



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

December 30, 2008

Jennifer Edwards Thies
Arizona Department of Environmental Quality
Waste Programs Division
1110 West Washington Street
MC 4415B-1
Phoenix, AZ 85007



Re: Draft Remedial Investigation Report for the West Van Buren Water Quality Assurance Revolving Fund Registry Site

Dear Ms. Thies:

The Environmental Protection Agency (EPA), with support from Shaw Environmental, Inc., contractor to the US Army Corps of Engineers, has reviewed the Arizona Department of Environmental Quality's (ADEQs) October 2008 Draft Remedial Investigation (RI) Report for the West Van Buren Water Quality Assurance Revolving Fund (WQARF) Registry Site. The draft RI was prepared for ADEQ by Terra Next. EPA has the following comments on the document:

General Comments

1. Figures are rarely cited when discussing the various sites identified during the investigation of the West Van Buren Area (WVBA). It would be helpful to include maps that identify the locations of the sites.
2. The presentation of the chemical data varies within sections. For example, several facilities have the actual VOC concentrations for all media, but other sites do not include specific concentration for some media. The site data should be presented consistently. The data should also be consistently presented for the ADEQ monitored well data. Specific groundwater concentrations were presented for the MAU, but not for the UAU wells.
3. Several sites performed remediation and subsequently turn off their systems with approval of the ADEQ, once soil gas concentrations reached asymptotic levels.

These concentrations should be listed in the remediation discussions and compared to any appropriate screening number.

4. It would be helpful if the document explained that site-specific figures of the remedial investigation were available in the Appendices.
5. Numerous sites have been granted no further action or were not required to investigate groundwater at their sites. Due to the age of some of the investigations, sampling methodologies were not as comprehensive as today. Has ADEQ considered reviewing the sites to assess if additional soil gas data or better preserved soils samples should be collected to determine if continuing sources still exist?
6. Insufficient soil gas samples were available for many facilities to assess whether a vapor intrusion pathway exists. The report does not adequately evaluate this pathway for the facilities.
7. Section 5.1.2, the report states that dense non-aqueous phase liquids (DNAPL) were not identified. The generally accepted screening levels for DNAPL are site concentrations at 1% or greater of aqueous solubility in water, VOC concentrations exceeding 100 to 1,000 ug/L in soil gas, or VOC concentrations greater than 10,000 mg/kg in soils. A majority of the facilities discussed met one or more of the criteria for screening for DNAPL (EPA Quick Reference Fact Sheet, DNAPL Site Characterization, September 1994).

As these are older release sites, the potential DNAPL may have dissolved away. The dissolved and sorbed phase of VOCs may reside in lower permeable zones which act as continual sources. Most wells in the WVBA do not monitor the lower permeable zones and evaluate the more transmissive zones. A detail Site Conceptual Model should be evaluated on the need to investigate lower permeable zones that may need to be targeted to assess if there are continuous sources that may need remediation.

8. A conclusions section should be included. Generally, observation on the trends in the plume would be helpful and whether the WVBA was adequately characterized. Additionally, a recommendation section should be included or at least an outline of the next steps to be taken for the WVBA.
9. We would suggest switching the order of Section 2.0 and 3.0 to have the physical setting of the area presented first. The previous investigation discussion would then be followed by the nature and extent of contamination.
10. Section 6.0, the section titles do not necessarily reflect the information presented in the bullets within the Section. Suggest revising Section 6.0 as follows:
 - Section 6.1 Site Physical Characteristics (bullets 1 through 10)
 - Section 6.2 Groundwater Flow (bullets 11 through 15)

Section 6.3 Nature and Extent of Contamination (bullets 16 through 25)
Renumber Section 6.2 to Section 6.4

11. A CD with a PDF of the report was provided. However, a searchable PDF would be very helpful in the review of this document.
12. A Table of Contents and page numbering for each of the Appendices A through S would be helpful for readers to better access the information included there.

