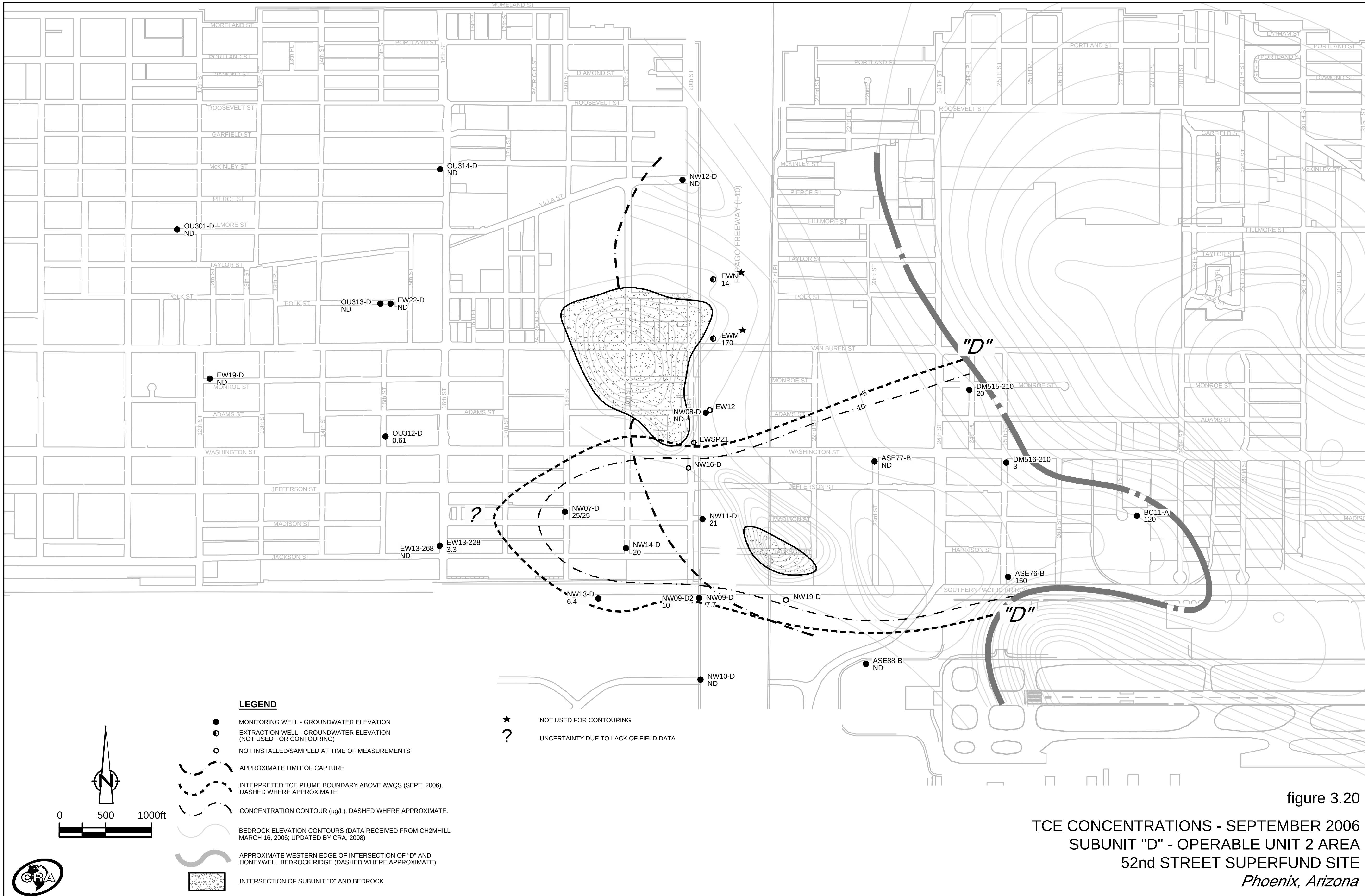


figure 3.20

TCE CONCENTRATIONS - SEPTEMBER 2006
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX057 FIGURE 3.20 APR 07/2011

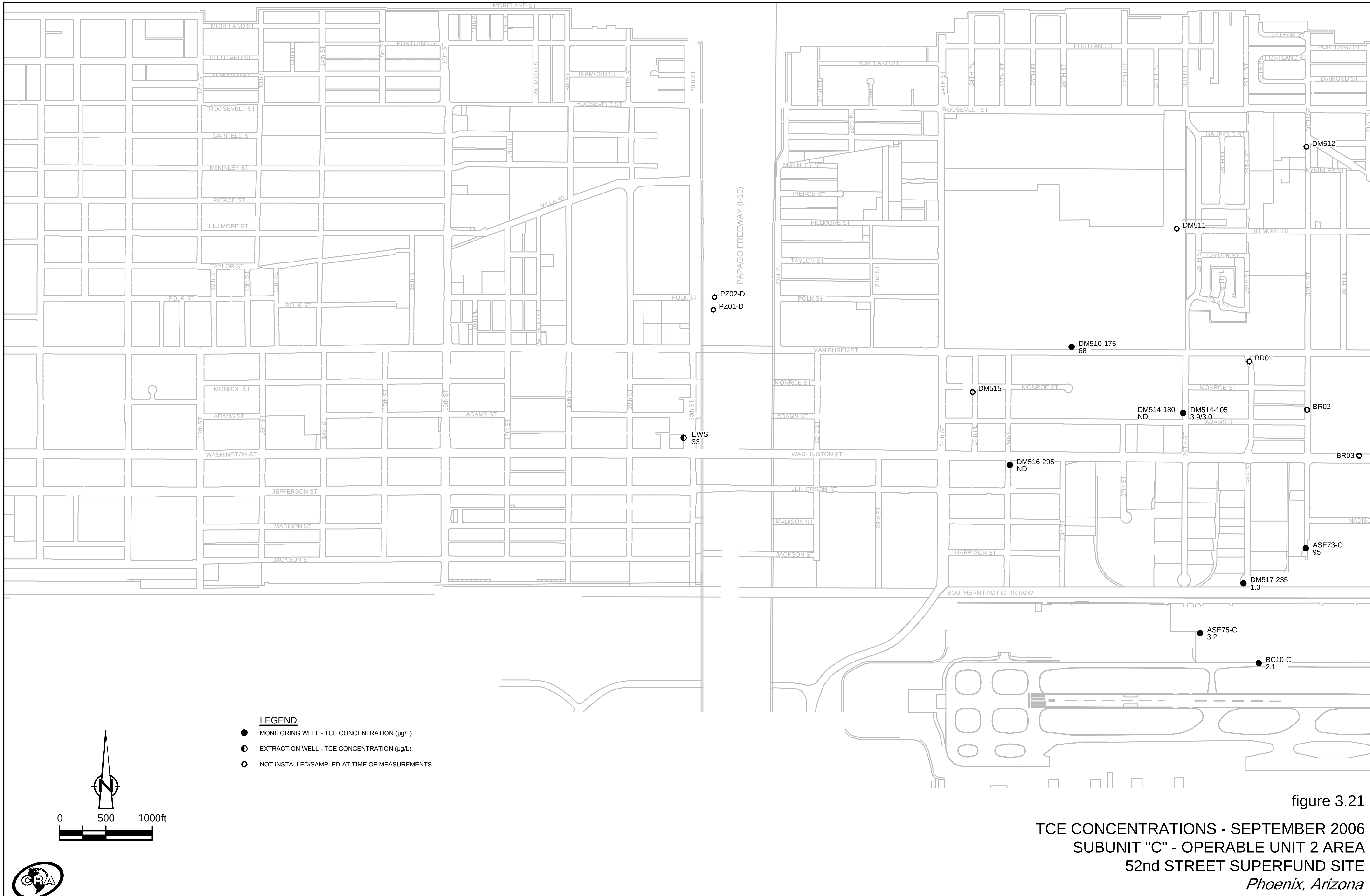


figure 3.21

TCE CONCENTRATIONS - SEPTEMBER 2006
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX058 FIGURE 3.21 FEB 23/2011

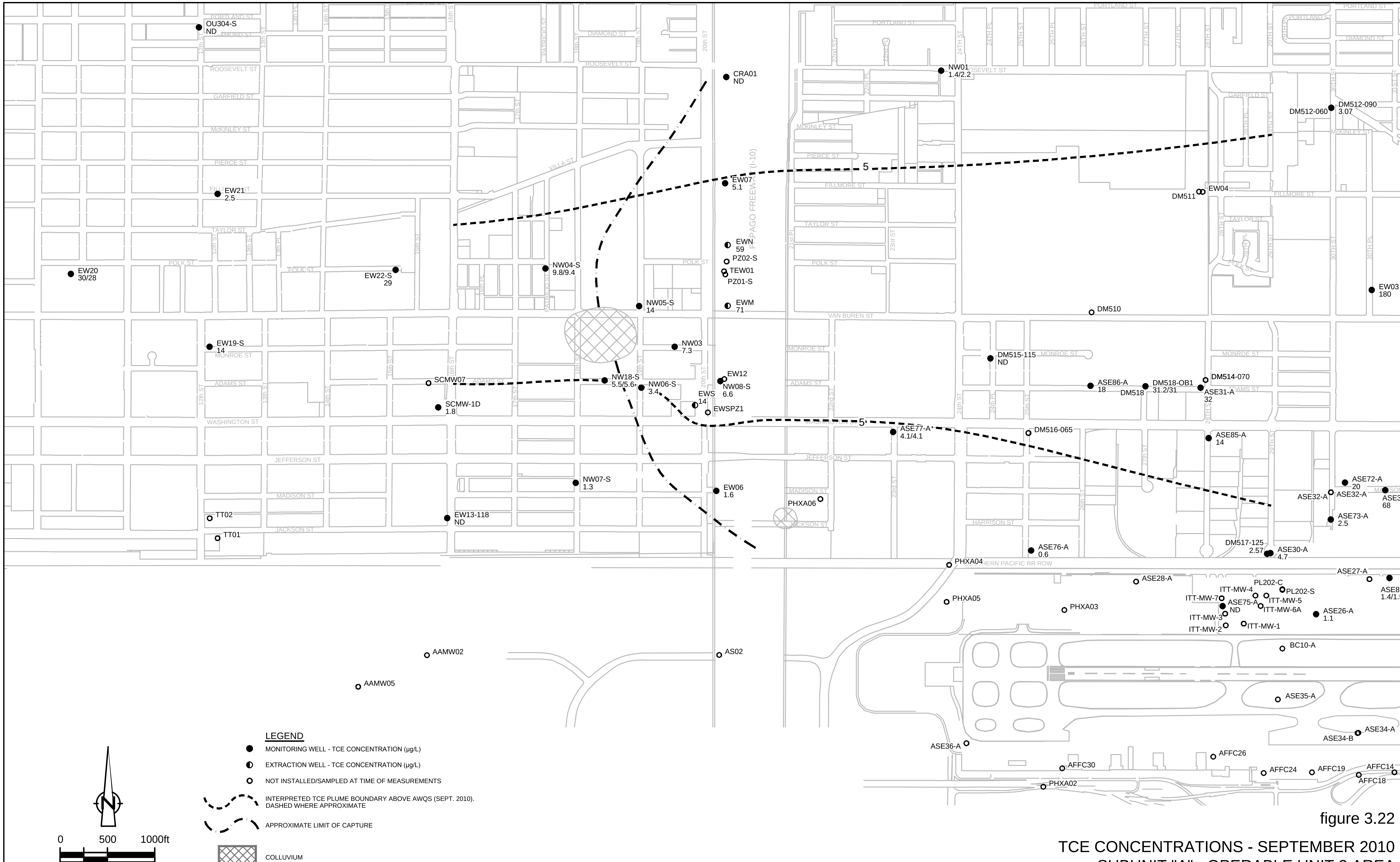
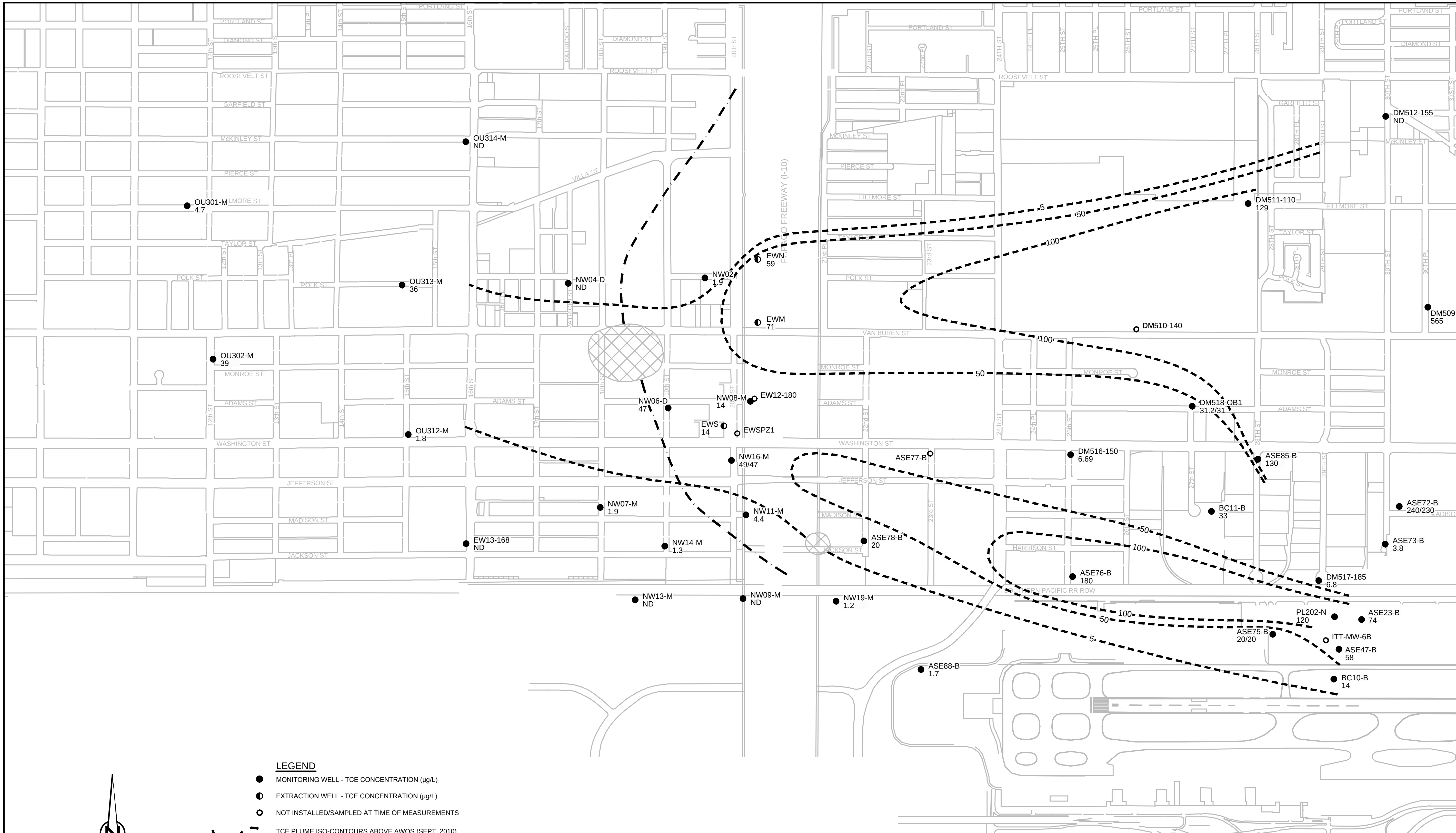


figure 3.22

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX008 FIGURE 3.22 APR 07/2011



LEGEND

MONITORING WELL - TCE CONCENTRATION (µg/L)

EXTRACTION WELL - TCE CONCENTRATION (µg/L)

NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS

TCE PLUME ISO-CONTOURS ABOVE AWQS (SEPT. 2010). DASHED WHERE APPROXIMATE

APPROXIMATE LIMIT OF CAPTURE

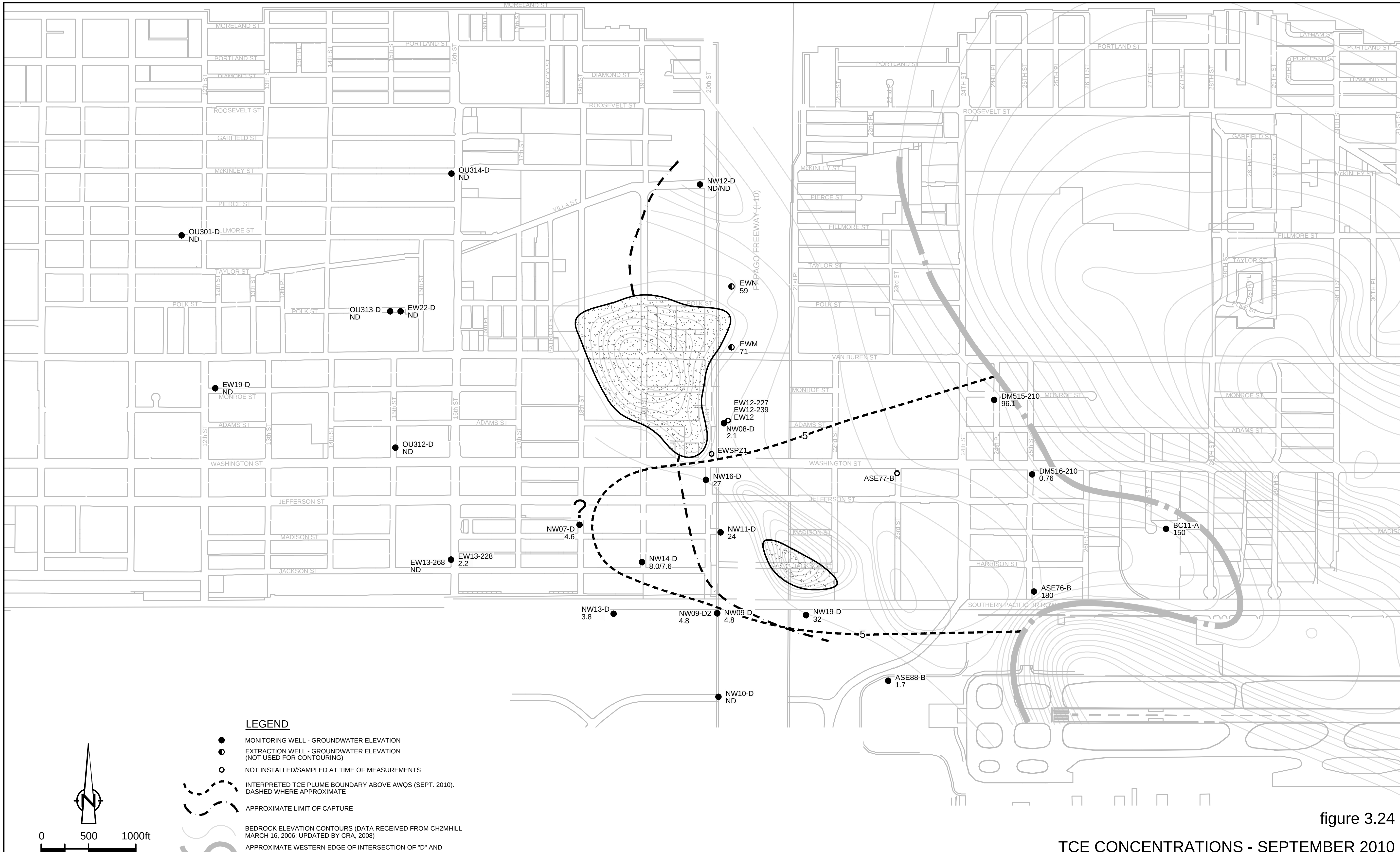
COLLUVIUM

0 500 1000ft

figure 3.23

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX009 FIGURE 3.23 APR 07/2011



LEGEND

- MONITORING WELL - GROUNDWATER ELEVATION
- EXTRACTION WELL - GROUNDWATER ELEVATION (NOT USED FOR CONTOURING)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- INTERPRETED TCE PLUME BOUNDARY ABOVE AWQS (SEPT. 2010). DASHED WHERE APPROXIMATE
- APPROXIMATE LIMIT OF CAPTURE
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK
- ? UNCERTAINTY DUE TO LACK OF FIELD DATA

figure 3.24

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX010 FIGURE 3.24 APR 07/2011

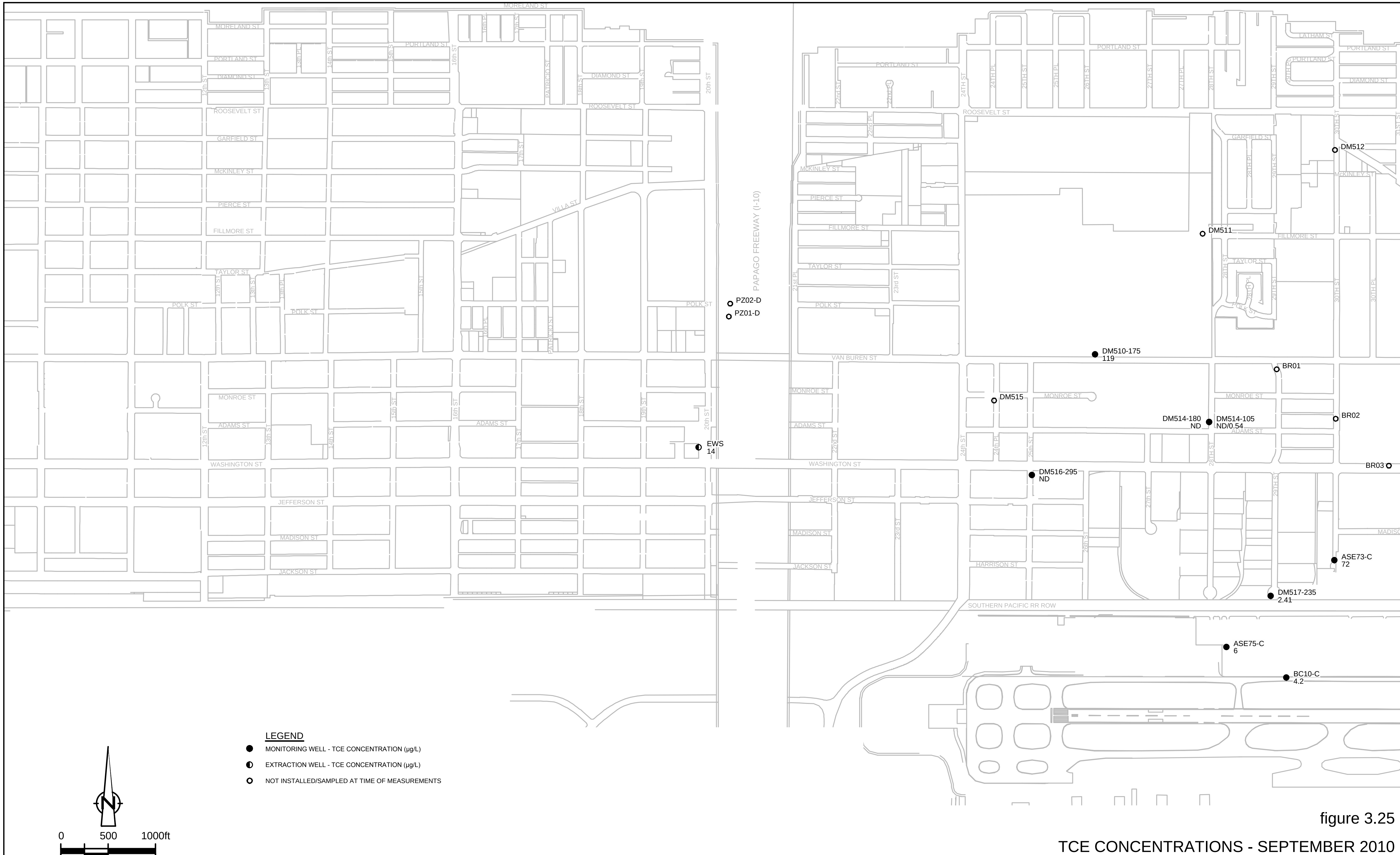


figure 3.25

TCE CONCENTRATIONS - SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX011 FIGURE 3.25 FEB 23/2011

