ENGINEERING EVALUATION / COST ANALYSIS FOR ARSENIC IN SOIL

SPRING VALLEY OPERABLE UNITS 4 and 5
WASHINGTON, D.C.

VOLUME III – TECHNICAL MEMORANDA AND OTHER SUPPORTING DATA

CONTRACT DAHA90-94-D-0010, TASK ORDER DA01
DERP-FUDS HTRW PROJECT NO. C03DC091802

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared By:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VIRGINIA 22030

December 17, 2003

VOLUME III – TECHNICAL MEMORANDA AND OTHER SUPPORTING DATA

This volume contains:

- Technical Memoranda and Other Supporting Data:
  - Arsenic Speciation Technical Memorandum
  - Arsenic Bioavailability Technical Memorandum
  - Arsenic SPLP Technical Memorandum
  - AUES List Sampling – Report of Results:
    - 3819 48th Street, 4710 Quebec Street, 4625 & 4633 Rockwood Parkway
    - CDC and AU Lot 12
    - Sedgwick Trench
  - DCDOH Comments on AUES List Sampling and USACE Response to the Comments
  - Sampling Procedures Supporting Memoranda

TECHNICAL MEMORANDUM

ARSENIC SPECIATION STUDY

SPRING VALLEY OPERABLE UNIT 4 and 5

WASHINGTON, DC

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared by:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

January 20, 2003

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

1.0.0.1 The purpose of this technical memorandum is to discuss the results of the arsenic speciation study for the Spring Valley investigation. This sampling was performed in support of the Operable Unit 4 (OU-4) and 5 (OU-5) Remedial Investigation/Feasibility Study (RI/FS). The objective of this limited study was to determine if there were differences between site-specific soils and background soils in terms of arsenic speciation (trivalent vs. pentavalent arsenic and organic vs. inorganic arsenic compounds). Differences in arsenic species could be attributed to anthropogenic (resulting from influences of human beings) sources of arsenic. It has been shown that natural processes can also change the oxidation states of arsenic regardless of the original source (Oremland and Stolz, May 2003). Anthropogenic sources of arsenic may be associated with AUES activities, but could also be associated with the use of pressure-treated lumber, pesticides, herbicides, coal, or fertilizer.

2.0 BACKGROUND

2.0.0.1 In August and September 1999, the United States Environmental Protection Agency (USEPA) collected background soil samples in support of Spring Valley OU-3 investigations (Background Trip Report, USEPA, January 2000). These samples covered four distinct soil associations or types present in Spring Valley.

2.0.0.2 As an extension of the OU-3 investigations, remedial investigations addressing geographically larger areas of Spring Valley were undertaken as OU-4 and OU-5. As part of this investigation, grid soil sampling was performed by Parsons throughout Spring Valley. The sampling was performed to determine the extent and concentrations of arsenic (As) in surface soils in Spring Valley. All sampling was performed in accordance with the Work Management Plan (WMP) for OU-4 (Parsons ES, August 14, 2000 and Amendment 3 to the WMP, October 1, 2002).

2.0.0.3 Analysis of the toxic effects of arsenic is complicated by the fact that arsenic can exist as different forms in the environment. Arsenic can exist as inorganic or organic compounds, as well as several different electronic valence states. According to the September 2000 ATSDR Toxicological Profile for Arsenic (Update), a number of studies have indicated that among the inorganic arsenic compounds, the trivalent arsenites (As+3) are somewhat more toxic than the pentavalent arsenates (As+5). In addition, organic arsenicals are usually viewed as being less toxic than the inorganic arsenic compounds. Therefore, an investigation was undertaken to determine the amount of organic vs. inorganic arsenic, as well as the valence state of the inorganic arsenic found at the Spring Valley site, in order to gain additional information about the potential risk associated with exposure to the arsenic contaminated soil.

2.0.0.4 Based on the results of the grid sampling, grids with relatively high arsenic concentrations, distributed throughout Spring Valley, were sampled for speciation. Additionally, six background samples representing the four soil types were collected from the same locations the USEPA sampled; these were also analyzed for arsenic speciation. These background samples were collected to ensure that the site sample soil types were represented for the purposes of comparing site data and background data. However, only three of the four soil types were present in the sampled site soils.

3.0 SAMPLE COLLECTION

3.0.0.1 On November 21, 2002, fifteen (15) samples were collected, including twelve (12) soil samples, one (1) field duplicate sample, and a matrix spike/matrix spike duplicate (MS/MSD) pair. See Table 1. Figure 1 indicates the speciation sampling locations. Figure 2 indicates the background sampling locations. These figures are presented at the end of the report.

3.0.0.2 All samples were collected as discrete surface soil samples, from 0-6 inches in depth. The soil types are also indicated on Table 1.

3.0.0.3 Samples were sent to the Battelle Marine Science Laboratories of Sequim, Washington, for arsenic speciation testing. Battelle Marine Science Laboratories conducted the arsenic speciation tests in accordance with the guidelines of Method 1632, Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry, Revision A (USEPA, 2001). The method is for determination of inorganic arsenic (IA), arsenite (As+3), arsenate (As+5), monomethylarsonic acid (MMA), and dimethylarsinic acid (DMA). Appendix A contains the method Standard Operating Procedure (SOP).

4.0 DATA VERIFICATION SUMMARY REPORT

4.0.0.1 This section describes the data verification performed by Parsons for the arsenic speciation soil sampling.

4.0.0.2 The following data verification summary report covers environmental soil samples and associated field quality control (QC) samples collected from Spring Valley OU-4 and OU-5 on November 21, 2002. The samples were analyzed by Battelle Marine Sciences Laboratories for IA, As+3, As+5, MMA, and DMA. MMA and DMA are the organic arsenic compounds. Battelle Marine Sciences Laboratories followed the procedures outlined in Method 1632 to perform all analyses.

4.0.0.3 Field QC samples collected were a field duplicate sample, a matrix spike sample and a matrix spike duplicate sample. The field QC samples were analyzed for the same parameters as their associated samples.

4.0.0.4. All samples were collected by Parsons following the procedures outlined in the WMP (Parsons ES, August 14, 2000 and Amendment 3 to the WMP, October 1, 2002).

4.1 Evaluation Criteria

4.1.0.1 The data submitted by the laboratory has been reviewed and validated following the guidelines outlined in the USACE "Shell for Analytical Chemistry Requirements," EM 200-1-3 Appendix I (February 2001). The data was also examined for compliance to the methodology presented in Method 1632. Information reviewed in the data package included sample results, method blank (MB), standard reference material (SRM), laboratory quality control results and chain-of-custody forms. The analyses and findings presented in this report are based on the reviewed information and whether the guidelines in the USACE Shell and SW-846 were met. All sample results and laboratory reporting limits have been adjusted for percent moisture.

TABLE 1
Soil Associations of Speciation Samples
Spring Valley Operable Units 4 and 5
(All Samples Collected November 21, 2002)

Spring Valley Background Sampling

Sample ID	Sample Description	Sample Location[\1]
OU4-BS-Mg (DRG)	Brown to light brown silty sand with mica.	**Dalecarlia Reservoir Grounds (DRG)**
OU4-BS-ULSC(FRP)	Brown silty clay. Moist.	**Fort Reno Park (FRP)**
OU4-BS-ULMg (TP)	Light brown silty soil.	**West of the Water Treatment Plant (TP)**
OU4-BS-Mg (BKP)	Brown silty soil with trace mica. Moist.	**Battery Kemble Park (BKP)**
OU4-BS-ULB (GP)	Reddish brown to dark brown silty clay. Moist. *MS/MSD.*	**Glover Parkway (GP)**
OU4-BS-ULMg (PP)	Brown to reddish brown silty clay.	**Palisades Park (PP)**
OU4-BS-ULB MS/MSD	***MS/MSD sample (OU4 BS-ULB).***	**Glover Parkway (GP)**

[\1] Sample locations are approximately the same locations used by the EPA to collect their background samples.

Elevated Arsenic Samples Within Spring Valley

Sample ID	Sample Description	Background Soil Association Match[\2]
OU4-4230FR-(60,80)	Reddish brown to dark brown silty clay.	ULB
OU4-4007(49)-(60,20)	Brown to dark brown silty sand. Moist.	Mg
OU4-4007(49)-(80,100)	Brown to reddish brown silty clay. Moist.	ULMg
OU4-3709CP-(40,60)	Brown silty soil. Moist. Collected a Duplicate sample.	ULMg
OU4-3709CP-DUP	***Duplicate sample of 3709CP-(40,60).***	ULMg
OU4-KREEG-(130,170)	Brown to reddish brown silty clay with trace mica.	ULMg
OU5-CSA-5-L15-(100,400)	Brown silty soil.	ULMg

[\2] Background Soil Associations: Mg - Manor Glenelg; ULSC- Urban Land Sassafras Chillum; ULMg - Urban Land Manor Glenelg; ULB - Urban Land Brandywine

4.2 Arsenic Speciation

4.2.0 General

4.2.0.1 This data group consisted of fifteen (15) samples, including twelve (12) soil samples, one (1) field duplicate sample and a pair of MS and MSD samples. Battelle Marine Sciences Laboratories received the samples on November 22, 2002.

4.2.0.2 The arsenic analyses were performed using the guidelines in Method 1632, Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry, Revision A (USEPA, 2000). Battelle Marine Sciences Laboratories reported the results for total arsenic, As^{+3}, As^{+5}, MMA and DMA with "U" qualifiers for concentrations that were not detected at the method detection limit and "J" qualifiers for concentrations below the method detection limit and above the critical value. Battelle defined "Method Detection Limit" based on tissue method detection limits in Method 1632, since this method does not provide soil/sediment method detection limits.

4.2.1 Accuracy

4.2.1.1 Accuracy was evaluated using the percent recovery (%R) results for the blank spike (BS) sample, standard reference material (SRM) and the MS/MSD samples. Soil sample OU4-BS-ULB (GP) was used as the MS/MSD sample in this data group.

- All BS %Rs were within acceptance criteria as specified by the method.
- The SRM %R was within 5% of the theoretical amount for inorganic arsenic.
- The MS/MSD %Rs were within acceptance criteria as specified by the method.

4.2.2 Precision

4.2.2.1 Precision was evaluated using the Relative Percent Difference (RPD) results obtained from the field duplicate sample results, the MS/MSD results and the laboratory duplicate samples. Sample OU4-BS-ULB (GP) was used as the MS/MSD sample in this data group. Sample OU4-3709CP-DUP was collected and analyzed as the field duplicate of sample OU4-3709CP-(40,60). The laboratory randomly selected OU4-3709CP-DUP as the laboratory duplicate sample.

- The MS/MSD %RPD was within acceptance criteria as specified by the method.

4.2.2.2 There are no criteria specified by the method or USACE Shell document for field duplicate % RPD; therefore an internal limit of 70% for soils was applied. The field duplicate RPD was within 70% for all arsenic compounds.

4.2.2.3 There are no criteria specified by the method or USACE Shell document for MS/MSD % RPD; therefore an internal limit of 70% for soils was applied. The MS/MSD RPD was within 70% for all arsenic compounds.

4.2.2.4 There are no criteria specified by the method or USACE Shell for laboratory duplicate % RPD; therefore an internal limit of 70% for soils was applied. The laboratory duplicate RPD was within 70% for all arsenic compounds.

4.2.3 Completeness

4.2.3.1 Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data. All results were considered usable. The completeness for this SDG is therefore 100% compared to the minimum acceptance limit of 90%.

4.2.4 Representativeness

4.2.4.1 Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Actual analytical procedures were the same as those described in Method 1632;
- All samples were analyzed within appropriate hold time;
- All initial calibration criteria were met;
- All initial and continuing calibration verification criteria were met, except for the following: MMA was slightly below the acceptance criteria for the continuing calibration verification as specified in the method. The recovery for MMA in the first CCV was 79% with a tolerance of 80-120%. No corrective action was deemed necessary since the recovery was only slightly below method criteria. All other CCVs for all arsenic compounds were within method specified limits;
- All second source verification criteria were met.

4.2.4.2 There was one method blank associated with the arsenic analyses in this data group. The method blank was free of any arsenic compounds above the method detection limit. As^{+3} and As^{+5} were found in the method blank at concentrations between zero and the method detection limit.

5.0 RESULTS AND UNCERTAINTY DISCUSSION

5.0.0.1 Of the 15 samples (including QA/QC) analyzed for arsenic speciation by Battelle Marine Sciences Laboratories, all of the samples had detectable concentrations of total arsenic and As^{+5}, and 14 of the 15 samples had detectable concentration of As^{+3}. Of the 15 samples collected, 7 were considered background samples (including the MS/MSD sample) and 7 were collected as part of the study [including a duplicate sample of OU4-3709CP-(40,60)]. Battelle randomly selected an internal duplicate of OU4-3709CP-DUP to make a total of 15 samples analyzed (Table 2).

5.0.0.2 Uncertainties in this study are associated with the limited number of site samples collected, the historical knowledge of the specific types of arsenic compounds used at the AUES, and the effects that more than 80 years of weathering may have on the interpretation of the findings. Finally, there are uncertainties associated with the non-routine method that needed to be used to speciate arsenic. For example, to determine the arsenic species, a mild leaching condition was used by the laboratory, so that the valence state of the arsenic is not altered during the process. The leaching conditions used are not able to dissolve some arsenic compounds, and as a result, only a portion of the total arsenic is quantified in the speciation samples. Therefore, not all of the arsenic present in the total arsenic analysis can be accounted for in the As^{+5} and As^{+3} results.

TABLE 2

SPRING VALLEY OU-4 and OU-5

SPECIATED ARSENIC RESULTS

(Samples Collected 11/21/02, Received 11/22/02)

Sample Name	Lab Code	Units	Percent Dry WT	Total As ICP-MS	As+3	As+5	As +3/Total As (unitless)	As +5/Total As (unitless)	MMA	DMA
BACKGROUND										
OU4-BS-Mg(DRG)	1869-22	mg/kg dw	82.0	0.511	0.020 U	0.0396	0.0391	0.077	0.01 U	0.04 U
OU4-BS-ULSC(FRP)	1869-23	mg/kg dw	86.3	3.96	0.00564 JB	0.268	0.0014	0.067	0.01 U	0.04 U
OU4-BS-ULMg(TP)	1869-24	mg/kg dw	85.4	6.21	0.00434 JB	0.314	0.0007	0.051	0.01 U	0.04 U
OU4-BS-Mg(BKP)	1869-25	mg/kg dw	80.3	3.92	0.00645 JB	0.395	0.0016	0.100	0.01 U	0.04 U
OU4-BS-ULB(GP)	1869-26	mg/kg dw	79.0	2.93	0.00375 JB	0.117	0.0013	0.040	0.01 U	0.04 U
OU4-BS-ULMg(PP)	1869-27	mg/kg dw	81.8	3.09	0.00462 JB	0.157	0.0015	0.051	0.01 U	0.04 U
SITE SAMPLES										
OU4-4230FR-(60,80)	1869-29	mg/kg dw	84.4	4.64	0.0115 JB	0.623	0.0025	0.134	0.01 U	0.04 U
OU4-4007(49)-(60,20)	1869-30	mg/kg dw	82.5	133	0.484	24.57	0.0036	0.185	0.01 U	0.04 U
OU4-4007(49)-(80,100)	1869-31	mg/kg dw	76.3	13.6	0.0336	2.75	0.0025	0.202	0.01 U	0.04 U
OU4-3709CP-(40,60)	1869-32	mg/kg dw	83.6	21.2	0.0905	1.54	0.0043	0.073	0.01 U	0.04 U
OU4-3709CP-(40,60) Field Dup	1869-33r1	mg/kg dw	83.9	15.3	0.0694	2.66	0.0045	0.174	0.01 U	0.04 U
OU4-3709CP-(40,60) Lab Dup	1869-33r2	mg/kg dw	83.9	15.6	0.0567	2.81	0.0036	0.180	0.01 U	0.04 U
OU4-KREEG-(130,170)	1869-34	mg/kg dw	79.7	7.66	0.0159	1.23	0.0021	0.161	0.01 U	0.04 U
OU5-CSA-5-L15-(100,400)	1869-35	mg/kg dw	82.3	265	0.485	49.38	0.0018	0.186	0.01 U	0.04 U
Blank		mg/kg dw		0.188 U	0.00235 J	0.00281 J	--	--	0.01 U	0.04 U
Method Detection Limit				0.188	0.02	0.03	--	--	0.01	0.04

TABLE 2

SPRING VALLEY OU-4 and OU-5

SPECIATED ARSENIC RESULTS

(Samples Collected 11/21/02, Received 11/22/02)

Sample Name	Lab Code	Units	Percent Dry WT	Total As ICP-MS	As+3	As+5	As +3/Total As (unitless)	As +5/Total As (unitless)	MMA	DMA
Laboratory QA/QC Samples										
BLANK SPIKE RESULT										
Blank		mg/kg dw		--	0.00235 J	0.00281 J	--	--	0.01 U	0.04 U
Blank Spike		mg/kg dw		--	21.4	25.9	--	--	28.3	31.5
Spike concentration				--	25.0	25.0	--	--	25.0	25.0
Percent recovery				--	**86%**	**104%**	--	--	**113%**	**126%**
Acceptable QC Range				*(75-125%)*	*(30-170%)*	*(50-150%)*	--	--	*(60-140%)*	*(40-160%)*
MATRIX SPIKE RESULT										
OU4-BS-ULB(GP)	1869-26	mg/kg dw		2.93	0.00375 JB	0.117	--	--	0.01 U	0.04 U
OU4-BS-ULB(GP) MS	1869-26 MS	mg/kg dw		58.5	21.9	38.1	--	--	40.0	39.8
Spike concentration				57.5	29.8	37.8	--	--	37.8	37.8
Percent recovery				**97%**	**74%**	**100%**	--	--	**106%**	**105%**
Acceptable QC Range										
OU4-BS-ULB(GP)	1869-26	mg/kg dw		2.93	0.00235 J	0.117	--	--	0.01 U	0.04 U
OU4-BS-ULB(GP) MSD	1869-26 MSD	mg/kg dw		62.5	23.4	26.2	--	--	25.0	28.3
Spike concentration				62.0	29.7	25.3	--	--	25.3	25.3
Percent recovery				**96%**	**79%**	**103%**	--	--	**99%**	**112%**
Acceptable QC Range				*(75-125%)*	*(30-170%)*	*(50-150%)*	--	--	*(60-140%)*	*(40-160%)*

TABLE 2

SPRING VALLEY OU-4 and OU-5

SPECIATED ARSENIC RESULTS

(Samples Collected 11/21/02, Received 11/22/02)

Sample Name	Lab Code	Units	Percent Dry WT	Total As ICP-MS	As+3	As+5	As +3/Total As (unitless)	As +5/Total As (unitless)	MMA	DMA
Laboratory QA/QC Samples										
STANDARD REFERENCE MATERIAL										
MESS-3				20.1	--	--	--	--	--	--
certified value				21.2	NC	NC	--	--	NC	NC
range				±1.1	--	--	--	--		
percent difference				5%	--	--	--	--	--	--
Acceptable QC Range				*(<25%)*	--	--	--	--	--	--
REPLICATE ANALYSIS RESULTS										
OU4-3709CP-(40,60) Field Dup	1869-33r1	mg/kg dw		15.3	0.0694	2.66	--	--	0.01 U	0.04 U
OU4-3709CP-(40,60) Lab Dup	1869-33r2	mg/kg dw		15.6	0.0567	2.81	--	--	0.01 U	0.04 U
RPD				**2%**	**20%**	**6%**	--	--	--	--
Acceptable QC Range				*(<25%)*	*(<35%)*	*(<35%)*	--	--	*(<25%)*	*(<40%)*

U Not detected at or above MDL shown
J Reported below Method Detection Limit; estimated value only
JB J description above plus, result is less than 5 times amount found in associated blank
-- Not applicable
NC Not certified

5.0.0.3 The reason for attempting to quantify the different forms of arsenic at the site was to determine if the species can be determined to be site-related or the result of releases that are not related to AUES activities. Differences in the pattern of background arsenic compared to the site-related samples could indicate the source of the arsenic (i.e., naturally occurring vs. anthropogenic). If the species are site-related, then it may be possible to make some conclusions regarding the relative risk associated with site-related contamination compared to the risk associated with exposure to naturally occurring arsenic.