Specific Comments

1. Page 1-2, Section 1.2. Please include information on opportunities for community involvement when discussing the WQARF process.
2. Page 1-10, Section 1.3.2.4, second paragraph, 17th and 18th sentences. The 17th sentence states, "The Freon -11 was recycled." However the 18th sentence states, "Used solvent was allowed to evaporate." Please clarify this apparent contradiction.
3. Page 1-11, Section 1.3.2.4, first paragraph, last sentence. The sentence states, "... and renovated in 1999 when the detergent spill occurred." No discussion of this detergent spill was provided in this section.
4. Page 2-1, Section 2.1: Numerous site descriptions refer to volatile organic compounds (VOCs) detected in background samples. Additional information regarding where the background samples were collected and how a background for VOCs was established.
5. Page 2-10, Section 2.2.2.2: We suggest adding additional information to the title of the section to indicate that this was a study and part of the previous investigations.
6. Page 2-10, Section 2.2.2.3: We suggest adding additional information to the title of the section, possibly indicating the linkage with chromium.
7. Page 2-10, Section 2.2.3: The previous investigation of the RID wells is presented, but at the end of the section more recent data is referenced but not discussed. The most recent data should be presented to provide as it is more applicable to current conditions.
8. Page 2-12, Section 2.2.3, first paragraph: Please state more specifically that there are no surface water quality standards for the contaminants detected during both rounds of canal sampling for surface water used for the irrigation of crops and /or for the consumption by livestock.

9. Page 2-12, Section 2.3: The facilities investigations are provided for numerous sites. However, the data are inconsistently presented. Specific detected concentrations are sometimes provided for one or all media and sometimes only compared to a regulatory standard. The specific data should be presented, which was done in many descriptions.
10. Page 2-15, Section 2.3.2, first paragraph, 6th sentence. This sentence states that the concentration detected in soil gas was collected at approximately 5 feet bgs, however Table 2-15 indicates that the sample depth was 10 feet bgs.
11. Page 2-16, Section 2.3.2, first paragraph, 8th sentence. It would be helpful to explain how the vertical profiling described in the paragraph was completed to better understand the discussion of results.
12. Page 2-16, Section 2.3.2, second paragraph, first sentence. The reader is directed to Appendix B; however the figure in Appendix B provides very little information on the soil vapor extraction system referenced at this site. We suggest adding additional information to the figure.
13. Page 2-17, first paragraph: The aquifer units UAU1 and UAU2 are introduced in the MCM discussion, however, information defining these units is not provided until Section 3.0. The MAU1 is introduced in the next section for the Dolphin site and similarly not previously defined. These units are also in the next two section discussion for ALSco and CRC.
14. Page 2-19, first paragraph: Which wells does ADEQ currently monitor/sample.
15. Page 1-19, second paragraph: Why were only 12 of the 14 wells identified for domestic use sampled? What is the status of the other 2 wells? What was the sampling detection limit? What levels of VOCs were left in soil gas when the SVE system at Southwest Solvent Recycling facility was shut off?
16. Page 2-22, Section 2.3.5, first paragraph, 16th sentence: This sentence states that the soil sample “was collected at a depth of approximately five feet bgs...” Table 2.3 lists the sample depth as 55 feet bgs, please clarify this discrepancy.
17. Page 2-32, Section 2.4.1.5, first paragraph: The last sentence indicates additional remedial work will be completed, however, it should be stated for which COCs and approximate timeframe.
18. Page 2-35, Section 2.4.2, third paragraph, fifth sentence: The sentence references and “operation optimization study mentioned above,” however, this study is not mentioned previously. Please provide additional information regarding the study.
19. Page 3-10, Section 3.5.2.2, third paragraph, third sentence: This sentence states that a “depression in the surface of the groundwater table is located in the

northwestern portion of the WBVA...” An alternative explanation is that the higher groundwater elevations in wells AVB29-01, AVB73-01 and AVB74-01 are due to these wells’ proximity to the leaky RID canal.