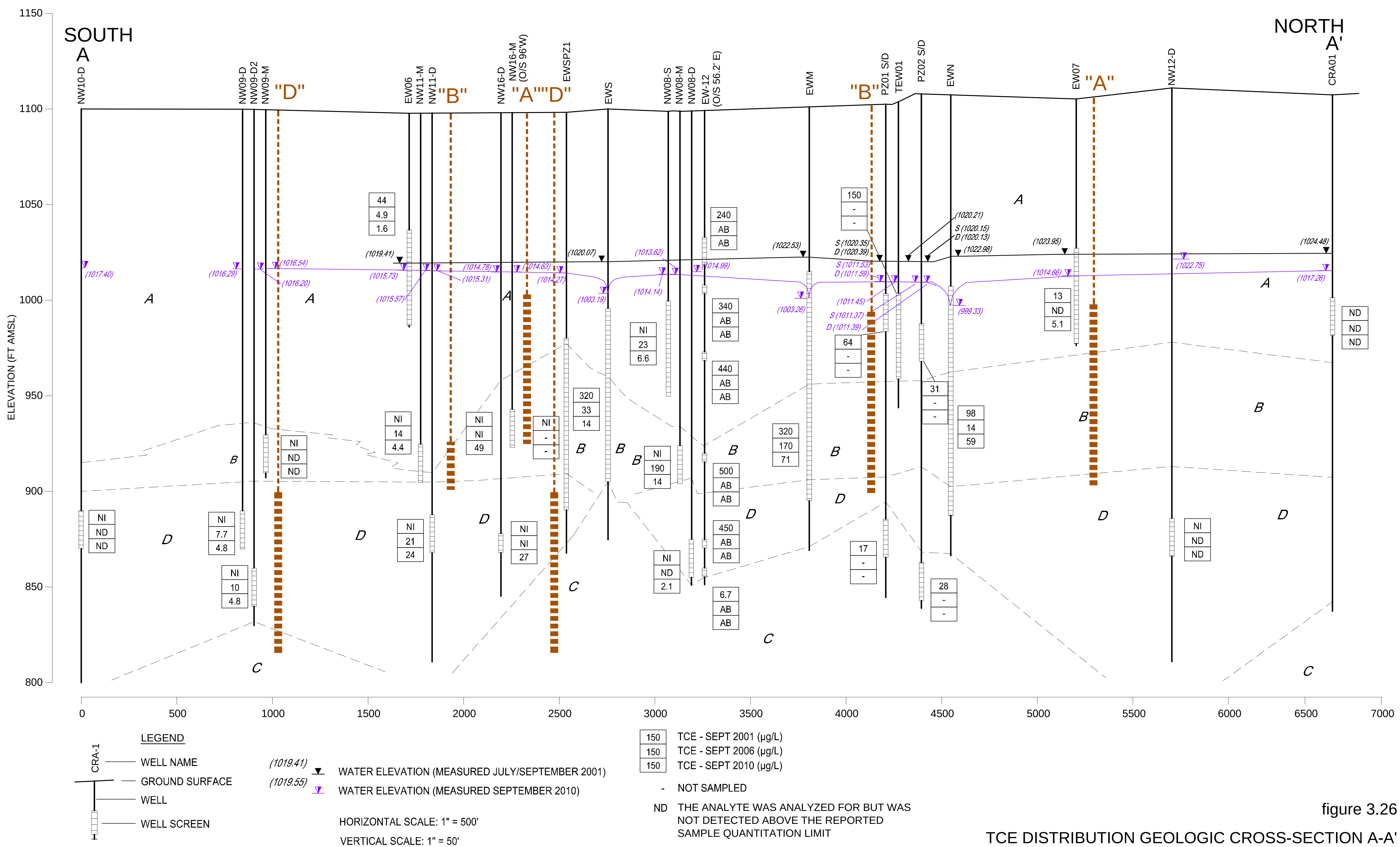
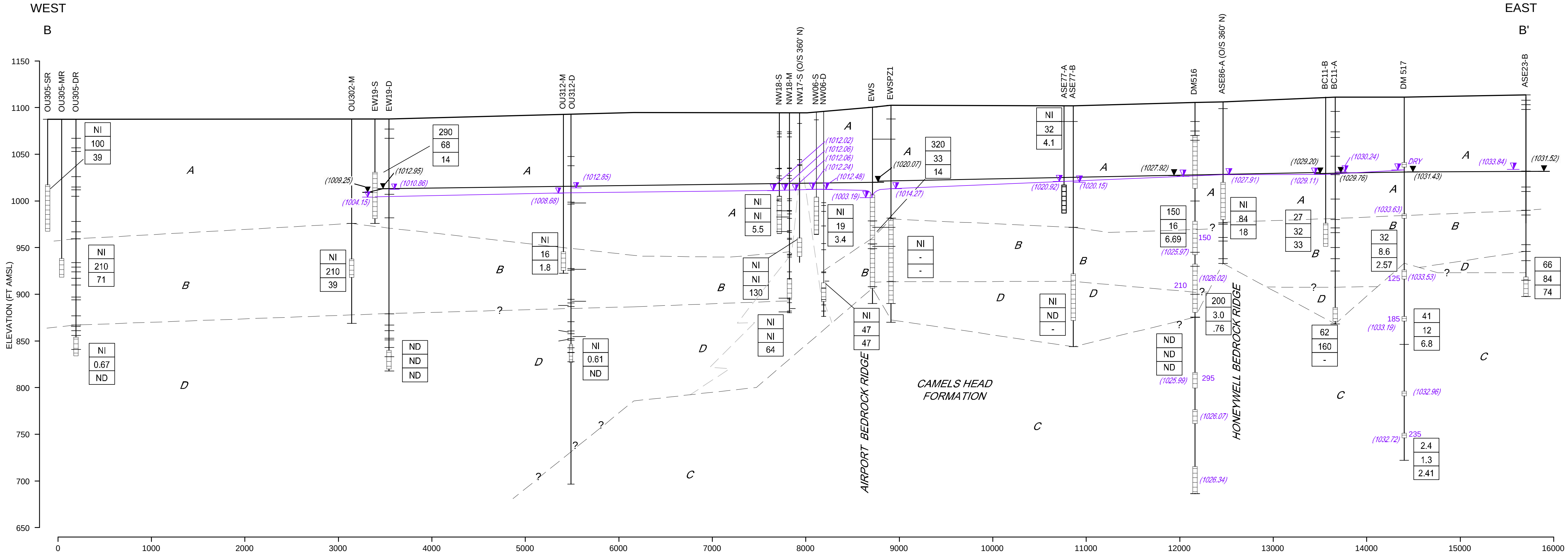


figure 3.26

TCE DISTRIBUTION GEOLOGIC CROSS-SECTION A-A'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX012 FIGURE 3.26 APR 08/2011



LEGEND

EWS — WELL NAME
— GROUND SURFACE
— WELL
— WELL SCREEN

(1009.25) WATER ELEVATION (MEASURED JULY/SEPTEMBER 2001)

(1005.44) WATER ELEVATION (MEASURED SEPTEMBER 2010)

(NM) - NOT INSTALLED / NOT MEASURED

HORIZONTAL SCALE: 1" = 1250'

VERTICAL SCALE: 1" = 125'

150 TCE - SEPT 2001 (µg/L)
150 TCE - SEPT 2006 (µg/L)
150 TCE - SEPT 2010 (µg/L)

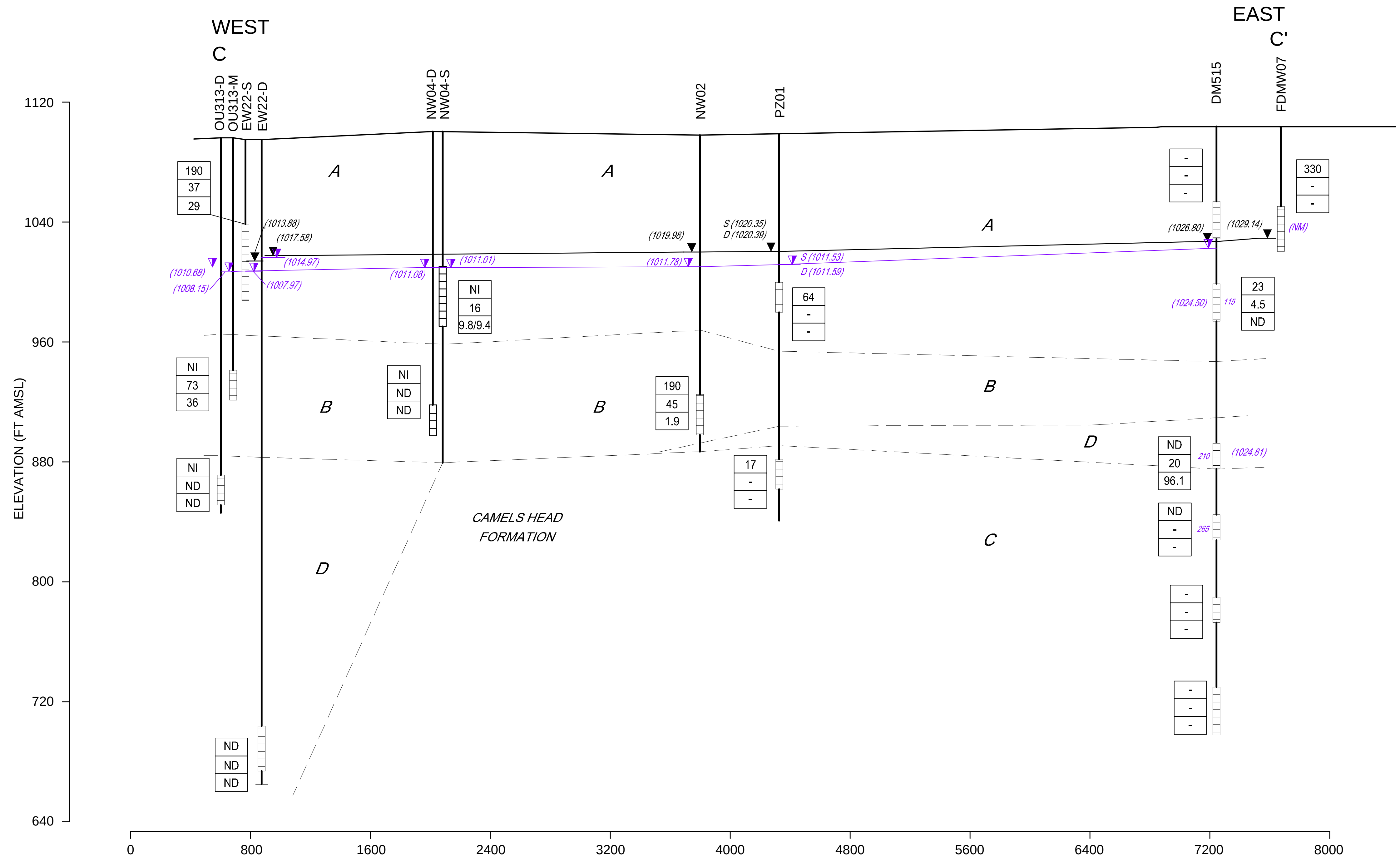
\- NOT SAMPLED

ND THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT

NI NOT INSTALLED

figure 3.27

TCE DISTRIBUTION GEOLOGIC CROSS-SECTION B-B'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona



LEGEND

CRA-1 — WELL NAME

GROUND SURFACE

WELL

WELL SCREEN

(1013.88) WATER ELEVATION (MEASURED JULY/SEPTEMBER 2001)

(1004.89) WATER ELEVATION (MEASURED SEPTEMBER 2009)

NM - NOT INSTALLED / NOT MEASURED

HORIZONTAL SCALE: 1" = 800'

VERTICAL SCALE: 1" = 80'

150 TCE - SEPT 2001 (μg/L)

150 TCE - SEPT 2006 (μg/L)

150 TCE - SEPT 2010 (μg/L)

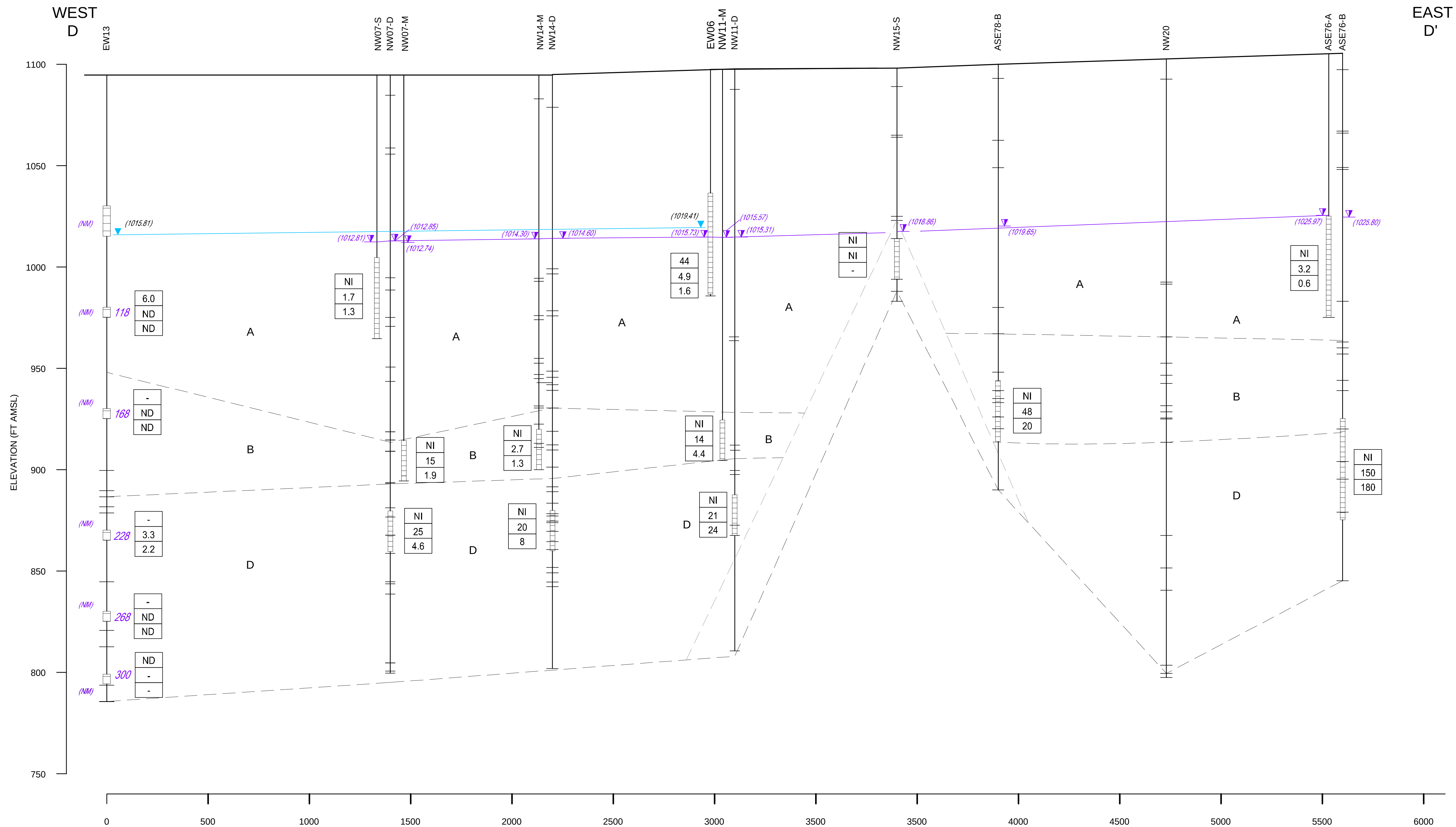
- NOT SAMPLED

ND THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT

NI NOT INSTALLED

figure 3.28

TCE DISTRIBUTION GEOLOGIC CROSS-SECTION C-C'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona



LEGEND

CRA-1 — WELL NAME

GROUND SURFACE

WELL

WELL SCREEN

(1015.81) WATER ELEVATION (MEASURED JULY/SEPTEMBER 2001)

(1002.57) WATER ELEVATION (MEASURED SEPTEMBER 2009)

HORIZONTAL SCALE: 1" = 500'

VERTICAL SCALE: 1" = 50'

150	TCE - SEPT 2001 (µg/L)
150	TCE - SEPT 2006 (µg/L)
150	TCE - SEPT 2010 (µg/L)

- NOT SAMPLED

ND THE ANALYTE WAS ANALYZED FOR BUT WAS NOT DETECTED ABOVE THE REPORTED SAMPLE QUANTITATION LIMIT

NI NOT INSTALLED

figure 3.29

TCE DISTRIBUTION GEOLOGIC CROSS-SECTION D-D'
OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX015 FIGURE 3.29 APR 08/2011

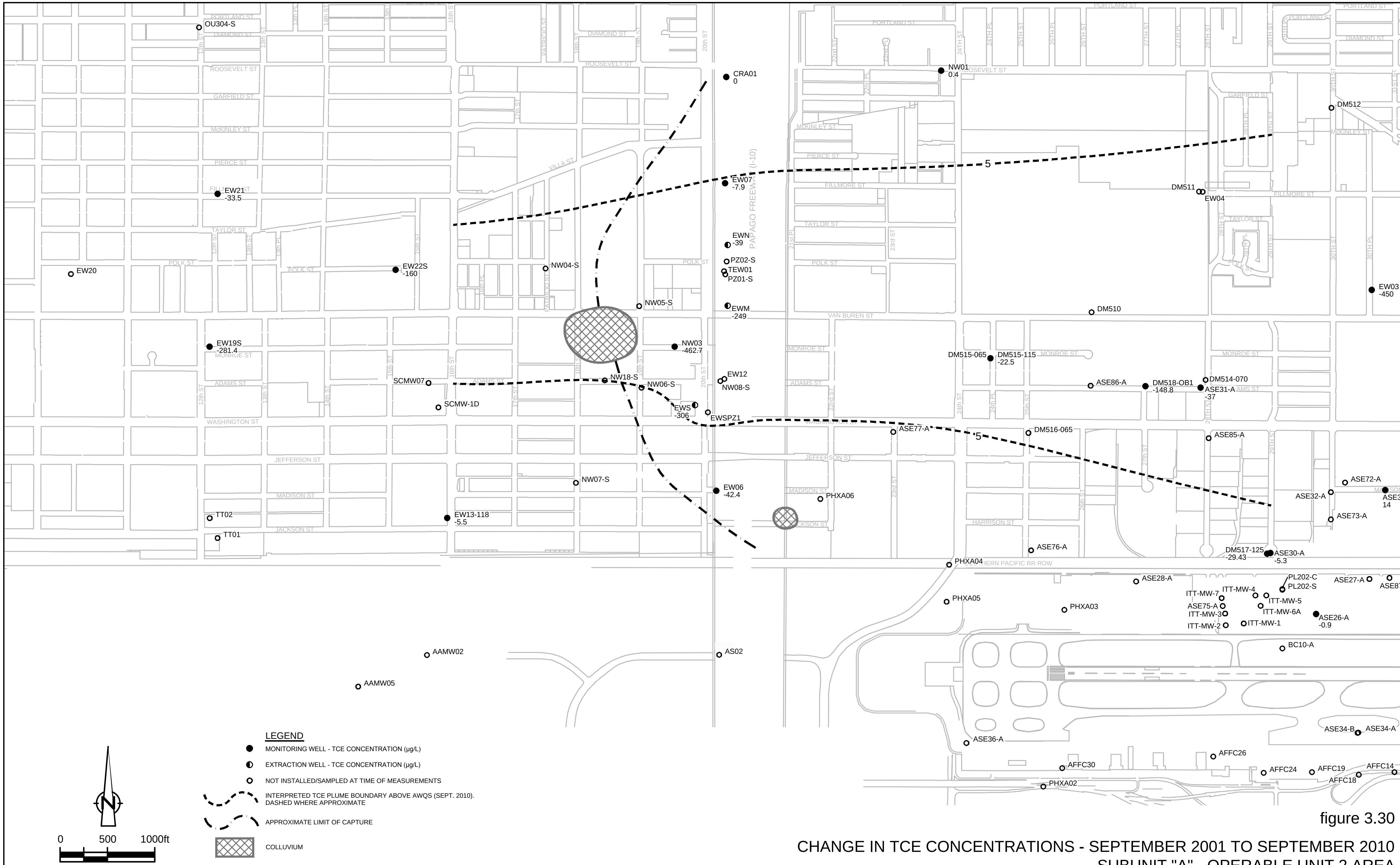


figure 3.30

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2001 TO SEPTEMBER 2010
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX030 FIGURE 3.30 APR 08/2011

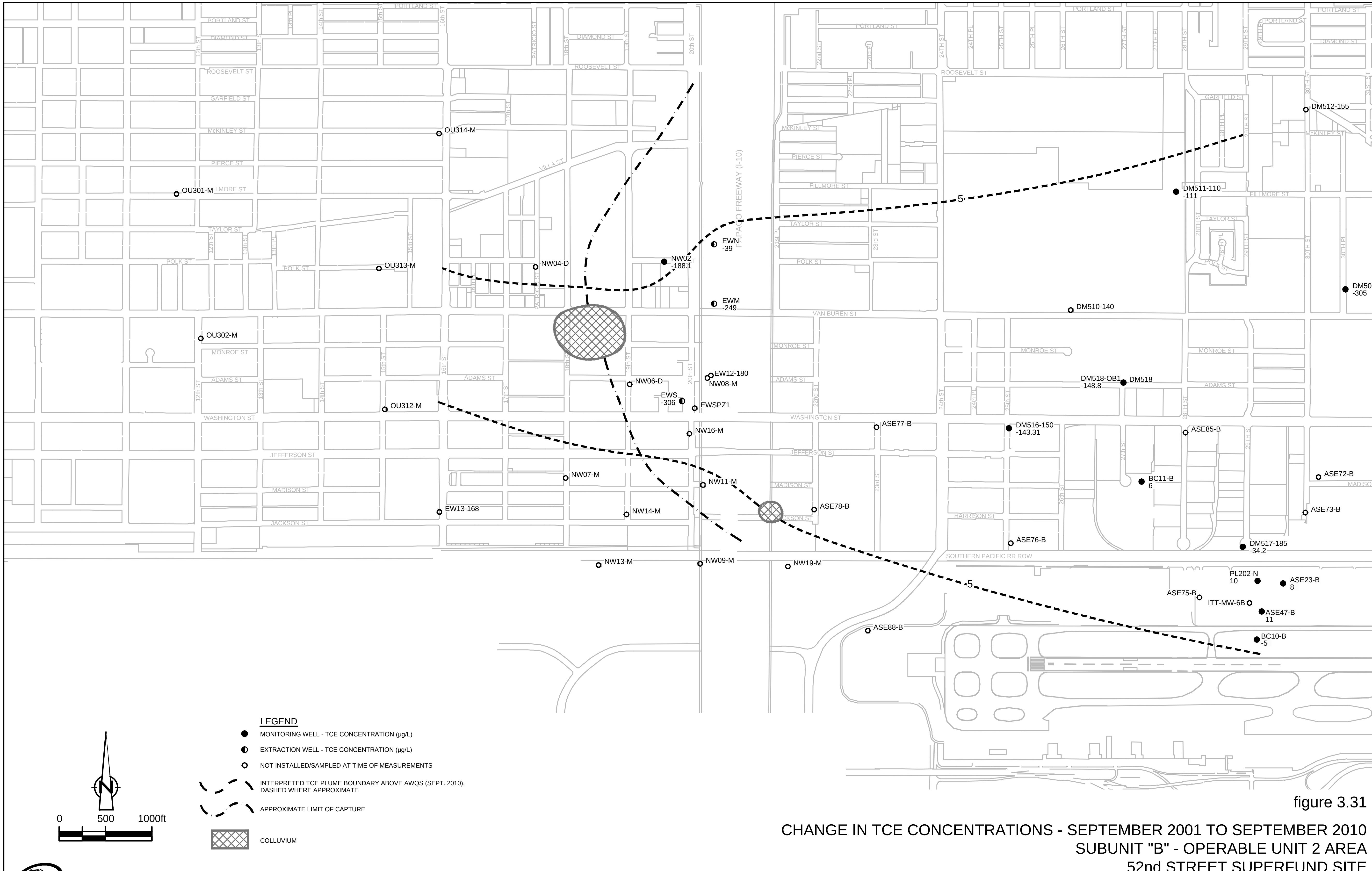


figure 3.31

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2001 TO SEPTEMBER 2010
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX031 FIGURE 3.31 APR 08/2011

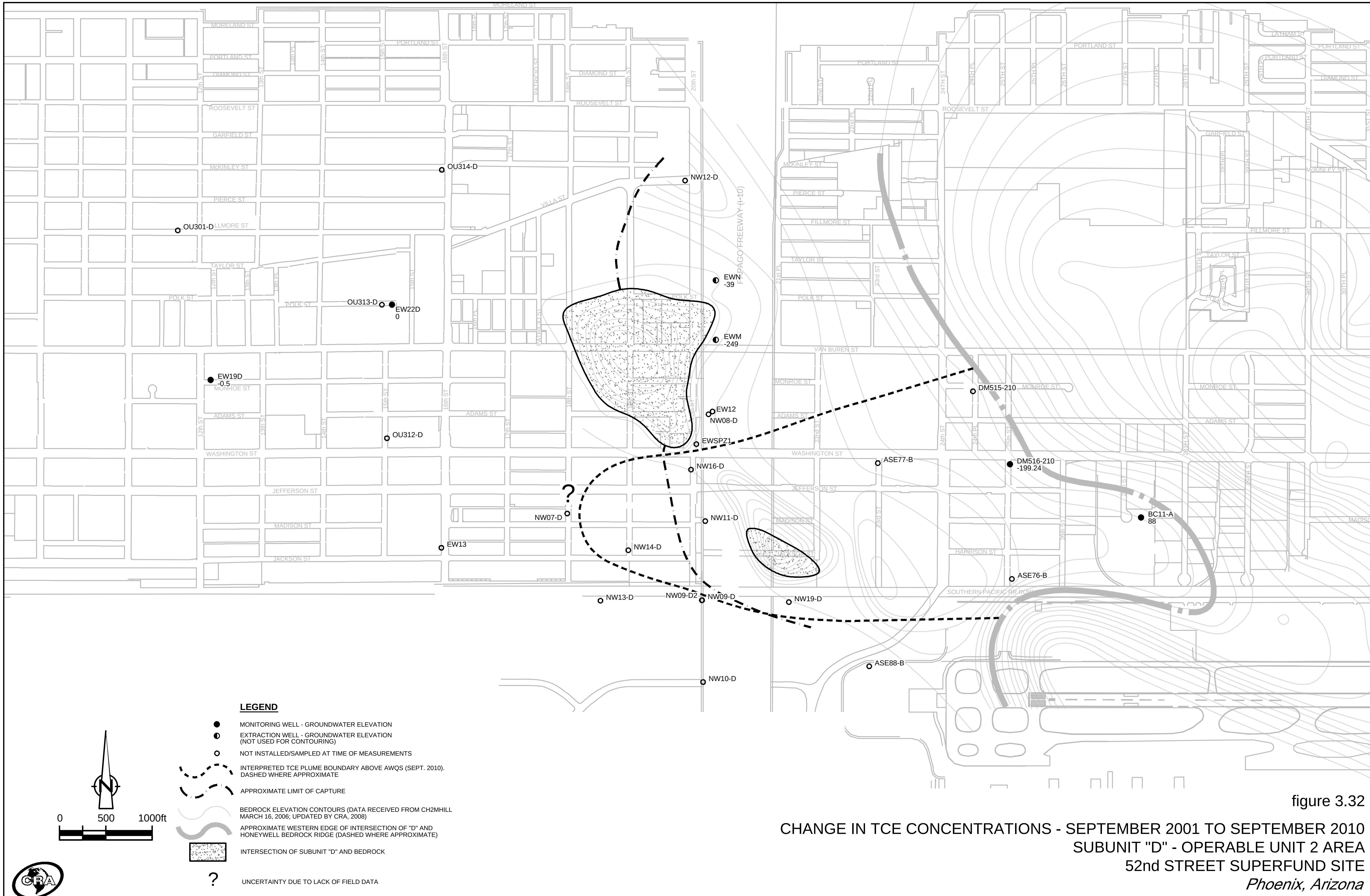


figure 3.32

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2001 TO SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX032 FIGURE 3.32 APR 08/2011

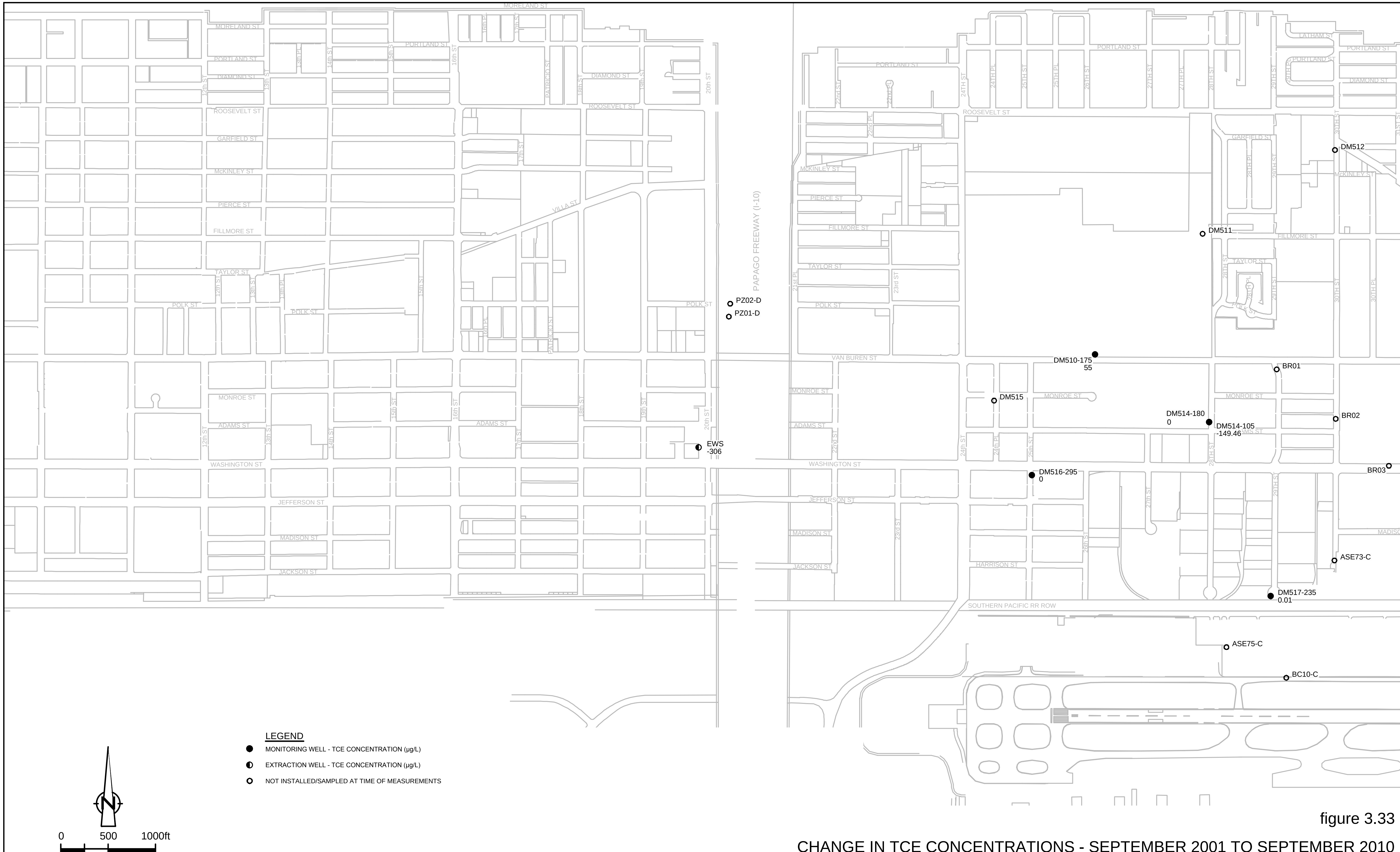


figure 3.33

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2001 TO SEPTEMBER 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX033 FIGURE 3.33 FEB 23/2011