5.0.0.4 To obtain a general comparison of the background samples to the site samples collected for the study, the means of the Total As for background samples and site samples [not including the duplicates for OU4-3709CP-(40,60)] were calculated (Table 3). Since the small sample size makes it difficult to determine if the distribution is normal, a non-parametric test was used to compare the medians rather than the means. To determine if the medians were different, a Mann-Whitney test was performed. This test allows generalized differences between the background samples and the site samples to be determined for Total As, but does not allow specific areas of contamination to be identified. The results of Mann-Whitney test (Table 4) indicated that there was a significant difference between the median of the background samples and the site samples.

Table 3. Mean Arsenic Concentrations (mg/kg)

	Background Samples	**Site Samples**
Total Arsenic	3.44 ± 1.85	73.6 ± 105.9
As^{+3}	0.0058 ± 0.0023	0.18 ± 0.23
As^{+3}/Total Arsenic	0.0076 ± 0.0154	0.0028 ± 0.0009
As^{+5}	0.22 ± 0.11	13.5 ± 19.8
As^{+5}/Total Arsenic	0.064 ± 0.022	0.17 ± 0.03

5.0.0.5 To verify that these differences were also present for the As^{+5} species, the ratio of the As^{+5} to the Total As was calculated for each sample. Then the median of the ratios (As^{+5}/Total As) of all background samples and the median of the ratios (As^{+5}/Total As) for all site samples was calculated. The Mann-Whitney test was used and it was determined that there was a significant difference between the two data sets.

5.0.0.6 A ratio can be calculated in a similar manner for the As^{+3}/Total As. Therefore, the ratio of the As^{+3} to the Total As was calculated for each sample. Then the median of the ratios (As^{+3}/Total As) of all background samples and the median of the ratios (As^{+3}/Total As) for all site samples was calculated. The Mann-Whitney test was used, and it was determined that there was **not** a significant difference between the two data sets.

5.0.0.7 In addition, all samples were analyzed for the organic arsenic compounds MMA and DMA. According to the ATSDR Toxicological Profile for Arsenic (September 2000 Update), organic arsenic compounds can be naturally occurring, or their presence might indicate an anthropogenic source. However, these organic compounds were not detected above detection limits in any of the samples.

TABLE 4
Spring Valley OU4 and OU-5
Mann-Whitney U test performed on the Speciated As-to-Total As Ratios

Sample Name	Total As ICP-MS		As+3			As+5		As +5/Total As (unitless)		As+3/Total As (unitless)	
BACKGROUND											
OU4-BS-Mg(DRG)	0.511	-0.6713857	0.010	U	-4.6052	0.040	-3.2288	0.077	-2.56395	0.0196	-3.933784
OU4-BS-ULSC(FRP)	3.96	1.37624403	0.00564	JB	-5.1785	0.268	-1.3152	0.067	-2.703063	0.0014	-6.55471
OU4-BS-ULMg(TP)	6.21	1.8261609	0.00434	JB	-5.4397	0.314	-1.1585	0.051	-2.97593	0.0007	-7.265855
OU4-BS-Mg(BKP)	3.92	1.36609165	0.00645	JB	-5.0442	0.395	-0.9287	0.100	-2.302585	0.0016	-6.410247
OU4-BS-ULB(GP)	2.93	1.07500242	0.00375	JB	-5.5868	0.117	-2.1418	0.040	-3.218876	0.0013	-6.661819
OU4-BS-ULMg(PP)	3.09	1.12817109	0.00462	JB	-5.3783	0.157	-1.8536	0.051	-2.97593	0.0015	-6.506515
SITE SAMPLES											
OU4-4230FR-(60,80)	4.64	1.53471437	0.0115	JB	-4.4616	0.623	-0.4731	0.134	-2.009915	0.0025	-5.996284
OU4-4007(49)-(60,20)	133	4.89034913	0.484		-0.7256	24.57	3.20137	0.185	-1.687399	0.0036	-5.615973
OU4-4007(49)-(80,100)	13.6	2.61006979	0.0336		-3.3945	2.75	1.00989	0.202	-1.599488	0.0025	-6.004589
OU4-3709CP-(40,60)	17.4	2.85647021	0.0722		-2.6283	2.33	0.84587	0.142	-1.951928	0.0041	-5.484785
OU4-KREEG-(130,170)	7.66	2.03601198	0.0159		-4.1434	1.23	0.20355	0.161	-1.826351	0.0021	-6.179422
OU5-CSA-5-L15-(100,400)	265	5.57972983	0.485		-0.7246	49.38	3.89958	0.186	-1.682009	0.0018	-6.304359

As +5/Total As

	Value	Rank		Value	Rank
Bkgd	0.040	1	Samp	0.134	7
Bkgd	0.051	2.5	Samp	0.142	8
Bkgd	0.051	2.5	Samp	0.161	9
Bkgd	0.067	4	Samp	0.185	10
Bkgd	0.077	5	Samp	0.186	11
Bkgd	0.100	6	Samp	0.202	12

R1= 21.

Median 0.059 — R2= 57

Median 0.173

n1 = 6

critical value = 5

n2 = 6

U1 = 0.0000

U2 = 36.

Smallest value 0, less than critical value, therefore, the null hypothesis is rejected.
There is a significant difference between the medians.

As +3/Total As

	Value	Rank		Value	Rank
Bkgd	0.0007	1	Samp	0.0018	6
Bkgd	0.0013	2	Samp	0.0021	7
Bkgd	0.0014	3	Samp	0.0025	8
Bkgd	0.0015	4	Samp	0.0025	9
Bkgd	0.0016	5	Samp	0.0036	10
Bkgd	0.0196	12	Samp	0.0041	11

R1= 27.

Median 0.0015 — R2= 51

Median 0.0025

n1 = 6

critical value = 5

n2 = 6

U1 = 6.0000

U2 = 30.

Smallest value 6, greater than critical value, therefore, the null hypothesis is accepted.
There is no significant difference between the medians.

TABLE 4
Spring Valley OU4 and OU-5
Mann-Whitney U test performed on the Speciated As-to-Total As Ratios

Sample Name	Total As ICP-MS	As+3	As+5	As +5/Total As (unitless)	As+3/Total As (unitless)

As +5

	Value	Rank		Value	Rank
Bkgd	0.040	1	Samp	0.623	7
Bkgd	0.117	2	Samp	1.23	8
Bkgd	0.157	3	Samp	2.33	9
Bkgd	0.268	4	Samp	2.75	10
Bkgd	0.314	5	Samp	24.57	11
Bkgd	0.395	6	Samp	49.38	12

R1= 21.

Median	0.213	R2=	57
		Median	2.54
n1 = 6			
critical value = 5		n2 = 6	

U1 =	0.0000
U2 =	36.

Smallest value 0, less than critical value, therefore, the null hypothesis is rejected.
There is a significant difference between the medians.

As +3

	Value	Rank		Value	Rank
Bkgd	0.00375	1	Samp	0.0115	7
Bkgd	0.00434	2	Samp	0.0159	8
Bkgd	0.00462	3	Samp	0.0336	9
Bkgd	0.00564	4	Samp	0.0722	10
Bkgd	0.00645	5	Samp	0.484	11
Bkgd	0.010	6	Samp	0.485	12

R1= 21.

Median	0.0015	R2=	57
		Median	0.0025
n1 = 6			
critical value = 5		n2 = 6	

U1 =	0.0000
U2 =	36.

Smallest value 0, less than critical value, therefore, the null hypothesis is rejected.
There is a significant difference between the medians.

TABLE 4
Spring Valley OU4 and OU-5
Mann-Whitney U test performed on the Speciated As-to-Total As Ratios

Sample Name	Total As ICP-MS	As+3	As+5	As +5/Total As (unitless)	As+3/Total As (unitless)

Total As

	Value	Rank		Value	Rank
Bkgd	0.511	1	Samp	4.64	6
Bkgd	2.93	2	Samp	7.66	8
Bkgd	3.09	3	Samp	13.6	9
Bkgd	3.92	4	Samp	17.4	10
Bkgd	3.96	5	Samp	133	11
Bkgd	6.21	7	Samp	265	12

	R1= 22.		
Median	3.505		R2= 56
		Median	15.5
n1 = 6			
critical value = 5		n2 = 6	

U1 =	1.0000
U2 =	35.

Smallest value 1, less than critical value, therefore, the null hypothesis is rejected.
There is a significant difference between the medians.

6.0 CONCLUSIONS

6.0.0.1 Concentrations of Total Arsenic, As^{+5}, and As^{+3}, appear elevated in the site samples when compared to background samples. Also, the ratio of As^{+5}/Total As was significantly higher in the site samples. While there is no indication that anthropogenic activities would specifically contribute one species of arsenic over another, naturally occurring arsenic would likely have the same profile of arsenic species. This profile is indicated by the ratios of the arsenic species to total arsenic. Differences in the ratios of As^{+5}/Total As between site samples and background samples is a possible indicator of potential anthropogenic sources of arsenic contamination. In addition, none of the organic arsenic compounds analyzed were detected in either site or background samples.

6.0.0.2 The findings of this report indicate that, due to the significant difference in the As^{+5}/Total As ratios, the arsenic observed in the site samples may be from a different source than the arsenic in the background samples. Based solely on this report, the source of the As^{+3} and As^{+5} in the site samples cannot be determined. While the findings show that there may be an anthropogenic source of arsenic at the site, because of the uncertainties associated with the types of arsenic originally used at the site and the effects that more than 80 years of weathering may have, the findings cannot clearly indicate what that source may be. The anthropogenic source of arsenic may be associated with AUES, but it could also be associated with the use of pressure-treated lumber, pesticides, herbicides, coal, or fertilizer.

6.0.0.3 Because of the limitations of the study, the arsenic speciation findings were not relied upon to make Spring Valley project decisions. Neither the 12.6 ppm arsenic screening level nor the 20 ppm arsenic remediation endpoint was based on the results of this study.

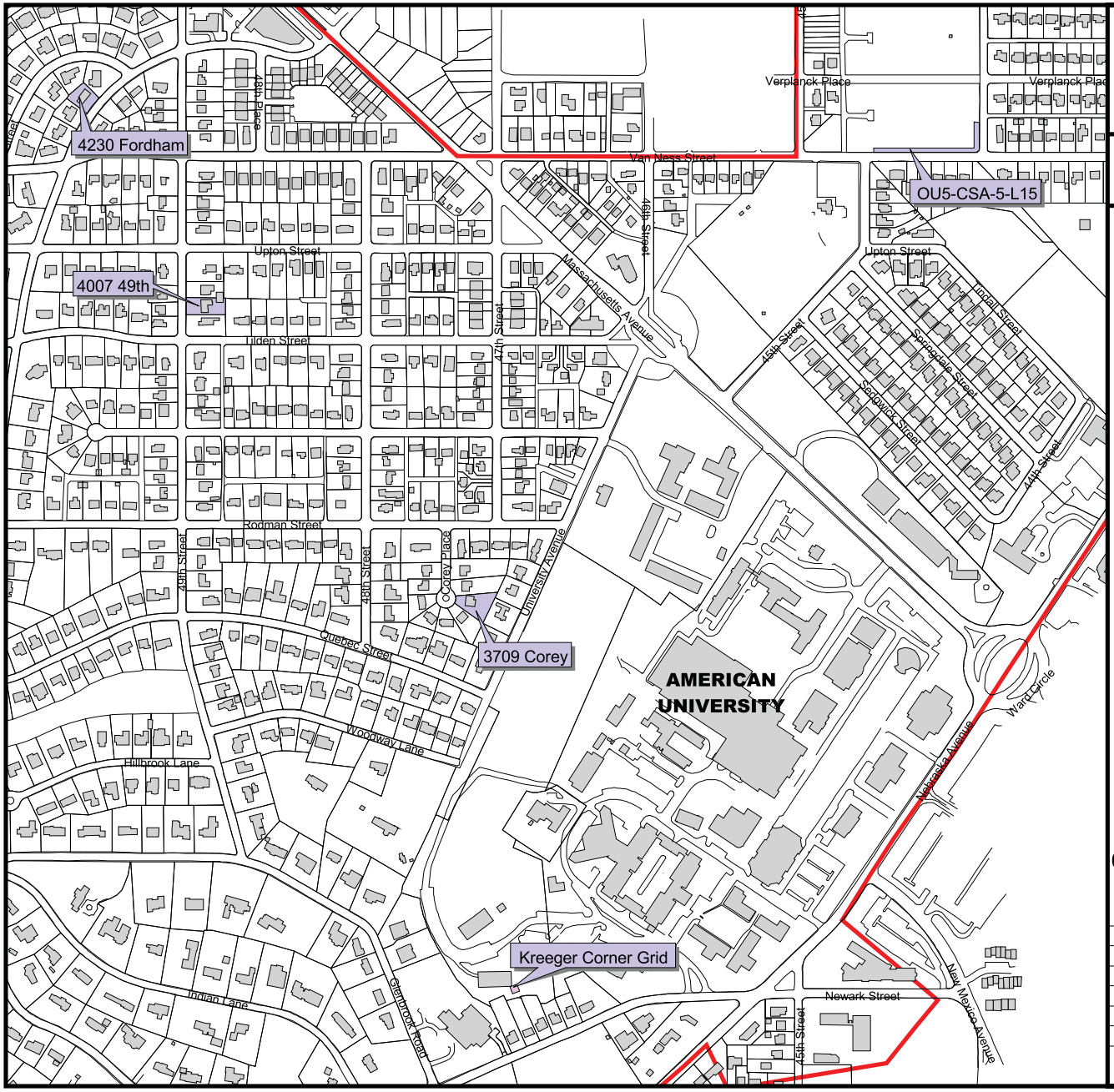


Figure 1
Arsenic Speciation Sample Locations

Spring Valley Operable Unit 4 & 5
Washington D.C.

Legend

- Roads
- Buildings
- Speciation Samples
- Parcels
- SV Boundary

Note:
Background sampling locations associated with speciation not shown.

N
W E
S

600 0 600 Feet

1 inch = 600 feet

Scale:	1 : 7200
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.apr
Date:	01/20/2003
Figure Number:	1
Page Number:	15

PARSONS

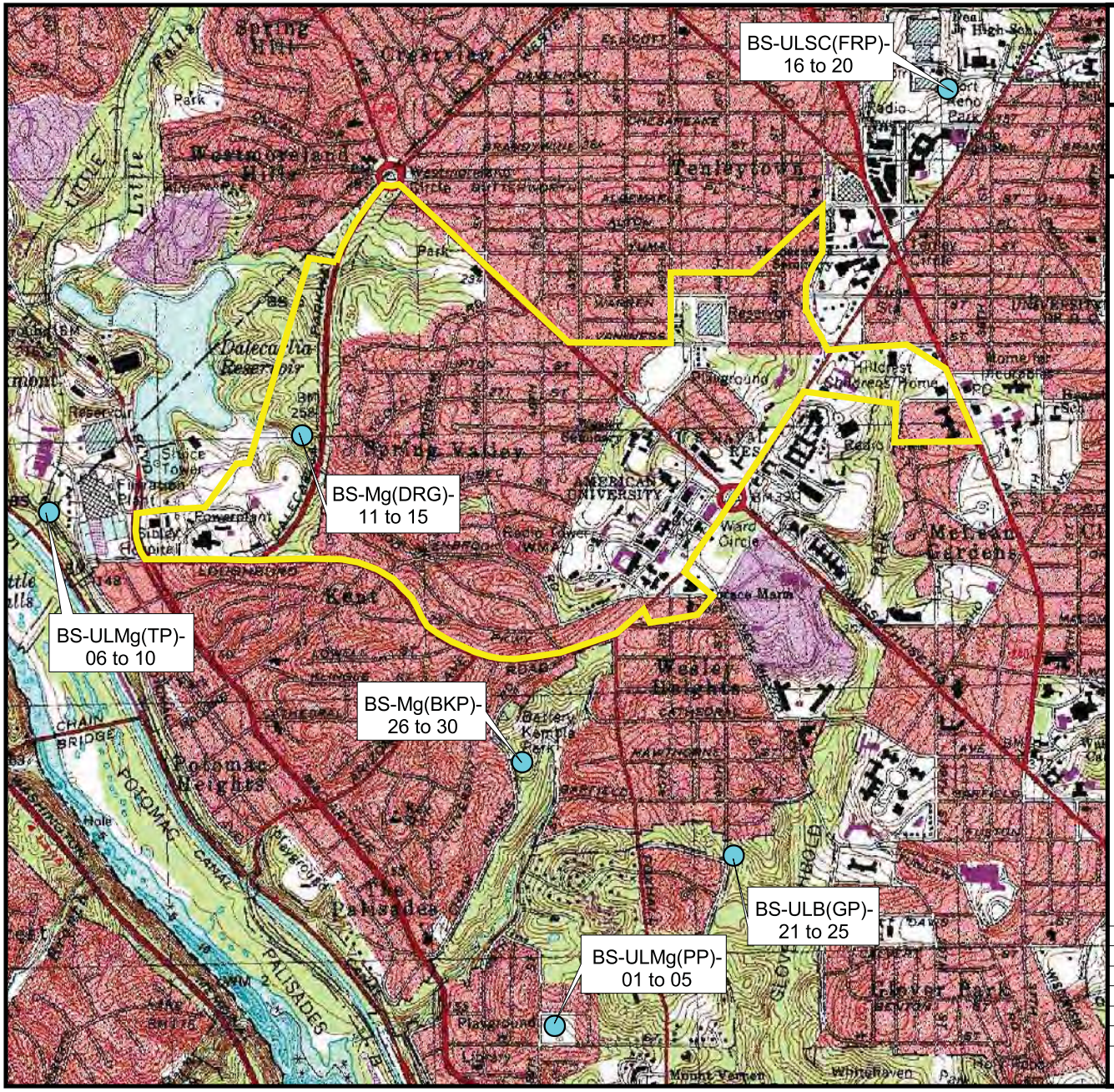


Figure 2
Background Sample Locations

Spring Valley Operable Units 4 and 5
Washington D.C.

Legend

SV FUDS Boundary

DRG - Dalecarlia Reservoir Grounds
FRP - Fort Reno Park
TP - West of Water Treatment Plant
BKP - Battery Kemble Park
GP - Glover Parkway
PP - Palisades Park

N
W E
S

1000 0 1000 2000 Feet

Scale:	1 : 20,000
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.apr
Date:	07/14/2003
Figure Number:	2
Page Number:	16

PARSONS

APPENDIX A: METHOD STANDARD OPERATING PROCEDURE

EPA-821-R-01-006
January 2001

Method 1632

Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry

Revision A

January 2001

U.S. Environmental Protection Agency
Office of Water
Engineering and Analysis Division (4303)
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Acknowledgments

Method 1632 was prepared under the direction of William A. Telliard of the U.S. Environmental Protection Agency's (EPA's) Office of Water (OW), Engineering and Analysis Division (EAD). The method was prepared under EPA Contract 68-C3-0337 by the DynCorp Environmental Programs Division with assistance from Quality Works, Inc. and Interface, Inc. The method is based on procedures developed by Eric Crecelius of the Battelle Marine Sciences Laboratory in Sequim, Washington.

Disclaimer

This draft method has been reviewed and approved for publication by the Analytical Methods Staff within the Engineering and Analysis Division of the U.S. Environmental Protection Agency. Mention of trade names or commercial products does not constitute endorsement or recommendation for use. This method version contains minor editorial changes to the September 2000 version.

