

Danielle R. Taber

From: Gail Clement <gailclement@earthlink.net>
Sent: Monday, January 12, 2015 5:36 PM
To: Danielle R. Taber
Cc: Tina LePage; Mike Gaudette; Drazek, Joseph A.; Scott R. Green
Subject: Univar Comments, Roosevelt Irrigation District's July 2014 Draft Feasibility Study Report, West Van Buren Area WQARF Site
Attachments: FINAL RID FS Report Univar Comments.pdf; Attachment Univar Response Comment WOC Shallow GW FS Report.pdf

Please see attached Univar Comments, Roosevelt Irrigation District's *July 2014 Draft Feasibility Study Report for the West Van Buren Area WQARF Site* and the associated attachment. Thank you, Gail Clement

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January 12, 2015

Ms. Danielle Taber, Project Manager
Remedial Projects Section, Waste Programs Division
Arizona Department of Environmental Quality
1110 W. Washington Street
Phoenix, AZ 85007

Re: Univar Comments
Roosevelt Irrigation District's *July 2014 Draft Feasibility Study Report,*
West Van Buren Area WQARF Site

Dear Ms. Taber:

Univar USA Inc. ("Univar") hereby submits its comments to the July 2014 Draft Feasibility Study ("FS") Report for the West Van Buren Area ("WVBA") WQARF Site prepared on behalf of the Roosevelt Irrigation District ("RID") by Synergy Environmental, LLC and Montgomery & Associates.

General Comment:

As in past WVBA submittals, RID continues to conflate the West Central Phoenix WQARF sites into one site. The West Central Phoenix WQARF Site was established in 1987 and was split into five separate and distinct WQARF sites in 1998. This information is widely available and well known and should be known to RID and its consultants. Nevertheless, RID ignored that information and incorrectly modified the ADEQ-identified plume maps associated with the five individual sites to indicate that all five plumes comingle into one plume that merges with the WVBA WQARF Site. RID's identification of all five of these WQARF sites as actually just one site that collectively threaten the WVBA is devoid of any technical analysis or justification. This blatant effort by RID to mislead the public and artificially expand the number of parties that may have some future potential to possibly contribute to the WVBA regional plume must be disregarded.

Based on recent and historic water quality data, the volatile organic compound ("VOC") groundwater plume originating from the West Osborn Complex WQARF Site has comingled and continues to comingle with the WVBA VOC plume. In contrast, over 35 rounds of groundwater sampling have been conducted at the East Grand Avenue WQARF Site. Comprehensive groundwater monitoring data demonstrate that the extent of the EGA East Grand Avenue WQARF Site plume is well defined and decreasing in size and concentration. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site. ADEQ concurs that the East

Grand Avenue WQARF Site has not contributed to groundwater contamination in the West Osborn Complex WQARF Site. ADEQ has completed identification of responsible parties who contributed contamination to the West Osborn Complex WQARF Site, and none of the West Osborn Complex WQARF Site responsible parties are associated with the East Grand Avenue WQARF Site.

Specific Comments:

Page ES-1, Paragraph 2

RID fails to differentiate between the sites within the West Central Phoenix Area and states that the co-mingled plumes from adjacent sites, including the West Central Phoenix Area sites, flow into the WVBA Site. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site.

Page ES-1, Figure

The figure incorrectly depicts one plume within the box identified as the *West Central Phoenix Area WQARF Sites*. ADEQ has conservatively represented the extent of contamination associated with the five individual West Central Phoenix WQARF sites on figures that are readily available. RID incorrectly modified the ADEQ-identified plumes associated with the five individual sites to falsely suggest that all five plumes comeingle into one plume that merges with the WVBA WQARF Site.

Page ES-2, Paragraph 3

RID does not differentiate between the sites within the West Central Phoenix Area and states that contributions from adjacent sites flow into the WVBA Site, which could flow westward without RID pumping. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site.

Page 3, Last Paragraph

RID does not differentiate between the sites within the West Central Phoenix Area. RID references Figure 2 of its FS Report which is their representation of the regional extent of TCE and PCE in UAU groundwater above the applicable Aquifer Water Quality Standards of 5.0 µg/L, extrapolated from the four regional sites, one of which is the West Central Phoenix Area. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site. See specific figure comments.

Page 4, Paragraph 1

RID does not differentiate between the sites within the West Central Phoenix Area and states that groundwater contamination from the West Central Phoenix sites migrates into and impacts the WVB Site. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site.

Page 9, Paragraph 3

RID references Figure 2, which is its representation of the regional extent of TCE and PCE in UAU groundwater above the applicable Aquifer Water Quality Standards of 5.0 µg/L. Figure 2 does not differentiate the individual plumes within the West Central Phoenix Area. There is no explanation of the data sources, the dates of sampling or the quality of data used to develop Figure 2. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site. See also the specific comment regarding RID's Figures below.

Page 50, Paragraphs 1

RID states that other sources, including the East Grand Avenue WQARF Site, are suspected to have contributed to the West Osborn Complex WQARF Site contamination according to the *January 31, 2012 Final Feasibility Study Report for the Shallow Groundwater System, West Osborn Complex WQARF Site* (West Osborn Complex Shallow Groundwater FS Report), prepared by Geotrans. On October 8, 2012, Univar submitted comprehensive and detailed comments to ADEQ refuting the unsubstantiated allegations contained in the West Osborn Complex Shallow Groundwater FS Report (attached). Although Geotrans alleged that the East Grand Avenue WQARF Site contributed to the West Osborn Complex UAU groundwater contamination, there are no data to support their allegation. Over 35 rounds of groundwater sampling have been conducted at the East Grand Avenue WQARF Site. Comprehensive groundwater monitoring data indicate that the extent of the EGA East Grand Avenue plume is well defined and decreasing in size and concentration. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site or into the plume(s) originating from the West Osborn Complex WQARF Site.

Page 50, Paragraphs 3

RID restates erroneous information contained in the West Osborn Complex Shallow Groundwater FS Report regarding the source of TCE concentrations at MW-204S and the frequency of upgradient groundwater monitoring. Well MW-204S is located within the current and historic plume boundary of the West Osborn Complex WQARF Site. The source of contamination to this well is the West Osborn Complex.