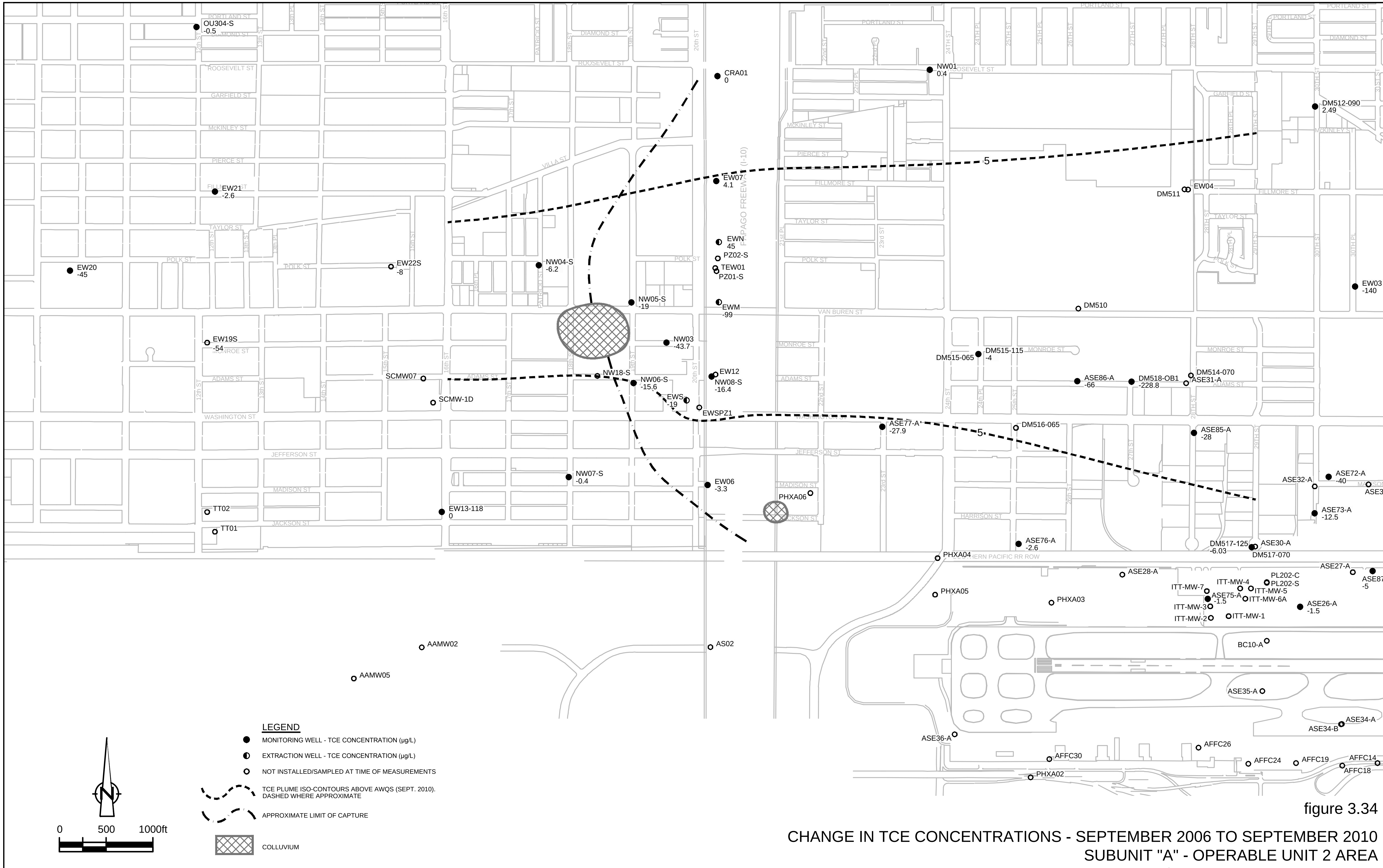


figure 3.34

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2006 TO SEPTEMBER 2010
SUBUNIT "A" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX034 FIGURE 3.34 APR 08/2011

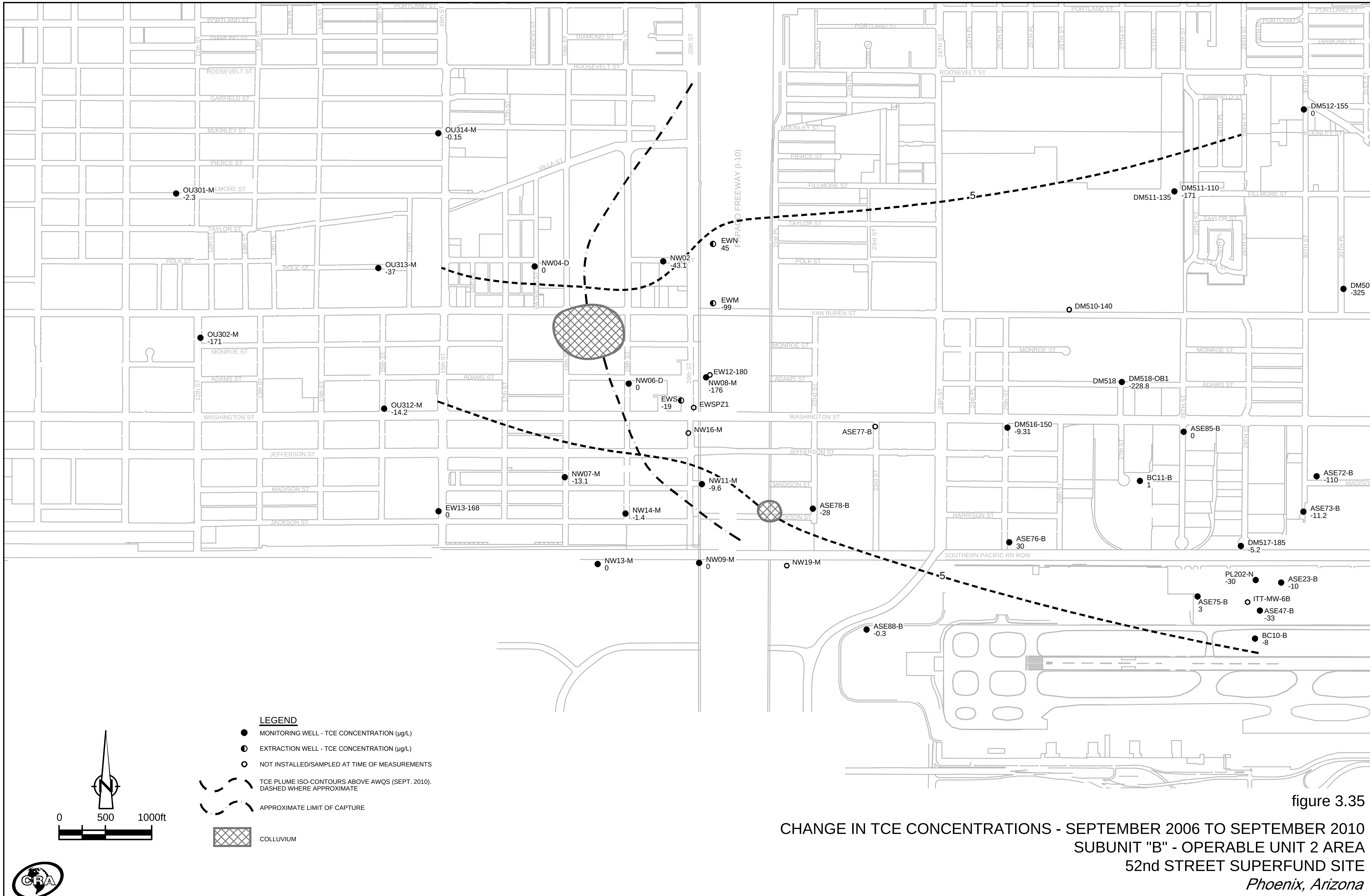
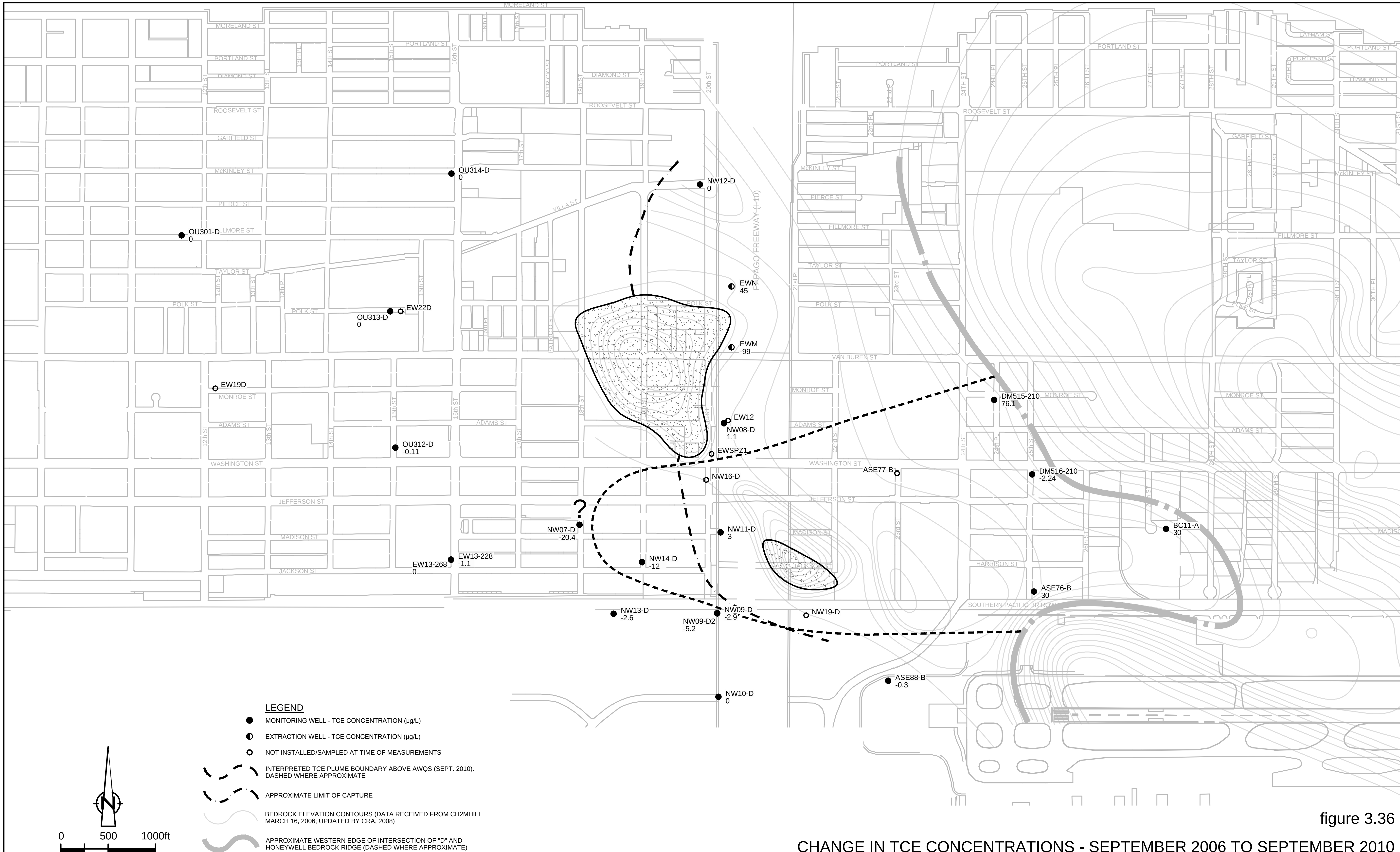


figure 3.35

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2006 TO SEPTEMBER 2010
SUBUNIT "B" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX035 FIGURE 3.35 APR 08/2011



LEGEND

- MONITORING WELL - TCE CONCENTRATION (µg/L)
- EXTRACTION WELL - TCE CONCENTRATION (µg/L)
- NOT INSTALLED/SAMPLED AT TIME OF MEASUREMENTS
- INTERPRETED TCE PLUME BOUNDARY ABOVE AWQS (SEPT. 2010). DASHED WHERE APPROXIMATE
- APPROXIMATE LIMIT OF CAPTURE
- BEDROCK ELEVATION CONTOURS (DATA RECEIVED FROM CH2MHILL MARCH 16, 2006; UPDATED BY CRA, 2008)
- APPROXIMATE WESTERN EDGE OF INTERSECTION OF "D" AND HONEYWELL BEDROCK RIDGE (DASHED WHERE APPROXIMATE)
- INTERSECTION OF SUBUNIT "D" AND BEDROCK
- ? UNCERTAINTY DUE TO LACK OF FIELD DATA

figure 3.36

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2006 TO SEPTEMBER 2010
SUBUNIT "D" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX036 FIGURE 3.36 APR 08/2011

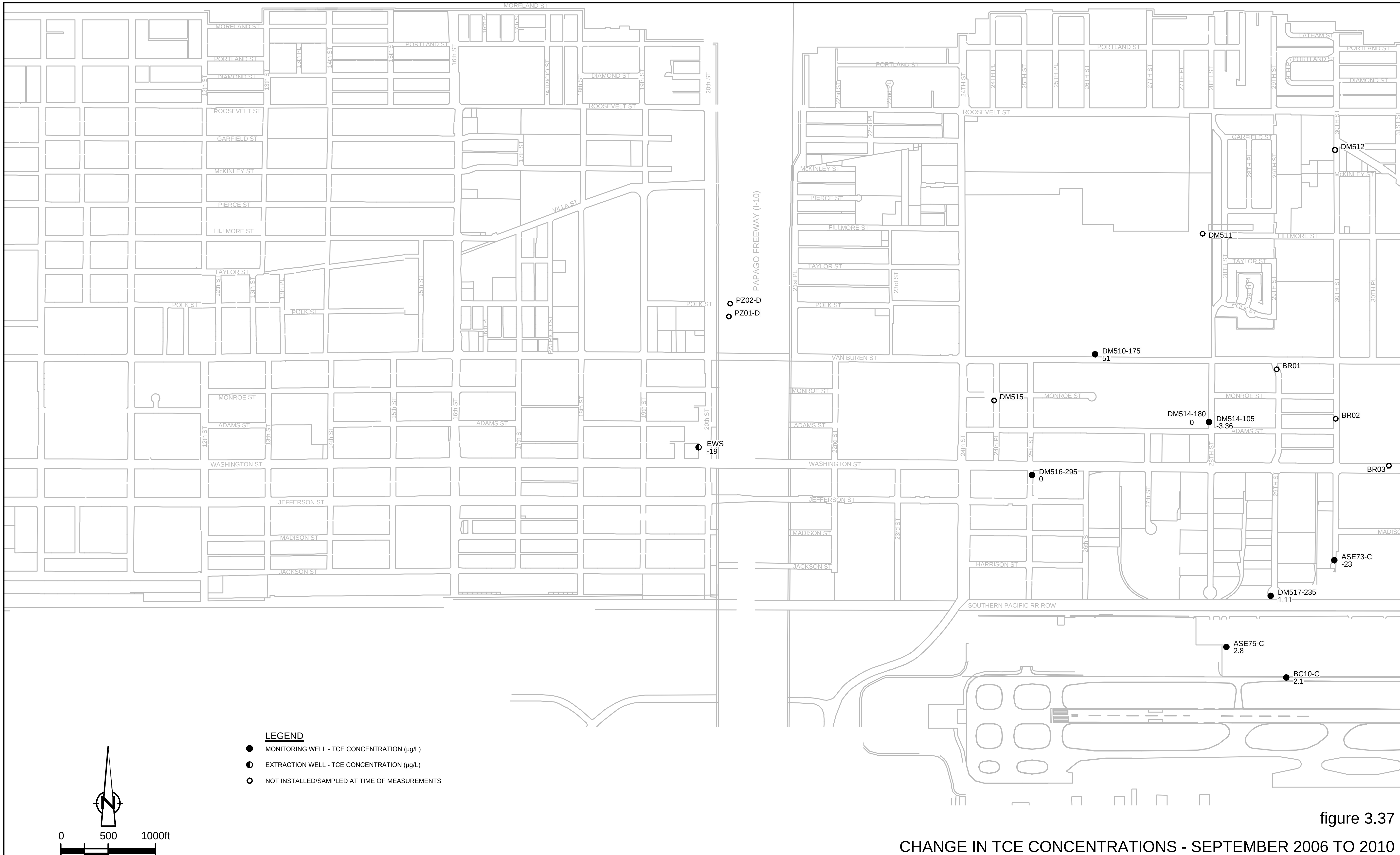


figure 3.37

CHANGE IN TCE CONCENTRATIONS - SEPTEMBER 2006 TO 2010
SUBUNIT "C" - OPERABLE UNIT 2 AREA
52nd STREET SUPERFUND SITE
Phoenix, Arizona

013932-151(026)GN-PX037 FIGURE 3.37 FEB 23/2011

TABLES

TABLE 3.1

OU2 AREA GES GROUNDWATER MONITOR WELL NETWORK
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

Well ID *Monitoring Wells/ Piezometers*	*Construction Type*	*Location*	*Monitoring*	
			Hydraulic	*Water Quality*
CRA01	C	I-10 and Roosevelt Street	X	X
EW06	C	20th Street and Madison Street	X	X
EW07	C	20th Street and Fillmore Street	X	X
EW19-D	C	12th Street and Monroe Street	X	
EW19-S	C	12th Street and Monroe Street	X	
EW21	C	12th Street and Fillmore Street	X	
EW22-D	C	15th Street and Polk Street	X	X
EW22-S	C	15th Street and Polk Street	X	X
EWSPZ1	C	20th Street north of Washington Street	X	
NW01	C	24th Street and Roosevelt Street	X	X
NW02	C	Between 19th and 20th Streets on Polk Street	X	X
NW03	C	Between 19th and 20th Streets on Monroe Street	X	X
NW04-S & D	C	Patricio Street, between Polk and Van Buren Streets	X	X
NW05-S	C	19th Street, between Van Buren and Polk Streets	X	X
NW06-S & D	C	19th Street, between Adams and Washington Streets	X	X
NW07-S, M & D	C	18th Street, between Madison and Jefferson Streets	X	X
NW08 - Salt River Gravels (S)	C	20th Street and Adams Street	X	X
NW08 - Basin Fill (M & D)	C	20th Street and Adams Street	X	X
NW09-D, D2 & M	C	20th Street, south of UPRR track	X	X
NW10-D	C	Sky Harbor Circle and 20th Street	X	X
NW11-M & D	C	20th Street and Madison Street	X	X
NW12-D	C	Villa Street and 20th Street	X	X
NW13-M & D	N	South of UPRR track and west of 19th Street	X	X
NW14-M & D	N	19th Street and Jackson Street	X	X
NW15-S	C	Jackson Street east of 22nd Street	X	
NW16-M & D	N	20th Street south of Washington Street	X	
NW17-S	C	Monroe Street west of 19th Street	X	X
NW18-S & M	C	Adams Street east of 18th Street	X	X
NW19-M&D	C	Harrison Street and 24th Street	X	X
OU312-M & D	C	15th Street and Adams Street	X	
OU313-M & D	C	15th Street and Polk Street	X	
OU314-M & D	C	McKinley Street and 16th Street	X	
PZ01-S & D	N	I-10 and Polk Street	X	
PZ02-S & D	N	I-10 and Polk Street	X	
TEW01	C	I-10 and Polk Street	X	

Notes:
S = Shallow
D = Deep
M = Middle
C = Conventional Well
N = Nested Well
UPRR = Union Pacific Railroad

TABLE 3.2

OU2 AREA GES GROUNDWATER MONITOR WELL SCREENED INTERVALS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

Well ID	*X Coordinate*	*Y Coordinate*	*Hydrostratigraphic Unit*	*ADEQ Hydrostratigraphic Subunit Screened*	*Reference Elevation (ft AMSL)*	*Ground Elevation (ft AMSL)*	*Screen Top Depth (ft bgs)*	*Screen Bottom Depth (ft bgs)*	*Screen Top Elevation (ft AMSL)*	*Screen Bottom Elevation (ft AMSL)*
OU2 GES Network Wells										
CRA01	463,136.23	894,253.99	SRG	A	1,106.43	1,107.29	105.5	125.50	1,000.93	980.93
EW06	463,030.97	889,882.84	SRG	A	1,097.75	1,097.75	61.0	111.00	1,036.75	986.75
EW07	463,123.11	893,133.29	SRG	A	1,104.96	1,105.20	78.0	128.00	1,026.96	976.96
EW19-D [4]	457,697.83	891,405.06	BF	D	1,087.48	1,087.85	247.0	267.00	840.48	820.48
EW19-S [4]	457,678.87	891,405.37	SRG	A	1,087.42	1,087.74	57.0	107.00	1,030.42	980.42
EW21 [4]	457,761.90	893,019.02	SRG	A	1,094.11	1,094.80	58.0	108.00	1,036.11	986.11
EW22-D	459,655.30	892,217.60	BF	D	1,095.75	1,096.33	407.0	427.00	688.75	668.75
EW22-S	459,644.28	892,218.24	SRG	A	1,095.72	1,096.39	58.0	108.00	1,037.72	987.72
EWM	463,149.81	891,836.24	SRG/BF	A/B/D	1,103.61	NI	86.0	206.00	1,017.61	897.61
EWN	463,150.06	892,478.65	SRG/BF	A/B/D	1,110.78	NI	100.0	220.00	1,010.78	890.78
EWS	462,804.97	890,786.77	SRG/BF	A/B/C	1,100.37	NI	94.0	194.00	1,006.37	906.37
EWSPZ1	462,940.00	890,712.00	SRG/BF	A/B/D	1,098.26	NI	118.0	208.00	980.26	890.26
NW01	465,406.43	894,322.64	SRG	A	1,112.22	1,112.22	90.0	110.00	1,022.22	1,002.22
NW02	462,610.64	892,289.91	SRG	B	1,101.83	1,101.83	173.0	193.00	928.83	908.83
NW03	462,590.35	891,405.62	SRG	A	1096.92	1,097.16	120.0	140.00	976.92	956.92
NW04-D	461,225.33	892,235.10	SRG	B	1098.93	1,100.39	183.0	203.00	915.93	895.93
NW04-S	461,225.30	892,231.81	SRG	A	1098.86	1,100.37	90.0	130.00	1,008.86	968.86
NW05-S	462,214.74	891,833.81	SRG	A	1098.84	1,100.37	88.0	128.00	1,010.84	970.84
NW06-D	462,238.65	890,968.88	BF	B	1095.53	1,097.30	181.5	201.50	914.03	894.03
NW06-S	462,239.01	890,971.81	SRG	A	1095.49	1,097.29	89.5	129.50	1,005.99	965.99
NW07-D	461,546.77	889,962.89	BF	D	1094.03	1,094.45	215.0	235.00	879.03	859.03
NW07-M	461,546.79	889,956.83	BF	B	1093.89	1,094.40	180.0	200.00	913.89	893.89
NW07-S	461,546.74	889,966.35	SRG	A	1094.12	1,094.44	90.0	130.00	1,004.12	964.12
NW08-D	463,071.52	891,034.69	BF	D	1098.68	1,099.02	224.0	244.00	874.68	854.68
NW08-M	463,075.33	891,037.96	BF	B	1097.55	1,098.94	175.0	195.00	922.55	902.55
NW08-S	463,071.95	891,042.29	SRG	A	1097.39	1,098.80	100.0	150.00	997.39	947.39
NW09-D	463,002.21	889,027.40	BF	D	1,099.58	1,099.84	210.0	230.00	889.58	869.58
NW09-D2	462,997.99	889,026.62	BF	D	1,099.30	1,099.87	240.0	260.00	859.30	839.30
NW09-M	462,996.54	889,032.87	BF	B	1,099.42	1,099.92	170.0	190.00	929.42	909.42
NW10-D	463,012.51	888,143.23	BF	D	1,098.91	1,099.47	210.0	230.00	888.91	868.91
NW11-D	463,035.91	889,880.93	BF	D	1,097.69	1,098.07	210.0	230.00	887.69	867.69
NW11-M	463,028.37	889,884.51	SRG/BF	B	1,097.59	1,098.14	173.0	193.00	924.59	904.59
NW12-D	462,818.29	893,558.17	BF	D	1,104.23	1,104.55	225.0	245.00	879.23	859.23
NW13-D	461,903.18	889,018.75	BF	D	1,096.61	1,096.93	215.0	235.00	881.61	861.61
NW13-M	461,903.43	889,018.53	BF	B	1,096.67	1,096.93	175.0	195.00	921.67	901.67
NW14-D	462,203.48	889,564.00	BF	D	1,096.12	1,096.35	215.0	235.00	881.12	861.12
NW14-M	462,203.25	889,563.85	BF	B	1,096.11	1,096.35	175.0	195.00	921.11	901.11
NW15-S	463,755.88	889,597.93	Colluvium	NA	1,098.96	1,099.31	84.0	104.00	1,014.96	994.96
NW16-D	462,882.12	890,437.08	BF	D	1,097.96	1,098.30	220.0	230.00	877.96	867.96
NW16-M	462,882.12	890,437.08	BF	B	1,097.92	1,098.30	155.0	175.00	942.92	922.92
NW17-S	461,993.75	891,409.94	Colluvium	NA	1,096.75	1,097.00	130.0	145.00	966.75	951.75
NW18-M	461,857.01	891,048.77	Colluvium	NA	1,094.92	1,095.27	170.0	190.00	924.92	904.92
NW18-S	461,850.21	891,048.98	SRG	A	1,094.78	1,095.26	90.0	130.00	1,004.78	964.78
NW19-D	463,938.05	889,006.25	BF	D	1,100.50	1,101.06	205.0	220.00	895.50	880.50
NW19-M	463,943.91	889,005.87	BF	B	1,100.69	1,101.28	165.0	185.00	935.69	915.69
OU312-D [4]	459,599.15	890,776.43	BF	D	1,090.77	NI	245.6	265.60	845.17	825.17
OU312-M [4]	459,599.97	890,700.12	SRG	B	1,090.79	NI	146.7	166.70	944.09	924.09
OU313-D [4]	459,546.09	892,217.30	BF	D	1,095.71	NI	224.7	244.70	871.01	851.01
OU313-M [4]	459,536.02	892,217.15	SRG	B	1,095.75	NI	154.7	174.70	941.05	921.05
OU314-D [4]	460,195.17	893,851.88	BF	D	1,099.14	NI	231.2	251.20	867.94	847.94
OU314-M [4]	460,183.85	893,673.11	SRG	B	1,099.05	NI	145.7	165.70	953.35	933.35
PZ01-D	463,124.48	892,169.75	BR	C	1,102.69	1,102.46	217.0	237.00	885.69	865.69
PZ01-S	463,124.48	892,169.75	SRG	A	1,102.69	1,102.46	99.0	119.00	1,003.69	983.69
PZ02-D	463,138.84	892,306.08	BR	C	1,107.95	1,108.25	245.0	265.00	862.95	842.95
PZ02-S	463,138.84	892,306.08	SRG	A	1,107.95	1,108.25	120.0	140.00	987.95	967.95
TEW01	463,111.30	892,203.14	SRG	A	1,103.56	1,103.85	100.0	145.00	1,003.56	958.56