EPA welcomes suggestions for improvement of this method. Suggestions and questions concerning this method or its application should be addressed to:

W.A. Telliard
Engineering and Analysis Division (4303)
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
Phone: 202/260-7134
Fax: 202/260-7185

Introduction

This analytical method supports water quality monitoring programs authorized under the Clean Water Act (CWA, the "Act"). CWA Section 304(a) requires EPA to publish water quality criteria that reflect the latest scientific knowledge concerning the physical fate (e.g., concentration and dispersal) of pollutants, the effects of pollutants on ecological and human health, and the effect of pollutants on biological community diversity, productivity, and stability.

CWA Section 303 requires each State to set a water quality standard for each body of water within its boundaries. A State water quality standard consists of a designated use or uses of a water body or a segment of a water body, the water quality criteria that are necessary to protect the designated use or uses, and an anti-degradation policy. These water quality standards serve two purposes: (1) they establish the water quality goals for a specific water body, and (2) they are the basis for establishing water quality-based treatment controls and strategies beyond the technology-based controls required by CWA Sections 301(b) and 306.

In defining water quality standards, a State may use narrative criteria, numeric criteria, or both. However, the 1987 amendments to CWA required States to adopt numeric criteria for toxic pollutants (designated in Section 307(a) of the Act) based on EPA Section 304(a) criteria or other scientific data, when the discharge or presence of those toxic pollutants could reasonably be expected to interfere with designated uses.

In some cases, these water quality criteria (WQC) are as much as 280 times lower than levels measurable using approved EPA methods and required to support technology-based permits. EPA developed new sampling and analysis methods to specifically address State needs for measuring toxic metals at WQC levels, when such measurements are necessary to protect designated uses in State water quality standards. The latest criteria published by EPA are those listed in the National Toxics Rule (58 FR 60848) and the Stay of Federal Water Quality Criteria for Metals (60 FR 22228). These rules include WQC for 13 metals, and it is these criteria on which the new sampling and analysis methods are based. Method 1632 was specifically developed to provide reliable measurements of inorganic arsenic at EPA WQC levels using hydride generation quartz furnace atomic absorption techniques. It has since been modified to include determination of arsenic species.

In developing methods for determination of trace metals, EPA found that one of the greatest difficulties was precluding sample contamination during collection, transport, and analysis. The degree of difficulty, however, is highly dependent on the metal and site-specific conditions. This method is designed to preclude contamination in nearly all situations. It also contains procedures necessary to produce reliable results at the lowest WQC levels published by EPA. In recognition of the variety of situations to which this Method may be applied, and in recognition of continuing technological advances, Method 1632 is performance based. Alternative procedures may be used so long as those procedures are demonstrated to yield reliable results.

Requests for additional copies of this publication should be directed to:
U.S. EPA NCEPI
P.O. Box 42419

Cincinnati, OH 45242
1-800-490-9198
Fax: (513) 489-8695
http://www.epa.gov/ncepihom/

Note: This Method is performance based. The laboratory is permitted to omit any step or modify any procedure provided that all performance requirements in this Method are met. The laboratory may not omit any quality control tests. The terms "shall," "must," and "may not" define procedures required for producing reliable data at water quality criteria levels. The terms "should" and "may" indicate optional steps that may be modified or omitted if the laboratory can demonstrate that the modified method produces results equivalent or superior to results produced by this Method.

Method 1632

Chemical Speciation of Arsenic in Water and Tissue by Hydride Generation Quartz Furnace Atomic Absorption Spectrometry

1.0 Scope and Application

1.1 This method is for determination of inorganic arsenic (IA), arsenite (As^{+3}), arsenate (As^{+5}), monomethylarsonic acid (MMA), and dimethylarsinic acid (DMA) in filtered and unfiltered water and in tissue by hydride generation and quartz furnace atomic absorption detection. The method is for use in EPA's data gathering and monitoring programs associated with the Clean Water Act. The method is based on a contractor-developed method (Reference 16.1) and on peer-reviewed, published procedures for the speciation of As in aqueous samples (Reference 16.2).

1.2 This method is accompanied by Method 1669: *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels* (the Sampling Guidance). The Sampling Guidance may be necessary to preclude contamination during the sampling process.

1.3 This method is designed for measurement of As species in water in the range 0.01-50 g/L and in tissue in the range 0.10-500 g/g dry weight. This method may be applicable to determination of arsenic species in industrial discharges after sample dilution. Existing regulations (40 CFR parts 400-500) typically limit concentrations in industrial discharges to the part-per-billion (ppb) range, whereas ambient As concentrations are normally in the low part-per-trillion (ppt) to low part-per-billion range.

1.4 The method detection limits and minimum levels of quantitation in this method are usually dependent on the level of background elements and interferences rather than instrumental limitations. Table 1 lists method detection limits (MDLs) and minimum levels of quantitation (MLs) in water when no background elements or interferences are present as determined by two laboratories. Table 1 also shows MDLs and MLs in a reference tissue matrix (corn oil).

1.5 The ease of contaminating water samples with As and interfering substances cannot be overemphasized. This method includes suggestions for improvements in facilities and analytical techniques that should maximize the ability of the laboratory to make reliable trace metals determinations and minimize contamination (Section 4.0). Additional suggestions for improvement of existing facilities may be found in EPA's *Guidance on Establishing Trace Metals Clean Rooms in Existing Facilities*, which is available from the National Center for Environmental Publications and Information (NCEPI) at the address listed in the introduction to this document.

1.6 Clean and ultra clean—The terms "clean" and "ultra clean" have been applied to the techniques needed to reduce or eliminate contamination in trace metals determinations. These terms are not used in this method because they lack an exact definition. However, the information provided in this method is consistent with EPA's summary guidance on clean and ultra clean techniques.

1.7 This method follows the EPA Environmental Methods Management Council's "Format for Method Documentation."

1.8 This method is "performance based." The laboratory is permitted to modify the method to overcome interferences or lower the cost of measurements if all performance criteria are met. Section 9.1.2 gives the requirements for establishing method equivalency.

1.9 Any modification of this method, beyond those expressly permitted, shall be considered a major modification subject to application and approval of alternate test procedures at 40 CFR 136.4 and 136.5.

1.10 Each laboratory that uses this method must demonstrate the ability to generate acceptable results (Section 9.2).

1.11 This method is accompanied by a data verification and validation guidance document, *Guidance on the Documentation and Evaluation of Trace Metals Data Collected for CWA Compliance Monitoring*. This guidance document may be useful for reviewing data collected using this method.

2.0 Summary of Method

2.1 Aqueous sample—A 500- to 1000-mL water sample is collected directly into a cleaned fluoropolymer, conventional or linear polyethylene, polycarbonate, or polypropylene sample bottle using sample handling techniques specially designed for collection of metals at trace levels (Reference 16.3). Water samples are preserved in the field by the addition of 3 mL of pretested 6M HCl per liter of sample. The recommended holding time is 28 days.

2.2 Tissue sample—A 10- to 50-g wet weight sample is collected into a glass or fluoropolymer, conventional or linear polyethylene, polycarbonate, or polypropylene sample bottle, also using sample handling techniques specially designed for collection of metals at trace levels. The tissue sample is either freeze-dried and stored at room temperature or stored frozen at less than -18 °C. Prior to analysis, tissue samples are digested in HCl or NaOH at 80 °C for 16 hours. Matrix spike recoveries indicate that As^{+3} is more stable in HCl than NaOH.

2.3 An aliquot of water sample or tissue digestate is placed in a specially designed reaction vessel, and 6M HCl is added.

2.4 Four percent $NaBH_4$ solution is added to convert IA, MMA, and DMA to volatile arsines.

2.5 Arsines are purged from the sample onto a cooled glass trap packed with 15% OV-3 on Chromosorb® W AW-DMCS, or equivalent.

2.6 The trapped arsines are thermally desorbed, in order of increasing boiling points, into an inert gas stream that carries them into the quartz furnace of an atomic absorption spectrophotometer for detection. The first arsine to be desorbed is AsH_3, which represents IA in the sample. MMA and DMA are desorbed and detected several minutes after the first arsine.

2.7 Quality is ensured through calibration and testing of the hydride generation, purging, and detection systems.

2.8 To determine the concentration of As^{+3}, another aliquot of water sample or tissue digestate is placed in the reaction vessel and Tris-buffer is added. The procedure in Sections 2.4 through 2.7 is repeated to quantify only the arsine produced from As^{+3}.

2.9 The concentration of As^{+5} is the concentration of As^{+3} subtracted from the concentration of IA.

3.0 Definitions

3.1 Apparatus—Throughout this method, the sample containers, sampling devices, instrumentation, and all other materials and devices used in sample collection, sample processing, and sample analysis that come in contact with the sample and therefore require careful cleaning will be referred to collectively as the Apparatus.

3.2 Dissolved Inorganic Arsenic—All $NaBH_4$-reducible As^{+3} and As^{+5} found in aqueous solution filtrate after passing the sample through a 0.45 µm capsule filter.

3.3 Total Inorganic Arsenic—All $NaBH_4$-reducible As^{+3} and As^{+5} found in a sample. In this method, total inorganic arsenic and total recoverable inorganic arsenic are synonymous.

3.4 Definitions of other terms used in this method are given in the glossary at the end of the method.

4.0 Contamination and Interferences

4.1 Preventing ambient water samples from becoming contaminated during the sampling and analytical processes constitutes one of the greatest difficulties encountered in trace metal determinations. Over the last two decades, marine chemists have come to recognize that much of the historical data on the concentrations of dissolved trace metals in seawater are erroneously high because the concentrations reflect contamination from sampling and analysis rather than ambient levels. Therefore, it is imperative that extreme care be taken to avoid contamination when collecting and analyzing ambient water samples for As species at trace levels.

4.2 Samples may become contaminated by numerous routes. Potential sources of trace metal contamination during sampling include: metallic or metal-containing labware, containers, sampling equipment, reagents, and reagent water; improperly cleaned and stored equipment, labware, and reagents; and atmospheric inputs such as dirt and dust. Even human contact can be a source of trace metal contamination.

4.3 Contamination Control

4.3.1 Philosophy—The philosophy behind contamination control is to ensure that any object or substance that contacts the sample is arsenic-free and free from any material that may contain As, As species, or material that might interfere with the analysis of samples.

4.3.1.1 The integrity of the results produced must not be compromised by contamination of samples. This method and the Sampling Method give requirements and suggestions for control of sample contamination.

4.3.1.2 Substances in a sample cannot be allowed to contaminate the laboratory work area or instrumentation used for trace metal measurements. This method gives requirements and suggestions for protecting the laboratory.

4.3.1.3 Although contamination control is essential, personnel health and safety remain the highest priority. The Sampling Method and Section 5.0 of this method give requirements and suggestions for personnel safety.

4.3.2 Avoiding contamination—The best way to control contamination is to completely avoid exposure of the sample to contamination in the first place. Avoiding exposure means performing operations in an area known to be free from contamination. Two of the most important factors in avoiding/reducing sample contamination are (1) an awareness of potential sources of contamination and (2) strict attention to the work being done. Therefore, it is imperative that the procedures described in this method be carried out by well-trained, experienced personnel.

4.3.3 Use a clean environment—The ideal environment for processing samples is a class 100 clean room (Section 1.5). If a clean room is not available, all sample preparation should be performed in a class 100 clean bench or a nonmetal glove box fed by arsenic- and particle-free air or nitrogen. Digestions should be performed in a nonmetal fume hood situated, ideally, in the clean room.

4.3.4 Minimize exposure—Any apparatus that will contact samples, blanks, or standard solutions should be opened or exposed only in a clean room, clean bench, or glove box so that exposure to an uncontrolled atmosphere is minimized. When not in use, the apparatus should be covered with clean plastic wrap and stored in the clean bench, in a plastic box, or in a glove box, or bagged in clean zip-type bags. Minimizing the time between cleaning and use will also minimize contamination.

4.3.5 Clean work surfaces—Before a given batch of samples is processed, all work surfaces in the hood, clean bench, or glove box in which the samples will be processed should be cleaned by wiping with a lint-free cloth or wipe soaked with reagent water.

4.3.6 Wear gloves—Sampling personnel must wear clean, non-talc gloves during all operations involving handling of the apparatus, samples, and blanks. Only clean gloves may touch the apparatus. If another object or substance is touched, the glove(s) must be changed before again handling the apparatus. If it is even suspected that gloves have become contaminated, work must be halted, the contaminated gloves removed, and a new pair of clean gloves put on. Wearing multiple layers of clean gloves will allow the old pair to be quickly stripped with minimal disruption to the work activity.

4.3.7 Use metal-free apparatus—All apparatus used for determination of As and/or As species at ambient water quality criteria levels must be nonmetallic and free of material that may contain metals.

4.3.7.1 Construction materials—Only fluoropolymer (FEP, PTFE), conventional or linear polyethylene, polycarbonate, or polypropylene containers should be used for samples that will be analyzed for As. PTFE is less desirable than FEP because the sintered material in PTFE may contain contaminants and is susceptible to serious memory effects (Reference 16.4). All materials, regardless of construction, that will directly or indirectly contact the sample must be cleaned using the procedures given (Section 6.1.2) and must be known to be clean and arsenic-free before proceeding.

Note: Glass containers may be used for tissue sample collection.

4.3.7.2 Serialization—It is recommended that serial numbers be indelibly marked or etched on each piece of apparatus so that contamination can be traced. Logbooks should be

maintained to track the sample from the container through the labware to injection into the instrument. It may be useful to dedicate separate sets of labware to different sample types; e.g., receiving waters and effluents. However, the apparatus used for processing blanks and standards must be mixed with the apparatus used to process samples so that contamination of all labware can be detected.

4.3.7.3 The laboratory or cleaning facility is responsible for cleaning the apparatus used by the sampling team. If there are any indications that the apparatus is not clean when received by the sampling team (e.g., ripped storage bags), an assessment of the likelihood of contamination must be made. Sampling must not proceed if it is possible that the apparatus is contaminated. If the apparatus is contaminated, it must be returned to the laboratory or cleaning facility for proper cleaning before it is used in any sampling activity.

4.3.8 Avoid sources of contamination—Avoid contamination by being aware of potential sources and routes of contamination.

4.3.8.1 Contamination by carryover—Contamination may occur when a sample containing low concentrations of As is processed immediately after a sample containing relatively high concentrations of As. To reduce carryover, the sample introduction system may be rinsed between samples with dilute acid and reagent water. When an unusually concentrated sample is encountered, it should be followed by analysis of a method blank to check for carryover. Samples known or suspected to contain the lowest concentration of As should be analyzed first followed by samples containing higher levels.

4.3.8.2 Contamination by samples—Significant laboratory or instrument contamination may result when untreated effluents, in-process waters, landfill leachates, and other samples containing high concentrations of As are processed and analyzed. This method is not intended for application to these samples, and samples containing high concentrations should not be permitted into the clean room and laboratory dedicated for processing trace metal samples.

4.3.8.3 Contamination by indirect contact—Apparatus that does not directly come in contact with the samples may still be a source of contamination. For example, clean tubing placed in a dirty plastic bag may pick up contamination from the bag and subsequently transfer the contamination to the sample. Therefore, it is imperative that every piece of the apparatus that is directly or indirectly used in the collection, processing, and analysis of water and tissue samples be thoroughly cleaned (see Section 6.1.2).

4.3.8.4 Contamination by airborne particulate matter—Less obvious substances capable of contaminating samples include airborne particles. Samples may be contaminated by airborne dust, dirt, particles, or vapors from unfiltered air supplies; nearby corroded or rusted pipes, wires, or other fixtures; or metal-containing paint. Whenever possible, sample processing and analysis should occur as far as possible from sources of airborne contamination.

4.4 Interferences—Water vapor may condense in the transfer line between the cold trap and the atomizer if it is not well heated. Such condensation can interfere with the determination of DMA.

5.0 Safety

5.1 The toxicity or carcinogenicity of each chemical used in this method has not been precisely determined; however, each compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. It is recommended that the laboratory purchase a dilute standard solution of the As and/or As species to be used in this method. If solutions are prepared from pure solids, they shall be prepared in a hood, and a NIOSH/MESA-approved toxic gas respirator shall be worn when high concentrations are handled.

5.2 This method does not address all safety issues associated with its use. The laboratory is responsible for maintaining a current awareness file of OSHA regulations for the safe handling of the chemicals specified in this method. A reference file of material safety data sheets (MSDSs) should also be made available to all personnel involved in these analyses. It is also suggested that the laboratory perform personal hygiene monitoring of each analyst who uses this method and that the results of this monitoring be made available to the analyst. Additional information on laboratory safety can be found in References 16.5-16.8.

5.3 Samples suspected to contain high concentrations of As and/or As species are handled using essentially the same techniques used in handling radioactive or infectious materials. Well-ventilated, controlled access laboratories are required. Assistance in evaluating the health hazards of particular laboratory conditions may be obtained from certain consulting laboratories and from State Departments of Health or Labor, many of which have an industrial health service. Each laboratory must develop a strict safety program for handling As and/or As species.

5.3.1 Facility—When samples known or suspected of containing high concentrations (> 50 µg/Lor >500µg/g) of total As are handled, all operations (including removal of samples from sample containers, weighing, transferring, and mixing) should be performed in a glove box demonstrated to be leak tight or in a fume hood demonstrated to have adequate air flow. Gross losses to the laboratory ventilation system must not be allowed. Handling of the dilute solutions normally used in analytical and animal work presents no inhalation hazards except in an accident.

5.3.2 Protective equipment—Disposable plastic gloves, apron or laboratory coat, safety glasses or mask, and a glove box or fume hood adequate for radioactive work should be used when handling arsenic powders. During analytical operations that may give rise to aerosols or dusts, personnel should wear respirators equipped with activated carbon filters.

5.3.3 Training—Workers must be trained in the proper method of removing contaminated gloves and clothing without contacting the exterior surfaces.

5.3.4 Personal hygiene—Hands and forearms should be washed thoroughly after each manipulation and before breaks (including coffee, lunch, and shift).

5.3.5 Confinement—Isolated work areas posted with signs, with their own segregated glassware and tools, and with plastic absorbent paper on bench tops will aid in confining contamination.

5.3.6 Effluent vapors—The effluent vapors from the atomic absorption spectrophotometer (AAS) should pass through either a column of activated charcoal or a trap designed to remove As and/or As species.

5.3.7 Waste handling—Good waste handling techniques include minimizing contaminated waste. Plastic bag liners should be used in waste cans. Janitors and other personnel must be trained in the safe handling of waste.

5.3.8 Decontamination

5.3.8.1 Decontamination of personnel—Use any mild soap with plenty of scrubbing action.

5.3.8.2 Glassware, tools, and surfaces—Satisfactory cleaning may be accomplished by washing with any detergent and water.

5.3.9 Laundry—Clothing known to be contaminated should be collected in plastic bags. Persons who convey the bags and launder the clothing should be advised of the hazard and trained in proper handling. If the launderer knows of the potential problem, the clothing may be put into a washing machine without contact. The washing machine should be run through a full cycle before being used for other clothing.

6.0 Apparatus and Materials

NOTE: *The mention of trade names or commercial products in this method is for illustrative purposes only and does not constitute endorsement or recommendation for use by the Environmental Protection Agency. Equivalent performance may be achievable using apparatus, materials, or cleaning procedures other than those suggested here. The laboratory is responsible for demonstrating equivalent performance.*

6.1 Sampling Equipment

6.1.1 Sample collection bottles—Fluoropolymer, conventional or linear polyethylene, polycarbonate, or polypropylene, 500-1000 mL for aqueous samples. Glass or plastic (fluoropolymer, etc.) jars for tissue samples.

6.1.2 Cleaning—Sample collection bottles, glass jars, and glass vials are cleaned with liquid detergent and thoroughly rinsed with reagent water. The bottles are then immersed in 1N trace metal grade HCl for at least 48 hours. The bottles are thoroughly rinsed with reagent water, air dried in a class 100 area, and double-bagged in new polyethylene zip-type bags until needed.