RID wrongly states that monitor wells have not been sampled in the upgradient direction from well MW-204S. Monitor wells located upgradient of well MW-204S and between well MW-204S and the East Grand Avenue WQARF Site have been routinely sampled since 1999. Over 35 rounds of groundwater sampling have been conducted at the East Grand Avenue WQARF Site. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site extended into the West Osborn Complex WQARF Site to well MW-204S.

Page 51, Paragraphs 2

RID does not differentiate between the sites within the West Central Phoenix Area and states that groundwater contamination from the West Central Phoenix sites migrates into and impacts the WVB Site. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site have extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site.

Page 56, Paragraph 1

RID speculates that releases of Contaminants of Concern (“COCs”) at the East Grand Avenue WQARF Site may be contributing to contaminant loading observed to the south of the West Osborn Complex WQARF Site. There are no data that support RID’s speculation. Over 35 rounds of groundwater sampling have been conducted at the East Grand Avenue WQARF Site. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site.

Figures

According to the description on Figure 2, “Groundwater contamination depicted on this map represents the author’s interpretation of currently available data to estimate the geographic extent of PCE and TCE contamination in commingled contaminant plumes throughout the central and west central Phoenix area. There are numerous sources of contaminants of concern in groundwater throughout this region and interpolation of data and its representation in a consolidated regional plume is subjective; the actual extent of contamination may be different. Sources of data include depth specific UAU and MAU monitor wells and large capacity RID wells that produce groundwater largely from the UAU. The representation of the extent of groundwater contamination within the Motorola 52nd Street Superfund Site is generated from the most recent plume map published by ADEQ and posted on their web site.”

Univar agrees that the plumes represented on Figure 2 (and RID’s other FS Report figures) are subjective and the interpretation of RID’s consultants. RID’s figures represent the WVBA WQARF Site with a box drawn above the WVBA WQARF Site labeled both “West Central Phoenix WQARF Sites” and “West Osborn Complex WQARF Site”. These figures continue to

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conflate the individual plumes within the West Central Phoenix WQARF area into one plume, which is not consistent with ADEQ interpretation or the actual water quality data. The data sources, the dates of sampling and the quality of data are not provided. The methods used to interpret data and represent the plumes are not provided.

The plume associated with the East Grand Avenue WQARF Site is currently and has been historically separate and distinct from the plumes associated with West Osborn Complex WQARF Site and the WVBA WQARF Site. No current or historical data indicate VOCs originating from the East Grand Avenue WQARF Site extended into the West Osborn Complex WQARF Site, into the plume(s) originating from the West Osborn Complex WQARF Site or into the WVBA WQARF Site.

If you have any questions related to our comments, or wish to discuss any of them in more detail, please contact our consultant, Gail Clement, G.M. Clement Associates, at 928/282-3630, or me at 208/888-1094.

Sincerely,



Michael Gaudette
Senior Project Manager

cc: Tina L. LePage, Manager, ADEQ Remedial Projects Section
Scott R. Green, Manager, ADEQ Remedial Projects Unit
Joseph Drazek, Quarles & Brady LLP
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October 8, 2012

Mr. Kevin C. Snyder, Hydrologist
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, AZ 85007

Re: Univar's Comments
January 31, 2012 Final Feasibility Study Report for the Shallow Groundwater System,
West Osborn Complex (WOC) WQARF Site, Phoenix, AZ

Dear Mr. Snyder:

Univar USA Inc. has reviewed the January 31, 2012 Final Feasibility Study Report for the Shallow Groundwater System (FS Report), West Osborn Complex (WOC) WQARF Site. The final WOC FS Report contained new sections reinterpreting the source and extent of volatile organic compound contamination associated with the WOC and North Canal Plume WQARF Sites, which differ considerably from the final WOC RI Report. As a result, Univar prepared the following comments to address several erroneous statements found in the WOC FS report regarding the downgradient extent of contamination allegedly attributable to the East Grand Avenue (EGA) WQARF Site and, in particular, the former VW&R (Univar) facility.

If you have any questions related to our comments, or wish to discuss any of them in more detail, please contact our consultant, Gail Clement at 928/282-3630, or me at 208/888-1094.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Gaudette".

Michael Gaudette
Senior Project Manager

cc: Tima Le Page, Arizona Department of Environmental Quality
Andre Chiaradia, Arizona Department of Environmental Quality
Gail Clement, G.M. Clement Associates, Inc.
Edward Nemecek,
Joe A. Drazek, Quarles & Brady LLP

Univar USA Inc. Comments
Final Feasibility Study Report for the Shallow Groundwater System,
West Osborn Complex WQARF Site, Phoenix, Arizona

GENERAL COMMENTS

Introduction

The Final Feasibility Study Report for the Shallow Groundwater System (FS Report), West Osborn Complex (WOC) WQARF Site was submitted to the Arizona Department of Environmental Quality (ADEQ) on January 31, 2012. The final WOC FS Report contained new sections reinterpreting the source and extent of volatile organic compound (VOC) contamination associated with the WOC and North Canal Plume (NCP) WQARF Sites, which differ considerably from the final WOC Remedial Investigation Report (WOC RI Report). As a result, Univar USA Inc. (Univar) prepared the following comments to address several erroneous statements found in the WOC FS Report regarding the downgradient extent of contamination allegedly attributable to the East Grand Avenue (EGA) WQARF Site and, in particular, the former VW&R facility.