TABLE 3.2

OU2 AREA GES GROUNDWATER MONITOR WELL SCREENED INTERVALS
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

Well ID	*X Coordinate*	*Y Coordinate*	*Hydrostratigraphic Unit*	*ADEQ Hydrostratigraphic Subunit Screened*	*Reference Elevation (ft AMSL)*	*Ground Elevation (ft AMSL)*	*Screen Top Depth (ft bgs)*	*Screen Bottom Depth (ft bgs)*	*Screen Top Elevation (ft AMSL)*	*Screen Bottom Elevation (ft AMSL)*
OU2 GES Supplemental Wells										
AS02 (2)	463,059.52	888,148.52	SRG	A	1099.75	1,098.90	50.0	90.00	1,049.75	1,009.75
ASE-28A (2)	467,463.76	888,923.82	SRG	A	1,108.20	NI	68.0	88.00	1,040.20	1,020.20
ASE76-A (2)	466,354.46	889,252.70	SRG	A	1,105.42	NI	80.0	130.00	1,025.42	975.42
ASE76-B (2)	466,346.35	889,253.15	BF	B/D	1,105.34	NI	180.0	230.00	925.34	875.34
ASE77-A (2)	464,925.48	890,548.28	SRG	A	1,101.86	NI	85.0	115.00	1,016.86	986.86
ASE78-B (2)	464,216.08	889,597.38	BF	B	1,099.97	NI	156.0	186.00	943.97	913.97
ASE86-A (2)	466,982.30	890,992.82	SRG	A	1,106.07	NI	86.0	126.00	1,020.07	980.07
ASE88-B (2)	464,805.79	888,313.43	BF	B/D	1,103.08	NI	175.0	215.00	928.08	888.08
BC11-A (2)	467,741.10	889,919.54	BF	D	1,111.21	NI	225.0	240.00	886.21	871.21
BC11-B (2)	467,756.54	889,918.78	BF	B	1,111.25	NI	135.0	160.00	976.25	951.25
DM515-115 (3)	465,925.20	891,282.80	SRG	A	1,103.61	NI	115.0	NI	988.61	NI
DM515-210 (3)	465,925.20	891,282.80	BF	D	1,103.61	NI	210.0	NI	893.61	NI
DM515-265 (3)	465,925.20	891,282.80	BR	C	1,103.61	NI	265.0	NI	838.61	NI
EW13-118 (4)	460,187.58	889,593.26	SRG	A	1,092.71	NI	114.5	119.50	980.11	975.11
EW13-168 (4)	460,187.58	889,593.26	SRG	B	1,092.71	NI	164.5	169.50	930.11	925.11
EW13-228 (4)	460,187.58	889,593.26	BF	D	1,092.71	NI	224.5	229.50	870.11	865.11
EW13-268 (4)	460,187.58	889,593.26	BF	D	1,092.71	NI	264.5	269.50	830.11	825.11
PHXA01 (5)	665,526.56 (1)	886,498.06	SRG	A	1,102.77	NI	50.0	140.00	1,052.77	962.77
PHXA02 (5)	666,482.86 (1)	886,756.23	SRG	A	1,105.51	NI	50.0	140.00	1,055.51	965.51
PHXA03 (5)	666,705.65 (1)	888,624.12	SRG	A	1,106.17	NI	53.0	106.50	1,053.17	999.67
PHXA04 (5)	665,488.25 (1)	889,100.53	SRG	A	1,104.58	NI	50.0	140.00	1,054.58	964.58
PHXA05 (5)	665,461.71 (1)	888,709.97	SRG	A	1,104.53	NI	50.0	140.00	1,054.53	964.53
PHXA06 (5)	464,128.81	889,796.69	SRG	A	1,100.41	NI	50.0	140.00	1,050.41	960.41
Wells Dry - Removed from Network in 2003										
FDMW07	466,298.03	891,504.25	SRG	A	1,104.57	1,104.57	55.0	85.00	1,049.57	1,019.57
MW01 (Hertz)	464,611.89	888,658.59	SRG	A	1,101.33	1,101.33	64.0	89.00	1,037.33	1,012.33
MW05 (Shurgin)	460,018.76	890,674.99	SRG	A	1,091.80	1,091.80	52.0	92.00	1,039.80	999.80
Well Removed from Network in 2008 (access issues - on private property)										
EW23	460,419.10	895,405.49	SRG	A	1,101.51	1,101.84	57.0	107.00	1,044.51	994.51
Wells - Removed from Network in 2010 - Honeywell discontinued monitoring with ADEQ approval										
ASE36-A (6)	465,671.30	887,215.73	SRG	A	1102.58	NI	69.0	99.0	1033.58	1003.58
ASE77-B (6)	464,927.37	890,548.37	BF	B/D	1101.76	NI	180.0	230.0	921.76	871.76

Notes:
SRG - Salt River Gravels
BF - Basin Fill Deposits
BR - Bedrock
ft AMSL - feet Above Mean Sea Level
ft bgs - feet below ground surface
NI - No Information
NA - Not Applicable
(1) PHX wells is different survey datum
(2) Quality data collected by CH2MHILL on behalf of Honeywell
(3) Quality data collected by Clear Creek Associates on behalf of Freescale
(4) Quality data collected by Shaw Environmental Inc. on behalf of EPA
(5) Sampled by Arcadis

ADEQ Hydrostratigraphic Unit Designation
A - Salt River Gravels
B - Interbedded sands and silt/clays
C - Bedrock
D - Interbedded sands and silt/clays with fine grained silt/clay marker bed at top of unit

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	*September 2001*	*September 2006*	*September 2010*	*September 2001 to September 2010*	*September 2006 to September 2010*
A Wells					
AS02 [2]	1,019.08	Dry	1,017.62	-1.5	--
ASE19-A [2]	1,054.76	1,053.19	1,057.66	2.9	4.5
ASE20-A [2]	--	1,051.69	--	--	--
ASE22-A [2]	1,034.64	1,027.07	1,038.64	4.0	11.6
ASE26-A [2]	1,032.07	1,023.60	1,035.02	2.9	11.4
ASE27-A[2]	1,033.33	--	1,036.59	3.3	--
ASE28-A [2]	1,028.36	Dry	1,029.01	0.7	--
ASE30-A [2]	1,031.05	Dry	1,033.08	2.0	--
ASE31-A [2]	1,030.47	Dry	1,029.86	-0.6	--
ASE32-A [2]	1,032.24	Dry	1,034.36	2.1	--
ASE33-A [2]	1,032.83	1,023.70	1,035.01	2.2	11.3
ASE34-A [2]	--	1,025.49	1,037.54	--	12.1
ASE34-B [2]	--	1,025.30	1,037.06	--	11.8
ASE35-A [2]	1,031.26	1,022.48	1,034.72	3.5	12.2
ASE36-A [2]	1,024.61	1,014.22	1,025.45	0.8	11.2
ASE41-A [2]	--	1,050.59	--	--	--
ASE46-A [2]	--	1,049.45	--	--	--
ASE51-A [2]	--	1,054.05	--	--	--
ASE52-A [2]	--	1,056.07	1,060.48	--	4.4
ASE53-A [2]	--	1,056.59	--	--	--
ASE54-A [2]	--	1,051.35	1,055.60	--	4.3
ASE55-A [2]	--	1,046.73	1,052.87	--	6.1
ASE56-A [2]	--	1,050.64	--	--	--
ASE57-A [2]	--	1,051.79	--	--	--
ASE58-A [2]	--	1,049.58	1,054.49	--	4.9
ASE59-A [2]	--	1,056.50	--	--	--
ASE62-A [2]	--	1,047.39	1,053.22	--	5.8
ASE64-A [2]	--	1,049.41	1,058.70	--	9.3
ASE65-A [2]	--	1,035.16	1,045.88	--	10.7
ASE66-A [2]	--	1,052.46	--	--	--
ASE68-A [2]	--	1,051.93	1,056.96	--	5.0
ASE69-A [2]	--	1,054.16	1,057.08	--	2.9
ASE70-A [2]	--	1,050.72	1,053.63	--	2.9
ASE71-A [2]	--	1,023.95	--	--	--
ASE72-A [2]	--	1,022.86	1,034.15	--	11.3
ASE73-A [2]	--	1,023.14	1,034.61	--	11.5
ASE75-A [2]	--	1,020.90	1,032.06	--	11.2
ASE76-A [2]	--	1,015.48	1,025.97	--	10.5
ASE77-A [2]	--	1,011.35	1,020.92	--	9.6
ASE81-A [2]	--	1,051.43	1,054.71	--	3.3
ASE83-A [2]	--	1,027.72	1,039.33	--	11.6
ASE83-B [2]	--	1,027.41	1,039.00	--	11.6
ASE84-A [2]	--	1,031.27	1,043.01	--	11.7

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	*September 2001*	*September 2006*	*September 2010*	*September 2001 to September 2010*	*September 2006 to September 2010*
A Wells (Cont'd)					
ASE85-A [2]	--	1,020.26	1,030.65	--	10.4
ASE86-A [2]	--	1,018.25	1,027.91	--	9.7
ASE87-A [2]	--	1,025.81	1,037.31	--	11.5
ASE89-A [2]	--	1,048.08	1,057.36	--	9.3
ASE90-A [2]	--	1,047.05	1,056.05	--	9.0
ASE91-A [2]	--	1,048.08	1,055.56	--	7.5
ASE92-A[2]	--	1,048.48	1,056.20	--	7.7
ASE95-A [2]	--	1,037.00	1,047.74	--	10.7
ASE96-A [2]	--	1,046.20	1,055.76	--	9.6
ASE97-A [2]	--	1,036.76	--	--	--
ASE98-A [2]	--	1,041.39	1,052.33	--	10.9
ASE99-A [2]	--	1,043.34	1,054.00	--	10.7
ASE100-A [2]	--	1,037.89	1,049.03	--	11.1
ASE101-A [2]	--	1,041.34	1,052.28	--	10.9
ASE102-A [2]	--	1,044.79	1,055.07	--	10.3
ASE103-A [2]	--	1,036.07	1,047.27	--	11.2
ASE105-A [2]	--	1,048.17	1,058.49	--	10.3
ASE106-A [2]	--	1,046.11	1,056.06	--	10.0
ASE107-A [2]	--	1,047.40	1,057.53	--	10.1
ASE108-A [2]	--	1,047.13	1,054.06	--	6.9
ASE109-A [2]	--	1,048.68	1,058.67	--	10.0
ASE110-A [2]	--	1,047.09	1,057.24	--	10.2
ASE111-A [2]	--	1,054.77	1,061.63	--	6.9
ASE112-A [2]	--	1,048.18	1,058.94	--	10.8
ASE113-A [2]	--	1,048.70	1,059.10	--	10.4
ASE114-A [2]	--	1,048.11	1,058.52	--	10.4
BC08-B [2]	1,048.21	1,046.66	--	--	--
BC10-A [2]	1,031.59	1,023.00	1,034.40	2.8	11.4
BC12 [2]	1,046.50	1,045.08	1,050.74	4.2	5.7
BC16 [2]	1,054.81	1,050.14	--	--	--
BC18 [2]	1,039.18	Dry	1,045.36	6.2	--
BC03 [2]	1,054.90	1,051.19	1,055.02	0.1	3.8
BC09 [2]	1,034.25	1,026.15	1,037.52	3.3	11.4
BR05 [3]	--	1,051.07	1,054.89	--	3.8
CRA01	1,024.48	1,012.15	1,017.26	-7.2	5.1
DM122-A [3]	1,085.24	1,084.45	Dry	--	--
DM507-084 [3]	1,056.88	1,052.25	1,054.97	-1.9	2.7
DM510-070 [3]	--	Dry	--	--	--
DM510-110 [3]	1,031.88	1,020.96	1,029.24	-2.6	8.3
DM511-065 [3]	1,046.57	Dry	--	--	--
DM511-110 [3]	1,045.18	1,037.38	1,041.30	-3.9	3.9
DM512-060 [3]	--	--	Dry	--	--
DM512-090 [3]	--	1,046.17	1,048.23	--	2.1

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	*September 2001*	*September 2006*	*September 2010*	*September 2001 to September 2010*	*September 2006 to September 2010*
A Wells (Cont'd)					
DM513-070 [3]	1,058.33	Dry	Dry	--	--
DM515-065 [3]	--	Dry	--	--	--
DM515-115 [3]	1,026.80	1,015.31	1,024.50	-2.3	9.2
DM516-065 [3]	1,040.78	--	--	--	--
DM517-070 [3]	--	--	--	--	--
DM517-125	1,031.43 [3]	1,022.10 [7]	1,033.63	2.2	11.5
EW03 [3]	1,053.25	1,048.01	1,050.43	-2.8	2.4
EW06	1,019.41	1,006.30	1,015.73	-3.7	9.4
EW07	1,023.95	1,007.20	1,014.66	-9.3	7.5
EW12-093 [4]	1,020.38	--	--	--	--
EW12-128 [4]	1,020.39	--	--	--	--
EW13-118 [4]	1,015.81	1,002.81	1,011.57	-4.2	8.8
EW19-S	1,009.25	996.91	1,004.15	-5.1	7.2
EW20 [4]	1,006.42	994.10	1,001.01	-5.4	6.9
EW21	1,011.25	998.57	1,004.97	-6.3	6.4
EW22-S	1,013.88	1,000.98	1,007.97	-5.9	7.0
EW23	1,019.95	1,007.81	--	--	--
EW24-R [4]	--	--	--	--	--
FDMW07	1,029.14	--	--	--	--
GHMW11 [4]	--	--	991.65	--	--
NW01	1,035.70	1,026.63	1,030.63	-5.1	4.0
NW03	1,020.18	1,004.23	1,012.44	-7.7	8.2
NW04-S	--	1,004.71	1,011.01	--	6.3
NW05-S	--	1,004.98	1,011.55	--	6.6
NW06-S	--	1,005.10	1,013.57	--	8.5
NW07-S	--	1,004.02	1,012.81	--	8.8
NW08-S	--	1,006.35	1,014.14	--	7.8
NW18-S	--	--	1,012.02	--	--
OU304-S [4]	--	1,000.34	1,005.49	--	5.1
OU305-S [4]	--	--	--	--	--
OU305-SR [4]	--	991.10	997.64	--	6.5
OU307-S [4]	--	993.56	998.69	--	5.1
OU308-S [4]	--	982.35	988.08	--	5.7
OU309-S [4]	--	984.40	989.53	--	5.1
OU311-S [4]	--	984.72	992.31	--	7.6
PHXA03 [5]	--	1,016.90	--	--	--
PHXA04 [5]	--	1,013.70	--	--	--
PHXA05 [5]	--	1,013.20	--	--	--
PHXA06	--	1,010.01	1,019.95	--	9.9
PL101-A [2]	1,056.07	1,056.74	--	--	--
PL102-A [2]	1,059.59	1,058.63	1,061.73	2.1	3.1
PL103-A [2]	1,054.00	1,050.47	1,054.85	0.8	4.4
PL104-A [2]	Dry	Dry	1,040.07	--	--

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	***September 2001***	***September 2006***	***September 2010***	***September 2001 to September 2010***	***September 2006 to September 2010***
A Wells (Cont'd)					
PL105-A [2]	1,049.37	1,047.37	1,054.82	5.5	7.5
PL201-A [2]	1,051.78	1,048.58	1,053.86	2.1	5.3
PL202-C [2]	1,031.87	1,022.89	1,034.22	2.4	11.3
PL202-S [2]	1,032.11	Dry	1,034.46	2.4	--
PL2101 [2]	1,054.98	1,051.67	1,056.09	1.1	4.4
PL2102 [2]	1,055.12	1,051.58	1,055.55	0.4	4.0
PZ01-A [2]	1,055.39	1,050.65	--	--	--
PZ01-S	1,020.35	1,003.46	1,011.53	-8.8	8.1
PZ02-S	1,020.15	1,003.31	1,011.37	-8.8	8.1
SCMW-1D [4]	--	1,001.36	1,004.94	--	3.6
SCMW7 [4]	--	--	--	--	--
SMW05 [4]	--	--	--	--	--
SMW07 [4]	--	--	--	--	--
TEW01	1,020.21	1,003.36	1,011.45	-8.8	8.1
TT01 [4]	--	--	--	--	--
TT02 [4]	1,009.06	997.02	--	--	--
TT05 [4]	1,014.24	--	--	--	--
A/B Wells					
ASE37-A [2]	1,056.12	1,056.27	1,061.52	5.4	5.3
ASE38-A [2]	--	1,056.65	1,061.75	--	5.1
ASE39-A [2]	1,056.14	1,055.90	--	--	--
ASE60-A [2]	--	1,057.49	1,061.96	--	4.5
ASE61-A[2]	--	1,057.95	1,062.47	--	4.5
ASE63-A [2]	--	1,054.62	1,060.42	--	5.8
ASE67-A [2]	--	1,055.91	1,060.87	--	5.0
BC07-A [2]	1,053.29	1,055.23	1,061.21	7.9	6.0
DM518-OB1 [3]	1,029.72	1,018.92	1,028.93	-0.8	10.0
EWS	1,020.07 [1]	996.49	1,003.19	-16.9	6.7
EWSPZ1	--	1,005.40	1,014.27	--	8.9
EWM	1,022.53 [6]	992.56	1,003.26	-19.3	10.7
EWN	1,022.98 [6]	996.98	999.33	-23.7	2.4
B Wells					
ASE19-B [2]	1,055.75	--	1,057.53	1.8	--
ASE20-B [2]	1,054.68	1,051.77	1,056.47	1.8	4.7
ASE22-B [2]	1,034.09	1,026.47	1,038.00	3.9	11.5
ASE23-B [2]	1,031.52	1,022.54	1,033.84	2.3	11.3
ASE40-B [2]	1,051.38	1,049.32	1,056.02	4.6	6.7
ASE41-B [2]	1,052.99	1,050.67	1,056.56	3.6	5.9
ASE43-B [2]	1,054.21	1,051.38	1,056.27	2.1	4.9
ASE44-B [2]	1,055.27	1,052.28	1,056.61	1.3	4.3
ASE45-B [2]	1,054.83	1,052.14	1,057.13	2.3	5.0

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	*September 2001*	*September 2006*	*September 2010*	*September 2001 to September 2010*	*September 2006 to September 2010*
B Wells (Cont'd)					
ASE46-B [2]	1,051.92	1,049.17	1,054.82	2.9	5.6
ASE47-B [2]	1,031.49	1,022.68	1,034.01	2.5	11.3
ASE48-B [2]	1,055.85	1,052.98	1,057.19	1.3	4.2
ASE49-B [2]	1,056.06	1,053.64	1,058.04	2.0	4.4
ASE71-B [2]	--	1,023.98	--	--	--
ASE72-B [2]	--	1,022.86	1,034.16	--	11.3
ASE73-B [2]	--	1,023.20	1,034.60	--	11.4
ASE75-B [2]	--	1,020.35	1,031.46	--	11.1
ASE78-B [2]	--	1,009.77	1,019.65	--	9.9
ASE85-B [2]	--	1,020.16	1,030.56	--	10.4
BC01 [2]	1,058.84	1,057.83	1,061.30	2.5	3.5
BC10-B [2]	1,031.18	1,022.46	1,033.86	2.7	11.4
BC11-B [2]	1,029.20	1,018.47	1,029.11	-0.1	10.6
BC13 [2]	1,077.30	1,083.58	1,074.51	-2.8	-9.1
BC14 [2]	1,080.02	1,084.28	1,073.73	-6.3	-10.6
BC15 [2]	1,059.12	1,056.18	1,058.93	-0.2	2.8
BC17 [2]	1,056.22	1,052.17	1,055.27	-1.0	3.1
BC02 [2]	1,056.08	1,056.53	1,061.79	5.7	5.3
BC04 [2]	1,054.67	1,051.26	1,055.54	0.9	4.3
BC06 [2]	1,052.23	1,049.07	1,054.16	1.9	5.1
BC08-A [2]	1,048.31	1,046.86	1,054.72	6.4	7.9
DM118 [3]	1,125.78	1,119.68	1,118.43	-7.3	-1.3
DM119-072 [3]	--	1,107.26	1,105.96	--	-1.3
DM119-098 [3]	--	1,107.38	1,106.01	--	-1.4
DM120 [3]	1,098.63	1,093.67	1,091.48	-7.2	-2.2
DM122-B [3]	1,085.21	1,085.58	1,077.49	-7.7	-8.1
DM123-056 [3]	--	--	--	--	--
DM501-147 [3]	1,072.90	1,069.37	1,067.96	-4.9	-1.4
DM501-202 [3]	1,072.81	1,069.18	1,067.77	-5.0	-1.4
DM502-079 [3]	1,093.58	1,089.83	1,086.25	-7.3	-3.6
DM502-119 [3]	1,093.60	1,089.88	1,086.27	-7.3	-3.6
DM503 [3]	1,096.47	1,094.76	1,092.90	-3.6	-1.9
DM504 [3]	1,076.67	1,074.17	1,071.05	-5.6	-3.1
DM505 [3]	1,068.69	1,063.28	1,063.34	-5.4	0.1
DM506-100 [3]	1,064.19	1,062.41	1,062.34	-1.9	-0.1
DM506-185 [3]	1,064.23	1,062.55	1,062.33	-1.9	-0.2
DM507-188 [3]	1,057.02	1,052.21	1,055.02	-2.0	2.8
DM508 [3]	1,065.54	1,065.92	1,065.82	0.3	-0.1
DM509 [3]	1,052.86	1,047.59	1,049.98	-2.9	2.4
DM512-155 [3]	--	1,046.20	1,048.23	--	2.0
DM513-145 [3]	1,058.22	1,053.23	1,054.78	-3.4	1.5
DM513-195 [3]	1,058.29	1,053.76	1,055.13	-3.2	1.4
DM516-150	1,027.92 [3]	1,016.32 [7]	1,025.97	-2.0	9.6

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	***September 2001***	***September 2006***	***September 2010***	***September 2001 to September 2010***	***September 2006 to September 2010***
B Wells (Cont'd)					
DM517-185	1,031.37 [3]	1,022.06 [7]	1,033.53	2.2	11.5
EW02 [3]	1,075.59	1,074.37	1,071.37	-4.2	-3.0
EW12-180 [4]	1,020.00	--	--	--	--
NW02	1,019.98	1,004.13	1,011.78	-8.2	7.6
NW04-D	--	1,004.92	1,011.08	--	6.2
NW06-D	--	1,005.12	1,013.87	--	8.8
NW07-M	--	1,003.97	1,012.74	--	8.8
NW08-M	--	1,006.23	1,013.62	--	7.4
NW09-M	--	1,006.87	1,016.54	--	9.7
NW11-M	--	1,006.15	1,015.57	--	9.4
NW13-M	--	1,004.99	1,014.42	--	9.4
NW14-M	--	1,005.23	1,014.30	--	9.1
NW16-M	--	--	1,014.63	--	--
NW19-M	--	--	1,019.53	--	--
OU301-M [4]	--	997.77	1,004.27	--	6.5
OU302-M [4]	--	997.20	1,004.48	--	7.3
OU305-M [4]	--	--	--	--	--
OU305-M2 [4]	--	990.85	997.46	--	6.6
OU305-MR [4]	--	990.99	997.56	--	6.6
OU306-M [4]	--	989.37	996.54	--	7.2
OU307-M2 [4]	--	993.82	998.96	--	5.1
OU308-M2 [4]	--	982.97	988.88	--	5.9
OU309-M2 [4]	--	984.66	989.72	--	5.1
OU310-M [4]	--	978.53	985.12	--	6.6
OU310-M2 [4]	--	978.79	985.42	--	6.6
OU311-M [4]	--	984.61	992.20	--	7.6
OU311-M2 [4]	--	984.58	991.93	--	7.3
OU312-M	--	1,000.79	1,008.68	--	7.9
OU313-M	--	1,001.03	1,008.15	--	7.1
OU314-M	--	1,003.72	1,009.80	--	6.1
PL202-N [2]	1,031.53	1,022.36	1,033.63	2.1	11.3
PL2103 [2]	1,057.57	1,054.26	1,057.33	-0.2	3.1
PZ01-B [2]	1,055.37	1,050.66	--	--	--
B/D Wells					
ASE76-B [2]	--	1,015.22	1,025.80	--	10.6
ASE77-B [2]	--	1,010.64	1,020.15	--	9.5
ASE88-B [2]	--	1,011.36	1,021.83	--	10.5
D Wells					
BC11-A [2]	1,029.76	1,019.52	1,030.24	0.5	10.7
DM515-210	1,027.60	1,015.66	1,024.81	-2.8	9.1
DM516-210	1,027.91 [3]	1,016.32 [7]	1,026.02	-1.9	9.7

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	*September 2001*	*September 2006*	*September 2010*	*September 2001 to September 2010*	*September 2006 to September 2010*
D Wells (Cont'd)					
EW12-227 [4]	1,020.03	--	--	--	--
EW12-239 [4]	1,020.14	--	--	--	--
EW13-228 [4]	1,016.90	1,005.15	1,013.57	-3.3	8.4
EW13-268 [4]	1,016.95	1,005.79	1,014.14	-2.8	8.4
EW13-300 [4]	1,017.12	--	--	--	--
EW19-D	1,012.95	1,003.68	1,010.86	-2.1	7.2
EW22-D	1,017.58	1,008.38	1,014.97	-2.6	6.6
NW07-D	--	1,004.44	1,012.85	--	8.4
NW08-D	--	1,007.92	1,014.99	--	7.1
NW09-D	--	1,006.53	1,016.29	--	9.8
NW09-D2	--	1,006.40	1,016.20	--	9.8
NW10-D	--	1,007.21	1,017.40	--	10.2
NW11-D	--	1,006.00	1,015.31	--	9.3
NW12-D	--	1,018.00	1,022.88	--	4.9
NW13-D	--	1,005.06	1,014.51	--	9.5
NW14-D	--	1,005.29	1,014.60	--	9.3
NW16-D	--	--	1,014.78	--	--
NW19-D	--	--	1,019.36	--	--
OU301-D [4]	--	1,005.80	1,012.25	--	6.5
OU305-D [4]	--	--	--	--	--
OU305-DR [4]	--	995.21	--	--	--
OU306-D [4]	--	992.37	999.93	--	7.6
OU308-D [4]	--	984.58	991.09	--	6.5
OU312-D	--	1,005.00	1,012.85	--	7.9
OU313-D	--	1,003.36	1,010.68	--	7.3
OU314-D	--	1,012.48	1,018.34	--	5.9
C Wells					
ASE19-C [2]	1,055.91	1,053.02	1,057.62	1.7	4.6
ASE20-C [2]	1,054.57	1,051.65	1,056.38	1.8	4.7
ASE21-C [2]	1,060.25	1,058.75	1,061.93	1.7	3.2
ASE22-C [2]	1,034.27	1,026.66	1,038.18	3.9	11.5
ASE24-C [2]	1,052.29	1,048.53	1,054.44	2.2	5.9
ASE25-C [2]	1,046.79	1,040.35	1,052.11	5.3	11.8
ASE29-A [2]	1,035.90	1,032.93	1,037.87	2.0	4.9
ASE42-C [2]	1,039.47	1,035.46	1,042.52	3.0	7.1
ASE43-C [2]	1,054.14	1,051.10	1,056.17	2.0	5.1
ASE50-C [2]	1,056.10	1,053.68	1,058.06	2.0	4.4
ASE73-C [2]	--	1,023.37	1,034.79	--	11.4
ASE75-C [2]	--	1,020.29	1,031.44	--	11.2
ASE79-C [2]	--	1,050.65	1,054.68	--	4.0
ASE82-C [2]	--	1,035.44	1,046.87	--	11.4
ASE83-C [2]	--	1,027.00	1,038.52	--	11.5