NOTE: *Plastic sample bottles should not be cleaned with HNO_3 as it oxidizes chemicals that may remain in the plastic.*

6.1.3 Tissue digestion vials— Glass scintillation vials (25-mL) with fluoropolymer-lined lids are used for the digestion of tissue samples.

6.2 Equipment for bottle and glassware cleaning.

6.2.1 Vats—Up to 200-L capacity, constructed of high-density polyethylene (HDPE) or other nonmetallic, non-contaminating material suitable for holding dilute HCl.

6.2.2 Laboratory sink—In Class 100 clean area, with high-flow reagent water for rinsing.

6.2.3 Clean bench—Class 100, for drying rinsed bottles.

6.3 Atomic absorption spectrophotometer (AAS)—Any AAS may serve as a detector. A bracket is required to hold the quartz atomizer in the optical path of the instrument. Table 3 gives typical conditions for the spectrophotometer.

6.3.1 Electrodeless discharge lamp—For measuring As at 193.7 nm.

6.3.2 Quartz cuvette burner tube (Reference 16.2)—70 mm long and 9 mm in diameter with two 6 mm O.D. side tubes, each 25 mm long. Figure 1A shows a schematic diagram of the tube and bracket.

6.4 Reaction vessel—Figure 1B shows the schematic diagram for the vessel used for the reaction of the sample with sodium borohydride. The system consists of the following:

6.4.1 125-mL gas wash bottle—Corning # 1760-125, or equivalent, onto which an 8 mm O.D. sidearm inlet tube 2 cm long has been grafted. A smaller reaction vessel (30-mL size) can be used for up to 5 mL aqueous samples and tissue digestates.

6.4.2 Silicone rubber stopper septum—Ace Glass #9096-32, or equivalent.

6.4.3 Four-way fluoropolymer stopcock valve—Capable of switching the helium from the purge to the analysis mode of operation.

6.4.4 Flow meter/needle valve—Capable of controlling and measuring gas flow rate to the reaction vessel at 150 (±30) mL/minute.

6.4.5 Silicone tubing—All glass-to-glass connections are made with silicone rubber sleeves.

6.5 Cryogenic trap—Figure 1C shows the schematic diagram for the trap. It consists of the following:

6.5.1 Nichrome wire (22-gauge).

6.5.2 Variacs for controlling Nichrome wire.

6.5.3 A 6 mm O.D. borosilicate glass U-tube about 30 cm long with a 2 cm radius of bend (or similar dimensions to fit into a tall wide mouth Dewar flask), which has been silanized and packed halfway with 15% OV-3 on Chromosorb® W AW DMCS (45-60 mesh), or equivalent. The ends of the tube are packed with silanized glass wool.

6.5.3.1 Conditioning the trap—The input side of the trap (the side that is not packed) is connected with silicone rubber tubing to He at a flow rate of 40 mL/min, and the trap is placed in an oven at 175°C for two hours. At the end of this time, two 25 µL aliquots of GC column conditioner (Silyl-8®, Supelco, Inc., or equivalent) are injected through the silicone tubing into the glass trap. The trap is returned to the oven, with the He still flowing, for 24 hours.

6.5.3.2 After conditioning, the trap is wrapped with approximately 1.8 m of 22-gauge Nichrome wire, the ends of which are affixed to crimp-on electrical contacts.

6.5.3.3 The trap is connected by silicone rubber tubing to the output of the reaction vessel.

The output side of the trap is connected by 6 mm O.D. borosilicate tubing that has been wrapped by Nichrome wire to the input of the flame atomizer.

6.5.4 Dewar flask—Capable of containing the trap described in Section 6.5.3.

6.6 Recorder/integrator—Any integrator with a range compatible with the AAS is acceptable.

6.7 Pipettors—All-plastic pneumatic fixed volume and variable pipettors in the range of 10 µL to 5.0 mL.

6.8 Analytical balance—Capable of weighing to the nearest 0.01 g.

7.0 Reagents and Standards

7.1 River/reagent Water—Water demonstrated to be free from As species at the MDL as well as potentially interfering substances. The water can be prepared by distillation or collected from the field and filtered through a 0.2 µm filter. It has been observed that deionized water can have an oxidizing potential that diminishes As^{+3} response (References 16.1,16.2, and 16.9).

7.2 Hydrochloric acid—Trace-metal grade, purified, concentrated, reagent-grade HCl.

7.2.1 6M hydrochloric acid—Equal volumes of trace metal grade concentrated HCl (Section 7.2) and river/reagent water (Section 7.1) are combined to give a solution approximately 6M in HCl.

7.2.2 2M hydrochloric acid—Trace metal grade concentrated HCl (Section 7.2) and river/reagent water (Section 7.1) are combined in a 1:6 ratio to give a solution approximately 2M in HCl.

7.3 Tris buffer—394 g of Tris-HCl (tris(hydroxymethyl)aminomethane hydrochloride) and 2.5 g of reagent grade NaOH (sodium hydroxide) are dissolved in river/reagent water (Section 7.1) to make 1.0 L of a solution that is 2.5 M tris-HCl and 2.475 M HCl.

7.4 Sodium hydroxide — Reagent grade NaOH.

7.4.1 2M NaOH—Add 80 g of reagent grade NaOH to a 1-L flask. Add about 700 mL of river/reagent water. After the solid dissolves, dilute to 1 L to give a 2M NaOH solution.

7.4.2 0.02M NaOH—Add 10.0 mL of 2M NaOH (Section 7.4.1) to a 1-L flask. Dilute to 1 L with river/reagent water to give a 0.02M NaOH solution.

7.5 Sodium borohydride solution ($NaBH_4$)—Four grams of > 98% $NaBH_4$ (previously analyzed and shown to be free of measurable As) are dissolved in 100 mL of 0.02 M NaOH solution. This solution is stable for only 8-10 hours, and must be made daily.

7.6 Liquid nitrogen (LN_2)—For cooling the cryogenic trap.

7.7 Helium—Grade 4.5 (standard laboratory grade) helium.

7.8 Hydrogen—Grade 4.5 (standard laboratory grade) hydrogen.

7.9 Air—Grade 4.5 (standard laboratory grade) air.

7.10 Ascorbic acid

7.10.1 10% Ascorbic acid—Add 10 g reagent ascorbic acid to about 70 mL of river/reagent water (Section 7.1) and swirl to dissolve. After the powder dissolves, dilute to 100 mL, producing a solution which is stable for one year when stored at 4°C.

7.10.2 0.1% Ascorbic acid—Dilute 10 mL of 10% ascorbic acid solution to 1 L with river/reagent water. This solution should be made as needed.

7.11 Arsenic standards—It is recommended that laboratories purchase standard solutions of 1000 mg/L and dilute them to make working standard solutions (Section 7.13.6). Sections 7.13.1 through 7.13.4 give directions for making stock solutions if a source is not readily available.

7.11.1 Arsenite (As^{+3}) standard—A 1000 mg/L stock solution is made up by the dissolution of 1.73 g of reagent grade $NaAsO_2$ in 1.0 L of the 0.1% ascorbic acid solution (Section 7.12.2). This solution is stable for at least one year if kept refrigerated in an amber bottle.

7.11.2 Arsenate (As^{+5}) standard—To prepare a 1000 mg/L stock solution, 4.16 g of reagent grade Na_2HAsO_4 -$7H_2O$ are dissolved in 1.0 L of river/reagent water (Section 7.1). This stock solution has been found to be stable for at least 10 years.

7.11.3 Monomethylarsonate (MMA) standard—To prepare a stock solution of 1000 mg/L, 3.90 g of $CH_3AsO(ONa)_2$ -$6H_2O$ is dissolved in 1.0 L of river/reagent water (Section 7.1). This stock solution has been found to be stable for at least 10 years.

7.11.4 Dimethylarsinate (DMA) standard—To prepare a stock solution of 1000 mg/L, 2.86 g of reagent grade $(CH_3)_2AsO_2Na$-$3H_2O$ (cacodylic acid, sodium salt) is dissolved in 1.0 L river/reagent water (Section 7.1). This stock solution has been found to be stable for at least 10 years.

7.11.5 Working standard solution A—Prepare an intermediate solution containing 10 mg/L of As^{3+}, MMA and DMA combining measured aliquots of the above stock solutions (7.13.1, 7.13.3 and 7.13.4) and diluting to a measured volume with river/reagent water. Prepare a working standard solution containing 500 µg/L of As^{3+}, MMA and DMA by diluting the intermediate solution in river/reagent water.

NOTE: *As^{3+} is used for calibrating the analytical system for inorganic arsenic (As^{3+} + As^{5+}).*

7.11.6 Working standard solution B—Prepare an intermediate solution containing 10 mg/L of As^{3+}, As^{5+}, MMA and DMA combining measured aliquots of the above stock solutions (7.13.1 through 7.13.4) and diluting to a measured volume with river/reagent water. Prepare a working standard solution containing 500 µg/L of As^{3+},As^{5+}, MMA and DMA by diluting the intermediate solution in river/reagent water.

7.12 Corn oil—Reference matrix for tissue samples.

8.0 Sample Collection, Preservation, and Storage

8.1 Sample collection—Aqueous samples are collected as described in the Sampling Method (Reference 16.3). Tissue samples are collected as described in Reference 16.10.

8.2 Sample filtration—This step is not required if total IA and/or As species are the target analyte(s). For dissolved IA and/or As species, samples and field blanks are filtered through a 0.45 µm capsule filter at the field site as described in the Sampling Method. If the dissolved As species are required analytes, the water sample must be field filtered without contact to air. This can be accomplished by using a capsule filter and exercising care during the filtration process. The extra care is necessary because anoxic water may contain high concentrations of soluble iron and manganese that rapidly precipitate when exposed to air. Iron and manganese hydroxy/oxides precipitates remove dissolved As from water. After the sample is filtered, however, the concern is not as great. The samples are preserved through acidification, and when the water is acidified these precipitates will dissolve.

8.3 Water sample preservation—Sample preservation must be performed in the field to reduce changes in As speciation that may occur during transport and storage. Water samples are acidified to pH <2 with hydrochloric acid (3 mL 6M HCl/L sample) and stored at 0-4□ C from the time of collection until analysis. Other preservation techniques for water and a variety of matrices have been explored (References 16.1 and 16.11 through 16.13) but only the procedure described here is to be used. If As species are not target analytes, the samples may be preserved upon receipt by the laboratory.

8.3.1 Wearing clean gloves, remove the cap from the sample bottle, add the volume of reagent grade acid that will bring the pH to < 2 and recap the bottle immediately. If the bottle is full, withdraw the necessary volume using a precleaned plastic pipette and then add the acid.

NOTE: *When testing pH, do not dip pH paper or a pH meter into the sample; remove a small aliquot with a clean pipette and test the pH of the aliquot.*

8.3.2 Store the preserved sample for a minimum of 48 hours at 0-4□C to allow the As adsorbed on the container walls to completely dissolve in the acidified sample.

8.3.3 Sample bottles should be stored in polyethylene bags at 0-4□C until analysis.

8.3.3 The holding time for aqueous samples is 28 days from the time of collection until the time of analysis.

8.4 Tissue sample preservation—The tissue sample must be frozen in the sampling container at less than -18 □C or freeze-dried and stored at room temperature. The holding time for tissue samples is 2 years.

9.0 Quality Control/Quality Assurance

9.1 Each laboratory that uses this method is required to operate a formal quality assurance program (Reference 16.3). The minimum requirements of this program consist of an initial demonstration of laboratory capability, analysis of samples spiked with As and/or As species to evaluate and document data quality, and analysis of standards and blanks as tests of continued performance. To determine if the results of analyses meet the performance characteristics of the method, laboratory performance is compared to established performance criteria.

9.1.1 The laboratory shall make an initial demonstration of the ability to generate acceptable accuracy and precision with this method. This ability is established as described in Section 9.2.

9.1.2 In recognition of advances that are occurring in analytical technology, the laboratory is permitted to exercise certain options to eliminate interferences or lower the costs of measurements. These options include alternate digestion, concentration, and cleanup procedures, and changes in instrumentation. Alternate determinative techniques such as the substitution of a colorimetric technique or changes that degrade method performance are not allowed. If an analytical technique other than the techniques specified in this method is used, that technique must have a specificity equal to or better than the specificity of the techniques in the referenced method for the analytes of interest.

9.1.2.1 Each time this method is modified, the laboratory is required to repeat the procedures in Section 9.2. If the change will affect the detection limit of the method, the laboratory is required to demonstrate that the MDL (40 CFR part 136, Appendix B) is less than or equal to the MDL for this method or one-third the regulatory compliance level, whichever is greater. If the change will affect calibration, the laboratory must recalibrate the instrument according to Section 10.0 of this method.

9.1.2.2 The laboratory is required to maintain records of modifications made to this method. These records include the following, at a minimum:

9.1.2.2.1 The names, titles, addresses, and telephone numbers of the analyst(s) who performed the analyses and modification, and of the quality control officer who witnessed and will verify the analyses and modification.

9.1.2.2.2 A listing of metals measured (As and/or As species), by name and CAS Registry number.

9.1.2.2.3 A narrative stating reason(s) for the modification(s).

9.1.2.2.4 Results from all quality control (QC) tests comparing the modified method to this method, including:

(a) Calibration (Section 10.1)
(b) Calibration verification (Section 9.5 and 10.2)
(c) Initial precision and recovery (Section 9.2.2)
(d) Analysis of blanks (Section 9.6)
(e) Matrix spike/matrix spike duplicate analysis (Section 9.3 and 9.4)
(f) Ongoing precision and recovery (Section 9.7)

9.1.2.2.5 Data that will allow an independent reviewer to validate each determination by tracing the instrument output (peak height, area, or other signal) to the final result. These data are to include, where possible:

(a) Sample numbers and other identifiers
(b) Preparation dates
(c) Analysis dates and times
(d) Analysis sequence/run chronology

(e) Sample volume
(f) Volume before each preparation step
(g) Volume after each preparation step
(h) Final volume before analysis
(i) Dilution data
(j) Instrument and operating conditions (make, model, revision, modifications)
(k) Sample introduction system (ultrasonic nebulizer, hydride generator, flow injection system, etc.)
(l) Operating conditions (ashing temperature, temperature program, flow rates, etc.)
(m) Detector (type, operating conditions, etc.)
(n) Printer tapes and other recordings of raw data
(o) Quantitation reports, data system outputs, and other data to link the raw data to the results reported

9.1.3 Analyses of blanks are required to demonstrate freedom from contamination. Section 9.6 describes the required blank types and the procedures and criteria for analysis of blanks.

9.1.4 The laboratory shall spike at least 10% of the samples with As species to monitor method performance. Section 9.3 describes this test. When results of these spikes indicate atypical method performance, an alternate extraction or cleanup technique must be used to bring method performance within acceptable limits. If method performance for spikes cannot be brought within the limits given in this method, the result may not be reported or used for permitting or regulatory compliance purposes.

9.1.5 The laboratory shall, on an ongoing basis, demonstrate through calibration verification (for water and tissue samples) and through analysis of the ongoing precision and recovery aliquot (for tissue samples) that the analytical system is within specified limits. Sections 9.5 and 9.7 describe these required procedures.

9.1.6 The laboratory shall maintain records to define the quality of data that are generated. Section 9.3.4 describes the development of accuracy statements.

9.2 Initial demonstration of laboratory capability.

9.2.1 Method detection limit—To establish the ability to detect each As species, the laboratory must determine the MDL for each analyte per the procedure in 40 CFR 136, Appendix B using the apparatus, reagents, and standards that will be used in the practice of this method. The laboratory must produce an MDL for each analyte that is no more than one-tenth the regulatory compliance level or that is less than or equal to the MDL listed in Table 1, whichever is greater.

9.2.2 Initial precision and recovery (IPR)—To establish the ability to generate acceptable precision and recovery, the laboratory shall perform the following operations.

9.2.2.1 Analyze four aliquots of river/reagent water (Section 7.1) or corn oil (tissue reference matrix; Section 7.14) spiked with the analyte(s) of interest at one to five times the ML (Table 1). All sample preparation steps, and the containers, labware, and reagents that will be used with samples must be used in this test.

9.2.2.2 Using results of the set of four analyses, compute the average percent recovery (X) of

each analyte in each aliquot and the standard deviation (s) of the recovery of the analyte.

9.2.2.3 Compare X and s for each analyte with the corresponding limits for initial precision and recovery in Table 2. If s and X meet the acceptance criteria, system performance is acceptable and analysis of blanks and samples may begin. If, however, s exceeds the precision limit or X falls outside the range for accuracy, system performance is unacceptable. The laboratory should correct the problem and repeat the test (Section 9.2.2.1).

9.2.3 Quality control sample (QCS)—The QCS must be prepared from a source different from that used to produce the calibration standards. River/reagent water and marine water that contain certified concentrations of total As may be purchased. Certified reference materials for As species are not currently available. When beginning use of this method and on a quarterly basis, or as required to meet data quality needs, the calibration standards and acceptable instrument performance must be verified with the preparation and analyses of a QCS (Section 7.10). To verify the calibration standards, the determined mean concentration from three analyses of the QCS must be within ± 10% of the stated QCS value. If the QCS is not within the required limits, an immediate second analysis of the QCS is recommended to confirm unacceptable performance. If the calibration standards and/or acceptable instrument performance cannot be verified, the source of the problem must be identified and corrected before proceeding with further analyses.

9.3 Method Accuracy—To assess the performance of the method on a given sample matrix, the laboratory must perform matrix spike (MS) and matrix spike duplicate (MSD) sample analyses on 10% of the samples from each site being monitored, or at least one MS sample analysis and one MSD sample analysis must be performed for each sample set (samples collected from the same site at the same time, to a maximum of 10 samples), whichever is more frequent.

9.3.1 The concentration of the MS and MSD is determined as follows:

9.3.1.1 If, as in compliance monitoring, the concentration of analyte(s) in the sample is being checked against a regulatory concentration limit, the spike must contain the analyte(s) at that limit or at one to five times the background concentration, whichever is greater.

9.3.1.2 If the concentration(s) is not being checked against a regulatory limit, the concentration(s) must be at one to five times the background concentration or at one to five times the ML(s) in Table 1, whichever is greater.

9.3.2 Assessing spike recovery

9.3.2.1 Determine the background concentration (B) of As species by analyzing one sample aliquot according to the procedures in Section 11.0.

9.3.2.2 Prepare a matrix spiking solution that will produce the appropriate level (Section 9.3.1) of analyte(s) of interest in the sample when the spiking solution is added.

9.3.2.3 Spike two additional aliquots with the matrix spiking solution and analyze these aliquots to determine the concentration after spiking (A).

9.3.2.4 Calculate each percent recovery of the matrix spike and matrix spike duplicate by using Equation 1.

Equation 1

$$P = 100 * \frac{A - B}{T}$$

Where P = Percent recovery of the spike
A = Concentration of the spiked aliquot
B = Background concentration of the sample
T = Known value of the spike

9.3.3 Compare the percent recovery (P) with the corresponding QC acceptance criteria in Table 2. If P falls outside the designated range for recovery, the result has failed the acceptance criteria.

9.3.3.1 If the system performance is unacceptable, analyze the calibration verification standard (CALVER, Section 9.5.2) for water samples, or the ongoing precision and recovery sample (Section 9.7) for tissue samples. If the CALVER or OPR is within acceptance criteria (Table 2), the analytical system is within specified limits and the problem can be attributed to the sample matrix.

9.3.3.2 For samples that exhibit matrix problems, further isolate As species from the sample matrix using chelation, extraction, concentration, or other means, and repeat the accuracy test (Sections 9.3.2).

NOTE: *The use of these techniques to reduce matrix problems may affect the speciation of the As in solution.*

9.3.3.3 If matrix problems cannot be corrected and the recovery for As species remains outside the acceptance criteria, the analytical result in the unspiked sample is suspect and may not be reported or used for permitting or regulatory compliance purposes.