West Osborn Complex WQARF Site Background

The final WOC RI Report, prepared by GeoTrans, Inc., was issued on July 22, 2004. The following information and data were obtained from the WOC RI Report. The WOC is a 15 acre tract that was divided into three parcels, East, Middle and West in 1971. Manufacturing of electronic components was conducted by different owners beginning in 1957 until at least 1987 according to the WOC RI Report. In addition, one operator continued to manufacture until 1992. When the WOC was first developed, there was no municipal sewer service and on-site disposal of generated wastes was conducted using septic tanks and seepage pits. The WOC was connected to the municipal sewer service in 1966. According to the WOC RI Report, this connection did not result in all industrial wastes being discharged to City sewers. In addition to the septic systems/pits, other features were identified that provided conduits for subsurface discharge and transport of contaminants. These included: an on-site irrigation well (later found to be a conduit to deeper parts of the aquifer), two drywells, a concrete chamber with the appearance of an oil water separator, and two pipelines. One of the pipelines was traced from near the northwest corner of the Main Building on the Middle Parcel to the property boundary and appeared to terminate at a concrete headwall along the Grand Canal. A second, shorter pipeline was found extending from the on-site irrigation well to the northwest corner of the Main Building on the Middle Parcel, parallel and adjacent to the longer pipe. The pipeline terminating at the concrete headwall along the Grand Canal may have been permitted to discharge wastewater from the WOC into the Grand Canal. On January 9, 1964, SRP issued a discharge permit to Research Chemicals to discharge water into the Grand Canal at a location near the 35th Avenue Bridge. The pipe found during the investigation was located about 750 feet west of the location identified in the SRP discharge permit.

During the Phase I WOC RI soil and septic system sampling, trichloroethene (TCE), tetrachloroethene (PCE) and 1,1,2-trichloroethane (1,1,2-TCA) were found in concentrations above the applicable analytical reporting limits. TCE concentrations in soil and septic tank content samples ranged from 50 to 85,000 µg/kg. PCE concentrations in soil and septic content tank samples ranged from 66 to 550 µg/kg. 1,1,2-TCA was found in one sample at a concentration of 98 µg/kg.

During the WOC RI Phase II investigation, TCE was found in soil samples collected from soil borings at concentrations ranging from 9.9 to 510 µg/kg. The east pipeline that extended to a concrete headwall along the Grand Canal was also investigated during the WOC RI Phase II. Four soil samples were collected from locations below joints along the pipeline and one water sample was collected from water that had leaked from the pipe and into the excavation when the pipe was broken. Three of the four soils samples contained TCE in concentrations ranging from 52 to 61 µg/kg. The water that leaked from the pipeline contained, TCE, PCE and 1,1-dichloroethene (1,1-DCE) at concentrations of 52, 6.0 and 3.2 µg /L, respectively.

The WOC RI sampling confirmed the presence of elevated concentrations of TCE and PCE in soil, water and septic tank samples collected from within and near the on-site septic tanks and seepage pits and the east pipeline, indicating materials containing these contaminants were disposed in WOC septic tanks/pits and the east pipeline. 1,1, 2-TCA and 1,1-DCE were also found in single samples at elevated concentrations, which indicates that these VOCs may also have been released at the WOC. Three VOCs, TCE, PCE and 1,1-DCE, have been found in UAU groundwater beneath and downgradient of the WOC Site at concentrations exceeding their applicable Maximum Contaminant Levels (MCLs). Considering these data, the lengthy period of electronics manufacturing, the methods used for waste disposal, and the presence and probable use of other subsurface features for waste disposal, the WOC was and is a continuing source of VOCs to the environment.

EGA Background

The final RI Report for the EGA WQARF Site was prepared by Weston for ADEQ and issued in June 2006. In the EGA RI Report, three sources of VOCs to groundwater were identified, the former VW&R facility, the former Mogul facility, and an unknown source located upgradient and northeast of the former VW&R facility. Three contaminants of concern (COCs) were identified by ADEQ: TCE, PCE and 1,1-DCE. TCE is the primary COC. Fifteen rounds of groundwater sampling of monitor wells in the EGA Site were conducted between 1999 and 2002 to characterize the extent of VOCs. The groundwater monitoring utilized a variety of different sampling methods during this time period. Based on the data collected between 1999 and 2002, the EGA RI concluded *"The lateral extent of groundwater contamination is represented by the dissolved TCE plume as defined by monitor wells WCP-42, WCP-86, WCP-83, and WCP-96."*

In 2003, Univar began conducting routine groundwater monitoring at the EGA WQARF Site. Groundwater samples were collected quarterly in 2003 and semiannually since 2003 to the present. The results of the groundwater monitoring were reported to ADEQ in semiannual reports in 2003 and 2004 and in annual reports beginning in 2005. The data and the monitoring reports are readily available in

ADEQ's public records. Thirty-two (32) groundwater sampling rounds have been completed since 1999 for the EGA WQARF Site. The VOC plume associated with the former VW&R facility is very well characterized and declining in concentration and areal extent.

In 2008, Univar performed a comprehensive sampling round of monitor wells at and around the former VW&R facility. This data set is directly comparable to the data contained in the WOC FS Report. Samples collected from six sentinel wells located west-southwest of the former VW&R facility, WCP-46, WCP-47, WCP-89, WCP-94, WCP-202 and WCP-204, were all below the laboratory reporting limits for TCE; PCE; 1,1-DCE; 1,1,1-TCA; and cis-1,2-dichloroethene (cis-1,2-DCE). Figures 6 and 7 from the 2008 Annual Groundwater Monitoring Report were updated to include 1,1,1-TCA and cis-1,2-DCE concentration data, and they are included as an attachment to these comments. The results of the Univar sampling were compared with the data provided in the WOC FS Report. No current or historical data indicate VOCs originating from the former VW&R facility extended into the WOC Site or into the plume(s) originating from the NCP Site and/or the WOC Site (associated plumes).

Further, ADEQ has identified five separate WQARF Sites in the West Central Phoenix area. In ADEQ's representation of the extent of contamination associated with the EGA WQARF Site, ADEQ depicts the EGA plume boundaries as a separate plume that does not extend into the WOC WQARF Site or the associated plumes. Monitor wells located northwest, west, southwest and south of the former VW&R facility have long histories of non-detects and/or detections below the MCLs for the COCs. These data indicate that the extent of the EGA WQARF Site plume is very well defined as being localized generally northeast of Grand Avenue and a few hundred feet southwest of Grand Avenue.

Comments on specific portions of the WOC FS Report are addressed in the following.