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	***September 2001***	***September 2006***	***September 2010***	***September 2001 to September 2010***	***September 2006 to September 2010***
C Wells (Cont'd)					
ASE84-C [2]	--	1,030.93	1,042.47	--	11.5
BC08-C [2]	--	1,047.00	1,055.80	--	8.8
BC10-C [2]	--	1,022.09	1,033.45	--	11.4
BR01 [3]	--	1,043.84	1,046.54	--	2.7
BR02 [3]	--	1,044.61	1,045.11	--	0.5
BR03 [3]	--	--	--	--	--
BR04 [3]	--	1,050.35	1,057.00	--	6.7
DM119-137 [3]	--	1,107.43	1,106.06	--	-1.4
DM119-204 [3]	--	1,109.33	1,109.53	--	0.2
DM119-244 [3]	--	1,111.54	1,110.57	--	-1.0
DM119-284 [3]	--	1,111.55	1,110.59	--	-1.0
DM123-085 [3]	1,095.64	1,096.05	--	--	--
DM123-135 [3]	1,095.78	1,096.42	--	--	--
DM123-195 [3]	1,095.59	1,096.29	--	--	--
DM123-250 [3]	1,095.45	1,096.24	--	--	--
DM123-285 [3]	1,095.31	1,096.16	--	--	--
DM501-267 [3]	1,073.10	1,069.97	1,068.19	-4.9	-1.8
DM501-331 [3]	1,074.12	1,071.19	1,069.09	-5.0	-2.1
DM501-387 [3]	1,075.38	1,072.72	1,070.14	-5.2	-2.6
DM502-161 [3]	1,094.63	1,091.19	1,087.33	-7.3	-3.9
DM502-240 [3]	1,094.94	1,091.63	1,087.41	-7.5	-4.2
DM502-335 [3]	1,095.01	1,091.99	1,087.77	-7.2	-4.2
DM506-240 [3]	1,065.07	1,062.55	1,063.09	-2.0	0.5
DM506-305 [3]	1,065.80	1,063.94	1,063.41	-2.4	-0.5
DM506-375 [3]	1,066.86	1,065.06	1,063.50	-3.4	-1.6
DM507-240 [3]	1,056.89	1,052.16	1,054.88	-2.0	2.7
DM507-280 [3]	1,056.83	1,052.06	1,054.83	-2.0	2.8
DM507-315 [3]	1,056.82	1,052.11	1,054.83	-2.0	2.7
DM510-175 [3]	1,031.87	1,021.22	1,029.24	-2.6	8.0
DM510-235 [3]	1,032.27	1,021.62	1,029.66	-2.6	8.0
DM510-290 [3]	1,032.35	1,021.94	1,032.63	0.3	10.7
DM511-165 [3]	1,045.25	1,037.47	1,041.46	-3.8	4.0
DM511-225 [3]	1,045.66	1,037.94	1,041.86	-3.8	3.9
DM511-290 [3]	1,045.61	1,037.91	1,041.80	-3.8	3.9
DM512-225 [3]	--	1,046.84	1,048.86	--	2.0
DM512-295 [3]	--	1,047.09	1,049.07	--	2.0
DM512-345 [3]	--	1,048.12	1,050.01	--	1.9
DM513-240 [3]	1,058.88	1,053.68	1,055.35	-3.5	1.7
DM513-280 [3]	1,058.65	1,053.60	1,055.05	-3.6	1.5
DM513-315 [3]	1,058.57	1,053.66	1,054.83	-3.7	1.2
DM514-105	1,030.69 [3]	1,020.18 [7]	1,030.20	-0.5	10.0
DM514-180	1,031.15 [3]	1,020.38 [7]	1,030.38	-0.8	10.0
DM514-240 [3]	1,031.11	--	1,030.53	-0.6	--

TABLE 3.3

GROUNDWATER ELEVATIONS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Groundwater Elevation (ft AMSL)			*Change in Groundwater Elevation (ft)*	
Well ID	***September 2001***	***September 2006***	***September 2010***	***September 2001 to September 2010***	***September 2006 to September 2010***
C Wells (Cont'd)					
DM514-295 [3]	1,031.11	--	1,030.66	-0.4	--
DM515-265 [3]	1,028.04	1,015.62	1,024.71	-3.3	9.1
DM515-320 [3]	1,026.87	1,015.71	1,024.89	-2.0	9.2
DM515-380 [3]	1,027.80	1,015.65	1,024.86	-2.9	9.2
DM516-295	1,028.02 [3]	1,016.26 [7]	1,025.99	-2.0	9.7
DM516-335 [3]	1,027.87	--	--	--	--
DM516-390 [3]	1,028.04	--	--	--	--
DM517-235	1,031.27 [3]	1,021.56 [7]	1,033.19	1.9	11.6
DM517-315 [3]	1,030.98	--	1,032.96	2.0	--
DM517-365 [3]	1,031.20	--	1,032.72	1.5	--
DM603-205 [3]	--	1,103.75	1,103.33	--	-0.4
DM605-170 [3]	--	1,099.53	1,098.67	--	-0.9
DM605-240 [3]	--	1,102.33	1,101.44	--	-0.9
DM605-290 [3]	--	1,102.40	1,101.51	--	-0.9
PL103-C [2]	--	1,049.95	1,054.40	--	4.5
PZ01-D	1,020.39	1,003.45	1,011.59	-8.8	8.1
PZ02-D	1,020.13	1,003.35	1,011.39	-8.7	8.0
Colluvium Wells					
NW15-S	--	--	1,018.80	--	--
NW17-S	--	--	1,012.06	--	--
NW18-M	--	--	1,012.06	--	--

Notes:
"--" = No data
ft = feet
ft AMSL = feet above mean sea level
A negative number indicates an increase in water level (e.g., - 6.71)
A positive number indicates a decrease in water level (e.g., 6.71)
[1] Water level measured 10/03/01
[2] Data collected by CH2MHILL/Hargis on behalf of Honeywell
[3] Data collected by Clear Creek Associates on behalf of Freescale
[4] Data collected by Shaw Environmental Inc. on behalf of EPA
[5] Data collected by Arcadis G&M Inc. on behalf of City of Phoenix
[6] Water level measured 07/09/01
[7] Data collected by LFR, Inc. on behalf of ADEQ

TABLE 3.4

VERTICAL AND HORIZONTAL HYDRAULIC GRADIENTS FOR 2001 AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

			Monitoring Date	*9/5/2001*		*3/11/2010*		*6/3-6/5/2010*		*9/1-9/24/2010*		*12/4/2010*	
Well ID	*Former Hydrostratigraphic Unit*	*NEW ADEQ Hydrostratigraphic Subunit Screened*	*Reference Elevation (ft AMSL)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*
ASE76-A	SRG	A	1,105.42	1,010.14 (1)	NA	--	NA	--	NA	1,025.97	NA	--	NA
AES76-B	BF	B/D	1,105.34	1,009.84 (1)	-3.0E-03	--	NA	--	NA	1,025.80	-1.7E-03	--	NA
ASE77-A	SRG	A	1,101.86	1,008.71 (1)	NA	1,015.01	NA	1,019.27	NA	1,020.92	NA	--	NA
ASE77-B	BF	B/D	1,101.76	1,008.09 (1)	-5.4E-03	1,014.33	-5.9E-03	1,018.77	-4.3E-03	1,020.15	-6.7E-03	--	NA
EW13-118	SRG	A	1,092.71	1,015.81	NA	1,008.07	NA	--	NA	1,011.57	NA	--	NA
EW13-168	SRG	B	1,092.71	1,015.74	-1.4E-03	1,007.73	-6.8E-03	--	NA	1,011.72	3.0E-03	--	NA
EW13-228	BF	D	1,092.71	1,016.90	1.9E-02	1,010.71	5.0E-02	--	NA	1,013.57	3.1E-02	--	NA
EW13-268	BF	D	1,092.71	1,016.95	1.3E-03	1,011.61	2.2E-02	--	NA	1,014.14	1.4E-02	--	NA
EW13-300	BF	D	1,092.71	1,017.12	5.3E-03	--	NA	--	NA	--	NA	--	NA
EW22-S	SRG	A	1,095.72	1,013.88	NA	1,004.42	NA	1,007.27	NA	1,007.97	NA	1,008.02	NA
EW22-D	BF	D	1,095.75	1,017.57	1.2E-02	1,014.41	3.1E-02	1,016.30	2.8E-02	1,014.97	2.2E-02	1,016.83	2.8E-02
NW04-S	SRG	A	1,099.96	1,004.13 (6)	NA	1,007.98	NA	1,009.58	NA	1,011.01	NA	1,010.72	NA
NW04-D	SRG	B	1,099.92	1,004.24 (6)	1.5E-03	1,008.23	3.4E-03	1,009.88	4.1E-03	1,011.08	9.6E-04	1,011.58	1.2E-02
NW06-S	SRG	A	1,096.82	1,004.35 (6)	NA	1,008.91	NA	1,012.62	NA	1,013.57	NA	1,011.80	NA
NW06-D	BF	B	1,096.92	1,003.49 (6)	-1.2E-02	1,008.93	2.8E-04	1,012.63	1.4E-04	1,013.87	4.2E-03	1,011.75	-6.9E-04
NW07-S	SRG	A	1,094.19	1,005.64 (3)	NA	1,008.03	NA	1,012.23	NA	1,012.81	NA	1,012.03	NA
NW07-M	SRG	B	1,093.94	1,005.59 (3)	-7.1E-04	1,007.85	-2.6E-03	1,012.04	-2.7E-03	1,012.74	-1.0E-03	1,012.29	3.7E-03
NW07-D	BF	D	1,094.21	1,006.41 (3)	2.3E-02	1,008.55	2.0E-02	1,012.67	1.8E-02	1,012.85	3.1E-03	1,012.89	1.7E-02
NW08-S	SRG	A	1,098.45	1,005.07 (6)	NA	1,010.11	NA	1,012.56	NA	1,014.14	NA	1,013.47	NA
NW08-M	BF	B	1,098.65	1,004.35 (6)	-1.6E-02	1,009.70	-9.1E-03	1,012.31	-5.6E-03	1,013.62	-1.2E-02	1,014.02	1.2E-02
NW08-D	BF	D	1,098.72	1,006.02 (6)	3.4E-02	1,011.48	3.6E-02	1,013.83	3.1E-02	1,014.99	2.8E-02	1,014.96	1.9E-02
EW06	SRG	A	1,097.75	1,003.35 (5)	NA	1,010.24	NA	1,014.69	NA	1,015.73	NA	1,015.04	NA
NW11-M	SRG	B	1,097.59	1,003.64 (5)	3.5E-03	1,010.09	-1.8E-03	1,014.61	-9.8E-04	1,015.57	-2.0E-03	1,014.88	-1.9E-03
NW11-D	BF	D	1,097.69	1,003.94 (5)	8.1E-03	1,010.21	3.2E-03	1,014.66	1.4E-03	1,015.31	-7.0E-03	1,014.58	-8.1E-03
NW09-M	SRG	B	1,099.58	1,008.80 (7)	NA	1,010.99	NA	1,015.78	NA	1,016.54	NA	1,015.72	NA
NW09-D	SRG	D	1,099.30	1,008.09 (7)	-1.8E-02	1,010.95	-1.0E-03	1,015.90	3.0E-03	1,016.29	-6.3E-03	1,015.52	-5.0E-03
NW09-D2	BF	D	1,099.42	1,007.98 (7)	-3.7E-03	1,010.99	1.3E-03	1,015.84	-2.0E-03	1,016.20	-3.0E-03	1,015.39	-4.3E-03
NW13-M	SRG	B	1,096.67	1,006.44 (2)	NA	1,009.25	NA	1,013.96	NA	1,014.42	NA	1,013.82	NA
NW13-D	BF	D	1,096.61	1,006.59 (2)	3.7E-03	1,009.46	5.3E-03	1,014.21	6.3E-03	1,014.51	2.3E-03	1,013.95	3.2E-03

TABLE 3.4

VERTICAL AND HORIZONTAL HYDRAULIC GRADIENTS FOR 2001 AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

			Monitoring Date	*9/5/2001*		*3/11/2010*		*6/3-6/5/2010*		*9/1-9/24/2010*		*12/4/2010*	
Well ID	*Former Hydrostratigraphic Unit*	*NEW ADEQ Hydrostratigraphic Subunit Screened*	*Reference Elevation (ft AMSL)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*	*Groundwater Elevation (ft AMSL)*	*Vertical Gradient (ft/ft)*
NW14-M	SRG	B	1,096.11	1,006.79 [3]	NA	1,009.29	NA	1,013.83	NA	1,014.30	NA	1,013.90	NA
NW14-D	BF	D	1,096.12	1,006.94 [3]	3.8E-03	1,009.56	6.7E-03	1,014.13	7.5E-03	1,014.60	7.5E-03	1,014.05	3.7E-03
NW16-M	SRG	B	1,097.92	-	-	1,009.42	NA	1,013.64	NA	1,014.63	NA	1,014.02	NA
NW16-D	BF	D	1,097.96	-	-	1,010.02	2.9E-04	1,013.98	1.6E-04	1,014.78	7.3E-05	1,014.30	1.4E-04
NW19-M	SRG	B	1,100.50	1,007.21 [8]	NA	1,013.42	NA	1,018.49	NA	1,019.53	NA	1,018.44	NA
NW19-D	BF	D	1,100.69	1,007.05 [8]	-4.6E-03	1,013.35	-2.0E-03	1,018.60	3.1E-03	1,019.36	-4.9E-03	1,018.29	-4.3E-03
OU312-M	SRG	B	1,090.79	996.31 [4]	NA	1,004.75	NA	1,008.39	NA	1,008.68	NA	1,008.68	NA
OU312-D	BF	D	1,090.77	1,001.00 [4]	4.7E-02	1,010.89	6.2E-02	1,013.86	5.5E-02	1,012.85	4.2E-02	1,013.89	5.3E-02
OU313-M	SRG	B	1,095.75	996.93 [4]	NA	1,004.56	NA	1,007.56	NA	1,008.15	NA	--	NA
OU313-D	BF	D	1,095.71	999.70 [4]	4.0E-02	1,007.95	4.8E-02	--	NA	1,010.68	3.6E-02	1,011.10	NA
OU314-M	SRG	B	1,099.05	1,000.09 [4]	NA	1,006.45	NA	1,008.58	NA	1,009.80	NA	1,009.80	NA
OU314-D	BF	D	1,099.14	1,008.70 [4]	1.1E-01	1,017.13	1.4E-01	1,018.80	1.4E-01	1,018.34	1.1E-01	1,019.51	1.3E-01
PZ01-S	SRG	A	1,102.69	1,020.35	NA	1,006.79	NA	1,009.60	NA	1,011.53	NA	1,010.69	NA
PZ01-D	BR	C	1,102.69	1,020.39	3.4E-04	1,006.85	5.1E-04	1,009.68	6.8E-04	1,011.59	5.1E-04	1,010.74	4.2E-04
PZ02-S	SRG	A	1,107.95	1,020.15	NA	1,006.60	NA	1,009.42	NA	1,011.37	NA	1,010.34	NA
PZ02-D	BR	C	1,107.95	1,020.13	-1.6E-04	1,006.66	4.8E-04	1,009.45	2.4E-04	1,011.39	1.6E-04	1,010.36	1.6E-04

Notes:
SRG - Salt River Gravels
BF - Basin Fill Deposits
BR - Bedrock
A negative number indicates a Downward Gradient
NA = Not Applicable
ft AMSL = feet Above Mean Sea Level
ft/ft = feet per foot
"--" = Not Measured

Year	*Calculated Horizontal Hydraulic Gradient (ft/ft)*	*Wells Used in Calculations*		
2001	2.2×10^{-3}	EW22-S	EW21	EW19-S
	4.9×10^{-3}	NW01	CRA01	EW07
2006	3.3×10^{-3}	DM515	NW08-S	EW06
	1.9×10^{-3}	EW22-S	EW21	EW19-S
	7.4×10^{-3}	NW01	CRA01	EW07
2010	3.7×10^{-3}	DM515	NW08-S	EW06
	1.9×10^{-3}	EW22-S	EW21	EW19-S
	6.1×10^{-3}	NW01	CRA01	EW07

ADEQ Hydrostratigraphic Unit Designation
A - Salt River Gravels
B - Interbedded sands and silt/clays
C - Bedrock
D - Interbedded sands and silt/clays with fine grained silt/clay marker bed at top of unit

TABLE 3.5

VOC DATA FOR SUBUNIT "A" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
		TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID		*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*(μg/L)*	*TCE*	*TCE*
A Wells															
AFFC20	(8)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AS02	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-	-	-	-	-
ASE19-A	(5)	ND(2.0)	38	ND(5.0)	ND(2.0)	-	-	-	-	-	-	-	-	-	-
ASE20-A	(5)	-	-	-	-	ND(2.0)	14	ND(5.0)	ND (2.0)	-	-	-	-	-	-
ASE22-A	(5)	51	8.2	10	21	53	9.3	7.8	13	-	-	-	-	-	-
ASE22-AR	(5)	-	-	-	-	-	-	-	-	26	5.3	4.1	3.4	-	-
ASE26-A	(5)	ND(2.0)	3.2	7.5	ND(2.0)	2.6	4	8.8	ND(2.0)	1.1	ND(0.5)U	0.6	ND	-0.9	-1.5
ASE27-A	(5)	19	6.2	ND(5.0)	11	7.5	5.1	ND(5.0)	3.6	-	-	-	-	-	-
ASE28-A	(5)	ND(2.0)	5.1	6.6	ND(2.0)	-	-	-	-	-	-	-	-	-	-
ASE30-A	(5)	10	10	9.2	4.6	-	-	-	-	4.7	2.5	3.6	1.5	-5.3	-
ASE31-A	(5)	69	ND(2.0)	ND(5.0)	19	-	-	-	-	32	3.5	3.4	6.4	-37	-
ASE32-A	(5)	34	11	8	14	-	-	-	-	-	-	-	-	-	-
ASE33-A	(5)	54	8.8	10	22	-	-	-	-	68	1	4.2	19	14	-
ASE34-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE34-B	(5)	-	-	-	-	2.2	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE35-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE36-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE41-A	(5)	-	-	-	-	ND(2.0)	37	ND(5.0)	9.3	-	-	-	-	-	-
ASE46-A	(5)	-	-	-	-	2	30	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE51-A	(5)	-	-	-	-	7.9	13	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE52-A	(5)	-	-	-	-	23	9.2 J	-	ND(2.0)	ND(0.5)U	32	1.1	1.9	-	-22.5
ASE53-A	(5)	-	-	-	-	14	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE54-A	(5)	-	-	-	-	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	1.1	3.6	ND(0.5)U	ND	-	-0.9
ASE55-A	(5)	-	-	-	-	ND(20)	52	ND(50)	ND(2.0)	ND(0.5)U	13	ND(0.5)U	0.7	-	-19.5
ASE56-A	(5)	-	-	-	-	ND(2.0)	64 J	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE57-A	(5)	-	-	-	-	ND(20)	23	ND(50)	ND(2.0)	-	-	-	-	-	-
ASE58-A	(5)	-	-	-	-	ND(2.0)	12	ND(5.0)	ND(2.0)	1.9	12	ND(0.5)U	1.5	-	-0.1
ASE59-A	(5)	-	-	-	-	3.2	41	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE62-A	(5)	-	-	-	-	ND(2.0)	8.4	ND(5.0)	ND(2.0)	2.1	12	ND(0.5)U	1	-	0.1
ASE64-A	(5)	-	-	-	-	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE65-A	(5)	-	-	-	-	10	ND(2.0)	ND(5.0)	3.5	1.7	4.8	ND(0.5)U	ND	-	-8.3
ASE66-A	(5)	-	-	-	-	ND(2.0)	4.6	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE68-A	(5)	-	-	-	-	5.6	18	ND(5.0)	18	ND(0.5)U	4.5	ND(0.5)U	ND	-	-5.1
ASE69-A	(5)	-	-	-	-	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-1.5
ASE70-A	(5)	-	-	-	-	27	ND(2.0)	ND(5.0)	12	3.7	ND(0.5)U	ND(0.5)U	1.2	-	-23.3
ASE71-A	(5)	-	-	-	-	67	10	ND(5.0)	17	27	6.4	6.3	6.3	-	-40
ASE72-A	(5)	-	-	-	-	60	6.8	7	14	20	4.9	3.5	3.7	-	-40
ASE73-A	(5)	-	-	-	-	15	5.2	ND(5.0)	4.4	2.5	3.3	0.6	0.6	-	-12.5
ASE75-A	(5)	-	-	-	-	ND(2.0)	2	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-1.5
ASE76-A	(5)	-	-	-	-	3.2	3.2	ND(5.0)	ND(2.0)	0.6	ND(0.5)U	0.6	ND	-	-2.6

TABLE 3.5

VOC DATA FOR SUBUNIT "A" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
		TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID		*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*TCE*	*TCE*
A Wells (cont'd)															
ASE77-A	(5)	-	-	-	-	32	8.1	7.4	12	4.1	2.3	2.3	1.5	-	-27.9
ASE77-A **	(5)									4.1	2.3	2.3	1.5	4.1	4.1
ASE81-A	(5)	-	-	-	-	12	ND(2.0)	ND(5.0)	3.9	0.9	ND(0.5)U	ND(0.5)U	ND	-	-11.1
ASE83-A	(5)	-	-	-	-	6.9	3.6	ND(5.0)	2.3	0.7	2.6	ND(0.5)U	ND	-	-6.2
ASE83-B	(5)	-	-	-	-	31	23	22	15	16	15	14	7.3	-	-15
ASE84-A	(5)	-	-	-	-	7.1	2	ND(5.0)	2.3	1	7	ND(0.5)U	ND	-	-6.1
ASE85-A	(5)	-	-	-	-	42	5.8	ND(5.0)	11	14	4.5	2.5	2.9	-	-28
ASE86-A	(5)	-	-	-	-	84	6.1	8.7	25	18	5.5	3	3.9	-	-66
ASE87-A	(5)	-	-	-	-	6.5	5	ND(5.0)	2	1.4	2.8	ND(0.5)U	ND	-	-5.1
ASE87-A **	(5)	-	-	-	-	-	-	-	-	1.5	2.8	ND(0.5)U	ND	-	-
ASE89-A	(5)	-	-	-	-	ND(2.0)	3.5	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE90-A	(5)	-	-	-	-	ND(2.0)	28 J	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-1.5
ASE91-A	(5)	-	-	-	-	ND(2.0)	95	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE92-A	(5)	-	-	-	-	ND(2.0)	14	ND(5.0)	4.9	-	-	-	-	-	-
ASE95-A	(5)	-	-	-	-	ND(2.0)	5.2	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-1.5
ASE96-A	(5)	-	-	-	-	ND(2.0)	11	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-1.5
ASE96-A **	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE97-A	(5)	-	-	-	-	ND(2.0)	9.1 J	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE98-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE99-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE99-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE100-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE101-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE103-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE105-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE106-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE108-A	(5)	-	-	-	-	-	-	-	-	1.2	7.1	1.9	ND	-	-
ASE109-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE110-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE111-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE112-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE113-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE116-A	(5)	-	-	-	-	-	-	-	-	1.3	ND(0.5)U	ND(0.5)U	ND	-	-
ASE118-A	(5)	-	-	-	-	-	-	-	-	6.5	1.7	0.9	1.5	-	-
ASE120	(5)	-	-	-	-	-	-	-	-	71	13	14	12	-	-
ASE124-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE125-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE126-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	3.6	ND(0.5)U	ND	-	-
ASE126-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	3.5	ND(0.5)U	ND	-	-
ASE128-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE129-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-