9.3.4 Recovery for samples should be assessed and records maintained.

9.3.4.1 After the analysis of five samples of a given matrix type (river water, lake water, etc.) for which As species pass the tests in Section 9.3.3, compute the average percent recovery (P) (P = percent recovery in 9.3.2.4) and the standard deviation of the percent recovery (SP). Express the accuracy assessment as a percent recovery interval from P-2SP to P+2SP for each matrix. For example, if P = 90% and SP = 10% for five analyses of river water, the accuracy interval is expressed as 70-110%.

9.3.4.2 Update the accuracy assessment in each matrix regularly (e.g., after each 5-10 new measurements).

9.4 Precision of MS/MSD

9.4.1 Calculate the relative percent difference (RPD) between the MS and MSD using the concentrations found in the MS and MSD (Equation 1). Do not use the recoveries calculated in Section 9.3.2.4 for this calculation because the RPD of recoveries is inflated when the background concentration is near the spike concentration.

Equation 2

$$RPD = 100 * \frac{\left(\left|D_1 - D_2\right|\right)}{\frac{1}{2}\left(D_1 + D_2\right)}$$

Where:

RPD = Relative percent difference
D_1 = Concentration of the analyte in the MS sample
D_2 = Concentration of the analyte in the MSD sample

9.4.2 Compare the RPD with the limits in Table 2. If the criteria are not met, the analytical system performance is judged to be unacceptable. Correct the problem and reanalyze all samples in the sample set associated with the MS/MSD that failed the RPD test.

9.5 Calibration verification (also see Section 10.2)

9.5.1 Calibration verification (CALVER) shall be performed immediately after the analytical system is calibrated or before analyzing any samples in a sample batch. In addition, the CALVER standard shall be analyzed after every 10 samples and after the last analytical sample in a sample batch. Refer to Section 10.2.2 and 10.2.3 for procedures on analyzing the CALVER standard.

9.5.2 Recovery of the CALVER standard must be within the control limits specified in Table 2. If recovery of the CALVER standard is outside the control limits in Table 2, the analysis must be stopped, the problem corrected, the instrument recalibrated, and the calibration verified. Samples processed after the last satisfactory calibration verification must be re-analyzed.

9.6 Blanks—Blanks are analyzed to demonstrate freedom from contamination.

9.6.1 Calibration blanks– A calibration blank consists of river/reagent water placed in the reaction vessel and analyzed like a sample (Section 11.4 and 11.5). At least one calibration blank must be analyzed after calibration. A calibration blank is also analyzed after each analysis of the CALVER standard (Section 9.5). If As species or any potentially interfering substance is found in the blank at a concentration equal to or greater than the MDL (Table 1), sample analysis must be halted, the source of the contamination determined, the problem corrected, and the sample batch and a fresh calibration blank reanalyzed.

9.6.2 Method blanks—The method blank is an aliquot of river/reagent water or corn oil (tissue reference matrix; Section 7.14) that is treated exactly as a sample including exposure to all glassware, equipment and reagents that are used with samples. It is used to determine if analytes or interferences are present in the laboratory environment, the reagents, or the apparatus.

9.6.2.1 Prepare a minimum of 1 method blank with each sample batch (samples of the same matrix started through the preparation process on the same 12-hour shift, to a maximum of 20 samples). Three method blanks are preferred.

NOTE: *Method blanks for water samples are identical to the calibration blanks (see Section 9.6.1). Analyze the method blank immediately after analysis of the CALVER (Section 9.5) for water samples, or OPR (Section 9.7) for tissue samples, to demonstrate freedom from contamination.*

9.6.2.2 If As species or any potentially interfering substance is found in the blank at a concentration equal to or greater than the MDL (Table 1), sample analysis must be halted, the source of the contamination determined, the problem corrected, and the sample batch and a fresh method blank reanalyzed.

9.6.2.3 Alternatively, if a sufficient number of method blanks (three minimum) are analyzed to characterize the nature of a blank, the average concentration plus two standard deviations must be less than the regulatory compliance level.

9.6.2.4 If the result for a single method blank remains above the MDL or if the result for the average concentration plus two standard deviations of three or more blanks exceeds the regulatory compliance level, results for samples associated with those blanks may not be reported or used for permitting or regulatory compliance purposes. Stated another way, results for all initial precision and recovery tests (Section 9.2) and all samples must be associated with an uncontaminated method blank before these results may be reported or used for permitting or regulatory compliance purposes.

9.6.3 Field blanks for water samples

9.6.3.1 Analyze the field blank(s) shipped with each set of samples (samples collected from the same site at the same time, to a maximum of 10 samples). If the samples are filtered for the determination of dissolved As and/or As species, the field blank shall be filtered as well. Analyze the blank immediately before analyzing the samples in the batch.

9.6.3.2 If As species or any potentially interfering substance is found in the field blank at a concentration equal to or greater than the ML (Table 1), or greater than one-fifth the level in the associated sample, whichever is greater, results for associated samples may be the result of contamination and may not be reported or used for permitting or regulatory compliance purposes.

9.6.3.3 Alternatively, if a sufficient number of field blanks (three minimum) are analyzed to characterize the nature of the field blank, the average concentration plus two standard deviations must be less than the regulatory compliance level or less than one-half the level in the associated sample, whichever is greater.

9.6.3.4 If contamination of the field blanks and associated samples is known or suspected, the laboratory should communicate this to the sampling team so that the source of contamination can be identified and corrective measures taken before the next sampling event.

9.6.4 Equipment blanks—Before any sampling equipment is used at a given site, the laboratory or cleaning facility is required to generate equipment blanks to demonstrate that the sampling

equipment is free from contamination. Two types of equipment blanks are required: bottle blanks and sampler check blanks.

9.6.4.1 Bottle blanks—After undergoing appropriate cleaning procedures (Section 6.1.2), bottles should be subjected to conditions of use to verify the effectiveness of the cleaning procedures. A representative set of sample bottles should be filled with river/reagent water (Section 7.1) acidified to pH < 2 and allowed to stand for a minimum of 24 hours. Ideally, the time that the bottles are allowed to stand should be as close as possible to the actual time that sample will be in contact with the bottle. After standing, the water should be analyzed for any signs of contamination. If any bottle shows signs of contamination, the problem must be identified, the cleaning procedures corrected or cleaning solutions changed, and all affected bottles cleaned again.

9.6.4.2 Sampler check blanks for water samples—Sampler check blanks are generated in the laboratory or at the equipment cleaning contractor's facility by processing river/reagent water (Section 7.1) through the sampling devices using the same procedures that are used in the field (see Sampling Method). Therefore, the "clean hands/dirty hands" technique used during field sampling should be followed when preparing sampler check blanks at the laboratory or cleaning facility.

9.6.4.2.1 Sampler check blanks are generated by filling a large carboy or other container with river/reagent water (Section 7.1) and processing the river/reagent water (Section 7.1) through the equipment using the same procedures that are used in the field (see Sampling Method). For example, manual grab sampler check blanks are collected by directly submerging a sample bottle into the water, filling the bottle, and capping. Subsurface sampler check blanks are collected by immersing the sampler into the water and pumping water into a sample container. "Clean hands/dirty hands" techniques must be used.

9.6.4.2.2 The sampler check blank must be analyzed using the procedures in this method. If As and/or As species or any potentially interfering substance is detected in the blank, the source of contamination or interference must be identified and the problem corrected. The equipment must be demonstrated to be free from As and/or As species before the equipment may be used in the field.

9.6.4.2.3 Sampler check blanks must be run on all equipment that will be used in the field. If, for example, samples are to be collected using both a grab sampling device and a subsurface sampling device, a sampler check blank must be run on both pieces of equipment.

9.7 Ongoing Precision and Recovery - Because water samples do not require digestion prior to analysis, OPR samples are only required for tissue samples. CALVER analysis in Section 9.5 is equivalent to the analysis of an aqueous OPR.

9.7.1 For each sample batch (i.e., samples of the same matrix started through the extraction process on the same 12-hour shift, to a maximum of 20 samples), prepare an ongoing precision and recovery (OPR) aliquot in the same manner as IPR aliquots (Section 9.2.2).

9.7.2 Analyze the OPR aliquot before analyzing the method blank and samples from the same batch.

9.7.3 Compute the percent recovery of As species in the OPR aliquot.

9.7.4 Compare the recovery in the OPR sample to the limits for ongoing recovery in Table 2. If the acceptance criteria are met, system performance is acceptable and analysis of blanks and samples may proceed. If, however, recovery falls outside of the range given, the analytical processes are not being performed properly. Correct the problem, prepare the sample batch again, and repeat the OPR test.

9.7.5 Add results that pass the specifications to IPR and previous OPR data for As species. Update QC charts to form a graphic representation of continued laboratory performance. Develop a statement of laboratory accuracy by calculating the average percent recovery (P) and the standard deviation of percent recovery (SP). Express the accuracy as a recovery interval from P-2SP to P+2SP. For example, if P = 95% and SP = 5%, the accuracy is 85-105%.

9.8 The specifications in this method can be met if the instrument used is calibrated properly and then maintained in a calibrated state. A given instrument will provide the most reproducible results if dedicated to the settings and conditions required for the analyses of As and/or As species by this method.

9.9 Depending on specific program requirements, field duplicates may be collected to determine the precision of the sampling technique. The relative percent difference (RPD, Equation 2) between field duplicates should be less than 20%.

10.0 Calibration and Standardization

10.1 Calibration—Calibration is required before any samples or method blanks are analyzed.

10.1.1 Standards are analyzed by addition of measured aliquots of the working standard solution A (Section 7.13.5) directly into the reaction vessel that has been pre-filled with river/reagent water (70 mL for the 125-mL reaction vessel; 5 mL for the 30-mL reaction vessel). Proceed with analysis of the standards following procedures in Section 11.4.

10.1.2 The calibration must contain 3 or more non-zero points. For a given As species, the lowest calibration point must be less than or equal to the ML shown in Table 1.

10.1.3 Calculate the calibration factor (CF) for IA, MMA and DMA in each calibration standard using the following equation.

Equation 3

$$CF = \frac{R_x}{m_x}$$

Where,

CF = Calibration factor [peak area or height units / µg]

R_x = Peak height or area for As species in standard [peak area or height units]

m_x = Mass of As species in standard analyzed (µg)

10.1.4 For each analyte of interest, calculate the mean calibration factor (CF_m), the standard deviation of the CF_m (SD), and the relative standard deviation (RSD) of the mean, where RSD = 100 x SD/CF_m.

10.1.5 Appropriateness of CF—If the RSD as calculated in Section 10.1.4 is less than 20%, the CF_m may be used to calculate sample concentrations. Otherwise, use weighted linear regression to calculate a slope and intercept for the calibration line.

10.1.6 When analyzing for As^{3+}, the calibration line for IA can be used.

10.1.7 Following calibration, analyze a calibration blank. The concentrations of As and As species in the calibration blank be less than the MDL.

10.2 Calibration verification—A calibration verification is performed immediately after calibration and after analysis of a maximum of every 10 samples thereafter (Section 10.2.2). Blanks and samples may not be analyzed until these criteria are met.

10.2.1 Verify the specificity of the instrument for As and adjust the wavelength or tuning until the resolving power (Table 3) specified in this method is met.

10.2.2 Calibration verification for IA, MMA and DMA

10.2.2.1 Calibration verification (CALVER)—Prepare the CALVER standard by adding a measured volume of working standard solution B to the reaction vessel (pre-filled with river/reagent water) corresponding to the mid-level standard used to establish the calibration line. The CALVER standard is then purged and analyzed for IA, MMA and DMA following procedures in Section 11.4. Compute the percent recovery of As species using the initial calibration.

10.2.2.2 Compare the recovery with the corresponding limit for calibration verification in Table 2. If acceptance criteria are met, system performance is acceptable and analysis of blanks and samples may continue using the response from the initial calibration. If acceptance criteria are not met, system performance is unacceptable. Locate and correct the problem and/or prepare a new calibration verification standard and repeat the test (Sections 10.2.1 through 10.2.3), or recalibrate the system (Sections 10.1 and 10.2). All samples after the last

acceptable calibration verification must be reanalyzed.

10.2.3 Calibration verification for As^{3+}

10.2.3.1 Before the As^{3+} analysis of samples, the CALVER standard is analyzed at the beginning of an analytical batch, following every 10 samples, and at the end of an analytical batch. The CALVER standard is prepared by adding a measured volume of working standard solution B to the reaction vessel pre-filled with river/reagent water (70 or 5 mLs). The CALVER standard should correspond to the mid-level standard used to establish the calibration line. The CALVER standard is then purged and analyzed for As^{3+} in Section 11.5. Compute the percent recovery of As^{3+} using the initial calibration.

10.2.3.2 Compare the recovery with the corresponding limit for calibration verification in Table 2. If acceptance criteria are met, system performance is acceptable and analysis of blanks and samples may continue using the response from the initial calibration. If acceptance criteria are not met, system performance is unacceptable. Locate and correct the problem and/or prepare a new calibration check standard and repeat the test (Sections 10.2.1 through 10.2.3), or recalibrate the system (Sections 10.1 and 10.2). If the recovery does not meet the acceptance criteria specified in Table 2, analyses must be halted and the problem corrected. All samples after the last acceptable calibration verification for As^{3+} must be reanalyzed for As^{3+}.

10.3 Analyze a calibration blank following every calibration verification to demonstrate that there is no carryover of the analytes of interest and that the analytical system is free from contamination. The concentrations of As and As species in the calibration blank must be less than the MDL. If the concentration of an analyte in the blank result is equal to or exceeds the MDL, correct the problem, verify the calibration (Section 10.1), and repeat the analysis of the calibration blank.

11.0 Sample Preparation and Analysis

11.1 Set up the AAS system according to manufacturer's instructions. The settings in Tables 3 and 4 can be used as a guide. Calibrate the instrument according to Section 10.1.

NOTE: Precision and sensitivity are affected by gas flow rates and these must be individually optimized for each system using the settings in Table 5 as an initial guide.

11.2 To light the flame, turn on the air and H_2, and expose the end of the quartz cuvette to a flame. At this point, a flame will be burning out the ends of the tube. Allow the tube to heat for approximately five minutes, then place a flat metal spatula over each end of the tube in sequence. An invisible air/hydrogen flame should now be burning in the center of the cuvette. To check for the flame, place a mirror near the end of the tube and observe condensation of water vapor or turn-off the room light to observe the flame.

11.3 Tissue samples large enough to sub-sample must be homogenized to a fine paste with a stainless steel mill, or finely chopped with stainless steel tools on an acid-cleaned, plastic cutting board. Clean sample handling techniques must be followed. Digest tissue samples by adding 10 mL of 2M HCl to 0.5 g of either wet or dry tissue in a 25-mL glass scintillation vial. Cap the vial with a fluoropolymer-lined lid and heat overnight (16 hours) in an oven at 75 - 85 °C. Cool and

analyze the overlying liquid. Tissue may also be digested in 2M NaOH overnight at 75 - 85 °C; however, As^{+3} and As^{+5} are more stable in HCl than NaOH. If only IA, MMA, and DMA are required, the advantage of the NaOH digestion is that, if it is available, ICP-MS can be used to quantify total As (Reference 16.14) in the digestate.

11.4 Inorganic As, MMA, and DMA determination.

11.4.1 Purging of Samples

11.4.1.1 To achieve a detection limit < 0.01 µg/L, place a known volume of aqueous sample (up to 70 mL) into the large (125-mL) reaction vessel. If less than 70 mL of sample is used, add sufficient river/reagent water (Section 7.1) to result in a total volume of 70 mL. Add 5.0 mL of 6M HCl. Set the four-way valve on the reaction vessel to pass the flow of He through the sample and onto the trap and begin purging the vessel with He.

11.4.1.2 To analyze tissue digestates or to analyze water samples with a detection limit > 0.01 µg/L, place a known volume of aqueous sample (up to 5 mL) or tissue digestate (up to 2 mL) into the small (30 mL) reaction vessel. Add 1.0 mL of 6M HCl. Set the four-way valve on the reaction vessel to pass the flow of He through the sample and onto the trap and begin purging the vessel with He.

11.4.1.3 Lower the trap into a Dewar flask containing LN_2 and top the flask off with LN_2 to a constant level.

11.4.1.4 For a large reaction vessel, add 10 mL of $NaBH_4$ solution slowly (over a period of approximately two minutes) through the rubber septum with a disposable hypodermic syringe and begin timing the reaction. For the small reaction vessel, add 2.0 mL of $NaBH_4$ slowly over a 1-minute period. After seven minutes, turn the stopcock on the four-way valve to bypass the reaction vessel and pass helium directly to the trap. Arsines are purged from the sample onto the cooled glass trap packed with 15% OV-3 on Chromosorb® W AW DMCS, or equivalent.

11.4.2 Trap desorption and AAS analysis

11.4.2.1 Quickly remove the trap from the LN_2, activate the heating coils to heat the trap, and begin recording output from the AAS system. The transfer line is maintained at 75 - 85 °C. The trapped arsines are thermally desorbed, in order of increasing boiling points, into an inert gas stream that carries them into the quartz furnace of an atomic absorption spectrophotometer for detection. The first arsine to be desorbed is AsH_3, which represents total inorganic As in the sample. The MMA and DMA are desorbed and detected several minutes after the arsine.

11.4.2.2 To ensure that all organic reduction products have been desorbed from the trap, maintain the trap temperature at 65 - 85 °C and keep He flowing through the trap for at least three minutes between samples.

11.4.3 The trap should be cooled for one minute before re-using for another analysis to reduce the possibility of cracking.

11.5 Arsenite (As^{+3}) Determination

11.5.1 pH Adjustment

11.5.1.1 To analyze water samples with a detection limit < 0.01 µg/L, place a known volume (up to 70 mL) in the large (125-mL) reaction vessel. If less than 70 mL of sample is used, add sufficient river/reagent water (Section 7.1) to result in a total volume of 70 mL. Add 3.0 mL of Tris buffer to bring the sample's pH to 5 to 7. If the sample is strongly acidic or basic, it must be either neutralized or have more buffer added to obtain a pH of 5 to 7.

11.5.1.2 To analyze tissue digestates or to analyze water samples with a detection limit > 0.01 µg/L, place a known volume of aqueous sample (up to 5 mL) or tissue digestate (up to 2 mL) in the small reaction vessel. Add 1.0 mL of Tris buffer. If the sample is strongly acidic or basic, it must be either neutralized or have more buffer added to obtain a pH of 5 to 7.

11.5.2 Purging of samples—For a large reaction vessel, add 3.0 mL of $NaBH_4$ solution quickly (about 10 seconds) through the rubber septum with a disposable hypodermic syringe and begin timing the reaction. For a small reaction vessel, add 1.0 mL of $NaBH_4$ in a short injection (about 10 seconds). The injections are quicker for As^{+3} determinations than for Inorganic As, MMA, DMA determinations (Section 11.4.1.4) because rapid evolution of H_2 does not occur at a neutral pH. After seven minutes, turn the stopcock on the four-way valve to bypass the reaction vessel and pass helium directly to the trap. Arsines are purged from the sample onto the cooled glass trap packed with 15% OV-3 on Chromosorb® W AW DMCS, or equivalent.

11.5.3 Trap desorption and AAS analysis—Desorption of arsines from the trap follows the same procedure as in Sections 11.4.2 through 11.4.3 to complete the determination of As^{+3} concentration. During this procedure, small, irreproducible quantities of organic arsines may be released at this pH and should be ignored. This separation of arsenite is reproducible and essentially 100% complete.

11.6 Arsenate (As^{+5}) determination—The concentration of As^{+5} is calculated by subtracting the As^{+3} determined in Section 11.5 from the total inorganic As determined on an aliquot of the same sample in Section 11.4.