SPECIFIC COMMENTS

1. PCE Migration: Section 3.3.1, Page (p.) 21, 2nd bullet: *"...according to historical WOC Facility information, PCE was not used in manufacturing; therefore, it is assumed that PCE has migrated onto the Site from one or more upgradient sources; and Section 5.2.3, p. 37, 2nd paragraph: "This PCE contamination is believed to be associated with upgradient sources, including the NCP, and possibly the WGA and EGA WQARF site."*

Comment: Despite the claims above regarding WOC historical information, as summarized in the General Comments and as noted in Section 2.3 of the WOC FS, TCE, PCE and 1,1-DCE ... *"were identified at the WOC facility in the contents of and in native soils adjacent to various waste/wastewater disposal facilities..."* PCE concentrations ranged from 66 to 550 µg/kg. Given these data were collected over 40 years after operations began at the WOC facility, the presence of PCE onsite within and next to disposal facilities indicates that the WOC is a source of PCE.

The 2008 EGA monitoring data are directly comparable to the data contained in the WOC FS Report. Samples collected from six sentinel wells located west-southwest of the former VW&R facility, WCP-46, WCP-47, WCP-89, WCP-94, WCP-202 and WCP-204, were all below the laboratory reporting limits for TCE; PCE; 1,1-DCE; 1,1,1-TCA; and cis-1,2-DCE. The results of the Univar sampling were compared with

the data provided in the WOC FS Report. No current or historical data indicate PCE originating from the former VW&R facility extended into the WOC Site or the associated plumes.

WOC FS Figure 3- 11 includes ADEQ's interpretation of the WOC plume(s) and the separate EGA plume and its extent. The maximum extent of the EGA plumes is depicted as trending southwest indicating that the long term groundwater flow direction was also to the southwest. The eastern boundary of the WOC Site is located approximately 0.7 miles virtually due west of the EGA Site. ADEQ's interpretation of available data depicting the average groundwater flow direction and the results of groundwater quality monitoring indicate there are no data that PCE originating from the former VW&R facility ever reached the vicinity of the WOC Site or the associated plumes.

Based on a series of groundwater flow directions depicted on water level maps and the analytical data in the WOC FS Report, the only logical source of PCE in the WOC Site is from the NCP Site, from the WOC Site, or more likely a combination of the two; see section 3.4.2 of the WOC FS Report that describes high concentrations of PCE encountered at the NCP Site that likely began migrating south soon after the Canal lining in 1998. See Figure 3-12 that clearly outlines large scale PCE contamination in groundwater at the north end of the WOC/NCP plume(s). See also General Comments.

2. Detached 1,1-DCE Plume: Section 3.3.1, p. 21, last bullet: *"A detached 1,1-DCE plume also exists in the central area of the (WOC) Site plume..."* .

Comment: The statement above clearly states the "detached" plume is in the "central area" of the WOC Site plume. The simplest explanation that fits the facts is that the 1,1-DCE originated in the multiple sources of the WOC plume. The term "detached plume" is not defined in the WOC RI or FS Reports. The hypothesis of a "detached plume" does not appear to have any technical basis of support in the document. There is no discussion of changes to the EGA Site and/or the WOC/NCP Site conceptual models or any new data provided in support of the hypothesis. There is no description of why or how a "detached" plume would or could occur in the local groundwater system. There is no description of any physical or chemical mechanism that would account for the existence of a "detached plume". No time frame for the "detached plume" hypothesis (i.e., when and why did it occur) is presented.

Figures 3-11, 3-12, 3-13, and 3-15 in the WOC FS show that the so called "detached plume" lies well within the historic plume boundaries of the NCP and WOC WQARF Sites. With no supporting data or other information regarding "detachment", and using available (as opposed to no) data, the simplest explanation is that the alleged "detached plume" is a remnant of the very large plume associated with several WOC/NCP facilities that operated for at least 32 years.

The 2008 EGA monitoring data are directly comparable to the data contained in the WOC FS Report. Samples collected from six sentinel wells located west-southwest of the former VW&R facility, WCP-46, WCP-47, WCP-89, WCP-94, WCP-202 and WCP-204, were all below the laboratory reporting limits for TCE; PCE; 1,1-DCE; 1,1,1-TCA; and cis-1,2-DCE. The results of the Univar sampling were compared with the data provided in the WOC FS Report. No current or historical data indicate 1,1-DCE originating from

the former VW&R facility extended into the WOC Site or the associated plumes. See also General Comments.

3. Plume Boundary: Section 3.4, p. 23, last sentence; continued p.24: *“Plume boundary maps for... WOC, NCP, North Plume, East Grand Avenue (EGA) and ...WGA, are shown on Figure 3-11.”: “...and EGA (plume) are based on the January 2009 Maps provided on the ADEQ website...”.*

Comment: *“According to the ADEQ, from 1957 to 1989, all entities operating at the WOC Facility were involved in the manufacturing of electronic components, their manufacturing processes were similar...”* (WOC FS Report Section 2.6, page 8). One entity continued manufacturing through 1992 for a total of 35 years of electronic component manufacturing at the WOC. The former VW&R facility operated for approximately 13 years from 1957 to 1970.

As noted in the General Comments, 15 rounds of groundwater sampling were conducted by ADEQ between 1999 and 2002 to characterize the extent of contamination in the EGA WQARF Site. Groundwater samples were collected quarterly in 2003 and semiannually since 2003 to the present by Univar. The results of the groundwater monitoring were reported to ADEQ in routine monitoring reports that are readily available in ADEQ’s public records.

Although the January 2009 ADEQ map represents the EGA plume to be larger than current and 2008 data support, the EGA plume is clearly separate and distinct from other WQARF plumes. The ADEQ January 2009 map and WOC FS Figure 3-11 portray the following: Based on the historical directions of groundwater flow, it is clear another source of VOCs exists to the north-northeast of the former VW&R facility and at least one other site in the vicinity of, or within the EGA, the Mogul Site, has data sets that indicate other localized source(s) also exist.

Comprehensive groundwater monitoring data indicate that the extent of the EGA VOC plume is well defined and decreasing in size and concentration. The maximum extent of the VOC plume originating from the former VW&R facility is based on 32 rounds of groundwater monitoring that began in 1999 and continues to the present. There are no data supporting the hypothesis that the EGA plume extended to the vicinity of the “detached plume” as identified in the WOC FS Report. See also General Comments and Comment 2.