20. Page 3-11, Section 3.5.2.3, second paragraph, first bullet: This bullet states that six paired wells “consistently exhibited downward vertical flow...” It should be noted in this bullet that AVB124 was only measured during two of the four quarters.
21. Page 3-12, Section 3.5.2.4, fifth paragraph: The first sentence states, “The aquifer test revealed that there are two aquifers that respond differently to pumping of the RID well.” Please indicate which wells were used to monitor the lower aquifer as the piezometers listed in the text were installed to only 150 feet.
22. Page 3-12, Section 3.5.2.4, third paragraph, second sentence and fifth paragraph second sentence. The third paragraph states, “A 15-hour constant-rate extraction test was then conducted at a pumping rate of 50 gpm.” However, in the fifth paragraph it states that samples were collected “after extraction of 1,000, 15,000, and 56,000 gallons...” The constant rate test extracted only 45,000 gallons, which is inconsistent with the sampling at 56,000 gallons. Please clarify.
23. Page 4-3, Section 4.1, first full paragraph, last line: The sentence states, “The highest detected concentration of chromium was 40,500 $\mu\text{g/l}$ from ADEQ well AVB72-01 in 2003...” Table 4-4 shows 1,530 $\mu\text{g/l}$ for this well in 2003. Please clarify.
24. Page 4-7, Section 4.2.1.4: This section discusses the 52nd Motorola Superfund Site, Operable Unit 3, which bounds the WVBA on the east. It would be helpful either in this section or in the hydrogeology sections to link ADEQ hydrostratigraphic units and how they roughly correspond to the UAU and MAU.
25. Page 4-14, Section 4.2.3.1, first paragraph, fourth sentence: The sentence states, “Groundwater data shown on Figures 4-1, 4-2, 4-3, 4-7, and 4-11...” PCE data for the DIMW wells is shown on Figure 4-11 as NA, however data is shown in Table 4-5. Please update the figure with the first quarter 2008 data.
26. Page 4-15, Section 4.2.3.1, first paragraph, fourth sentence: The sentence states, “Groundwater data shown on Figures 4-1, 4-2, 4-4, 4-8, and 4-12...” TCE data for the DIMW wells is shown on Figure 4-12 as NA, however data is shown in Table 4-5. Please update the figure with the first quarter 2008 data.
27. Page 4-15, Section 4.2.3.1, second paragraph, fourth sentence: The sentence states, “Groundwater data shown on Figures 4-1, 4-2, 4-5, 4-9, and 4-13...” 1,1-DCE data for the DIMW wells is shown on Figure 4-13 as NA, however data is shown in Table 4-5. Please update the figure with the first quarter 2008 data.

28. Page 4-19, Section 4.3.1.3, first paragraph, third bullet, second sentence: The sentence states, "Based on the contours, 1,1-DCE contamination exceeding the AWQS is present only in the eastern WVBA,..." This statement does not take into account the 7.4 $\mu\text{g/l}$ concentration detected in well RID 106. The sentence should be revised.
29. Page 4-20, Section 4.3.2.1, first paragraph, first bullet, first sentence: The sentence states, "PCE concentrations are presented on Figure 4-15, and are limited to the western end of the WVBA." This statement does not take well AVB69-01 (26 $\mu\text{g/l}$) into account.
30. Page 4-21, Section 4.3.2.3, first paragraph, fourth bullet, second sentence: The sentence states, "One groundwater sample, collected from well AVB134-02, exceeded the total chromium AWQS of 100 $\mu\text{g/l}$." The concentration for this well is shown as NA on Figure 4-25, the figure should be updated to match the text.
31. Page 4-22, Section 4.3.3.3, first paragraph, fourth bullet, second sentence: The sentence states, "Of the five wells analyzed..." Only four wells are shown as analyzed on Figure 4-36. The figure or text should be revised, as appropriate.
32. Page 6-1, third and fourth bullet: How is the direction of groundwater flow altered when the Salt River acts as a source of groundwater recharge and the RID wells are pumping?
33. Page 6-5, first sub-bullet and fifth sub-bullet: The first sub-bullet describes March through June 2003 PCE data and indicates a site investigation is being conducted in the area of a data gap. The fifth sub-bullet presents 2008 PCE data, but does not reference the site data. Should the reference be included in the later bullet as it is stated this investigation is being conducted "currently."
34. Page 6-5, first bullet, second sub-bullet, first sentence: The sentence states, "TCE contamination exceeding the AWQS extends from the eastern boundary of the WVBA to approximately 59th Avenue..." Figure 4-12 shows the 5 $\mu\text{g/l}$ contour extending to the west of 67th Avenue. The text should be revised to reflect the figure.
35. Page 6-6, first sub-bullet: The sentence states, "1,1-DCE contamination exceeding the AWQS extends from the eastern boundary of the WVBA to approximately 35th Avenue..." The sentence should include well RID106 to the west.
36. Page 6-7, first bullet, first sub-bullet, first sentence: The sentence states, "PCE contamination exceeding the AWQS discontinuously extends..." The data shown

on Figure 4-22 does not present a reason to show divided plumes. See Figure Comment 11.