TABLE 3.5

VOC DATA FOR SUBUNIT "A" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
Well ID		*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*2001-2010 TCE*	*2006-2010 TCE*
A Wells (cont'd)															
BE-MW-8	ERM	-	-	-	-	-	-	-	-	0.66	ND(0.5)	ND(0.5)	ND(0.5)	-	-
BC03	(5)	52	ND(2.0)	7.7	35	15	ND(2.0)	ND(5.0)	5	1.8	ND(0.5)U	ND(0.5)U	ND	-50.2	-13.2
BC08-B	(5)	ND(2.0)	37	ND(5.0)	ND(2.0)	ND(2.0)	24	ND(5.0)	ND(2.0)	-	-	-	-	-	-
BC09	(5)	80	10	ND(5.0)	14	81	9.8	ND(5.0)	16	9.6	1.2	ND(0.5)U	2	-70.4	-71.4
BC10-A	(5)	ND(2.0)	2.3	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
BC12	(5)	-	-	-	-	-	-	-	-	11	ND(1.0)U	ND(1.0)U	1.6	-	-
BC16	(5)	91	ND(2.0)	18	73	35	ND(2.0)	ND(5.0)	15	9.8	ND(0.5)U	ND(0.5)U	1.7	-81.2	-25.2
BC18	(5)	5.8	8.6	ND(5.0)	ND(2.0)	-	-	-	-	ND(0.5)U	5.4	ND(0.5)U	ND	-5.3	-
BMWMW04		8.1	8.4	6.1	2.7	-	-	-	-	-	-	-	-	-	-
BR05	(3)	-	-	-	-	35	ND(0.5)	2.4	12.57	6.43	ND(0.5)	ND(0.5)	1.45	-	-28.57
CRA01		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	0	0
DM507-084	(3)	170	0.6	24	130	57	ND(0.5)	6.7	25	10.9	ND(0.5)	0.78	3.14	-159.1	-46.1
DM507-084 **	(3)									11.3	ND(0.5)	0.93	3.16	11.3	11.3
DM510-110	(3)	360	ND(0.5)	19	180	260	ND(0.5)	14	83	3.07	ND(0.5)	ND(0.5)	ND	-356.93	-256.93
DM512-090	(3)	-	-	-	-	0.58 J	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
DM513-070	(3)	6.3	ND(0.5)	ND(0.5)	14	-	-	-	-	-	-	-	-	-	-
DM515-115	(3)	23	ND(0.5)	6.9	190	4.5	0.59	1.9	40	ND(0.5)	1.45	0.51	14.8	-22.5	-4
DM517-125	(3)	32	23	13	13	8.6	4.2	3.5	3.4	2.57	1.31	1.51	1.15	-29.43	-6.03
EW03	(3)	630	ND(5.0)	35	225.5	320	ND(0.5)	25	121.1	180	ND(0.5)	8.16	72.1	-450	-140
EW06		44	55	38	7.3	4.9 J	4.4 J	4.8 J	1.2	1.6	1.6	1.1	ND	-42.4	-3.3
EW07		13	ND(2.0)	ND(2.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	5.1	ND(1.0)	ND(1.0)	ND	-7.9	4.1
EW12-078	(4)	240	5.9	5.3	94	-	-	-	-	-	-	-	-	-	-
EW12-093	(4)	340	4.9	13	170	-	-	-	-	-	-	-	-	-	-
EW13-118	ERM	6	7.1	9.4	1.5	ND(0.5)	ND(0.5)	ND(0.5)	ND(2.0)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-5.5	0
EW12-128	(4)	440	4	10	140	-	-	-	-	-	-	-	-	-	-
EW19-S	ERM	290	11	11	85.1	68	11	9.8	19	14	3.1	1.2	3.4	-276	-54
EW20	ERM	-	-	-	-	75	1.3	ND(0.5)	17.5	30	3.9	2.2	6.2	-	-45
EW20 **	ERM	-	-	-	-	-	-	-	-	28	3.9	3.2	6.7	-	-
EW21	ERM	36	ND(1.0)	ND(1.0)	5.5	5.1	ND(0.5)	ND(0.5)	0.57	2.5	ND(0.5)	ND(0.5)	ND	-33.5	-2.6
EW22-S	ERM	190	ND(1.0)	ND(1.0)	39.2	37	1.5	1.7	8.3	29	3.3	4	6.8	-161	-8
EW23		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	-	-	-	-	-	-
EWOU3-10S-R	ERM	-	-	-	-	46.0	9.7	1.0	14.7	15	2.9	2	3.7	-	-31
FDMW07		330	ND	14	110	-	-	-	-	-	-	-	-	-	-
NW01		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.0)	1.4	ND(1.0)	ND(1.0)	ND	0.4	0.4
NW01		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(2.0)	2.2	ND(1.0)	ND(1.0)	ND	1.2	1.2
NW03		470	ND(1.0)	8.7	150	51	14	16	16	7.3	2.6	3.3	2.2	-462.7	-43.7
NW04-S		-	-	-	-	16	ND(1.0)	ND(1.0)	2.8	9.8	1.2	1.3	2.3	-	-6.2
NW04-S **		-	-	-	-	-	-	-	-	9.4	1.1	1.3	2.2	-	-
NW05-S		-	-	-	-	33	2.4	1.9	9.4	14	2.9	3	4.3	-	-19
NW06-S		-	-	-	-	19	12	13	6.4	3.4	2.2	1.8	1.2	-	-15.6
NW07-S		-	-	-	-	1.7	1.3	ND(1.0)	ND(1.0)	1.3	1.4	ND(1.0)	ND	-	-0.4
NW08-S		-	-	-	-	23	12	13	8.5	6.6	3.1	3.7	2.2	-	-16.4

TABLE 3.5

VOC DATA FOR SUBUNIT "A" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
		TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID		*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*TCE*	*TCE*
<u>*A Wells (cont'd)*</u>															
NW18-S		-	-	-	-	-	-	-	-	5.5	2.7	2.9	1.7	-	-
NW18-S **		-	-	-	-	-	-	-	-	5.6	2.8	3.2	1.6	-	-
OU304-S	ERM	-	-	-	-	1.0	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	-0.5
OU305-S	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OU305-SR	ERM	-	-	-	-	100	1.4	1.9	19	39	5.4	5.6	9.3	-	-61
OU307-S	ERM	-	-	-	-	0.64	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	-0.14
OU308-S	ERM	-	-	-	-	14	ND(0.5)	ND(0.5)	1.4	8.2	ND(0.5)	ND(0.5)	1.1	-	-5.8
OU309-S	ERM	-	-	-	-	1.2	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	-0.7
OU311-S	ERM	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	0
PHXA01	(7)	-	-	-	-	ND(0.5)	ND(1.0)	ND(0.50)	ND(0.5)	-	-	-	-	-	-
PHXA02	(7)	-	-	-	-	ND(0.5)	ND(1.0)	ND(0.50)	ND(0.5)	-	-	-	-	-	-
PHXA03	(6)	-	-	-	-	1.2	ND(1.0)	1.1	ND(0.5)	-	-	-	-	-	-
PHXA04	(6)	-	-	-	-	2.1	2.4	2.8	ND(0.5)	-	-	-	-	-	-
PHXA05	(6)	-	-	-	-	0.85	ND(1.0)	0.83	ND(0.5)	-	-	-	-	-	-
PHXA06	(6)	-	-	-	-	4.8	5.9	6.2	1.3	-	-	-	-	-	-
PL101-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	2.5	-	-	-	-	-	-
PL102-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	0.7	ND(0.5)U	ND(0.5)U	ND	-1.3	-1.3
PL103-A	(5)	75	ND(2.0)	11	53	40 J	ND(2.0)	ND(5.0)	12	2.2	ND(0.5)U	ND(0.5)U	ND	-72.8	-37.8
PL105-A	(5)	ND(2.0)	130	ND(5.0)	ND(2.0)	ND(2.0)	61	ND(5.0)	ND(2.0)	ND(0.5)U	3.6	ND(0.5)U	ND	-1.5	-1.5
PL201-A	(5)	2.8	9.4	ND(5.0)	ND(2.0)	ND(2.0)	10	ND(5.0)	ND(2.0)	ND(0.5)U	48	ND(0.5)U	0.8	-2.3	-1.5
PL202-C	(5)	ND(2.0)	4	ND(5.0)	ND(2.0)	ND(2.0)	2.5	ND(5.0)	ND(2.0)	-	-	-	-	-	-
PL202-S	(5)	5.3	6.7	ND(5.0)	2	-	-	-	-	-	-	-	-	-	-
PL2101	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	5	ND(5.0)	ND(2.0)	0.7	7.4	ND(0.5)U	ND	-1.3	-1.3
PL2102	(5)	2.6	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	1.8	1.6	ND(0.5)U	ND	-0.8	-0.2
PZ01-A	(5)	230	ND(2.0)	51	190	70	ND(2.0)	10	46	12	ND(0.5)U	1.4	5.3	-218	-58
PZ01-S		64	ND(1.0)	ND(1.0)	3.7	-	-	-	-	-	-	-	-	-	-
PZ02-S		31	ND(1.0)	ND(1.0)	7.2	-	-	-	-	-	-	-	-	-	-
SCMW-1D	ERM	-	-	-	-	-	-	-	-	1.8	1.1	1.1	ND	-	-
SMW05	(4)	-	ND(1.0)	-	-	-	-	-	-	-	-	-	-	-	-
TEW01		150	ND(1.0)	2	20	-	-	-	-	-	-	-	-	-	-
TT02	(4)	2.4	-	3.4	-	-	-	-	-	-	-	-	-	-	-
TT05	(4)	ND(1.0)	-	-	150	-	-	-	-	-	-	-	-	-	-
TTMW01	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>*A/B Wells*</u>															
ASE37-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	3.8	ND(2.0)	ND(5.0)	3.2	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-3.3
ASE38-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	4.8	ND(2.0)	ND(5.0)	2.1	ND(2.5)U	ND(2.5)U	ND(2.5)U	ND	0.5	-2.3
ASE39-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	4.5	ND(2.0)	ND(5.0)	8	-	-	-	-	-	-
ASE60-A	(5)	-	-	-	-	40	ND(2.0)	ND(5.0)	ND(2.0)	17	ND(0.5)U	0.8	ND	-	-23
ASE61-A	(5)	-	-	-	-	2.6	ND(2.0)	ND(5.0)	ND(2.0)	0.6	ND(0.5)U	0.7	ND	-	-2
ASE63-A	(5)	-	-	-	-	4.6	ND(2.0)	ND(5.0)	9.5	ND(2.5)U	ND(2.5)U	ND(2.5)U	ND	-	-2.1
ASE63-A **	(5)	-	-	-	-	-	-	-	-	2.8	ND(1.7)U	ND(1.7)U	ND	-	-
ASE122-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-

TABLE 3.5

VOC DATA FOR SUBUNIT "A" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
		TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID		*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*TCE*	*TCE*
<u>A/B Wells (cont'd)</u>															
ASE123-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE130-A	(5)	-	-	-	-	-	-	-	-	ND(1.7)U	5.3	ND(1.7)U	ND	-	-
ASE130-A **	(5)	-	-	-	-	-	-	-	-	ND(1.7)U	5.7	ND(1.7)U	ND	-	-
BC07-A	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-1.5
DM518-OB1	(3)	180	3.5	13	91	260	1.4	14	77	31.2	5.35	4.21	6.07	-148.8	-228.8
DM518-OB1 **	(3)	-	-	-	-	-	-	-	-	31	5.15	3.96	5.72	-	-
<u>A/B/C Wells</u>															
EWS		320	12	16	85	33	12	14	9.4	14	4	6.2	3.4	-306	-19
<u>A/B/D Wells</u>															
EWM		320	ND(1.0)	6.1	73.1	170	3.8	9.2	38	71	2.9	4.5	19	-249	-99
EWN		98	ND(1.0)	ND(1.0)	14	14	ND(1.0)	ND(1.0)	1.6	59	ND(1.0)	2.4	11	-39	45
<u>A/C Wells</u>															
ASE127-A	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND	ND(0.5)U	-	-
ASE127-A **	(5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND	ND(0.5)U	-	-

Notes:
µg/L = micrograms per liter
TCE = Trichloroethylene
1,1-DCA = 1,1 Dichloroethane
1,1-DCE = 1,1 Dichloroethene
1,2-DCE = 1,2 Dichloroethene
VOCs = Volatile Organic Compounds
"-" = Not sampled
E = Value above quantitation range
J = Analyte was analyzed for and was positively defined, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.
Results are estimated although the data are considered usable and may be used as appropriate to meet project objectives. Results are qualitatively acceptable and quantitatively uncertain
ND(x.x) = Not detected above the reported sample quantitation limit x.x. For VOC analytical data, there is not a quantitation limit due to varying limits in data used
ND(x.x) U = Qualified as not detected at or above value in parenthesis
J+ = Approximate concentration with high bias in sample
A positive number indicates an increase in TCE concentration (e.g., 1.8)
(1) Concentration is sum of all detected VOCs (not used in this Table)
(2) Total concentrations include detected concentrations of benzene, toluene, ethylbenzene, or xylenes (not used in this Table)
(3) Sampled by Clear Creek Associates
(4) Sampled by Shaw Environmental
(5) Sampled by CH2MHill
(6) Sampled by Arcadis
(7) Sampled by Hydro Geo Chem
(8) Sampled by Environmental Cost Management
(9) Sampled by LFR, Inc.
* The value is the highest for a particular analyte collected during baseline sampling event (July - September 2001)
** Duplicate sample collected during sampling event (September 2010)

TABLE 3.6

VOC DATA FOR SUBUNIT " B" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
		TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID		*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*TCE*	*TCE*
B Wells															
ASE19-B	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	16	8.7	ND(5.0)	ND(2.0)	9.2	0.8	1.1	ND	7.2	-6.8
ASE19-B **		-	-	-	-	-	-	-	-	8.6	0.9	1.1	0.5	6.6	-7.4
ASE20-B	(5)	3.2	ND(2.0)	ND(5.0)	ND(2.0)	2.0	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE22-B	(5)	320	45	160	69	250	28	74	46.4	180	21	45	28	-140	-70
ASE23-B	(5)	66	ND(2.0)	ND(5.0)	17	84	5.0	10	34	74	16	34	29	8	-10
ASE40-B	(5)	ND(2.0)	13	ND(5.0)	ND(2.0)	ND(2.0)	3.0	ND(5.0)	ND(2.0)	3	7.4	ND(0.5)U	2.4	1	1
ASE41-B	(5)	ND(2.0)	13	ND(5.0)	ND(2.0)	4.6	13	ND(5.0)	2.8	ND(1.7)U	ND(1.7)U	ND(1.7)U	ND	-0.3	-2.9
ASE43-B	(5)	5.4	ND(2.0)	ND(5.0)	ND(2.0)	2.4	ND(2.0)	ND(5.0)	ND(2.0)	7.8	3.6	0.9	0.7	2.4	5.4
ASE44-B	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	2.4	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE45-B	(5)	ND(2.0)	13	ND(5.0)	ND(2.0)	16	17	ND(5.0)	2.8	3.5	1.6	0.5	0.6	1.5	-12.5
ASE46-B	(5)	ND(2.0)	5.8	ND(5.0)	ND(2.0)	ND(2.0)	4.7	ND(5.0)	2.4	11	5.5	0.7	1.2	9	9
ASE47-B	(5)	47	ND(2.0)	ND(5.0)	13	91 J	2.6	6.7	27	58	13	46	22	11	-33
ASE48-B	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	6.3	13	ND(5.0)	ND(2.0)	2	8.5	ND(0.5)U	ND	0	-4.3
ASE48-B **		-	-	-	-	-	-	-	-	2.3	8.5	ND(0.5)U	ND	0.3	-4
ASE49-B	(5)	ND(2.0)	6.1	ND(5.0)	ND(2.0)	25	5.6	ND(5.0)	ND(2.0)	5.6	1	1.3	0.7	3.6	-19.4
ASE71-B	(5)	-	-	-	-	45 J	5.2	ND(5.0)	11	35	2.5	0.9	6.5	-	-10
ASE72-B	(5)	-	-	-	-	350	12	27	51	240	13	22	39	-	-110
ASE72-B **		-	-	-	-	-	-	-	-	230	12	22	38	-	-120
ASE73-B	(5)	-	-	-	-	15	5	ND(5.0)	5.4	3.8	4.3	1	1	-	-11.2
ASE75-B	(5)	-	-	-	-	17	ND(2.0)	ND(5.0)	3.4	20	0.6 J	1.5 J	5.7	-	3
ASE75-B **	(5)	-	-	-	-	-	-	-	-	20	0.7 J	1.5 J	5.9	-	3
ASE78-B	(5)	-	-	-	-	48	13	30	15	20	6.5	17	6.5	-	-28
ASE85-B	(5)	-	-	-	-	130	12	18	27	130	16	25	28	-	0
BC01	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
BC10-B	(5)	19	ND(2.0)	ND(5.0)	6.6	22	2.4	6.5	8.8	14	7.3	25	5.3	-5	-8
BC11-B	(5)	27	23	15	11	32	7.4	8.2	12	33	5.5	9.0	7.1	6	1
BC13	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
BC14	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
BC15	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-1.5
BC15 **		-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-1.5
BC17	(5)	32	ND(2.0)	ND(5.0)	18	11	ND(2.0)	ND(5.0)	3.7	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-31.5	-10.5
BC02	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	27	ND(2.0)	ND(5.0)	ND(2.0)	4	ND(0.5)U	0.7	0.5	2	-23
BC04	(5)	23	ND(2.0)	ND(5.0)	3.1	21	ND(2.0)	ND(5.0)	ND(2.0)	3.8	ND(0.5)U	ND(0.5)U	ND	-19.2	-17.2
BC06	(5)	6.0	2.1	ND(5.0)	ND(2.0)	5.0	3.8	ND(5.0)	ND(2.0)	15	4.2	0.6	2.2	9	10
BC08-A	(5)	3.7	ND(2.0)	ND(5.0)	ND(2.0)	4.3	2.2	9.5	ND(2.0)	5.7	2.4	1.7	0.5	2	1.4
DM118	(3)	1.2	-	ND(0.5)	ND(0.5)	-	-	-	-	6.81	ND(0.5)	ND(0.5)	0.69	5.61	-
DM120	(3,6)	3.7	-	ND(0.5)	ND(0.5)	14	ND(0.5)	ND(0.5)	1	11.4	ND(0.5)	ND(0.5)	0.84	7.7	-2.6
DM122-B	(3)	ND(0.5)	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0	0

TABLE 3.6

VOC DATA FOR SUBUNIT " B" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
Well ID	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*2001-2010 TCE*	*2006-2010 TCE*
B Wells (cont'd)														
DM501-147 [3]	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	1.6	ND(0.5)	ND(0.5)	ND(0.5)	3.09	ND(0.5)	ND(0.5)	ND	2.59	1.49
DM501-202 [3]	6.1	ND(0.5)	ND(0.5)	0.9	2.3	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
DM502-079 [3]	7.1	-	4.4	16	9	ND(0.5)	0.64	3.6	8.4	ND(0.5)	ND(0.5)	1.94	1.3	-0.6
DM502-119 [3]	6.5	-	2.9	67	4.7 J	ND(0.5)	2.1 J	42	2.11	ND(0.5)	1.43	60.3	-4.39	-2.59
DM503 [3,6]	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
DM504 [3]	150 J	ND(5.0)UJ	9.3 J	34.0 J	69	ND(0.5)	4.6	23	72.6	ND(0.5)	4.28	26.7	-77.4	3.6
DM506-100 [3]	21	ND(0.5)	8.0	24	36	ND(0.5)	14	34	8.25	ND(0.5)	2.36	8.07	-12.75	-27.75
DM506-185 [3]	160	ND(0.5)	0.8	17	86	0.53	ND(0.5)	15	7	ND(0.5)	ND(0.5)	0.93	-153	-79
DM507-188 [3]	1.6	ND(0.5)	2.9	160	1.4	ND(0.5)	5.8	93	4.02	ND(0.5)	1.76	39.4	2.42	2.62
DM508 [3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DM509 [3,6]	870	ND(0.5)	3.7	163.1	890	ND(2.5)	20	310	565	ND(0.5)	41.5	185	-305	-325
DM511-110 [3]	240	ND(0.5)	4.1	22	300	ND(0.5)	11 J	44	129	ND(0.5)	6.45	39.7	-111	-171
DM512-155 [3]	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	0
DM513-145 [3]	72	ND(0.5)	0.5	5.5	71	ND(0.5)	0.83	4.5	67.5	ND(0.5)	0.73	4.22	-4.5	-3.5
DM513-195 [3]	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	0
DM516-150 [3]	150	35	42	211.4	[6] 16	1.1	1.6	23	6.69	4.35	2.15	9.55	-143.31	-9.31
DM517-185 [3]	41	33	22	17	[6] 12	5.5	4.8	5	6.8	3.39	3.47	2.91	-34.2	-5.2
DM603-115 [3]	5.4	-	ND(0.5)	0.6	4.8	ND(0.5)	ND(0.5)	0.5	-	-	-	-	-	-
DM604 [3]	-	-	-	-	3.9	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
EW02 [3]	99	ND(5.0)	ND(5.0)	5.1	56	ND(0.5)	2.8	2	29.1	ND(0.5)	1.11	1.55	-69.9	-26.9
EW12-180	500	8.7	19	48	-	-	-	-	-	-	-	-	-	-
EW13-168 [4]	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(5.0)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	0
NW02	190	ND(1.0)	ND(1.0)	33	45	ND(1.0)	ND(1.0)	7.7	1.7	ND(1.0)	ND(1.0)	--	-188.3	-43.3
NW02 **	190	ND(1.0)	ND(1.0)	33	45	ND(1.0)	ND(1.0)	7.7	1.9	ND(1.0)	ND(1.0)	ND	-188.1	-43.1
NW04-D	-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	-	0
NW06-D	-	-	-	-	47	ND(1.0)	ND(1.0)	3.2	47	1.8	2.7	4.9	-	0
NW07-M	-	-	-	-	15	4.5	11	4.6	1.9	ND(1.0)	ND(1.0)	ND	-	-13.1
NW08-M	-	-	-	-	190	6.4	15	22	14	3.5	3	5.4	-	-176
NW09-M	-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	-	0
NW11-M	-	-	-	-	14	5.2	10	3.6	4.4	1.8	4	1.4	-	-9.6
NW13-M	-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	-	0
NW14-M	-	-	-	-	2.7	ND(1.0)	1.8	ND(1.0)	1.3	ND(1.0)	ND(1.0)	ND	-	-1.4
NW16-M	-	-	-	-	-	-	-	-	49	14	24	15	-	-
NW16-M **	-	-	-	-	-	-	-	-	47	14	23	14	-	-
NW19-M	-	-	-	-	-	-	-	-	1.2	ND(1.0)	1.3	ND	-	-
OU301-M [4]	-	-	-	-	7.0	ND(0.5)	ND(0.5)	0.99	4.7	ND(0.5)	0.5	0.63	-	-2.3
OU302-M [4]	-	-	-	-	210	13	26	48	39	5.8	7.9	8.3	-	-171
OU305-M [4]	-	-	-	-	-	-	-	-	110	8.4	12	22	-	-

TABLE 3.6

VOC DATA FOR SUBUNIT " B" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
Well ID	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*2001-2010 TCE*	*2006-2010 TCE*
B Wells (cont'd)														
OU305-M2 (4)	-	-	-	-	210	4.6	7.2	32.92	-	-	-	-	-	-
OU305-MR (4)	-	-	-	-	210	3.5	5.6	40	71	7.8	9.7	15	-	-139
OU306-M (4)	-	-	-	-	14	6.5	9.8	3.5	0.63	ND(0.5)	ND(0.5)	ND	-	-13.37
OU307-M2 (4)	-	-	-	-	2.3	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
OU308-M2 (4)	-	-	-	-	42	ND(0.5)	ND(0.5)	2.8	33	ND(0.5)	ND(0.5)	3.4	-	-9
OU309-M2	-	-	-	-	-	-	-	-	2	ND(0.5)	ND(0.5)	ND	-	-
OU310-M (4)	-	-	-	-	130	20 E	25	29	15	3.5	5	3.5	-	-115
OU310-M2 (4)	-	-	-	-	180	24	38	37.72	38	6.9	13	9.7	-	-142
OU310-M2 **	-	-	-	-	-	-	-	-	38	7.1	13	9.6	-	-142
OU311-M (4)	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	0
OU311-M2 (4)	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	0.51	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	0
OU312-M (4)	-	-	-	-	16	8.0	12	4.1	1.8	0.67	1.3	0.53	-	-14.2
OU313-M (4)	-	-	-	-	73	ND(0.5)	ND(0.5)	5.6	36	ND(0.5)	0.5	3.2	-	-37
OU314-M (4)	-	-	-	-	0.65	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	-0.15
PL202-N (5)	110	ND(2.0)	7.3	13	150	2.7	26	25	120	6.4	16	36	10	-30
PL2103 (5)	4.6	ND(2.0)	ND(5.0)	ND(2.0)	2.2	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
PZ01-B (5)	580	ND(2.0)	7.1	190	440 J	-	39 J	190	150	ND(1.0)U	12	85	-430	-290
A/B Wells														
ASE37-A (5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	3.8	ND(2.0)	ND(5.0)	3.2	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-3.3
ASE38-A (5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	4.8	ND(2.0)	ND(5.0)	2.1	ND(2.5)U	ND(2.5)U	ND(2.5)U	ND	0.5	-2.3
ASE39-A (5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	4.5	ND(2.0)	ND(5.0)	8	-	-	-	-	-	-
ASE60-A (5)	-	-	-	-	40	ND(2.0)	ND(5.0)	ND(2.0)	17	ND(0.5)U	0.8	ND	-	-23
ASE61-A (5)	-	-	-	-	2.6	ND(2.0)	ND(5.0)	ND(2.0)	0.6	ND(0.5)U	0.7	ND	-	-2
ASE63-A (5)	-	-	-	-	4.6	ND(2.0)	ND(5.0)	9.5	ND(2.5)U	ND(2.5)U	ND(2.5)U	ND	-	-2.1
ASE63-A ** (5)	-	-	-	-	-	-	-	-	2.8	ND(1.7)U	ND(1.7)U	ND	-	-1.8
ASE122-A (5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE123-A (5)	-	-	-	-	-	-	-	-	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-	-
ASE130-A (5)	-	-	-	-	-	-	-	-	ND(1.7)U	5.3	ND(1.7)U	ND	-	-
ASE130-A ** (5)	-	-	-	-	-	-	-	-	ND(1.7)U	5.7	ND(1.7)U	ND	-	-
BC07-A (5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-1.5
DM518-OB1 (3)	180	3.5	13	91	260	1.4	14	77	31.2	5.35	4.21	6.07	-148.8	-228.8
** (3)	-	-	-	-	-	-	-	-	31	5.15	3.96	5.72	-149	-229
A/B/C Wells														
EWS	320	12	16	85	33	12	14	9.4	14	4	6.2	3.4	-306	-19
A/B/D Wells														
EWM	320	ND(1.0)	6.1	73.1	170	3.8	9.2	38	71	2.9	4.5	19	-249	-99
EWN	98	ND(1.0)	ND(1.0)	14	14	ND(1.0)	ND(1.0)	1.6	59	ND(1.0)	2.4	11	-39	45
B/C Wells														

TABLE 3.6

VOC DATA FOR SUBUNIT " B" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
	TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*TCE*	*TCE*
ASE120-B [5]	-	-	-	-	-	-	-	-	36	2.9	1.7	9.3	-	-
<u>B/D Wells</u>														
ASE76-B [5]	-	-	-	-	150	2.6	14	26	180	7.9	33	42	-	30
ASE77-B [5]	-	-	-	-	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE88-B [5]	-	-	-	-	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	1.7	ND(0.5)U	ND(0.5)U	ND	-	-0.3
BC11-A	62	ND(2.0)	5.6	12	120	3.8	17	27	150	14	31	41	88	30
DM516-210	200	35	39	110.8	[6, 7] 3	1.2	1.6	36	[6] 0.76	11.3	16.6	197	-199.24	-2.24
EW12-227	400	3.4	7.5	34	-	-	-	-	-	-	-	-	-	-
EW12-239	4.9	ND(1.0)	ND(1.0)	ND(1.0)	-	-	-	-	-	-	-	-	-	-
EW13-300	ND(0.50)UJ	ND(0.50)UJ	ND(0.50)UJ	ND(0.50)UJ	-	-	-	-	-	-	-	-	-	-
EW19-D	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-0.5	0
EW22-D	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	0	0
NW07-D	-	-	-	-	25	1.7	8.8	5.5	4.6	ND(1.0)	2.1	1.2	-	-20.4
NW08-D	-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.1	ND(1.0)	ND(1.0)	ND	-	1.1
NW09-D	-	-	-	-	7.7	ND(1.0)	1.3	1.5	4.8	ND(1.0)	ND(1.0)	ND	-	-2.9
OU312-D	-	-	-	-	0.61	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	-0.11
OU313-D	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	0
OU314-D	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	0

Notes:
TCE - Trichloroethylene
1,1-DCA = 1,1 Dichloroethane
1,1-DCE = 1,1 Dichloroethene
1,2-DCE = 1,2 Dichloroethene
µg/L = micrograms per liter
VOCs = Volatile Organic Compounds
"-" = Not sampled
A negative number indicates a decrease in TCE/VOC concentration (e.g., -7.4)
A positive number indicates an increase in TCE/VOC concentration (e.g., 16)
E = Value above quantitation range
J+ = Approximate concentration with high bias in sample
ND(x.x) = Not detected above the reported sample quantitation limit x.x. For VOC analytical data, there is not a quantitation limit due to varying limits in data used
ND(x.x) U = Qualified as not detected at or above value in parenthesis
(1) Concentration is sum of all detected VOCs (not used in this Table)
(2) Total concentrations include detected concentrations of benzene, toluene, ethylbenzene, or xylenes (not used in this Table)
(3) Sampled by Clear Creek Associates
(4) Sampled by Shaw Environmental
(5) Sampled by CH2MHill
(6) Sampled by LFR, Inc.
* The value is the highest for a particular analyte collected during baseline sampling event (July - September 2001)
** Duplicate sample collected during sampling event (September 2010)