4. TCE Sampling Data: Section 3.4.1, p. 25, 1st incomplete paragraph, last sentence: *“... because the WGA wells located between the EGA source area and the WOC wells have not been sampled since 2002, the migration of contamination through the existing monitoring network may have been missed.”*

Comment: This statement is incorrect. No data exist to support this hypothesis. Although WGA wells may not have been sampled, periodic groundwater monitoring has been conducted at the EGA WQARF Site since 1999. These data are readily available at ADEQ. The extent of contamination associated with

the former VW&R facility is well characterized and distinct from the WOC WQARF Site and associated plumes. See also General Comments and Comment 3.

5. PCE Sampling Data: Section 3.4.2, p.25, 3rd paragraph: *"... because the WGA wells located between the EGA source area and the WOC wells have not been sampled since 2002, the migration of contamination through the interlying monitoring network may have been missed. The low concentration of PCE observed at MW-209S is disconnected from the known source areas and is likely a result of a release to the northeast."*

Comment: This statement is incorrect. No data exist to support this hypothesis. Although WGA wells may not have been sampled, periodic groundwater monitoring has been conducted at the EGA WQARF Site since 1999. These data are readily available at ADEQ. The extent of contamination associated with the former VW&R facility is well characterized and distinct from the WOC WQARF Site and associated plumes. See also General Comments and Comments 1 and 3.

6. Detached 1,1-DCE Plume: Section 3.4.3, p. 26, 2nd paragraph: *"...Again, because this downgradient 1,1-DCE plume is detached from the northern 1,1-DCE plume (assumed to mean the combined NCP and the WOC plume) it is also likely that the elevated concentrations of 1,1-DCE in the area are a result of a separate upgradient source area towards the northeast, most likely EGA."*

Comment: Again, this statement is incorrect. No data exist to support this hypothesis. Although WGA wells may not have been sampled, periodic groundwater monitoring has been conducted at the EGA WQARF Site since 1999. These data are readily available at ADEQ. The extent of contamination associated with the former VW&R facility is well characterized and distinct from the WOC WQARF Site and associated plumes. See also General Comments and Comments 2 and 3.

7. PCE Sampling Data: Section 3.4.3, p. 26, 3rd paragraph: *"Once again it is important to note that because the WGA wells located between the EGA source area and the WOC wells have not been sampled since 2002, the migration of contamination through the interlying monitoring network may have been missed."*

Comment: Once again, this statement is incorrect. No data exist to support this hypothesis. Although WGA wells may not have been sampled, periodic groundwater monitoring has been conducted at the EGA WQARF Site since 1999. These data are readily available at ADEQ. The extent of contamination associated with the former VW&R facility is well characterized and distinct from the WOC WQARF Site and associated plumes. See also General Comments and Comment 1, 3 and 5.

8. Detached 1,1-DCE Plume: Section 3.4.3, p. 26, last paragraph: *"...1,1,1-TCA (the parent compound of 1,1-DCE)... A separate 1,1-DCE plume appears to exist in the vicinity of MW-204S and MW-206S, but does not connect to the 1,1-DCE plume at the WOC facility.*

Comment: 1,1,1-TCA is not a COC in the EGA WQARF Site. The EGA RI Report states, *"Because it has not appeared in detectable concentrations during the investigation, 1,1,1-TCA is not considered a contaminant of concern and will not be discussed further."* The 2008 EGA monitoring data are directly comparable to the data contained in the WOC FS Report. Samples collected from six sentinel wells located west-southwest of the former VW&R facility, WCP-46, WCP-47, WCP-89, WCP-94, WCP-202 and WCP-204, were all below the laboratory reporting limits for TCE; PCE; 1,1-DCE; 1,1,1-TCA; and cis-1,2-DCE. The results of the Univar sampling were compared with the data provided in the WOC FS Report. No current or historical data indicate 1,1,1-TCA or 1,1,-DCE originating from the former VW&R facility extended into the WOC Site or the associated plumes. See also General Comments and Comments 2, 3 and 6.