12.0 Data analysis and calculations

12.1 For water samples, compute the concentration of As species in ng/L using the calibration data (Section 10.1):

Equation 4

$$C\left[\frac{\mu g}{L}\right]=\frac{R_x}{CF_m V_s}$$

Where:

Rx	= Peak height or area for As species in the sample [peak height or area units]
CF_m	= Mean calibration factor for As species [peak height or area units /µg]
V_s	= Volume of sample purged and analyzed [L]

For tissue samples, compute the concentration of As species in µg/g as follows:

Equation 5

$$C\left[\frac{\mu g}{g}\right]=\left(\frac{R_x}{CF_m}\right)\left(\frac{V_{digest}}{V_d}\right)\left(\frac{1}{m_s}\right)$$

Where:

R_x	= Peak height or area As species in the digestate [peak height or area units]
CF_m	= Mean calibration factor for As species [peak height or area units /µg]
V_{digest}	= Total volume of tissue digestate [mL]
V_d	= Volume of digestate added to reaction vessel [mL]
m_s	= mass of sample digested [g]

12.2 If the concentration exceeds the calibration range, dilute the sample by successive factors of 10 until the concentration is within the calibration range.

12.3 Reporting

12.3.1 Report results for each As species at or above the ML, in µg/L or µg/g, to three significant figures. Report results for each As species in samples below the ML as less than the value of the ML, or as required by the regulatory authority or in the permit. Report results for each As species in field blanks at or above the ML, in µg/L or µg/g, to three significant figures. Report results for each As species in field blanks below the ML but at or above the MDL to two significant figures. Report results for each As species not detected in field blanks as less than the value of the MDL, or as required by the regulatory authority or in the permit.

12.3.2 Report results for each As species in samples, method blanks, and field blanks separately, unless otherwise requested or required by a regulatory authority or in a permit. If blank correction is requested or required, subtract the concentration of each As species in the method blank, average of multiple method blanks, or field blank from the concentration of

the respective As species in the sample to obtain the net sample As species concentration. Among the preceding blanks, only one may be subtracted.

12.3.3 Results from tests performed with an analytical system that is not in control must not be reported or otherwise used for permitting or regulatory compliance purposes, but does not relieve a discharger or permittee of reporting timely results.

13.0 Method Performance

Tables 1 contains MDLs and MLs for As species in water and tissue matrices. The QC acceptance criteria in Table 2 are based on quality control data generated during As speciation analysis by Method 1632 for the Cook Inlet Study (1998). Details on how the criteria were developed can be found in Reference 16.16.

14.0 Pollution Prevention

14.1 Pollution prevention encompasses any technique that reduces or eliminates the quantity or toxicity of waste at the point of generation. Many opportunities for pollution prevention exist in laboratory operation. EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice. Whenever feasible, laboratory personnel should use pollution prevention techniques to address their waste generation. When wastes cannot be feasibly reduced at the source, the Agency recommends recycling as the next best option. The acids used in this method should be reused as practicable by purifying with electrochemical techniques. The only other chemicals used in this method are the neat materials used in preparing standards. These standards are used in extremely small amounts and pose little threat to the environment when managed properly. Standards should be prepared in volumes consistent with laboratory use to minimize the disposal of excess volumes of expired standards.

14.2 For information about pollution prevention that may be applied to laboratories and research institutions, consult Less is Better: Laboratory Chemical Management for Waste Reduction, available from the American Chemical Society's Government Affairs Publications , 1155 16th Street NW, Washington DC 20036, 202/872–4600, or govtrelations@acs.org.

15.0 Waste Management

15.1 The laboratory is responsible for complying with all federal, state, and local regulations governing waste management, particularly hazardous waste identification rules and land disposal restrictions, and for protecting the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Compliance with all sewage discharge permits and regulations is also required.

15.2 Acids and samples at pH < 2 must be either neutralized before being disposed or handled as hazardous waste.

15.3 For further information on waste management, consult *The Waste Management Manual for Laboratory Personnel* and *Less is Better: Laboratory Chemical Management for Waste Reduction*, both available from the American Chemical Society's Government Affairs Publications, 1155 16th Street NW, Washington, DC 20036.

16.0 References

16.1 Crecelius, E.A., Bloom, N.S., Cowan, C.E., and Jenne, E.A., Speciation of Selenium and Arsenic in Natural Waters and Sediments, Volume 2: Arsenic Speciation. Final Report, Prepared for Electric Power Research Institute, Palo Alto, CA by Battelle, Pacific Northwest Laboratories, Richland, WA, 1986.

16.2 Andreae, M.O. "Determination of Arsenic Species in Natural Waters," Anal. Chem. 1977, 49, 820.

16.3 Method 1669, "Method for Sampling Ambient Water of Metals at EPA Ambient Criteria Levels," U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Engineering and Analysis Division (4303), 401 M St SW, Washington, DC 20460 (January 1996).

16.4 Patterson, C.C. and Settle, D.M. "Accuracy in Trace Analysis"; In National Bureau of Standards Special Publication 422; LaFleur, P.D., Ed., U.S. Government Printing Office, Washington, DC, 1976.

16.5 "Working with Carcinogens," Department of Health, Education, and Welfare, Public Health Service, Centers for Disease Control, NIOSH, Publication 77-206, August 1977, NTIS PB-277256.

16.6 "OSHA Safety and Health Standards, General Industry," OSHA 2206, 29 CFR 1910.

16.7 "Safety in Academic Chemistry Laboratories," ACS Committee on Chemical Safety, 1979.

16.8 "Standard Methods for the Examination of Water and Wastewater," 18th ed. and later revisions, American Public Health Association, 1015 15th Street NW, Washington DC 20005, 1-35: Section 1090 (Safety), 1992.

16.9 Andrae, M.O., 1983. "Biotransformation of arsenic in the marine environment." In W.H. Lederer and R.J. Fensterheim (Eds.), Arsenic: Industrial, Biomedical, Environmental Perspectives. Van Nostrand-Reinhold, New York, pp. 378-392.

16.10 Lauenstein, G.G. and A.Y. Cantillo (Eds.). July, 1983. Silver Spring, MD. NOAA Technical Memorandum NOS ORCA 71. Sampling and Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992, Volume 1: Overview and Summary of Methods.

16.11 Aggett, J. and Kriegman, M.R. "Preservation of Arsenic(III) and Arsenic(V) in Samples of Sediment Interstitial Water," Analyst 1987, 112, 153.

16.12 Wing, R., D. K. Nordstrom, and G.A. Parks. "Treatment of Groundwater Samples to Prevent Loss or Oxidation of Inorganic Arsenic Species."; In Analytical Characterization of Arsenic in Natural Waters. R. Wing's Master's Thesis, 1987, Stanford University.

16.13 Crecelius, E. and J. Yager. "Intercomparison of Analytical Methods for Arsenic Speciation in Human Urine." Environmental Health Perspectives 1997, 105, 650.

16.14 Method 1640, "Determination of Trace Elements in Water by Preconcentration and Inductively Coupled Plasma-Mass Spectrometry," U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, Engineering and Analysis Division (4303), 401 M St SW, Washington, DC 20460 (April, 1997). Draft.

16.15 "Results of the EPA Method 1632 Validation Study," July 1996. Available from the EPA Sample Control Center, 6101 Stevenson Avenue, Alexandria, VA 22304, 703-461-2100.

16.16 "Development of Quality Control Criteria for Method 1632, Revision A," July 2000. Available from the EPA Sample Control Center, 6101 Stevenson Avenue, Alexandria, VA 22304, 703-461-2100.

17.0 Glossary

The definitions and purposes below are specific to this method, but have been conformed to common usage as much as possible.

17.1 Ambient water—Water in the natural environment (e.g., river, lake, stream, and other receiving water), as opposed to an effluent discharge.

17.2 Equipment blank—An aliquot of river/reagent water (Section 7.1) that is subjected in the laboratory to all aspects of sample collection and analysis, including contact with all sampling devices and apparatus. The purpose of the equipment blank is to determine if the sampling devices and apparatus for sample collection have been adequately cleaned before shipment to the field site. An acceptable equipment blank must be achieved before the sampling devices and apparatus are used for sample collection. In addition, equipment blanks should be run on random, representative sets of gloves, storage bags, and plastic wrap for each lot to determine if these materials are free from contamination before use.

17.3 Field blank—An aliquot of river/reagent water (Section 7.1) that is placed in a sample container in the laboratory, shipped to the field, and treated as a sample in all respects, including contact with the sampling devices and exposure to sampling site conditions, storage, preservation, and all analytical procedures, which may include filtration. The purpose of the field blank is to determine if the field or sample transporting procedures and environments have contaminated the sample.

17.4 Field duplicates (FD1 and FD2)—Two separate samples collected in separate sample bottles at the same time and place under identical circumstances and treated exactly the same throughout field and laboratory procedures. Analyses of FD1 and FD2 give a measure of the precision associated with sample collection, preservation, and storage, as well as with laboratory procedures.

17.5 Initial precision and recovery (IPR)—Four aliquots of the ongoing precision and recovery standard analyzed to establish the ability to generate acceptable precision and accuracy. IPR tests are performed before a method is used for the first time and any time the method or instrumentation is modified.

17.6 Matrix spike (MS) and matrix spike duplicate (MSD)—Aliquots of an environmental sample to which known quantities of the analytes are added in the laboratory. The MS and MSD are analyzed exactly like samples. Their purpose is to quantify the bias and precision caused by the sample matrix. The background concentrations of the analytes in the sample matrix must be determined in a separate aliquot and the measured values in the MS and MSD corrected for background concentrations.

17.7 May—This action, activity, or procedural step is optional.

17.8 May not—This action, activity, or procedural step is prohibited.

17.9 Method blank—An aliquot of river/reagent water (Section 7.1) or corn oil (Section 7.14) that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with samples. The method blank is used to determine if analytes or interferences are present in the laboratory environment, the reagents, or the apparatus.

17.10 Minimum level (ML)—The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed. The ML is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10n, where n is an integer.

17.11 Must—This action, activity, or procedural step is required.

17.12 Ongoing precision and recovery (OPR)—A method blank spiked with known quantities of analytes. The OPR is analyzed exactly like a sample. Its purpose is to assure that the results produced by the laboratory remain within the limits specified in the referenced methods for precision and accuracy.

17.13 Quality control sample (QCS)—A sample containing all or a subset of the analytes at known concentrations. The QCS is obtained from a source external to the laboratory or is prepared from a source of standards different from the source of calibration standards. It is used to check laboratory performance with test materials prepared external to the normal preparation process.

17.14 Reagent water—Water demonstrated to be free of As, As species, and potentially interfering substances at the MDLs for As and/or As species.

17.15 River Water—Freshwater containing arsenic species at concentrations below the MDLs.

17.16 Should—This action, activity, or procedural step is suggested but not required.

17.17 Stock solution—A solution containing an analyte that is prepared using a reference material traceable to EPA, the National Institute of Science and Technology (NIST), or a source that will attest to the purity and authenticity of the reference material.

18.0 Tables and Figures

TABLE 1. ARSENIC SPECIATION ANALYSIS USING METHOD 1632: METHOD DETECTION LIMIT (MDL) AND MINIMUM LEVEL (ML)[1]

	Water[2]		Tissue[3]	
Analyte	**MDL**	**ML**	**MDL**	**ML**
Inorganic Arsenic (As^{+3} +As^{+5})	0.003 □g/L	0.01 □g/L	0.03 □g/g	0.10 □g/g
Arsenite (As^{+3})	0.003 □g/L	0.01 □g/L	0.02 □g/g	0.10 □g/g
Monomethylarsonic acid (MMA)	0.004 □g/L	0.01 □g/L	0.01 □g/g	0.05 □g/g
Dimethylarsinic acid (DMA)	0.02 □g/L	0.05 □g/L	0.04 □g/g	0.10 □g/g

[1] MDL determined by the procedure in 40 CFR Part 136, Appendix B.
[2] MDL for inorganic As in water was obtained from a validation study involving two laboratories (Ref. 16.15). MDL for As^{+3}, MMA and DMA in water was obtained from data provided by Frontier Geosciences (Ref. 16.16).
[3] MDL for tissue was determined from spiked corn oil samples by Battelle Marine Sciences Laboratory (Ref. 16.16).

TABLE 2. QUALITY CONTROL ACCEPTANCE CRITERIA FOR EPA METHOD 1632[1]

	IPR (Section 9.2)				MS/MSD (Section 9.3)	
Analyte[2]	**s**	**X**	**OPR (Section 9.7)**	**Calibration Verification (Section 9.5)**	**%R**	**RPD**
IA	< 25%	60-140%	50-150%	80-120%	50-150%	< 35%
As^{+3}	< 25%	40-160%	30-170%	70-130%	30-170%	< 35%
MMA	< 20%	70-130%	60-140%	80-120%	60-140%	< 25%
DMA	< 30%	50-150%	40-160%	70-130%	40-160%	< 40%

[1] Acceptance criteria based on quality control data generated during As speciation analysis for the Cook Inlet Study (1998). Details can be found in Reference 16.16.
2 IA - Inorganic arsenic (As^{+3} + As^{+5}); MMA - monomethylarsonic acid; DMA - dimethylarsinic acid.

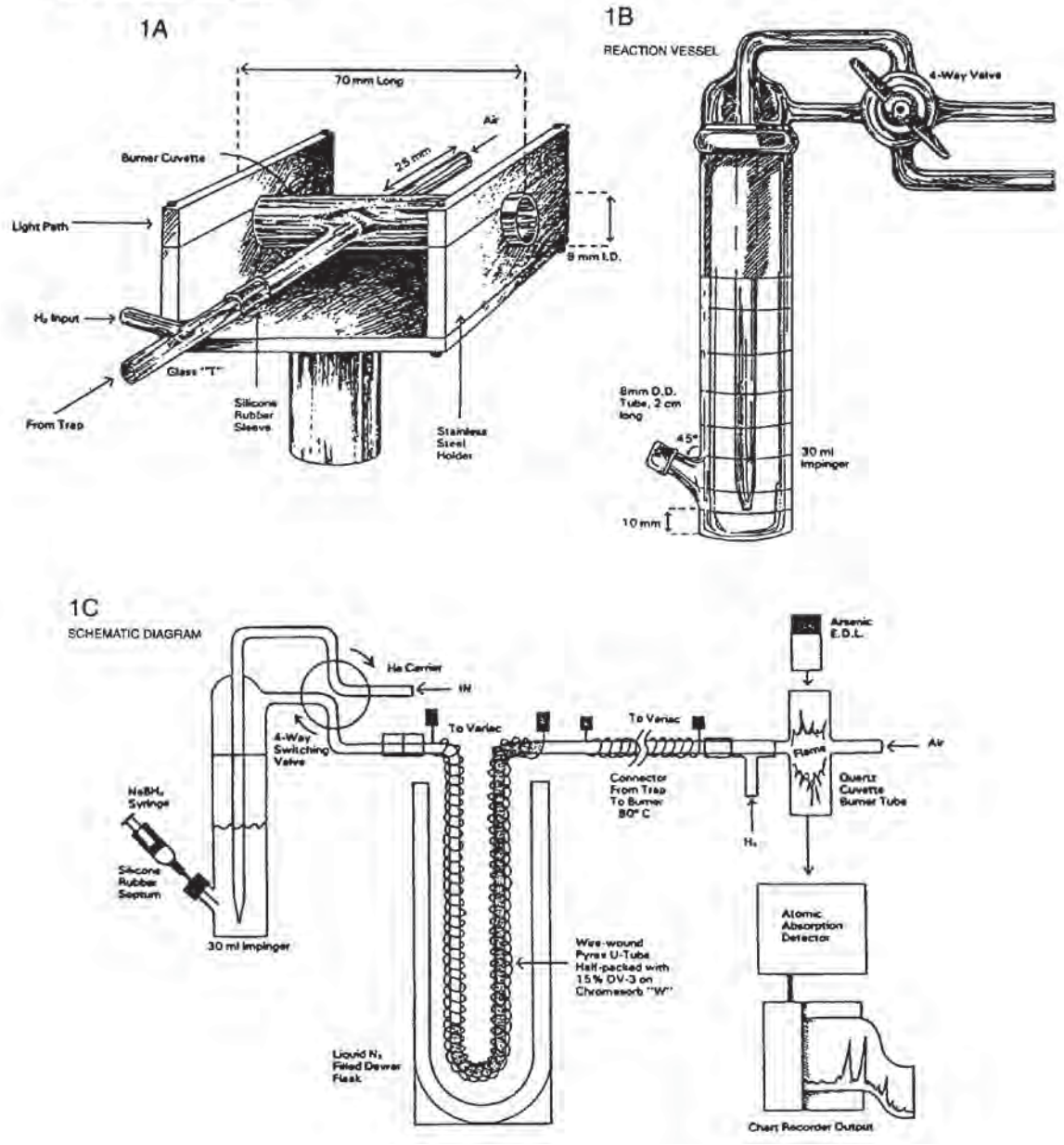
TABLE 3: TYPICAL SPECTROPHOTOMETER SETTINGS

Parameter	Typical Setting
EDL energy	59
EDL power	8 W
Wavelength	193.7 nm
Slit width	0.7 nm

TABLE 4: TYPICAL FLOW RATES AND PRESSURES FOR GASES IN THE HYDRIDE GENERATION SYSTEM

Gas	Flow Rate (mL/min)	Pressure (lb/in ^{2})
He	150	10
H_2	350	20
Air	180	20

Figure 1. Arsenic Speciation Apparatus: (a) Quartz Cuvette Burner Tube, (b) Reaction Vessel, and (c) Schematic Diagram



TECHNICAL MEMORANDUM

ARSENIC BIOAVAILABILITY STUDY

SPRING VALLEY OPERABLE UNIT 4
WASHINGTON, DC

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared by:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

JANUARY 31, 2002

1.0 INTRODUCTION

1.0.1 The purpose of this Technical Memorandum is to discuss the results of the arsenic bioavailability study for the Spring Valley investigation. This sampling was performed in support of the OU-4 Remedial Investigation/Feasibility Study (RI/FS). The objective of this limited study was to provide a better understanding of the site-specific bioavailability (that fraction of arsenic absorbed into the bloodstream of the human body) of arsenic and to provide the basis for modification of inputs to the risk assessment calculations.

2.0 BACKGROUND

2.0.1 In August and September 1999, the United States Environmental Protection Agency (USEPA) collected background soil samples in support of Spring Valley Operable Unit 3 (OU-3) investigations (Background Trip Report, USEPA, January 2000). These samples covered four distinct soil types present in Spring Valley.

2.0.2 As an extension of the OU-3 investigations, a remedial investigation addressing a geographically larger area of Spring Valley was undertaken as Operable Unit 4 (OU-4). As part of the OU-4 investigation, grid soil sampling for arsenic (As) was performed by Parsons Engineering Science (Parsons ES) on a portion of the American University (AU) campus designated AU Lot 12. AU Lot 12 contains the Child Development Center (CDC). The sampling was performed to determine the extent and concentrations of arsenic in surface soils on AU Lot 12 and the CDC. All sampling at the CDC was performed in accordance with the Work Management Plan (WMP) for OU-4, (*Parsons ES, August 14, 2000*, and Amendment 3 to the WMP *(October 1, 2002).*

2.0.3 Based on the results of the arsenic grid sampling, the three highest arsenic concentrations inside the CDC and the three highest outside the CDC (but within AU Lot 12) were sampled for bioavailability. Additionally, six background samples representing the four soil types were collected from the same locations the USEPA sampled; these were also analyzed for bioavailability. These samples were collected to match the soil types of the CDC/AU Lot 12 soil and to ensure that each of the four soil types were represented for the purposes of comparing site data and background data. However, only three of the four soil types were present at the CDC/AU Lot 12 area.

3.0 SAMPLE COLLECTION

3.0.1 On March 15, 2001, the bioavailability samples were collected from the CDC and AU Lot 12. On March 19, 2001, the background locations were sampled for bioavailability analysis. Figure 1-1 indicates the overall grid sampling and the bioavailability sampling locations for the CDC/AU Lot 12. Figure 1-2 shows the background sampling locations. Twelve (12) total samples, not including Quality Control (QC) samples, were collected**.** In addition to these 12 samples, a field duplicate and a matrix spike/matrix spike duplicate (MS/MSD) were collected (see Table 1.1).