37. Page 6-7, first bullet, second sub-bullet, first sentence: The sentence states, "TCE contamination exceeding the AWQS extends... to approximately 51st Avenue and north of the RID canal." The data shown on Figure 4-23 appears to underestimate the extent of concentrations exceeding the AWQS. See Figure Comment 12.
38. Page 7-4, second and third references: These references appear to reference the same document. Please clarify.
39. Page 7-12, second through fourth references: These references appear to reference the same report. Please clarify.

Table Comments

1. Table 2-3, page 2 of 3, Reynolds Metal Company, sixth row, fifth column: Cell shows "error" in the TCE column and is not explained in the notes.
2. Table 2-3, page 2 of 3, Van Waters & Rogers, Inc., 10th row, fourth column: In the PCE column, the value 1.080 is shaded in its cell. This value should not be shaded as it is below the HBGL.
3. Table 3-1, general comments. Data from 2005 through 2006 are included in this table, however they are not discussed nor included on figures. Data from the first quarter 2008 is omitted from Table 3-1, however the data are discussed in the text and included on figures.

Figure Comments

1. Figure 3-22: The 955 contour should be through Well AVB66-02 (955.00).
2. Figure 4-8: The 5 $\mu\text{g/l}$ contour should be south of well PS-2.
3. Figures 4-9: The 7 $\mu\text{g/l}$ contour should be extended westward toward AVB107-01 (5.0 $\mu\text{g/l}$). The 1 $\mu\text{g/l}$ should be between AVB92-01/02 and AVB65-01.
4. Figure 4-10: We suggest drawing 100 $\mu\text{g/l}$ contours to help the reader better understand the data being presented.
5. Figure 4-12: The 25 $\mu\text{g/l}$ contour should be drawn more to the west near RID-89 (23 $\mu\text{g/l}$).
6. Figure 4-13: The 7 $\mu\text{g/l}$ contour around RID-108 likely overstates the area above the AWQS.

7. Figure 4-14: The concentrations should be presented in $\mu\text{g/l}$ for consistency with other total chromium figures. We suggest drawing 100 $\mu\text{g/l}$ contour to help the reader better understand the data being presented.
8. Figure 4-18: The 5 $\mu\text{g/l}$ contour should be between RID-104 and AVB69-01.
9. Figure 4-19: There are no data to suggest closing the 5 $\mu\text{g/l}$ contour north of RID 109 or northeast of RID-107. The 1 $\mu\text{g/l}$ contour should be between RID-104 and AVB69-01.
10. Figure 4-19: There are no data to suggest closing the 7 $\mu\text{g/l}$ contour northeast of RID-107.
11. Figure 4-22: The 1 $\mu\text{g/l}$ contour should be drawn to the south of well AVB122-03. There is no data between RID-89 (9.3 $\mu\text{g/l}$) and AVB10-02 (8.4 $\mu\text{g/l}$) that suggests two discontinuous plumes. This is more pronounced after redrawing the 1 $\mu\text{g/l}$ contour as suggested above. Additional data should be provided to support this interpretation.
12. Figure 4-23: The 50 $\mu\text{g/l}$ should be redrawn more to the west of RID-92 toward RID-89. The 5 $\mu\text{g/l}$ contour should be drawn more toward the west of RID-89. There is no basis for the location of the 1 $\mu\text{g/l}$ northeast of well PTG-1B, the contour should be dashed and/or queried.
13. Figure 4-25: The concentrations should be presented in $\mu\text{g/l}$ for consistency with other total chromium figures.
14. Figures 4-37 and 4-38: The symbols should present chemical concentrations in the same order from top to bottom for consistency.

Appendices Comments

1. Appendix L, General Comment: The lithologic data on the logs is very helpful for the reviewer, however this Appendix is not easy to access. A Table of Contents and page numbering should be included to make this a more user friendly resource.
2. Appendix M, AVB40-05 and AVB76-01 hydrographs: These two hydrographs show groundwater elevations below the wells' total depths. Please explain. If measurement error is suspected, it should be noted on the chart.