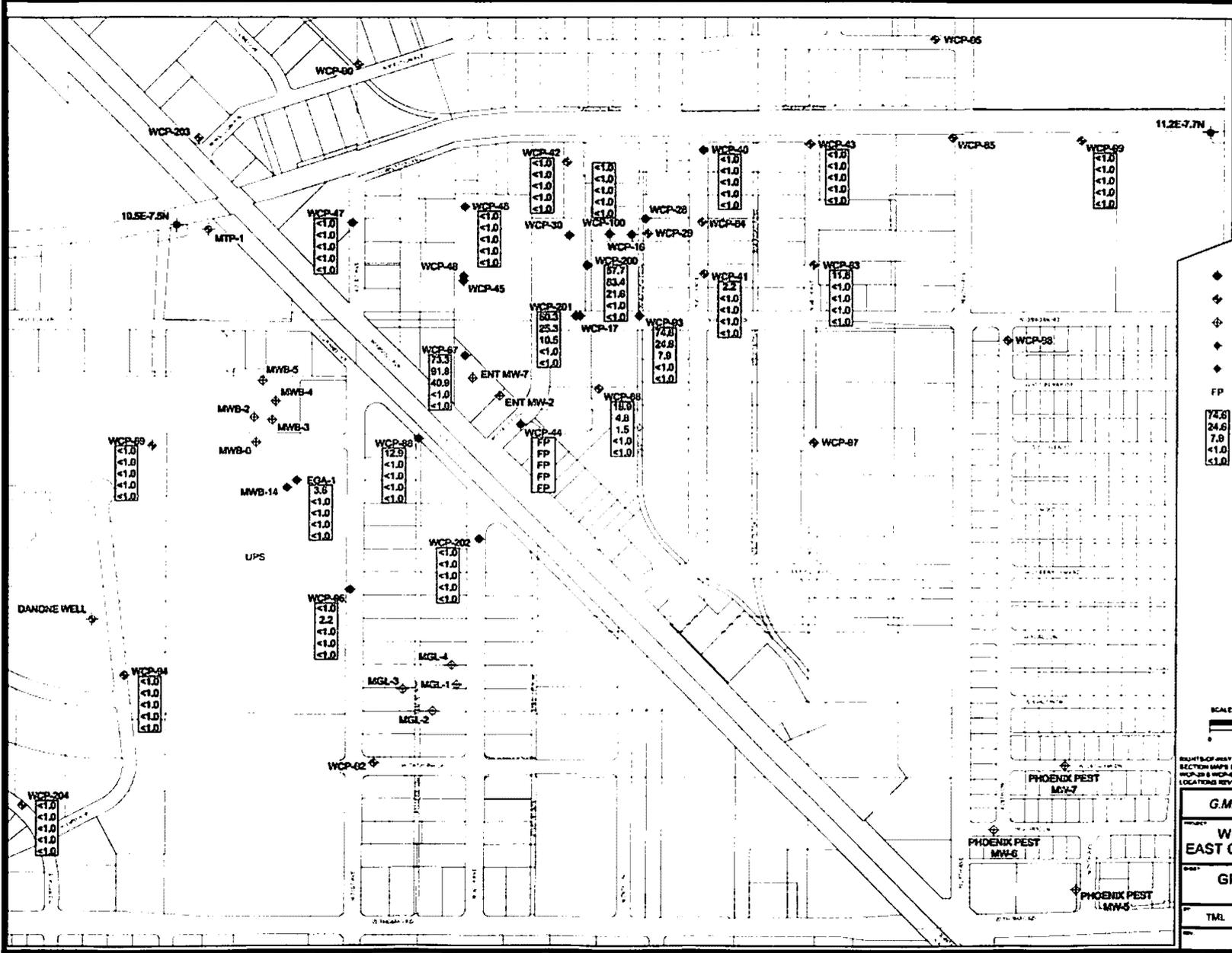
9. Cis-1,2-DCE Source: Section 3.4.4, p. 27, 1st paragraph: *"Concentrations of cis-1,2-DCE exceeding the AWQS of 7 µg/L have only been observed within the NCP site and the EGA site, and have not been observed within the WOC source area. Concentrations of cis-1,2-DCE below the AWQS have migrated downgradient and are occasionally detected in WOC wells."*

Comment: Cis-1,2-DCE is not a COC in the EGA WQARF Site. The 2008 EGA monitoring data are directly comparable to the data contained in the WOC FS Report. Samples collected from six sentinel wells located west-southwest of the former VW&R facility, WCP-46, WCP-47, WCP-89, WCP-94, WCP-202 and WCP-204, were all below the laboratory reporting limits for TCE; PCE; 1,1-DCE; 1,1,1-TCA; and cis-1,2-DCE. The results of the Univar sampling were compared with the data provided in the WOC FS Report. No current or historical data indicate cis-1,2-DCE originating from the former VW&R facility extended into the WOC Site or the associated plumes. See also General Comments.

10. Final Feasibility Study Report for the Lower Sand and Gravel Subunit, West Osborn Complex WQARF Site, Phoenix, Arizona, dated May 16, 2012 (WOC Lower Unit FS): Section 3.3.3, p. 23, 2nd bullet: *"Migration of the dissolved-phase PCE plume in the LSGS will also likely continue to occur to some degree. This plume is believed to have originated from a source to the north-northeast of the Site (in particular, the North Canal Plume...";* Section 3.4.3.2, p. 24, last paragraph: *"As the mound began to dissipate after the lining of the canal, the fingerprint of the WOC wells begins to show a range of increasing PCE percentages and correspondingly decreasing TCE percentages. The increase of PCE in the LSGS suggests that a conduit existed between the shallow and the LSGS portions of the aquifer. This conduit, which was likely the Pincus Well, allowed for the downward migration of PCE into the LSGS after the mound dissipated and PCE migrated southward onto the Site from the NCP.";* Section 3.4.4.1, p. 25, 2nd paragraph: *"This appearance of elevated concentrations of PCE considerably after the appearance of TCE in the LSGS suggests a continuing source and/or conduit from the SGWS to the LSGS. The continuing*

source is believed to be the southern migration of PCE from the NCP.”; Section 3.4.4.7, p. 26, 4th paragraph: Like the behavior observed in MW-2M, the appearance of elevated concentrations of PCE, much after the appearance of TCE in the LSGS again suggests a continuing source and/or conduit from the SGWS to the LSGS. The source is believed to be the southern migration of PCE from the NCP.”; and Section 3.4.5, p. 27, 3rd paragraph: “Given that PCE cannot be generated from TCE by any in-situ reaction mechanisms, it is believed that PCE must be migrating into the Site from the NCP.”

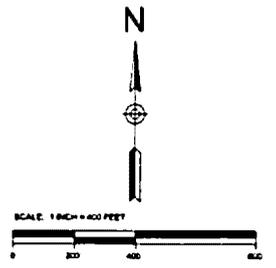
Comment: The WOC FS reports written for the upper sand and gravel unit and the lower sand and gravel unit were prepared and submitted by the same consulting firm. The WOC Lower Unit FS Report states in several sections that the source of PCE at the WOC is the North Canal Plume WQARF Site. The WOC Lower Unit FS does not identify the EGA WQARF Site as a potential source of PCE to the WOC Site. As stated previously, Univar disagrees that the WOC Site is not itself a source of PCE to groundwater (see General Comments and Specific Comment 1). Univar does not disagree that PCE from the NCP Site plume may have migrated into the WOC Site.