3.0.2 All samples were collected as discrete surface soil samples, from 0-6 inches in depth. The soil types are indicated on Table 1.1.

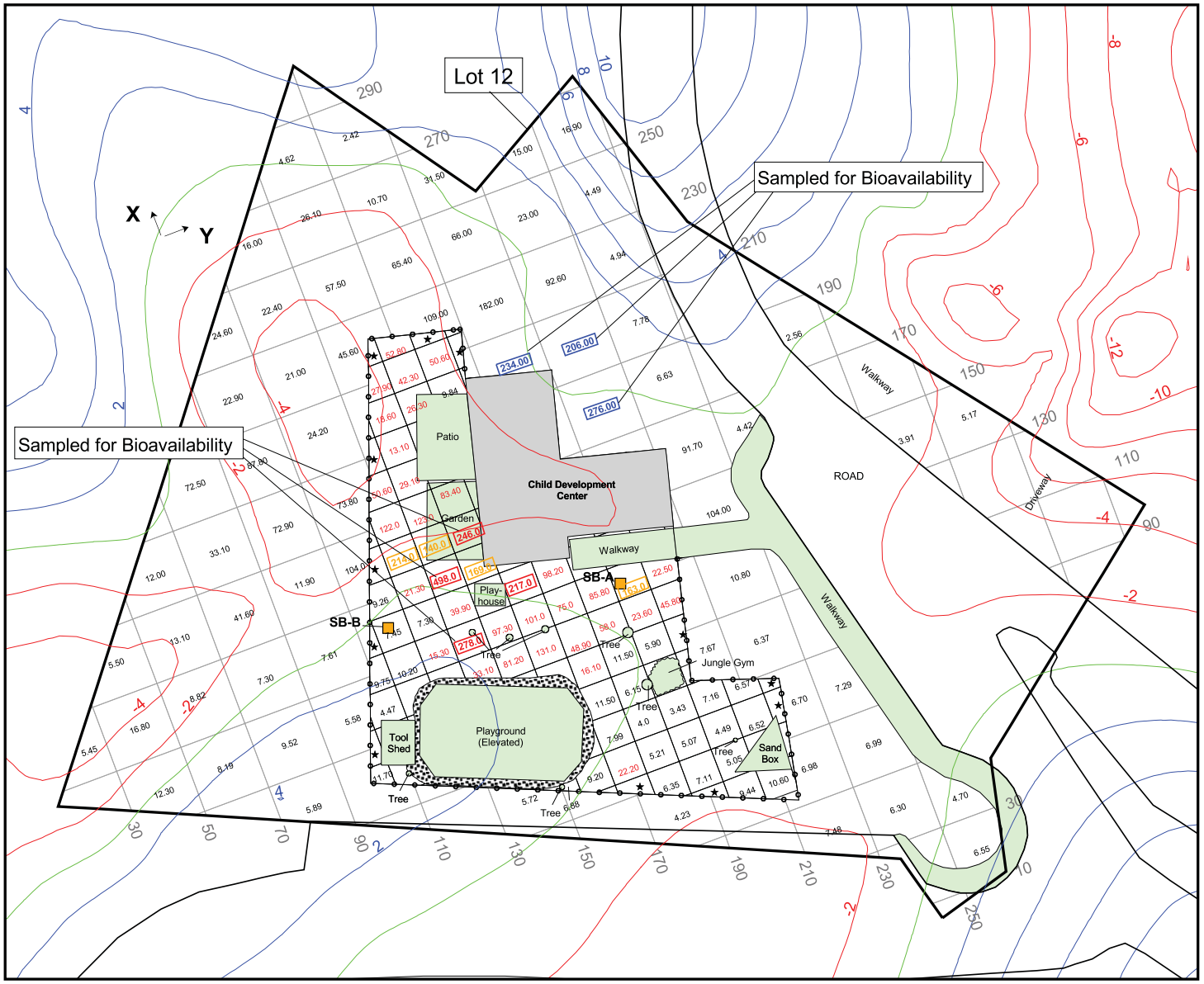


Figure 1-1
Bioavailability Sample Locations
Child Development Center / AU Lot 12

Spring Valley Operable Unit 4
Washington D.C.

Legend

- Boring Locations
- Cut and Fill, 1917-2000 (2 foot contours)
  - Level
  - Fill
  - Cut
- Fence
- AU Lot 12
- 10' Grid
- 20' Grid
- Physical Obstruction (Grid could not be sampled)
- Gravel
- ★ Sample Collected Outside Fence in 20' AU Lot 12 Grid

Note:
Sample results are Arsenic in Parts per Million.
Results in red are over 13 ppm inside the CDC.

- 498.0 The highest 5% arsenic levels inside the CDC
- 276.0 The 3 highest arsenic values outside the CDC
- 163.0 The next 5% highest arsenic values

30 0 30 Feet

1 inch = 30 feet

Scale:	1 : 360
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.apr
Date:	01/29/2002
Figure Number:	1-1
Page Number:	2

PARSONS

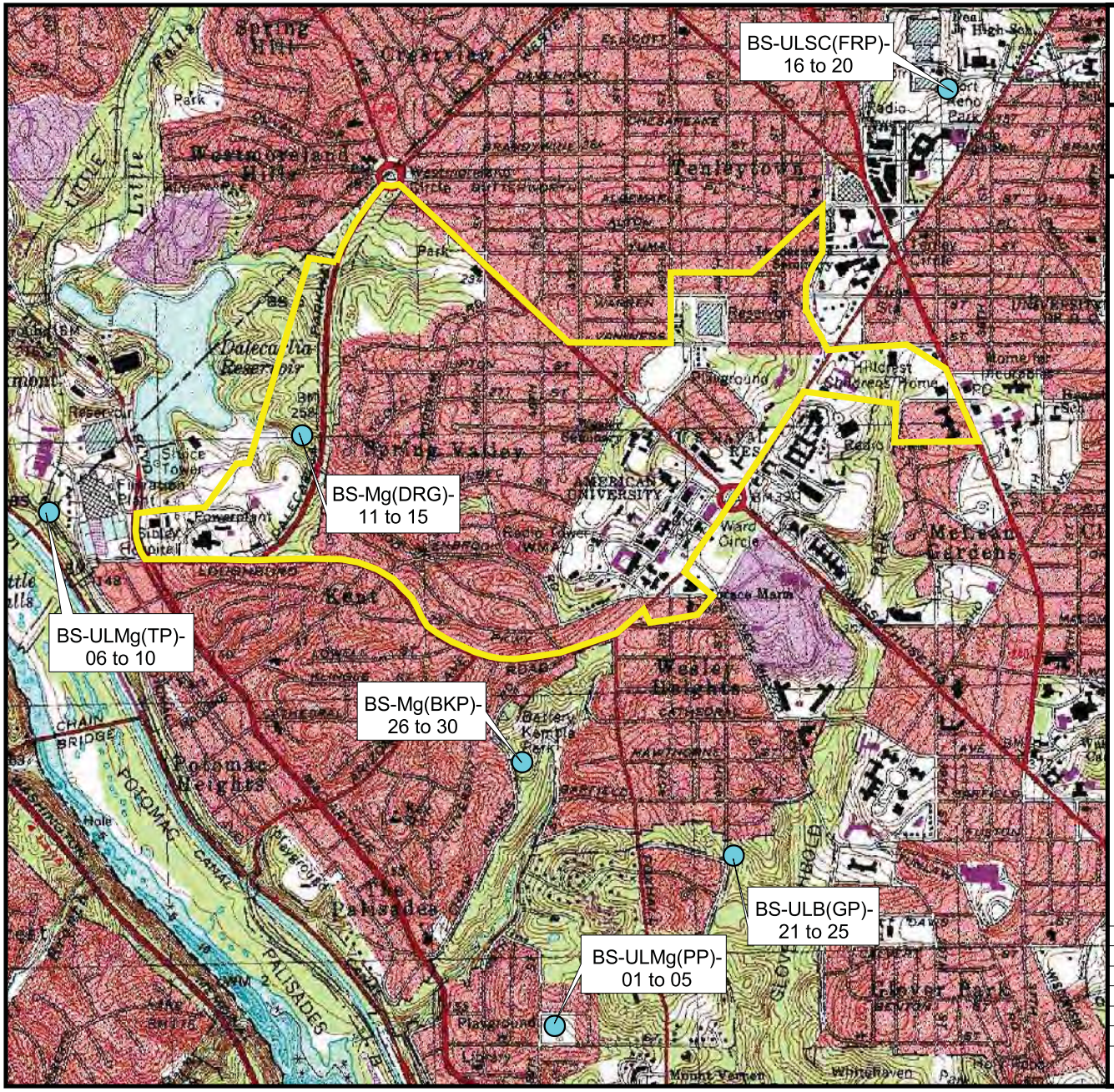


Figure 1-2
Background Sample Locations

Spring Valley Operable Units 4 and 5
Washington D.C.

Legend

SV FUDS Boundary

DRG - Dalecarlia Reservoir Grounds
FRP - Fort Reno Park
TP - West of Water Treatment Plant
BKP - Battery Kemble Park
GP - Glover Parkway
PP - Palisades Park

N
W E
S

1000 0 1000 2000 Feet

Scale:	1 : 20,000
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.apr
Date:	07/14/2003
Figure Number:	1-2
Page Number:	3

PARSONS

TABLE 1.1
Soil Types of Bioavailability Samples
Spring Valley Operable Unit 4

Spring Valley Background Sampling		
Sample ID	**Sample Description**	**Sample Location[\1]**
OU4-BS-Mg (DRG)	Light brown silty sand with trace mica.	**Dalecarlia Reservoir Grounds (DRG)**
OU4-BS-ULSC(FRP)	Brown silty soil.	**Fort Reno Park (FRP)**
OU4-BS-ULMg (TP)	Light brown silty soil.	**West of the Water Treatment Plant (TP)**
OU4-BS-Mg (BKP)	Brown silty soil with trace mica.	**Battery Kemble Park (BKP)**
OU4-BS-ULB (GP)	Dark brown silty sand.	**Glover Parkway (GP)**
OU4-BS-ULMg (PP)	Brown to reddish brown silty clay.	**Palisades Park (PP)**
OU4-BS-ULB MS/MSD	[**MS/MSD sample of Sx -(OU4-BS-ULB(GP)**] Dark brown silty sand.	**Glover Parkway (GP)**

[\1] - Sample locations are the same locations used by the EPA to collect their background samples

AU 12/CDC Six Highest Arsenic Grids		Background Sample Type Match[\2]
Sample ID	**Sample Description**	
OU4-CDC-(160,150)	Brown silty sand with some quartz and rocks	**OU4-BS-ULB (GP)**
OU4-CDC-(150,140)	Brown to tan silty sand.	**OU4-BS-Mg (DRG)**
OU4-CDC-(130,140)	Reddish brown to rusty brown clay with sand grains and quartz.	**OU4-BS-ULMg (PP)**
OU4-CDC-DUP	[**Duplicate of Sx -(160,150)**]Brown silty sand with some quartz and rocks	**OU4-BS-ULB (GP)**
OU4-AU12-(180,200)	Light brown silty clay.	**OU4-BS-ULMg (TP)**
OU4-AU12-(200,200)	Light brown silty clay.	**OU4-BS-ULMg (TP)**
OU4-AU12-(200,180)	Light brown silty clay.	**OU4-BS-ULMg (TP)**

[\2] - Background Soil Types: Mg - Manor Glenelg
ULSC - Urban Land Sassafras Chillum
ULMg - Urban Land Manor Glenelg
ULB - Urban Land Brandywine

3.0.3 The samples were submitted to the Laboratory for Environmental and Geological Studies, University of Colorado, at Boulder, care of Dr. John W. Drexler. Specifically, samples were submitted for determinations of the bioavailability of arsenic from soil. In addition, a determination of the types of particles (inorganic vs. organic) that contain bound arsenic was conducted. The report of results, which is included as Attachment A, contains a description of analytical methodologies.

4.0 RESULTS AND UNCERTAINTY DISCUSSION

4.0.1 Of the fifteen samples (including QA/QC) analyzed for bioavailability, only eleven samples had detectable concentrations in the test solution that could be used to derive a percent bioavailability (Table 1.2 and Attachment A). For those samples with detectable concentrations, the percent bioavailability ranged from 3 to 50 percent. As noted in Attachment A, at the time these experiments took place, the method was reported to correlate with the best available *in vivo* model for determining bioavailability, the juvenile swine model. In numerous historical *in vivo* studies the swine model closely models the digestive tracts of humans. However, the *in vitro* model was used because there was sufficient correlation to the *in vivo* model at a substantially reduced cost.

4.0.2 The data presented in Attachment A can be interpreted to conclude that risk estimates derived using detected concentrations of arsenic will likely overestimate the potential risks and hazards associated with exposures to the soils. Based on a bioavailability factor of 3%, these risks and hazards will be overestimated by up to a factor of 33 and clean-up criteria developed without accounting for bioavailability will result in criteria that can be up to 33 times too stringent. Even using the most conservative of these bioavailability values (i.e., 50%) results in the reduction of risk and hazard estimates by one-half and an increase of the calculated clean-up criteria by a factor of two. Attachment A is the laboratory report of data and does not directly address the overestimation of potential risks and hazards associated with exposures to the soils based on the bioavailability results.

4.0.3 In addition to the bioavailability study, a determination of the types of arsenic-bearing particles was conducted using both electron microprobe and chemical analysis. As noted in Attachment A, for the electron microprobe analysis (EMPA), data were acquired on only five samples because of low bulk arsenic concentrations resulting in a limited data set. In general the data indicated the arsenic bearing phases to be either iron oxides, manganese oxides, iron arsenic sulfates or clays as determined by particle analysis (Attachment A, Table 2). An interpretation of the data, when compared to the bioavailability data discussed above, show that for the four samples where the arsenic bearing phase was predominantly iron oxides (97 – 100%) and where clays were not identified as an arsenic bearing phase, the bioavailability ranged from 7 – 22%. For the single sample that had clays identified as an arsenic bearing phase (OU4-CDC, 150,140), the bioavailability was determined to be 50%. Data from the single sample suggests that arsenic in clays may be more bioavailable and that risk estimates will likely be overestimated for soils where the arsenic bearing phase is exclusive of clays. Conclusions about correlations between arsenic-bearing clays and bioavailability were not provided in Attachment A.

TABLE 1.2
Bioavailability Results
Spring Valley OU-4

Run at 1.5pH for 1 hr @ 39*c	Date Sampled	Field Numbers	As in bulk soil (mg/kg)	As% bioavailability
OU4-AU12 (180,200)	15-Mar-01	Par-1	215	8
OU4-BS-UlMg (PP)	19-Mar-01	Par-2	3	3
OU4-BS-Mg (DRG)	19-Mar-01	Par-3	1	
OU4-BS-ULB-MS/MSD	19-Mar-01	Par-4	2	15
OU4-BS-ULB (GP)	19-Mar-01	Par-5	2	5
OU4-AU12 (200,200)	15-Mar-01	Par-6	235	7
OU4-CDC-(130,140)	15-Mar-01	Par-7	12	7
OU4-CDC (150,140)	15-Mar-01	Par-8	154	50
OU4-AU12 (200,180)	15-Mar-01	Par-9	113	8
OU4-BS-ULSC (FRP)	19-Mar-01	Par-10	5	14
OU4-CDC (160,150)	15-Mar-01	Par-11	178	22
OU4-BSMg (BKP)	19-Mar-01	Par-12	3	
OU4-BS-UlMg (TP)	19-Mar-01	Par-13	3	
QA/QC				
Blank	NA[\1]			
OU4-BS-UlMg (TP) Dup	NA[\1]	Par-14	3	
OU4-CDC-DUP (of CDC 160, 150)	15-Mar-01	Par-15	178	23

[\1] Internal Lab QA/QC

5.0. CONCLUSION

5.0.1 The oral toxicity values used in risk assessments are based on epidemiology studies of human populations exposed to arsenic in drinking water (EPA, 2001). However, arsenic rendered insoluble in the soil will have reduced absorption. Studies in laboratory animals indicate that arsenic absorption is reduced in soils (Battelle, 2000). These studies indicate that arsenic in soil is typically one-half to one-tenth as bioavailable as arsenic in water. Therefore, the literature supports relative bioavailability adjustments ranging from 0.5 to 0.1 (Battelle, 2000). Simple extraction tests have shown good correlation in predicting bioavailability of arsenic to humans (Battelle, 2000; Casteel et al., 2001). In these systems, soils containing arsenic are incubated in a solution in a system that represents the human gastrointestinal system. The fraction of arsenic that dissolves represents the fraction that is available for absorption.

5.0.2 Overall the bioavailability experiments indicate that risks and hazards may be overestimated if these factors are not incorporated quantitatively. Due to the limited amount of data available, a regression model was not developed to determine a bioavailability adjustment factor (BAF) for use at Spring Valley. However, conservative assumptions can be made. The most conservative assumption would be to use a BAF of 50%, based on the single highest bioavailability obtained from any sample. The range of bioavailability in the remaining samples was lower, 3%-22%, with a mean of 10%.

5.0.3 Because of the limitations of the study, the arsenic bioavailability findings were not relied upon to make Spring Valley project decisions. Neither the 12.6 ppm arsenic screening level nor the 20 ppm arsenic remediation endpoint was based on the results of this study.

6.0. REFERENCES

6.0.1 Battelle and Exponent, 2000. Guide for Incorporating Bioavailability Adjustments into Human Health and Ecological Risk Assessments at U.S. Navy and Marine Corps Facilities. Part 1: Overview of Metals Bioavailability. Prepared for Naval Facilities Engineering Service Center. July 2000.

6.0.2 Casteel, S; Evans, T; Turk , J; Basta, N; Weis, C; Henningsen, G; Hoffman, M (2001) Refining the Risk Assessment of Metal-contaminated Soils. Int J Hyg Environ Health 203(5-6): 473-474.

ATTACHMENT A

LABORATORY REPORT

For

PARSONS

July 24, 2001

By

Dr. John W. Drexler
Laboratory for Environmental and Geological Studies
University of Colorado
Boulder, CO. 80309
(303) 492-5251

INTRODUCTION

Fifteen samples, including QA/QC, were sent to the laboratory for bioavailability and arsenic-bearing particle content (by EMPA), by Parsons. A representative split of each sample was collected for both analyses. Bioavailability results are listed in Table 1. EMPA results were only acquired on five samples because of low bulk arsenic concentrations. The results are listed in Table 2 along with a 95% Confidence Interval (CI) and graphically in Figures 2 through 6. Particle-size data is compiled in Figure 1. Bulk total arsenic data are reported in Table 3.

EMPA analysis indicates that over 90% of the arsenic mass has been sorbed to iron oxides. These oxides have a mean particle-size of 35 microns and contain an average of 4,600 mg/kg arsenic. No primary forms of arsenic (e.g., arsenic trioxide, lead arsenate, sodium arsenate) were found.