TABLE 3.7

VOC DATA FOR SUBUNIT "D" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
		TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID		*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*TCE*	*TCE*
D Wells															
DM515-210	[3]	-	-	-	-	20	ND(0.5)	ND(0.5)	0.79	96.1	0.56	3.66	43.3	-	76.1
DW05	ERM	-	-	-	-	1.1	ND(0.5)	0.78	ND(0.5)	0.51	ND(0.5)	ND(0.5)	ND(0.5)	-	-0.59
EW13-228	[4]	-	-	-	-	3.3	ND(0.5)	ND(0.5)	ND(0.5)	2.2	ND(0.5)	ND(0.5)	ND	-	-1.1
EW13-268	[4]	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	0
NW09-D2		-	-	-	-	10	ND(1.0)	1.2	2	4.8	ND(1.0)	ND(1.0)	ND	-	-5.2
NW10-D		-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	-	0
NW11-D		-	-	-	-	21	1.0	5.5	4.1	24	1.8	6.5	5.7	-	3
NW12-D		-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	-	0
NW12-D **		-	-	-	-	-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND	-	0
NW13-D		-	-	-	-	6.4	ND(1.0)	1.5	ND(1.0)	3.8	ND(1.0)	ND(1.0)	ND	-	-2.6
NW14-D		-	-	-	-	20	3.3	12	5.4	8.0	ND(1.0)	1.9	1.8	-	-12
NW14-D **		-	-	-	-	-	-	-	-	7.6	ND(1.0)	2.1	1.7	-	-12.4
NW16-D		-	-	-	-	-	-	-	-	27	ND(1.0)	ND(1.0)	ND	-	-
NW19-D		-	-	-	-	-	-	-	-	32	ND(1.0)	5.6	7.6	-	-
OU301-D	[4]	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	0
OU305-D	[4]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OU305-DR	[4]	-	-	-	-	0.67	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	-0.17
OU306-D	[4]	-	-	-	-	1.7	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	-1.2
OU308-D	[4]	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
A/B/D Wells															
EWM		320	ND(1.0)	6.1	73.1	170	3.8	9.2	38	71	2.9	4.5	19	-249	-99
EWN		98	ND(1.0)	ND(1.0)	14	14	ND(1.0)	ND(1.0)	1.6	59	ND(1.0)	2.4	11	-39	45
B/D Wells															
ASE76-B	[5]	-	-	-	-	150	2.6	14	26	180	7.9	33	42	-	30
ASE77-B	[5]	-	-	-	-	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	-	-	-	-	-	-
ASE88-B	[5]	-	-	-	-	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	1.7	ND(0.5)U	ND(0.5)U	ND	-	-0.3
BC11-A		62	ND(2.0)	5.6	12	120	3.8	17	27	150	14	31	41	88	30
DM516-210		200	35	39	110.8	[6, 7] 3	1.2	1.6	36	[6] 0.76	11.3	16.6	197	-199.24	-2.24
EW12-227		400	3.4	7.5	34	-	-	-	-	-	-	-	-	-	-
EW12-239		4.9	ND(1.0)	ND(1.0)	ND(1.0)	-	-	-	-	-	-	-	-	-	-
EW13-300		ND(0.50)UJ	ND(0.50)UJ	ND(0.50)UJ	ND(0.50)UJ	-	-	-	-	-	-	-	-	-	-
EW19-D		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-0.5	0

TABLE 3.7

VOC DATA FOR SUBUNIT "D" WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
	TCE	***1,1-DCA***	***1,1-DCE***	***1,2-DCE***	***TCE***	***1,1-DCA***	***1,1-DCE***	***1,2-DCE***	***TCE***	***1,1-DCA***	***1,1-DCE***	***1,2-DCE***	***2001-2010***	***2006-2010***
Well ID	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***(µg/L)***	***TCE***	***TCE***
B/D Wells (cont'd)														
EW22-D	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND	0	0
NW07-D	-	-	-	-	25	1.7	8.8	5.5	4.6	ND(1.0)	2.1	1.2	-	-20.4
NW08-D	-	-	-	-	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	2.1	ND(1.0)	ND(1.0)	ND	-	1.1
NW09-D	-	-	-	-	7.7	ND(1.0)	1.3	1.5	4.8	ND(1.0)	ND(1.0)	ND	-	-2.9
OU312-D	-	-	-	-	0.61	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	-	-0.11
OU313-D	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	0
OU314-D	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND	-	0

Notes:
TCE = Trichloroethylene
1,1-DCA = 1,1 Dichloroethane
1,1-DCE = 1,1 Dichloroethene
1,2-DCE = 1,2 Dichloroethene
A negative number indicates a decrease in TCE concentration (e.g. -3)
A positive number indicates an increase in TCE concentration (e.g. 6)
µg/L = micrograms per liter
VOCs - Volatile Organic Compounds
"--" = Not sampled
ND(x.x) = Not detected above the reported sample quantitation limit x.x. For VOC analytical data, there is not a quantitation limit due to varying limits in data used.
present in the
environmental sample. Results are estimated although the data are considered usable and may be used as appropriate to meet project objectives.
may or may not represent
the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
J+ = Approximate concentration with high bias in sample
ND(xx) U = Qualified as not detected at or above value in parenthesis
(1) Concentration is sum of all detected VOCs (not used in this Table)
(2) Total concentrations include detected concentrations of benzene, toluene, ethylbenzene, or xylenes (not used in this Table)
(3) Sampled by Clear Creek Associates
(4) Sampled by Shaw Environmental
(5) Sampled by CH2MHill
(6) Sampled by LFR on behalf of ADEQ
(7) Data point anomalous, not consistent with historic data
* The value is the highest for a particular analyte collected during baseline sampling event (July - September 2001).
** Duplicate sample collected during sampling event (September 2010).

TABLE 3.8

VOC DATA FOR SUBUNIT "C" AND COLLUVIUM WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		*Baseline (July - September 2001)**				*September 2006*				*September 2010*				*Change*	*Change*
Well ID		*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*TCE (µg/L)*	*1,1-DCA (µg/L)*	*1,1-DCE (µg/L)*	*1,2-DCE (µg/L)*	*2001-2010 TCE*	*2006-2010 TCE*
C Wells															
ASE19-C	(5)	2.7	ND(2.0)	ND(5.0)	ND(2.0)	2.8	ND(2.0)	ND(5.0)	ND(2.0)	6.7	0.6	0.9	ND	4	3.9
ASE20-C	(5)	11	ND(2.0)	ND(5.0)	ND(2.0)	8.2	ND(2.0)	ND(5.0)	ND(2.0)	8.6	ND(0.5)U	ND(0.5)U	0.6	-2.4	0.4
ASE21-C	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-1.5
ASE22-C	(5)	19	ND(2.0)	ND(5.0)	ND(2.0)	43	ND(2.0)	ND(5.0)	ND(2.0)	67	0.6	4.2	1.3	48	24
ASE24-C	(5)	12	ND(2.0)	ND(5.0)	ND(2.0)	22	ND(2.0)	ND(5.0)	ND(2.0)	22	ND(0.5)U	ND(0.5)U	1.5	10	0
ASE25-C	(5)	68	4.9	46	14	21	ND(2.0)	9.6	3.2	10	0.8	3.6	1.2	-58	-11
ASE25-C **	(5)	-	-	-	-	-	-	-	-	11	0.9	3.5	1	-57	-10
ASE29-A	(5)	2.6	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	5.5	ND(0.5)U	1.7	0.5	2.9	3.5
ASE42-C	(5)	62	66	57	25	19	18	9.2	7.2	11	5.6 J	3.7	2.5	-51	-8
ASE43-C	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	0.9	ND(0.5)U	ND(0.5)U	ND	-1.1	-1.1
ASE50-C	(5)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(5.0)	ND(2.0)	ND(0.5)U	ND(0.5)U	ND(0.5)U	ND	-1.5	-1.5
ASE73-C	(5)	-	-	-	-	95	16	20	25	72	13	16	19	-	-23
ASE75-C	(5)	-	-	-	-	3.2	ND(2.0)	ND(5.0)	ND(2.0)	6	ND(0.5)U	ND(0.5)U	1.1	-	2.8
ASE79-C	(5)	-	-	-	-	2.4 J	ND(2.0)	ND(5.0)	ND(2.0)	4.6	ND(0.5)U	ND(0.5)U	1.8	-	2.2
ASE82-C	(5)	-	-	-	-	34	2.2	16	4.7	32	3.7 J	19	4.1	-	-2
ASE83-C	(5)	-	-	-	-	6.8	ND(2.0)	ND(5.0)	2.6	6.5	3.1	3.4	2.8	-	-0.3
ASE84-C	(5)	-	-	-	-	9.7	5.6	ND(5.0)	3.7	2.5	5.3 J	0.7 J	0.7	-	-7.2
BC08-C	(5)	-	-	-	-	4.2	ND(2.0)	ND(5.0)	ND(2.0)	1.3	ND(0.5)U	0.6	ND	-	-2.9
BC10-C	(5)	-	-	-	-	2.1	ND(2.0)	ND(5.0)	ND(2.0)	4.2	ND(0.5)U	ND(0.5)U	0.7	-	2.1
DM119-137	(3)	2.3	-	ND (0.5)	ND (0.5)	-	-	-	-	ND(0.5)	ND(0.5)	ND(0.5)	8.51	-1.8	-
DM119-284	(3)	ND(0.5)	-	ND (0.5)	ND (0.5)	-	-	-	-	-	-	-	-	-	-
DM502-161	(3)	ND(0.5)	-	0.8	12	ND(0.5)	ND(0.5)	ND(0.5)	1.9	ND(0.5)	ND(0.5)	ND(0.5)	1.2	0	0
DM502-240	(3)	ND(0.5)	-	ND (0.5)	0.7	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
DM502-335	(3)	ND(0.5)	-	ND (0.5)	ND (0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	-	-	-	-	-	-
DM506-240	(3)	3.8	ND(0.50)	ND (0.5)	1.1	-	-	-	-	-	-	-	-	-	-

TABLE 3.8

VOC DATA FOR SUBUNIT "C" AND COLLUVIUM WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	*Baseline (July - September 2001)**					*September 2006*				*September 2010*				*Change*	*Change*
	TCE	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*		*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*TCE*	*1,1-DCA*	*1,1-DCE*	*1,2-DCE*	*2001-2010*	*2006-2010*
Well ID	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*		*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*	*TCE*	*TCE*
C Wells (cont'd)															
DM507-240 [3]	ND (0.5)	ND (0.5)	ND (0.5)	6.5		-	-	-	-	-	-	-	-	-	-
DM507-280 [3]	ND (0.5)	ND (0.5)	ND (0.5)	0.9		-	-	-	-	-	-	-	-	-	-
DM507-315 [3]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)		-	-	-	-	-	-	-	-	-	-
DM510-175 [3]	64	ND(0.5)	ND(0.5)	5.1		68	ND(0.5)	ND(0.5)	4.6	119	ND(0.5)	1.86	26.4	55	51
DM510-235 [3]	0.8	ND(0.5)	ND(0.5)	ND(0.5)		-	-	-	-	-	-	-	-	-	-
DM511-165 [3]	0.8	ND(0.5)	ND(0.5)	ND(0.5)		-	-	-	-	-	-	-	-	-	-
DM513-240 [3]	-	-	-	-		-	-	-	-	-	-	-	-	-	-
DM513-280 [3]	ND (0.5)	ND(0.5)	ND(0.5)	4.8		-	-	-	-	-	-	-	-	-	-
DM514-105 [3]	150	ND (0.5)	ND (0.5)	51	[6]	3.9	ND(0.5)	ND(0.5)	1.9	ND(0.5)	ND(0.5)	ND(0.5)	0.58	-149.5	-3.4
DM514-105 ** [3]	-	-	-	-	[6]	-	-	-	-	0.54	ND(0.5)	ND(0.5)	ND	-149.46	-3.36
DM514-180 [3]	ND (0.5)	ND(0.5)	ND(0.5)	ND(0.5)	[6]	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND	0	0
DM515-265 [3]	ND (0.5)	0.7	ND(0.5)	1.7		-	-	-	-	-	-	-	-	-	-
DM516-295 [3]	ND (0.5)	ND (0.5)	ND (0.5)	1.3	[6]	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.75)	ND(0.5)	ND(0.5)	ND(0.5)	ND	0	0
DM517-235 [3]	2.4	0.9	1.3	0.7	[6]	1.3	ND(0.5)	ND(0.5)	ND(0.5)	2.41	ND(0.5)	ND(0.5)	ND	0.01	1.11
DM605-240 [3]	ND (0.5)	-	ND (0.5)	ND (0.5)		ND(0.5)	ND(0.5)	ND(0.5)	ND (0.5)	-	-	-	-	-	-
DM605-290 [3]	ND (0.5)	-	ND (0.5)	ND (0.5)		ND(0.5)	ND(0.5)	ND(0.5)	ND (0.5)	-	-	-	-	-	-
PL103-C	-	-	-	-		-	-	-	-	70	ND(0.5)U	1	14	-	-
PZ01-D	17	ND(1.0)	ND(1.0)	2.2		-	-	-	-	-	-	-	-	-	-
PZ02-D	28	ND(1.0)	ND(1.0)	4.6		-	-	-	-	-	-	-	-	-	-
A/B/C Wells															
EWS	320	12	16	85		33	12	14	9.4	14	4	6.2	3.4	-306	-19
A/C Wells															
ASE127-A [5]	-	-	-	-		-	-	-	-	ND(0.5)U	ND(0.5)U	ND	ND(0.5)U	-	-
ASE127-A ** [5]	-	-	-	-		-	-	-	-	ND(0.5)U	ND(0.5)U	ND	ND(0.5)U	-	-

TABLE 3.8

VOC DATA FOR SUBUNIT "C" AND COLLUVIUM WELLS - SEPTEMBER 2001, 2006, AND 2010
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		Baseline (July - September 2001)*				September 2006				September 2010				Change	Change
Well ID		TCE (μg/L)	1,1-DCA (μg/L)	1,1-DCE (μg/L)	1,2-DCE (μg/L)	TCE (μg/L)	1,1-DCA (μg/L)	1,1-DCE (μg/L)	1,2-DCE (μg/L)	TCE (μg/L)	1,1-DCA (μg/L)	1,1-DCE (μg/L)	1,2-DCE (μg/L)	2001-2010 TCE	2006-2010 TCE
<u>Colluvium Wells</u>															
NW15-S		-	-	-	-	-	-	-	-	1.7	2.4	ND(1.0)	ND	-	-
NW17-S		-	-	-	-	-	-	-	-	130	2.1	3.6	28	-	-
NW18-M		-	-	-	-	-	-	-	-	64	9.4	15	13	-	-
<u>B/C Wells</u>															
ASE120-B	(5)	-	-	-	-	-	-	-	-	36	2.9	1.7	9.3	-	-

Notes:
TCE = Trichloroethylene
1,1-DCA = 1,1 Dichloroethane
1,1-DCE = 1,1 Dichloroethene
1,2-DCE = 1,2 Dichloroethene
μg/L = micrograms per liter
VOCs = Volatile Organic Compounds
"--" = Not
A negative number indicates a decrease in TCE concentration (e.g., -1.9).
A positive number indicates an increase in TCE concentration (e.g., 0.8).
ND(x.x) = Not detected above the reported sample quantitation limit x.x. For VOC analytical data, there is not a quantitation limit due to varying limits in data used.
J = Analyte was analyzed for and was positively defined, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.
Results are estimated although the data are considered usable and may be used as appropriate to meet project objectives. Results are qualitatively acceptable and quantitatively uncertain.
J+ = Approximate concentration with high bias in sample
ND(x.x) U = Qualified as not detected at or above value in parenthesis
(1) Concentration is sum of all detected VOCs (not used in this Table)
(2) Total concentrations include detected concentrations of benzene, toluene, ethylbenzene, or xylenes (not used in this Table)
(3) Sampled by Clear Creek Associates
(4) Sampled by Shaw Environmental (not used in this Table)
(5) Sampled by CH2MHill
(6) Sampled by LFR, Inc.
* The value is the highest for a particular analyte collected during baseline sampling event (July - September 2001)
** Duplicate sample collected during sampling event (September 2010)

TABLE 4.1

PROCESS SUMMARY - VOLUMES
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Volume (Gallons)						
Date	*EWN (x1,000)*	*EWM (x1,000)*	*EWS (x1,000)*	*Total Influent (EWN+M+S) (x1,000)*	*UV System (x1,000)*	*Treated Discharge (x1,000)*	*Backwash Wastewater Discharge*
Sept. 2001 to Dec. 2009 Totals	**2,593,514**	**5,307,669**	**1,016,679**	**8,917,865**	**542,712**	**8,812,355**	**7,533,855**
January 2010 Totals	8,900	19,589	3,434	31,923	0	31,645	19,690
February 2010 Totals	17,916	39,986	7,085	64,987	0	63,843	55,830
March 2010 Totals	26,932	59,986	10,583	97,501	0	95,450	37,660
April 2010 Totals	26,260	57,598	10,231	94,089	0	92,507	80,020
May 2010 Totals	27,039	57,748	10,575	95,362	0	94,238	35,420
June 2010 Totals	25,893	57,885	10,141	93,919	0	92,253	5,000
July 2010 Totals	26,775	59,352	8,758	94,885	0	94,284	124,510
August 2010 Totals	28,758	63,790	4,192	96,740	0	94,998	93,850
September 2010 Totals	25,812	55,287	12,963	94,062	0	92,172	3,830
October 2010 Totals	26,105	54,839	13,339	94,283	0	93,737	127,380
November 2010 Totals	30,341	55,528	13,145	99,014	3,396	97,713	88,950
December 2010 Totals	35,258	56,698	13,267	105,223	0	103,238	4,090
Total Gallons 2001 to 2010	**2,899,503**	**5,945,954**	**1,134,392**	**9,979,852**	**546,108**	**9,858,433**	**8,210,085**

TABLE 4.2

PROCESS SUMMARY - RUN TIMES
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Run Time (Hours)					
Date	*EWN*	*EWM*	*EWS*	*UV System*	*Backwash Pump 1*	*Backwash Pump 2*
Sept. 2001 to Dec. 2009 Totals	**58,882.4**	**62,735.0**	**61,085.5**	**2,519.4**	**1,266.0**	**1,637.5**
January 2010 Totals	244.8	244.9	244.9	0.0	1.8	119.9
February 2010 Totals	497.2	495.9	497.2	0.0	10.6	7.9
March 2010 Totals	743.9	744.0	744.0	0.0	5.3	7.0
April 2010 Totals	720.0	718.5	720.0	0.0	16.1	10.9
May 2010 Totals	743.1	742.9	742.8	0.0	2.5	9.2
June 2010 Totals	716.6	717.4	716.2	0.0	0.0	1.5
July 2010 Totals	727.8	738.6	727.7	0.0	9.4	27.6
August 2010 Totals	717.7	732.1	259.6	0.0	0.0	28.6
September 2010 Totals	718.9	718.5	718.5	0.0	0.0	1.2
October 2010 Totals	723.1	726.6	726.3	0.0	0.0	34.6
November 2010 Totals	720.0	720.0	720.0	23.0	0.0	20.1
December 2010 Totals	732.0	730.7	732.0	0.0	0.0	2.2
Total Hours 2001 to 2010	**66,887.5**	**70,765.1**	**68,634.7**	**2,542.4**	**1,311.7**	**1,908.2**

TABLE 4.3

SUMMARY OF SYSTEM 2010 MONTHLY UP-TIME PERCENTAGES
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Average Percent Uptime				
Month	***EWN***	***EWM***	***EWS***	***Treatment System***	***Comments***
January 2010	32.9 100.0*	32.9 100.0*	32.9 100.0*	32.9 100.0*	Includes all shutdowns
February 2010	74.0 99.9*	73.8 100.0*	74.0 100.0*	74.0 100.0*	Includes all shutdowns
March 2010	100.0	100.0	100.0	100.0	Includes all shutdowns
April 2010	100.0	99.8	100.0	100.0	Includes all shutdowns
May 2010	99.9	99.9	99.8	99.9	Includes all shutdowns
June 2010	99.5	99.6	99.5	99.6	Includes all shutdowns
July 2010	97.8	99.3	97.8	99.3	Includes all shutdowns
August 2010	96.5	98.4	34.9	98.4	Includes all shutdowns
September 2010	99.8	99.8	99.8	99.8	Includes all shutdowns
October 2010	97.2	97.7	97.6	97.7	Includes all shutdowns
November 2010	100.0	100.0	100.0	100.0	Includes all shutdowns
December 2010	98.4	98.2	98.4	98.4	Includes all shutdowns

Note:

*Annual SRP Grand Canal Shutdown removed from calculations

TABLE 4.4

SUMMARY OF EXTRACTION WELL FLOW RATE SET POINT CHANGES
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

Date of Flow Change	*Extraction Well* *EWN*	*EWM*	*EWS*	*Total*	*Comments*
9/26/2001 (Startup)	1,350	1,750	850	3,950	
9/27 to 10/11/2001	NC	NC	0	3,100	
10/11/2001	NC	NC	550	3,650	
10/12/2001	NC	NC	550 to 600	3,700	EWS increased as part of startup flow adjustment.
11/13/2001	NC	NC	600 to 550	3,650	EWS reduced due to drop in water table elevation.
1/3/2002	1,350 to 0	1,750 to 0	550 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
2/4/2002	0 to 1,350	0 to 1,750	0 to 550	3,650	Extraction and Treatment System restarted.
3/19/2002	NC	NC	550 to 500	3,600	EWM reduced to alleviate air entrainment.
4/9/2002	1,350 to 1,250	1,750 to 1,650	NC	3,400	
7/9/2002	1,250 to 1,150	NC	NC	3,300	EWN reduced to alleviate air entrainment.
7/22/2002	NC	NC	500 to 450	3,250	EWS reduced due to low groundwater level.
9/20/2002	NC	NC	450 to 400	3,200	EWS reduced due to low groundwater level.
11/1/2002	1,150 to 850	1,650 to 1,550	NC	2,800	EWN pump bowl changeout.
11/15/2002	NC	1,550 to 1,450	NC	2,700	EWM reduced to assist EWS pumping rate.
11/17/2002	NC	NC	400 to 350	2,650	EWS reduced due to low groundwater level.
1/8/2003	850 to 0	1,450 to 0	350 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
1/31/2003	0 to 850	0 to 1,450	0 to 350	2,650	Extraction and Treatment System restarted.
6/2/2003	NC	NC	350 to 300	2,600	EWS reduced due to low groundwater level.
9/30/2003	850 to 650	NC	NC	2,400	EWS reduced due to low groundwater level.
10/7/2003	NC	NC	300 to 250	2,350	EWS maintained at 250 gpm while operating in the cyclical pumping mode (20 hours on, 4 hours off), for an average flow rate of 209 gpm.
1/9/2004	650 to 0	1,450 to 0	250 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
2/11/2004	NC	0 to 1,450	0 to 250		Restart after Annual SRP Grand Canal Maintenance Shutdown.
2/11/2004	NC	1,450 to 1,650	250 to 200	1,850	EWS pump replaced with a 200 gpm submersible pump. EWN kept offline after the restart of the system and will remain offline until further notice. Adjusted flows to alleviate air entrainment.
6/7/2004	NC	1,650 to 0	NC	200	EWM down to replace pump bowl.
6/8/2004	0 to 850	0	NC	1,050	EWN up during EWM maintenance shutdown.
6/28/2004	850 to 0	0 to 1,550	NC	1,750	EWM restart after replacing pump bowl.
7/2/2004	0	1,550 to 1,500	NC	1,700	EWM reduced to alleviate air entrainment.
7/6/2004	0	1,500 to 1,400	NC	1,600	EWM reduced to alleviate air entrainment.
9/22/2004	0	1,400 to 1,350	NC	1,550	EWM reduced to alleviate air entrainment.
9/23/2004	600	1,350 to 1,300	NC	2,100	EWM reduced to alleviate air entrainment, started EWN to ensure capture.
10/5/2004	600	1,300	200 to 0	1,900	EWS down for pump motor replacement and well cleaning.
10/14/2004	600	1,300	0 to 200	2,100	EWS restarted after pump motor replacement and well cleaning.
11/20/2004	600 to 850	1,300 to 0	NC	1,050	EWM flow control valve malfunction.
11/24/2004	850 to 750	0 to 1,300	NC	2,250	EWM back online after fixing flow control valve.
11/30/2004	750 to 600	NC	NC	2,100	EWN back to normal operational set point.
12/29/2004	600 to 0	1,300 to 0	200 to 0	0	SRP Grand Canal shut down until 1/7/2005 due to flooding caused by heavy rains.
1/7/2005	NC	NC	NC	0	Annual SRP Grand Canal Maintenance Shutdown.
2/8/2005	0 to 800	NC	0 to 200	1,000	EWM off for line shaft bearing replacement and pump motor leveling. EWN increased to ensure capture.
2/16/2005	800 to 600	0 to 1,350	NC	2,150	EWM restarted after line shaft bearing replacement and pump motor leveling. EWN reduced to prevent air entrainment.
12/6/2005	600 to 0	1,350 to 0	200 to 0	0	Extraction and Treatment System shut down as a precaution due to the presence of TCE in the facility effluent.
12/14/2005	NC	0 to 1,350	NC	1,350	EWM restarted following carbon changeouts in GAC vessels.
12/15/2005	0 to 600	NC	0 to 200	2,150	EWS and EWN restarted following carbon changeouts in GAC vessels.
1/6/2006	600 to 0	1,350 to 0	200 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
2/6/2006	0 to 600	0 to 1,350	0 to 200	2,150	Restart after Annual SRP Grand Canal Maintenance Shutdown.
1/5/2007	600 to 0	1,350 to 0	200 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
2/5/2007	0 to 600	0 to 1,350	0 to 200	2,150	Restart after Annual SRP Grand Canal Maintenance Shutdown.
7/1/2007	600 to 0	NC	NC	1,550	EWN offline for soft start replacement (due to power surge).
7/2/2007	NC	1,350 to 1,550	200	1,750	EWM increased to ensure capture.
7/6/2007	NC	NC	200 to 0	1,550	EWS offline for pump replacement due to pump thrust bearings (pump replaced).
7/13/2007	0 to 600	1,550 to 1,350	0 to 200	2,150	EWN and EWS restarted following repairs to extraction wells. EWM reduced to prevent air entrainment.
12/4/2007	600 to 0	1,350 to 0	200 to 0	0	SRP Grand Canal shut down until 12/17/2007 due to SRP valve maintenance.
12/17/2007	0 to 600	0 to 1,350	0 to 200	2,150	Restart after SRP Grand Canal Shutdown.
1/4/2008	600 to 0	1,350 to 0	200 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
2/4/2008	0 to 600	0 to 1,350	0 to 200	2,150	Restart after Annual SRP Grand Canal Maintenance Shutdown.
4/29/2008	NC	NC	200 to 240	2,190	EWS increased to test if pump could operate at higher flow rate and maximize groundwater capture.
1/9/2009	600 to 0	1,350 to 0	240 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
2/9/2009	0 to 600	0 to 1,350	0 to 240	2,190	Restart after SRP Grand Canal shutdown.
1/11/2010	600 to 0	1,350 to 0	240 to 0	0	Annual SRP Grand Canal Maintenance Shutdown.
2/8/2010	0 to 600	0 to 1,350	0 to 240	2,190	Restart after SRP Grand Canal Shutdown.
8/4/2010	600 to 700	1,350 to 1,550	240 to 0	2,250	EWS offline for pump replacement/well rehabilitation. EWN and EWM setpoints increased to increase capture.
8/24/2010	700 to 600	1,550 to 1,290	0 to 300	2,190	EWM decreased/EWS increased to increase groundwater capture in southern part of plume.
11/15/2010	600 to 800	NC	NC	2,390	EWN increased to increase groundwater capture in northern part of plume.