EXPLANATION

- ◆ MONITOR WELL, UNIVAR
- ◈ MONITOR WELL, NON-SITE SPECIFIC
- ◊ MONITOR WELL, OTHER
- ◆ PRODUCTION WELL, SRP
- ◆ PRODUCTION WELL, OTHER
- FP FREE PRODUCT

72.8	TRICHLOROETHENE
24.6	TETRACHLOROETHENE
7.8	1,1-DICHLOROETHENE
6.8	1,2-DICHLOROETHENE
<1.0	1,1,1-TRICHLOROETHANE
<1.0	CONCENTRATIONS IN MICROGRAMS PER LITER SEPTEMBER 2008



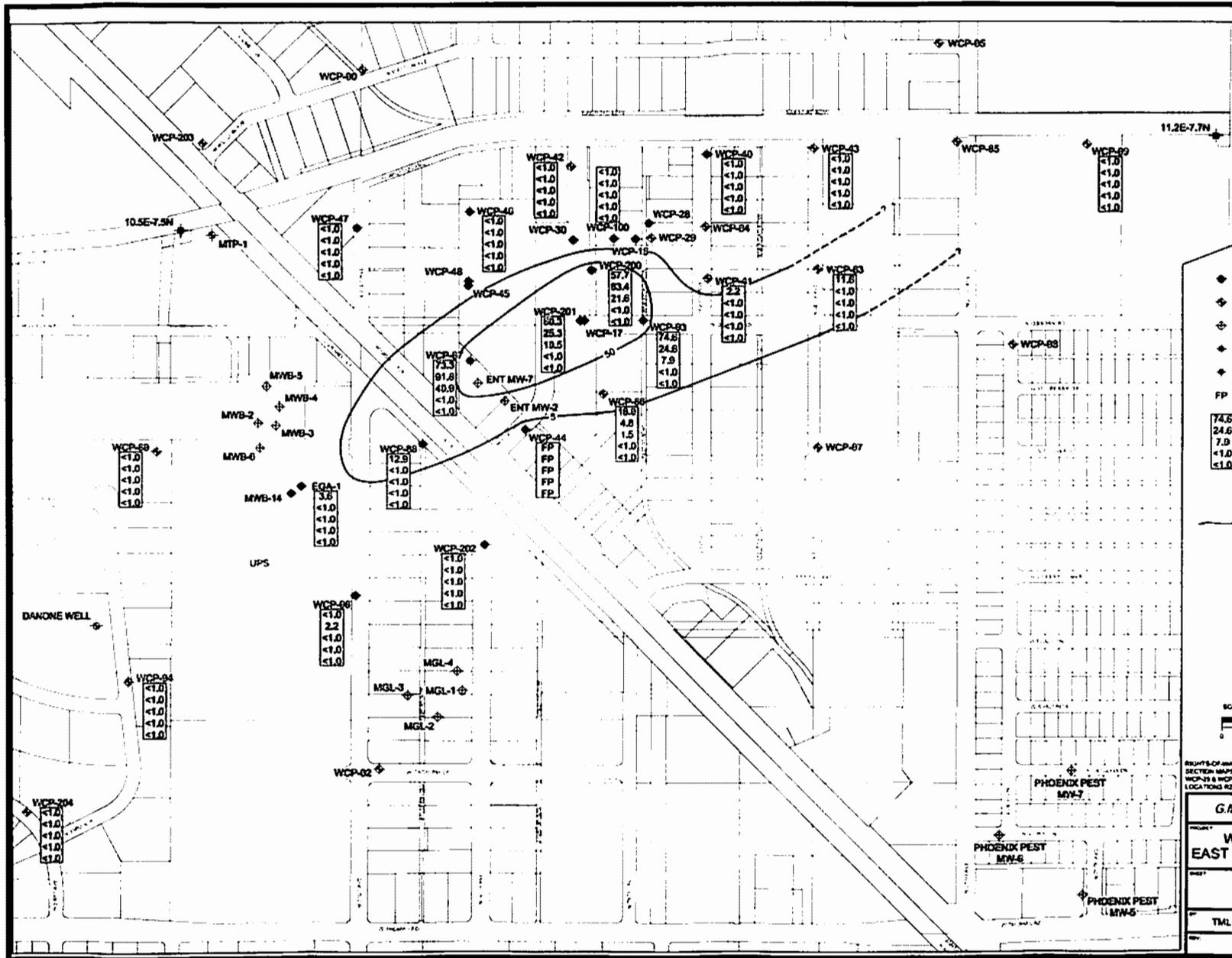
RIGHT BACKWAY AND PROPERTY LINES FROM THE CITY OF PHOENIX QUARTER SECTION MAPS (FORM 1897) 2002. WCP WELL LOCATIONS EXCEPT WCP-28 (WCP-28 & WCP-88) FROM GRANARIS SURVEY (1897) 2002. OTHER WELL LOCATIONS REVISED FROM GEOTECHNICAL, INC., OCT. 2002.

G.M. CLEMENT & ASSOCIATES, INC.

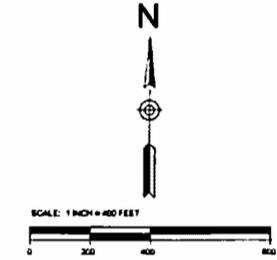
WEST CENTRAL PHOENIX, EAST GRAND AVENUE WQARF SITE