Typographical Errors noted in review

1. General Comment: ALSCo and ALSCO used interchangeably. ALSCo should be used for consistency with the acronym list.

2. Page 1-9, Section 1.3.2.4, third paragraph, second sentence: Suggest deleting “and” after “fabrication,” and adding “a” in front of “plastic”.
3. Page 1-11, first paragraph, 15th sentence: The amount of PCE used and stored on site doesn’t vary dependent upon surveys. This sentence should be reviewed for clarity.
4. Page 1-14, Section 1.3.2.6, first full paragraph, last sentence: Suggest replacing “that” with “which”.
5. Page 1-15, Section 1.3.2.6, last paragraph, last sentence: Replace “Table” with “Tables”.
6. Page 1-17, Kleinfelder Records Review Table, first column, second and third cell. Use acronyms for Arizona Department of Health Services and Arizona Department of Water Resources as these have been defined previously.
7. Page 1-18, Kleinfelder Records Review Table, first column, third cell. Use acronym for Roosevelt Irrigation District as it was defined previously.
8. Page 1-18, Kleinfelder Records Review Table, second column, sixth cell. Reformat second line for consistency.
9. Page 2-3, first bullet, first line: Insert the word “was” before “excavated”.
10. Page 2-6, Section 2.2.1.1, second sentence: Use acronym for Roosevelt Irrigation District as it was defined previously.
11. Page 2-7, Section 2.2.2, third bullet, sixth sentence: Change “survey” to “inventory”.
12. Page 2-7, Section 2.2.2, third bullet, seventh sentence: Add “degradation” after “quality”.
13. Page 2-19, Section 2.3.3, third paragraph, second sentence: Add “the” before “Southwest”.
14. Page 2-20, Section 2.3.4, second paragraph, second sentence: Replace “Data” with “These data also”.
15. Page 2-27, Section 2.3.7, first paragraph, first sentence: Define the acronym “PAO”.
16. Page 2-27, Section 2.3.7, first paragraph, seventh and eighth sentences: Insert a space between 1.6 and $\mu\text{g/l}$, and 2,900 and $\mu\text{g/l}$.
17. Page 2-30, Section 2.4.1.1, first sentence: Insert “it” between “operated” and “periodically”.
18. Page 3-14, Section 3.5.2.4, fourth paragraph, fourth line: Change “well AVB68-02” to “piezometer AVB68-02”.
19. Page 3-15, Section 3.5.2.4, third paragraph, last line: Begin sentence with “The highest concentrations...”
20. Page 4-1, Section 4.0, first paragraph, second sentence: Suggest changing “industry” to “industrial”.
21. Page 4-1, Section 4.1, second paragraph, first sentence: Use acronym HBGLs, as it was previously defined.
22. Page 4-2, Section 4.1, last paragraph, first sentence: Add “respectively” after “mg/kg”.
23. Page 4-2, Section 4.1, last paragraph, second sentence: The concentration for 1,1-DCE and TCA are reported as “ug/L” for soils, we believe it should be mg/kg.

24. Page 4-7, Section 4.2.1.4, third paragraph, first sentence: Use acronym for CERCLA as it was previously defined in the document.
25. Page 5-2, Section 5.1.1, second paragraph, third bullet: Please revise this bullet because it states that permeability is "lowest", but then "decreases northward".
26. Page 5-4, Section 5.2.1.1, third paragraph, third sentence: Replace the first "1966" with "1965".
27. Page 5-5, Section 5.2.1.1, second paragraph, second sentence: This sentence could be more correct if "organic carbon in" is added between "for" and "soil".
28. Page 5-8, Section 5.2.2, third paragraph, last sentence: Replace "then" with "than".
29. Page 7-2, second reference: Suggest capital letter "C" on "conducted".
30. Page 7-4, fifth and sixth reference: Blaes and BLAES is used, should be consistent throughout.
31. Page 7-6, sixth reference: Suggest capital letter "W" on "water".
32. Page 7-6, ninth reference: Suggest capital letter "R" on "report".
33. Page 7-12, last reference: This Kleinfelder, 1993 reference should be listed after Kleinfelder, 1992b on the following page.
34. Page 7-13, sixth reference: Suggest capital letter "C" on "closure".
35. Figure 1-1: Suggest re-labeling the facilities using the acronyms used in the document to make for easier reviewing.
36. Figure 3-2: Change horizontal scale to 1" = 2800'.
37. Figures 3-14 through 3-17: The map background is not visible.

If you have any questions regarding these comments, please contact me at (415) 972-3165.

Sincerely,



Janet Rosati
Remedial Project Manager

cc: Joellen Meitl, ADEQ