Notes:
gpm = gallons per minute
NC = no change
TCE = Trichloroethylene

TABLE 4.5

SUMMARY OF GAC CHANGEOUT DATES
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

		Replacement Quantity (pounds)
Ship Date	*GAC #* [1]	*Regenerated*
First Changeout 2010 (4 Sets in Service)		
April 16, 2010	1B	18,000
April 20, 2010	4B	18,000
April 22, 2010	6B	18,000
April 29, 2010	7B	18,000
May 7, 2010	8B	18,000
		90,000
Second Changeout 2010 (4 Sets in Service)		
July 27, 2010	1A	18,000
July 29, 2010	4A	18,000
August 3, 2010	6A	18,000
August 5, 2010	7A	18,000
August 10, 2010	8A	18,000
		90,000
Third Changeout 2010 (5 Sets in Service as of November 23, 2010)		
October 20, 2010	1B	18,000
October 22, 2010	4B	18,000
October 25, 2010	6B	18,000
October 27, 2010	7B	18,000
October 29, 2010	8B	18,000
November 19, 2010	2A/2B [2]	36,000
		126,000

Note:
GAC = Granular Activated Carbon
[1] These GAC vessels become secondary GAC vessels after carbon changeout
[2] On November 19, 2010, 36,000 lbs of regenerated carbon were added to GAC vessels 2A and 2B, and these vessels were placed in service on November 23, 2010 to accommodate for the increase in influent flow.

TABLE 4.6

SUMMARY OF ANALYTICAL RESULTS
DISCHARGE TO THE CITY OF PHOENIX SEWER
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

Parameter [1]	*Units*	*City of Phoenix Discharge Limitations*	*Frequency Date Number Status*	*Quarterly 3/1/2010 30110-MM-01 Final*	*Quarterly 6/1/2010 60110-MM-13 Final*	*Quarterly 9/1/2010 90110-MM-01 Final*	*Quarterly 12/2/2010 120210-MM-13 Final*
pH	s.u.	5.0 - 10.5		8.00	8.21	8.29	8.45
Benzene	µg/L	35		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloroform	µg/L	2,000		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Tetrachloroethene	µg/L	NA		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	µg/L	NA		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)

Notes:
[1] As required by the Industrial Wastewater Discharge Permit
s.u. = standard units
µg/L = micrograms per liter
ND( ) = Not Detected at the reporting limit in parenthesis
NA = Not applicable

TABLE 4.7

SUMMARY OF ANALYTICAL RESULTS
FACILITY DISCHARGE
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Treated Groundwater Discharge Standards	*Frequency* *Date* *Number* *Status*	*Monthly* *1/6/2010* *PS-010610-07* *Final*	*Monthly ** *1/6/2010* *PS-010610-08* *Final*	*Monthly* *2/10/2010* *PS-021010-07* *Final*	*Monthly ** *2/10/2010* *PS-021010-08* *Final*	*Monthly* *3/1/2010* *PS-030110-08* *Final*	*Monthly ** *3/1/2010* *PS-030110-09* *Final*	*Monthly* *4/1/2010* *PS-040110-07* *Final*	*Monthly ** *4/1/2010* *PS-040110-08* *Final*	*Monthly* *5/4/2010* *PS-050410-07* *Final*	*Monthly ** *5/4/2010* *PS-050410-08* *Final*	*Supplemental* *5/12/2010* *PS-051210-02* *Final*	*Supplemental ** *5/12/2010* *PS-051210-03* *Final*	*Monthly* *6/1/2010* *PS-060110-07* *Final*	*Monthly ** *6/1/2010* *PS-060110-08* *Final*
Volatile Organic Compounds (VOCs) (µg/L)																
Benzene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromodichloromethane	TTHM		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane	TTHM		ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Chloroform	TTHM		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloromethane	NNS		ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
1,1-Dichloroethane	NNS		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.9	2.0	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	7		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	70		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.6	1.6	3.6	3.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,2-Dichloroethene	100		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Tetrachloroethene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	1,000		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,1-Trichloroethane	200		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichlorofluoromethane	TTHM		ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)
Vinyl Chloride	2		ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Xylene	10,000		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
	Total Discharge VOCs		0.0	0.0	0.0	0.0	0.0	0.0	3.5	3.6	3.6	3.4	0.0	0.0	0.0	0.0
Field Parameters																
pH (s.u.)			6.42	6.42	6.50	6.50	6.60	6.60	6.99	6.99	6.66	6.66	6.75	6.75	7.11	7.11
Conductivity (µS/cm^3)			1,970	1,970	1,975	1,975	1,938	1,938	1,328	1,328	1,978	1,978	1,950	1,950	1,405	1,405
Temperature (°F)			76.6	76.6	75.6	75.6	75.1	75.1	77.7	77.7	77.8	77.8	76.9	76.9	79.6	79.6
System Status (X indicates operational)																
EWN			X	X	X	X	X	X	X	X	X	X	X	X	X	X
EWM			X	X	X	X	X	X	X	X	X	X	X	X	X	X
EWS			X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ultraviolet oxidation system with H2O2																
Ultraviolet oxidation system without H2O2																

Notes:
* indicates a duplicate sample
µg/L = micrograms per liter
ND( ) = Not Detected at the reporting limit in parenthesis
TTHM = Total Trihalomethanes = 100 µg/L
NNS = No numeric standard
s.u. = standard units
µS/cm^3 = microsiemens per centimeters cubed
^{o}F = degrees Fahrenheit
Status = Final - data validated by project chemist

TABLE 4.7

SUMMARY OF ANALYTICAL RESULTS
FACILITY DISCHARGE
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Treated Groundwater Discharge Standards	*Frequency*	*Monthly*	*Monthly **	*Monthly*	*Monthly **	*Monthly*	*Monthly **	*Monthly*	*Monthly **	*Monthly*	*Monthly **	*Monthly*	*Monthly **
		Date	*7/1/2010*	*7/1/2010*	*8/2/2010*	*8/2/2010*	*9/1/2010*	*9/1/2010*	*10/4/2010*	*10/4/2010*	*11/1/2010*	*11/1/2010*	*12/2/2010*	*12/2/2010*
		Number	*PS-070110-07*	*PS-070110-08*	*PS-080210-07*	*PS-080210-08*	*PS-090110-08*	*PS-090110-09*	*PS-100410-07*	*PS-100410-08*	*PS-110110-07*	*PS-110110-08*	*PS-120210-08*	*PS-120210-09*
		Status	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*
Volatile Organic Compounds (VOCs) (μg/L)														
Benzene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromodichloromethane	TTHM		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane	TTHM		ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Chloroform	TTHM		ND(1.0)	ND(1.0)	1.6	1.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloromethane	NNS		ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
1,1-Dichloroethane	NNS		1.6	1.6	2.2	2.2	ND(1.0)	ND(1.0)	1.2	1.3	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	7		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	70		ND(1.0)	ND(1.0)	2.4	2.2	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,2-Dichloroethene	100		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Tetrachloroethene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	1,000		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,1-Trichloroethane	200		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichlorofluoromethane	TTHM		ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)
Vinyl Chloride	2		ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Xylene	10,000		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
	Total Discharge VOCs		1.6	1.6	6.2	5.8	0.0	0.0	1.2	1.3	0.0	0.0	0.0	0.0
Field Parameters														
pH (s.u.)			7.04	7.04	6.91	6.91	6.96	6.96	6.35	6.35	7.13	7.14	7.08	7.08
Conductivity (μS/cm^3)			1,344	1,344	1,965	1,965	1,975	1,975	1,962	1,962	1,945	1,943	1,959	1,959
Temperature (°F)			80.2	80.2	78.6	78.6	78.8	78.8	78	78	77.7	77.7	77.6	77.6
System Status (X indicates operational)														
EWN			X	X	X	X	X	X	X	X	X	X	X	X
EWM			X	X	X	X	X	X	X	X	X	X	X	X
EWS			X	X	X	X	X	X	X	X	X	X	X	X
Ultraviolet oxidation system with H2O2														
Ultraviolet oxidation system without H2O2														

Notes:
* indicates a duplicate sample
μg/L = micrograms per liter
ND( ) = Not Detected at the reporting limit in parenthesis
TTHM = Total Trihalomethanes = 100 μg/L
NNS = No numeric standard
s.u. = standard units
μS/cm^3 = microsiemens per centimeters cubed
°F = degrees Fahrenheit
Status = Final - data validated by project chemist

TABLE 4.8

SUMMARY OF ANALYTICAL RESULTS
GRAND CANAL DISCHARGE
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Treated Groundwater Discharge Standards	Sample Location	SRP Discharge												
		Frequency	Monthly	Monthly	Monthly	Monthly	Monthly	Supplemental	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
		Date	1/6/2010	2/10/2010	3/1/2010	4/1/2010	5/4/2010	5/12/2010	6/1/2010	7/1/2010	8/2/2010	9/1/2010	10/4/2010	11/1/2010	12/2/2010
		Number	PS-010610-11	PS-021010-11	PS-030110-13	PS-040110-11	PS-050410-11	PS-051210-04	PS-060110-11	PS-070110-11	PS-080210-11	PS-090110-14	PS-100410-10	PS-110110-10	PS-120210-11
		Status	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Volatile Organic Compounds (VOCs) (µg/L)															
Benzene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromodichloromethane	TTHM		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane	TTHM		ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Chloroform	TTHM		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	1.8	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Chloromethane	NNS		ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
1,1-Dichloroethane	NNS		ND(1.0)	ND(1.0)	ND(1.0)	1.6	ND(1.0)	ND(1.0)	ND(1.0)	1.4	2.3	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,2-Dichloroethane	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1-Dichloroethene	7		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
cis-1,2-Dichloroethene	70		ND(1.0)	ND(1.0)	ND(1.0)	1.1	2.9	ND(1.0)	ND(1.0)	ND(1.0)	2.5	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
trans-1,2-Dichloroethene	100		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Tetrachloroethene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	1,000		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,1-Trichloroethane	200		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichloroethene	5		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Trichlorofluoromethane	TTHM		ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)	ND(4.0)
Vinyl Chloride	2		ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Xylene	10,000		ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Field Parameters															
pH (s.u.)			6.31	6.47	6.65	7.16	6.58	6.80	7.43	7.30	7.00	7.01	6.45	7.28	7.15
Conductivity (µS/cm^3)			1,948	1,947	1,942	1,310	1,952	1,939	1,353	1,313	1,956	1,974	1,941	1,965	1,971
Temperature (°F)			74.3	74.8	75.7	76.2	76.3	77.4	78.2	80.3	80.1	79.3	78.1	75.9	78.0
System Status (X indicates operational)															
EWN			X	X	X	X	X	X	X	X	X	X	X	X	X
EWM			X	X	X	X	X	X	X	X	X	X	X	X	X
EWS			X	X	X	X	X	X	X	X	X	X	X	X	X
Ultraviolet oxidation system with H2O2															
Ultraviolet oxidation system without H2O2															

Notes:
µg/L = micrograms per liter
ND( ) = Not Detected at the reporting limit in parenthesis
TTHM = Total Trihalomethanes = 100 µg/L
NNS = No numeric standard
s.u. = standard units
µS/cm^3 = microsiemens per centimeters cubed
°F = degrees Fahrenheit
Status = Final - data validated by project chemist

TABLE 4.9

SUMMARY OF METALS ANALYTICAL RESULTS
SRP DISCHARGE
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Surface Water Quality Standards[1]	Sample Location	SRP Discharge
		Frequency	Annually
		Date	9/1/2010
		Number	PS-090110-18
		Status	Final
Total Recoverable Metals (mg/L)			
Arsenic	2		0.0072
Barium	NNS		0.048
Boron	1		1.9
Cadmium	0.05		ND(0.0010)
Calcium	NNS		75
Copper	5		0.0049
Iron	NNS		ND(0.050)
Lead	10		ND(0.0010)
Magnesium	NNS		28
Mercury	NNS		ND(0.00020)
Potassium	NNS		8.4
Selenium	0.02		ND(0.10)
Sodium	NNS		290
Zinc	10		ND(0.010)
Field Parameters			
pH (s.u.)			7.01
Conductivity (μS/cm^3)			1,974
Temperature (°F)			79.3
System Status (X indicates operational)			
EWN			X
EWM			X
EWS			X

Notes:
[1] Water Quality Standards for Surface Waters are per Title 18, Ch. 11, Section 101 et. seq. of the Arizona Administration Code for agricultural irrigation uses (SRP Grand Canal designation)
mg/L = milligrams per liter
ND( ) = Not Detected at the reporting limit in parenthesis
NNS = No numeric standard
s.u. = standard units
μS/cm^3 = microsiemens per centimeters cubed
^{o}F = degrees Fahrenheit
Status = Final - data validated by project chemist

TABLE 4.10

SUMMARY OF GENERAL CHEMISTRY ANALYTICAL RESULTS
SRP DISCHARGE
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Surface Water Quality Standards [1]	Sample Location	SRP Discharge
		Frequency	Annually
		Date	9/1/2010
		Number	PS-090110-18
		Status	Final
General Chemistry (mg/L)			
Alkalinity, Bicarbonate	NNS		280
Alkalinity, as CaCO3	NNS		280
Chloride	NNS		310
Fluoride	NNS		ND(0.40)
Nitrate (as N)	NNS		7.1
Nitrite (as N)	NNS		0.53
Orthophosphate	NNS		ND(0.20)UJ
Sulfate	NNS		230
Total Dissolved Solids (TDS)	NNS		1,200
Hardness, Carbonate	NNS		300
Field Parameters			
pH (s.u.)			7.01
Conductivity (μS/cm^3)			1,974
Temperature (°F)			79.3
System Status (X indicates operational)			
EWN			X
EWM			X
EWS			X

Notes:
1 Water Quality Standards for Surface Waters are per Title 18, Ch. 11, Section 101 et. seq. of the Arizona Administration Code for agricultural irrigation uses (SRP Grand Canal designation)
mg/L = milligrams per liter
NNS = No numeric standard
ND( ) - Not Detected at the detection limit in parenthesis
s.u. = standard units
μS/cm^3 = microsiemens per centimeters cubed
UJ - The orthophosphate analytical results were qualified as estimated (UJ) because the Laboratory Control Sample and Laboratory Control Sample Duplicate recoveries violated acceptance criteria.Results may be biased low.
^{o}F = degrees Fahrenheit
Status = Final - data validated by project chemist

TABLE 4.11

SUMMARY OF BORON ANALYTICAL RESULTS
SRP DISCHARGE AND GRAND CANAL
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Surface Water Quality Standards[1]	*Sample Location*	*SRP Discharge*				*SRP Upgradient 470 ft from Discharge*				*SRP Downgradient 800 ft from Discharge*			
		Frequency	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*	*Quarterly*
		Date	*3/1/2010*	*6/1/2010*	*9/1/2010*	*12/2/2010*	*3/1/2010*	*6/1/2010*	*9/1/2010*	*12/2/2010*	*3/1/2010*	*6/1/2010*	*9/1/2010*	*12/2/2010*
		Number	*PS-030110-19*	*PS-060110-17*	*PS-090110-20*	*PS-120210-17*	*PS-030110-20*	*PS-060110-16*	*PS-090110-19*	*PS-120210-16*	*PS-030110-21*	*PS-060110-18*	*PS-090110-21*	*PS-120210-18*
		Status	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*	*Final*
<u>*Total Recoverable Metals (mg/L)*</u>														
Boron	1		2.0	2.0	2.2	2.2	ND(0.20)	ND(0.20)	0.38	ND(0.20)	0.35	0.24	0.39	0.57
<u>*Field Parameters*</u>														
pH (s.u.)			6.65	7.45	7.06	7.15	7.15	8.2	7.10	6.47	6.8	8.13	6.90	6.67
Conductivity (μS/cm^3)			1,942	1,362	1,979	1,971	905	742	952	925	1,902	756	945	1,110
Temperature (°F)			75.7	78.5	79.3	78.0	55.4	76.3	82.8	64.6	63.8	74.5	81.7	66.9
<u>*System Status (X indicates operational)*</u>														
EWN			X	X	X	X	X	X	X	X	X	X	X	X
EWM			X	X	X	X	X	X	X	X	X	X	X	X
EWS			X	X	X	X	X	X	X	X	X	X	X	X

Notes:
1 Water Quality Standards for Surface Waters are per Title 18, Ch. 11, Section 101 et. seq. of the Arizona Administration Code for agricultural irrigation uses (SRP Grand Canal designation)
mg/L = milligrams per liter
ND( ) = Not Detected at the reporting limit in parenthesis
s.u. = standard units
μS/cm^3 = microsiemens per centimeters cubed
^{o}F = degrees Fahrenheit
Status = Final - data validated by project chemist

TABLE 4.12

SUMMARY OF COMBINED INFLUENT ANALYTICAL RESULTS
METALS AND GENERAL CHEMISTRY
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

	Treated Groundwater Discharge Standards	Sample Location / Frequency / Date / Number / Status	Combined Influent: Annually 9/1/2010 PS-090110-02 Final	Combined Influent: Confirmation 9/23/2010 PS-092310-01 Final
Total Recoverable Metals (mg/L)				
Copper	NNS		0.0065	--
Potassium	NNS		6.7	--
Sodium	NNS		300	--
Vanadium	NNS		0.0087	--
Dissolved Metals (mg/L)				
Arsenic, Dissolved	0.01		0.0059	--
Barium, Dissolved	2		0.048	--
Calcium, Dissolved	NNS		74	--
Chromium, Dissolved	0.1		0.0043	--
Iron, Dissolved	NNS		ND(0.050)	--
Magnesium, Dissolved	NNS		28	--
General Chemistry (mg/L)				
Alkalinity as $CaCO_3$	NNS		290	--
Ammonia-N	NNS		ND(0.50)	--
Bicarbonate Alkalinity as $CaCO_3$	NNS		290	--
Fluoride	NNS		ND(0.40)	--
Nitrate-N	10		7.2	--
Nitrite-N	1		ND(0.20)	--
Orthophophorus	NNS		ND(0.20)UJ	--
Total Dissolved Solids	NNS		1,200	--
Total Suspended Solids	NNS		ND(10)	--
Hardness, Dissolved ($CaCO_3$)	NNS		300	--
Sulfate	NNS		230	--
Chloride	NNS		310	--
Dissolved Organic Carbon	NNS		ND(1.0)	--
Oil & Grease	NNS		14	6.2
Phosphorus	NNS		ND(0.10)	--
Total Organic Carbon	NNS		ND(1.0)	--
Total Kjeldahl Nitrogen	NNS		ND(1.0)	--
Field Parameters				
pH (s.u.)			6.98	7.12
Conductivity (µS/cm^3)			1,978	1,974
Temperature (°F)			78.5	77.5
System Status (X indicates operational)				
EWN			X	X
EWM			X	X
EWS			X	X
Ultraviolet oxidation system with H2O2				
Ultraviolet oxidation system without H2O2				

Notes:
mg/L = milligrams per liter
ND( ) = Not Detected at the reporting limit in parenthesis
NNS = No numeric standard
s.u. = standard units
µS/cm^3 = microsiemens per centimeters cubed
°F = degrees Fahrenheit
UJ = The orthophosphorus analytical results were qualified as estimated (UJ) because the Laboratory Control Sample and Laboratory Control Sample Duplicate recoveries violated acceptance criteria. Results may be biased low.
Status = Final - data validated by project chemist

TABLE 7.1

PROPOSED OU2 GES AREA GROUNDWATER MONITOR WELL SAMPLING FREQUENCIES - 2011
52ND STREET SUPERFUND SITE, OU2 AREA
PHOENIX, ARIZONA

Well ID Monitoring Wells/Piezometers	*Construction Type*	*Location*	*Former ADEQ Hydrostratigraphic Subunit Screened*	*Current Monitoring (2011)*		*Proposed Frequency (2012)*	*Justification for Sampling Reduction/Change/Comments*
				Hydraulic	*Water Quality*	*Water Quality*	
BC-16	C	32nd Street and Washington Street		X	Y	Y	Formerly sampled by CH2MHILL/Honeywell.
CRA01	C	I-10 and Roosevelt Street	A	X	Z	Z	
DM509	C	N 30th Place and E Van Buren	B	X	Y	Y	Formerly sampled by Clear Creek Associates/Freescale.
DM518-0B1	C	N 30th Place and Garfield Street	A	X	Y	Y	Formerly sampled by Clear Creek Associates/Freescale.
EW03	C	N 28th Street and E Van Buren	A	X	Y	Y	Formerly sampled by Clear Creek Associates/Freescale.
EW06	C	20th Street and Madison Street	A	X	Z	Z	
EW07	C	20th Street and Fillmore Street	A	X	Z	Z	
EW19-D	C	12th Street and Monroe Street	D	X	--	--	
EW19-S	C	12th Street and Monroe Street	A	X	--	--	
EW21	C	12th Street and Fillmore Street	A	X	--	--	
EW22-D	C	15th Street and Polk Street	D	X	Y	Y	No historic VOC detects, in OU3, and well outside VOC plume.
EW22-S	C	15th Street and Polk Street	A	X	Y	Y	Sufficient data base to establish trend. Rapid changes not expected.
EWM	E	Van Buren, east of 20th Street, on ADOT ROW	A/B/D	X	Z	Z	Sufficient data base to establish trend. Rapid changes not expected.
EWN	E	ADOT ROW	A/B/D	X	Z	Z	Sufficient data base to establish trend. Rapid changes not expected.
EWS	E	20th Street north of Washington Street	A/B/C	X	Z	Z	Sufficient data base to establish trend. Rapid changes not expected.
EWSPZ1	C	20th Street north of Washington Street	A/B/D	X	--	--	In the heart of the plume, screened across multiple units.
NW01	C	24th Street and Roosevelt Street	A	X	Z	Z	
NW02	C	Polk Street, between 19th and 20th Streets	B	X	Z	Y	Center of the plume, proximal to NW5-S, and historic decreasing VOC trend.
NW03	C	Monroe Street, between 19th and 20th Streets	A	X	Z	Z	
NW04-S	C	Patricio, between Polk and Van Buren	A	X	Z	Z	
NW04-D	C	Patricio, between Polk and Van Buren	B	X	Z	Z	
NW05-S	C	19th Street, between Van Buren and Polk	A	X	Y	Z	
NW06-S	C	19th Street, between Adams and Washington Streets	A	X	Y	Y	Center of plume, upgradient of capture zone.
NW06-D	C	19th Street, between Adams and Washington Streets	B	X	Y	Y	Center of plume, upgradient of capture zone.
NW07-S	C	18th Street, between Madison and Jefferson Streets	A	X	Z	Z	
NW07-M	C	18th Street, between Madison and Jefferson Streets	B	X	Z	Z	
NW07-D	C	18th Street, between Madison and Jefferson Streets	D	X	Z	Z	
NW08-S	C	20th Street and Adams Street	A	X	Y	Y	Center of the plume, upgradient of the system.
NW08-M	C	20th Street and Adams Street	B	X	Y	Y	Center of the plume, upgradient of the system.
NW08-D	C	20th Street and Adams Street	D	X	Y	Y	Center of the plume, upgradient of the system.
NW09-M	C	20th Street, south of UPRR track	B	X	Y	Y	Outside plume boundary, NW14-M and NW19-M are sentries for southern plume migration.
NW09-D	C	20th Street, south of UPRR track	D	X	Z	Z	Outside plume boundary, NW14-M and NW19-M are sentries for southern plume migration.
NW09-D2	C	20th Street, south of UPRR track	D	X	Z	Z	Outside plume boundary, NW14-M and NW19-M are sentries for southern plume migration.
NW10-D	C	Sky Harbor Circle and 20th Street	D	X	Y	Y	Well outside plume, no historic VOC detects.
NW11-M	C	20th Street and Madison Street	B	X	Z	Z	
NW11-D	C	20th Street and Madison Street	D	X	Z	Z	
NW12-D	C	Villa Street and 20th Street	D	X	Z	Y	Well outside plume, no historic VOC detects.
NW13-M	N	South of UPRR track and west of 19th Street	B	X	Z	Z	
NW13-D	N	South of UPRR track and west of 19th Street	D	X	Z	Z	
NW14-M	N	19th Street and Jackson Street	B	X	Z	Z	
NW14-D	N	19th Street and Jackson Street	D	X	Z	Z	
NW15-S	C	Jackson Street east of 22nd Street	Colluvium	X	Y	Y	Colluvium screened well, not part of the alluvial aquifer.
NW16-M	N	20th Street south of Washington Street	B	X	Y	Y	Center of the plume.
NW16-D	N	20th Street south of Washington Street	D	X	Y	Y	Center of the plume.
NW17-S	C	Monroe Street west of 19th Street	Colluvium	X	Z	Z	Colluvium screened well, not part of the alluvial aquifer.
NW18-S	C	Adams Street east of 18th Street	A	X	Z	Z	Center of the plume.
NW18-M	C	Adams Street east of 18th Street	Colluvium	X	Z	Z	Center of the plume.
NW19-M	C	Harrison Street and 24th Street	B	X	Z	Z	
NW19-D	C	Harrison Street and 24th Street	D	X	Z	Z	
OU312-M	C	15th Street and Adams Street	B	X	--	--	Sampled by OU3 contractor.
OU312-D	C	15th Street and Adams Street	D	X	--	--	Sampled by OU3 contractor.
OU313-M	C	15th Street and Polk Street	B	X	--	--	Sampled by OU3 contractor.
OU313-D	C	15th Street and Polk Street	D	X	--	--	Sampled by OU3 contractor.
OU314-M	C	McKinley Street and 16th Street	B	X	--	--	Sampled by OU3 contractor.
OU314-D	C	McKinley Street and 16th Street	D	X	--	--	Sampled by OU3 contractor.
PZ01-A	C	111 N 32nd Street	A	X	Y	Y	Formerly sampled by CH2MHILL/Honeywell
PZ01-B	C	111 N 32nd Street	B	X	Y	Y	Formerly sampled by CH2MHILL/Honeywell
PZ01-S	N	I-10 and Polk Street	A	X	--	--	
PZ01-D	N	I-10 and Polk Street	C	X	--	--	
PZ02-S	N	I-10 and Polk Street	A	X	--	--	
PZ02-D	N	I-10 and Polk Street	C	X	--	--	
TEW01	C	I-10 and Polk Street	A	X	--	--	

Notes:

S = Shallow	N = Nested Well	ADEQ Hydrostratigraphic Unit Designation
D = Deep	"--" = not sampled	A= Salt River Gravels (SRG)
M = Middle	X = Quarterly	B = Interbedded sands and silt/clays (Basin Fill [BF])
C = Conventional Well	Y = Annual (September)	C = Bedrock
E = Extraction Well	Z = Semi-Annual (March/September)	D = Interbedded sands and silt/clays w/ fine grained silt/clay marker bed at top of unit (BF)