GROUNDWATER QUALITY SEPTEMBER 2008

BY: TML	DATE: GMC	REVISED: 0-5-12	FIGURE: 5
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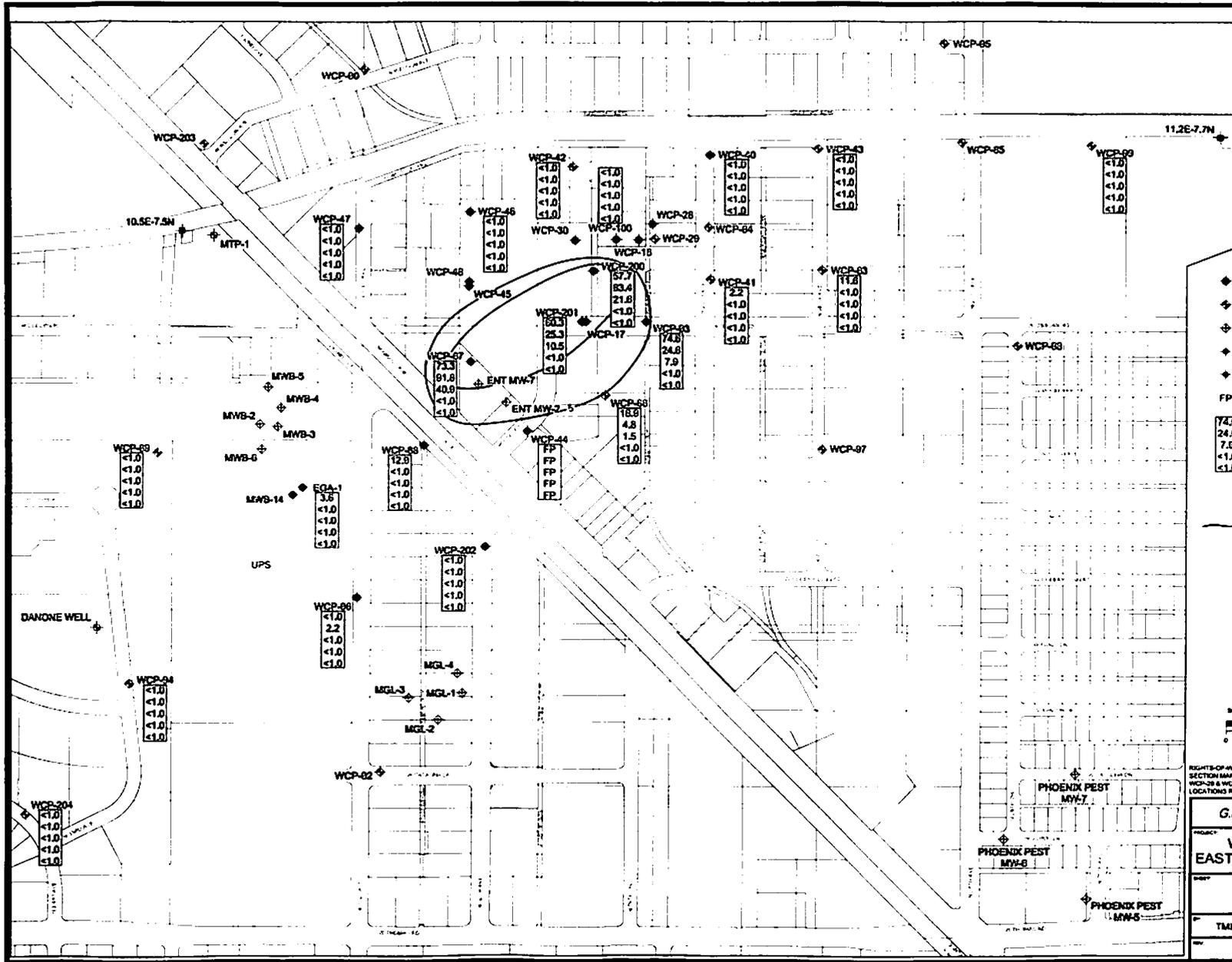


- EXPLANATION**
- ◆ MONITOR WELL, UNVAR
 - ◇ MONITOR WELL, NON-SITE SPECIFIC
 - ⊕ MONITOR WELL, OTHER
 - ◆ PRODUCTION WELL, SRP
 - ◆ PRODUCTION WELL, OTHER
 - FP FREE PRODUCT
- 74.6 TRICHLOROETHENE
 24.6 TETRACHLOROETHENE
 7.9 1,1-DICHLOROETHENE
 <1.0 CS-1,2-DICHLOROETHENE
 <1.0 1,1,1-TRICHLOROETHANE
 CONCENTRATIONS IN
 MICROGRAMS PER LITER
 SEPTEMBER 2008
- TCE ISOCONCENTRATION CONTOURS

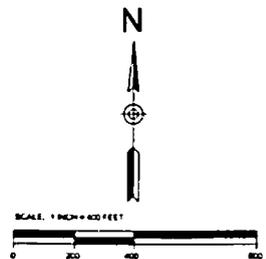


PORTIONS OF MAP AND PROPERTY LINES FROM THE CITY OF PHOENIX QUARTER SECTION MAPS (ORDIN. SEPT. 2002) WCP WELL LOCATIONS (CITY OF PHOENIX WCP-29 & WCP-86) FROM GEORIAN SURVEYING, SEPT. 2002 OTHER WELL LOCATIONS REVISED FROM GEORIAN, INC., OCT. 2002

G.M. CLEMENT & ASSOCIATES, INC.				
PROJECT WEST CENTRAL PHOENIX, EAST GRAND AVENUE WQARF SITE				
REPORT TCE CONCENTRATION SEPTEMBER 2008				
BY TML	CHK GMC	DATE Revised 9-5-12	PAGE NO. 6	



- EXPLANATION**
- ◆ MONITOR WELL, UNIVAR
 - ◆ MONITOR WELL, NON-SITE SPECIFIC
 - ◆ MONITOR WELL, OTHER
 - ◆ PRODUCTION WELL, SRP
 - ◆ PRODUCTION WELL, OTHER
 - FP FREE PRODUCT
- | | |
|------|------------------------|
| 74.0 | TRICHLOROETHENE |
| 24.0 | TETRACHLOROETHENE |
| 7.0 | 1,1-DICHLOROETHENE |
| <1.0 | cis-1,2-DICHLOROETHENE |
| <1.0 | 1,1,1-TRICHLOROETHANE |
- CONCENTRATIONS IN MICROGRAMS PER LITER
SEPTEMBER 2008
- PCE ISOCONCENTRATION CONTOURS



RIGHTS-OF-WAY AND PROPERTY LINES FROM THE CITY OF PHOENIX QUARTER SECTION MAPS CD030A, SEPT. 2002 WCP WELL LOCATIONS (EXCEPT WCP-28, WCP-29 & WCP-65) FROM URSAMM SURVEYING, SEPT. 2003. OTHER WELL LOCATIONS REVISED FROM GCO/TRAFF, INC., OCT. 2002.

G.M. CLEMENT & ASSOCIATES, INC.			
PROJECT:	WEST CENTRAL PHOENIX, EAST GRAND AVENUE WQARF SITE		
TITLE:	PCE CONCENTRATION SEPTEMBER 2008		
DATE:	TML	GMC	Revised 9-5-12
NO.:			7