TABLE 1.
Spring Valley Sampling - Bioavailability Results

Run at 1.5pH for 1 hr @ 39*c	Field Numbers	As in bulk soil (mg/kg)	mass soil (g)	calc As #1	ICP As (mg/l)	solution amt (l)	As% bio	Ph Stop
OU4-Au12 (180,200)	Par-1	215	1.00006	0.22	0.162	0.1	8	1.554
OU4-BS-Ulmg (PP)	Par-2	3	1.00573	0.00	0.001	0.1	3	1.545
OU4-BS-Mg (DRG)	Par-3	1	1.00264	0.00	DL	0.1		1.545
OU4-BS-ULB-MS/MSD	Par-4	2	1.00119	0.00	0.003	0.1	15	1.543
OU4-BS-ULB (GP)	Par-5	2	1.00409	0.00	0.001	0.1	5	1.54
OU4-Au12 (200,200)	Par-6	235	1.00508	0.24	0.164	0.1	7	1.538
OU4-CDC-(130,140)	Par-7	12	1.00206	0.01	0.008	0.1	7	1.558
OU4-CDC (150,140)	Par-8	154	1.00151	0.15	0.776	0.1	50	1.548
OU4-Au12 (200,180)	Par-9	113	1.00268	0.11	0.092	0.1	8	1.542
OU4-BS-ULSC (FRP)	Par-10	5	1.00094	0.01	0.007	0.1	14	1.6
OU4-CDC (160,150)	Par-11	178	1.0012	0.18	0.399	0.1	22	1.589
OU4-BSmg (BKP)	Par-12	3	1.00797	0.00	DL	0.1		1.568
OU4-BS-Ulmg (TP)	Par-13	3	0.99993	0.00	DL	0.1		1.562
QA/QC								
Blank					0.002			1.564
OU4-BS-Ulmg (TP) Dup	Par-14	3	1.00136	0.00	DL	0.1		1.561
OU4-CDC-DUP (of 160, 150)	Par-15	178	1.00458	0.18	0.404	0.1	23	1.543

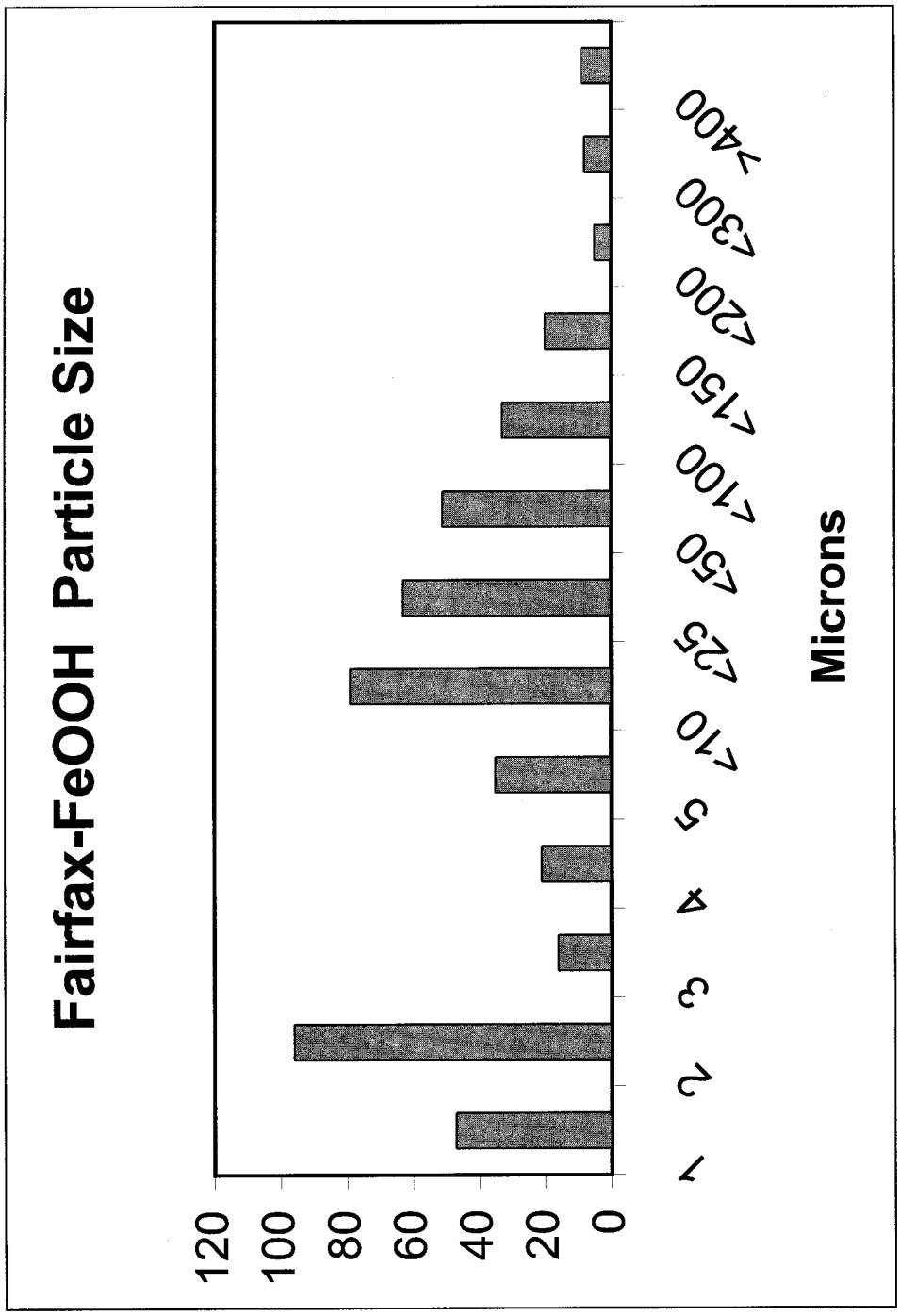
TABLE 2.
EMPA Results Frequency of Occurrence and Error Summary.

	OU4-AU12 200,200	+/- 95% CI	OU4 AU12 200,180	+/- 95% CI	OU4 CDC 160,150	+/- 95% CI
FeOOH	100%	95-100%	97%	87-99%	100%	
MnOOH			3%	1-13%		
Clays						
Fe-As Sulfate	Tr					
Particles Counted	107		44		152	

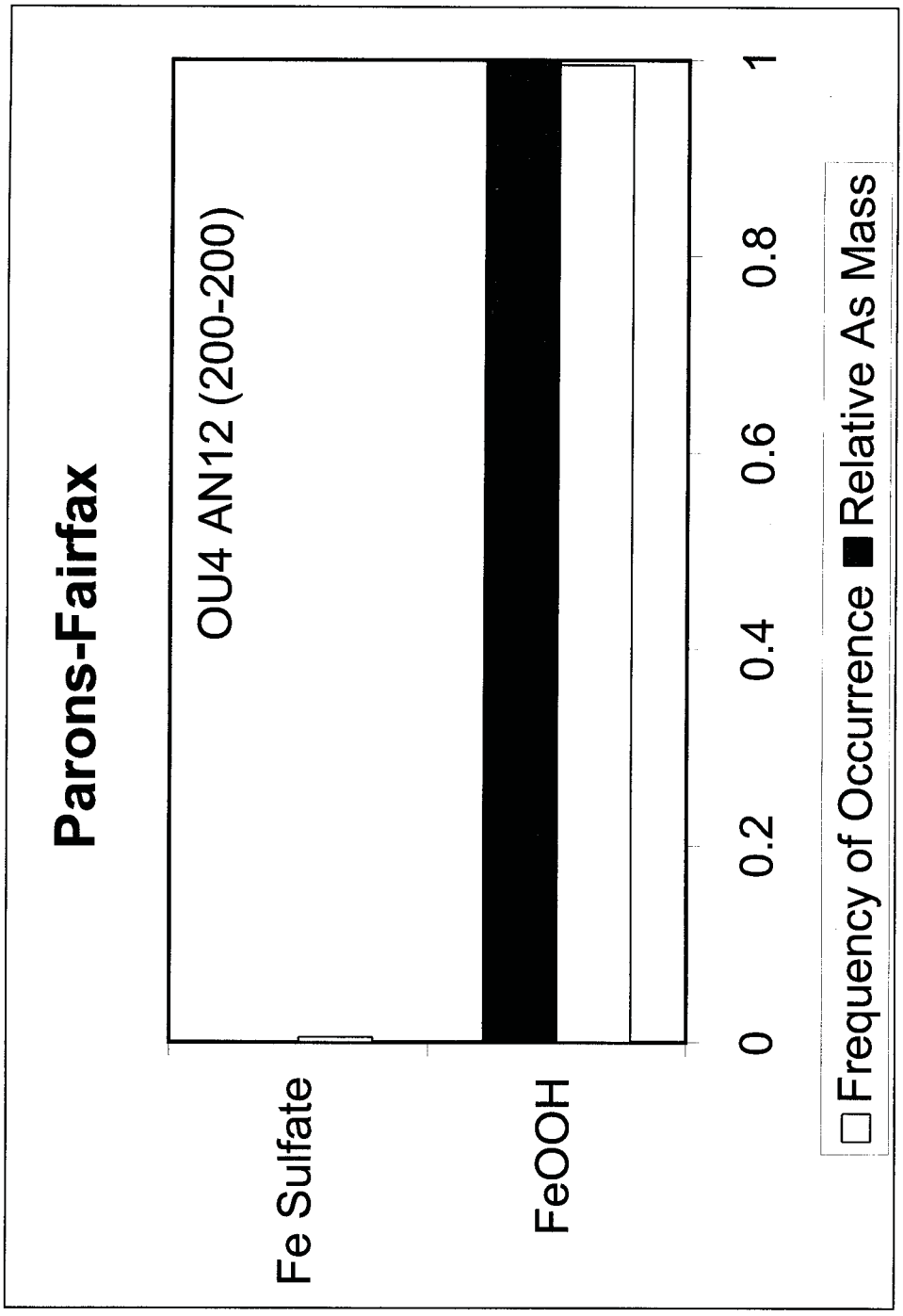
	OU4-AU12 180,200	+/- 95% CI	OU4 CDC 150,140	+/- 95% CI
FeOOH	100%		88%	78-93%
MnOOH				
Clays			12%	6-21%
Fe-As Sulfate				
Particles Counted	121		77	

TABLE 3.
Bulk Total Arsenic in Soils.

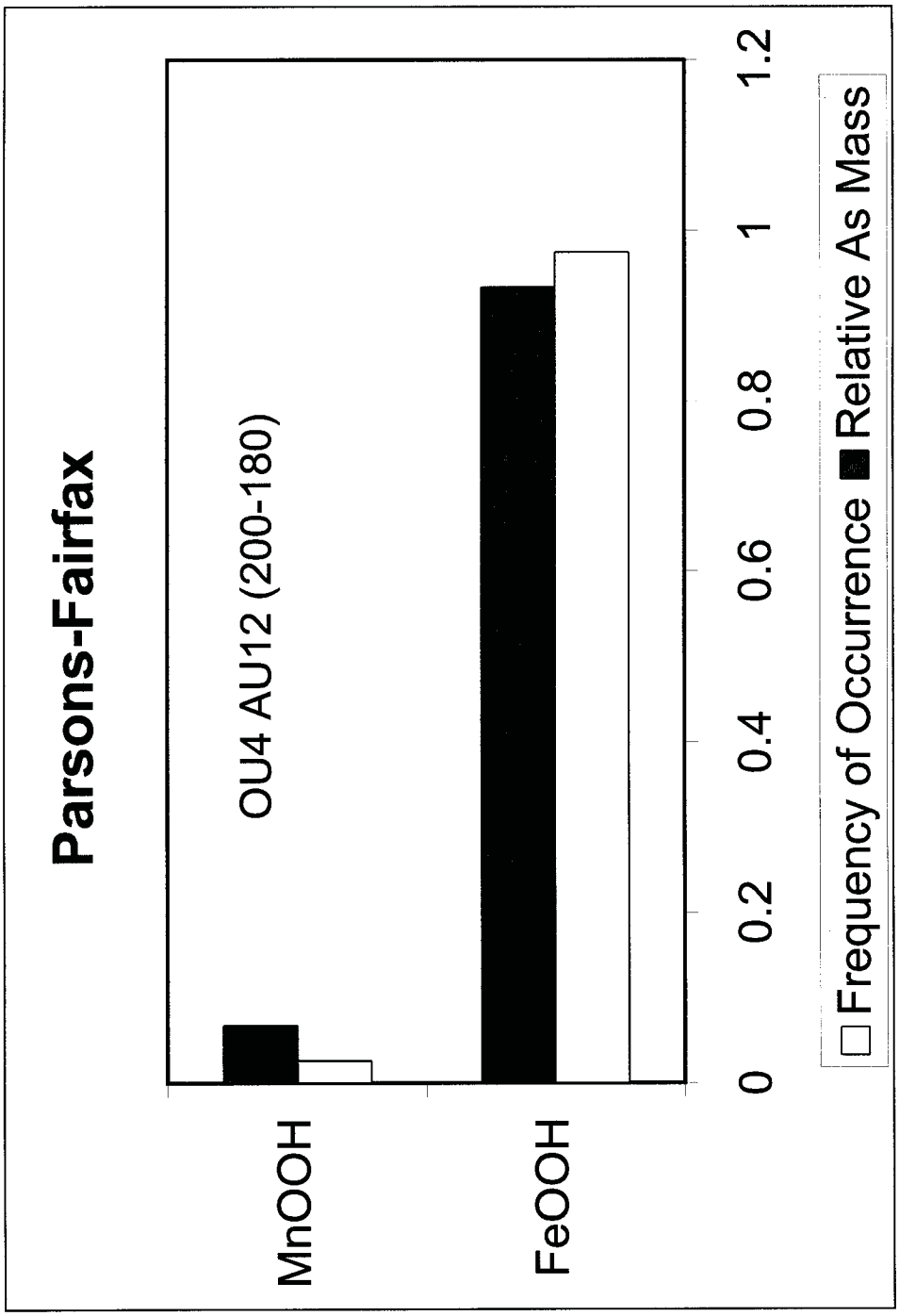
Sample ID.	As mg/kg	Dil. factor	Wt gr	Lab
<2 mm soil split				
OU4-Au 12 (180,200)	231.5	49.67759	1.00649	F-1
OU4-BS-Ulmg (PP)	3.7	49.89422	1.00212	F-2
OU4-BS-mg (DRG)	1.0	49.62631	1.00753	F-3
OU4-BS-ULB-MS/MSD	2.3	49.88526	1.0023	F-4
OU4-BS-ULB (GP)	1.9	49.83604	1.00329	F-5
OU4-CDC-Dup (160,150)	188.6	49.7458	1.00511	F-6
OU4-Au 12 (200,200)	275.2	49.73293	1.00537	F-7
OU4-CDC- (130,140)	11.3	49.62976	1.00746	F-8
OU4-CDC (150,140)	194.7	49.83306	1.00335	F-9
OU4-Au 12 (200,180)	119.5	49.74877	1.00505	F-10
OU4-BS-ULSC (FRP)	6.3	49.94406	1.00112	F-11
OU4-CDC (160,150)	297.0	49.9885	1.00023	F-12
OU4-BSmg (BKP)	3.1	50.02051	0.99959	F-13
OU4-BS-Ulmg (TP)	3.6	49.91714	1.00166	F-14
OU4-BS-Ulmg (TP)-dup	3.5	49.91714	1.00166	F-15
Blank-process-2mm	0.1	50	1	F-16
<250um soil split				
OU4-Au12 (180,200)	214.8	49.86139	1.00278	F-17
OU4-BS-Ulmg (PP)	3.1	49.60859	1.00789	F-18
OU4-BS-mg (DRG)	0.8	49.9925	1.00015	F-19
OU4-BS-ULB-MS/MSD	1.7	49.96902	1.00062	F-20
OU4-BS-ULB (GP)	1.9	49.82809	1.00345	F-21
OU4-CDC-Dup (160,150)	178.8	49.85095	1.00299	F-22
OU4-Au 12 (200,200)	235.1	49.75718	1.00488	F-23
OU4-CDC- (130,140)	12.0	49.75124	1.005	F-24
OU4-CDC (150,140)	153.7	49.95953	1.00081	F-25
OU4-Au 12 (200,180)	112.6	49.77948	1.00443	F-26
OU4-BS-ULSC (FRP)	4.8	49.66624	1.00672	F-27
OU4-CDC (160,150)	178.2	49.89074	1.00219	F-28
OU4-BSmg (BKP)	2.9	49.90917	1.00182	F-29
OU4-BS-Ulmg (TP)	3.3	49.96353	1.00073	F-30
OU4-BS-Ulmg (TP)-dup	2.8	49.96353	1.00073	F-31
Blank-process-250um	-0.1	50	1	F-32


Fairfax-FeOOH Particle Size
120
100
80
60
40
20
0
1
2
3
4
5
10
25
50
100
150
200
300
>400
Microns

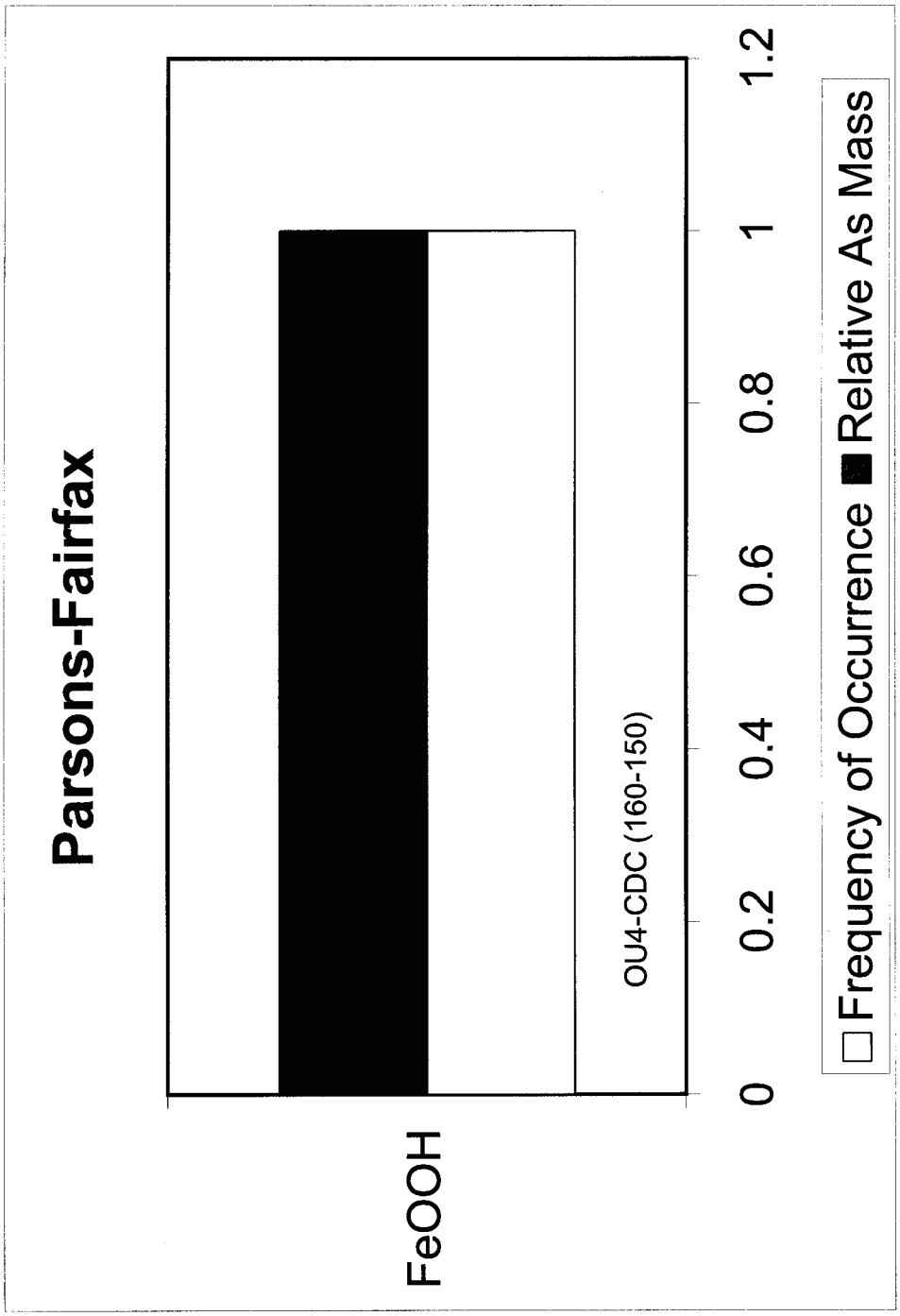
1


Parons-Fairfax
OU4 AN12 (200-200)
Fe Sulfate
FeOOH
0
0.2
0.4
0.6
0.8
1
Frequency of Occurrence
Relative As Mass

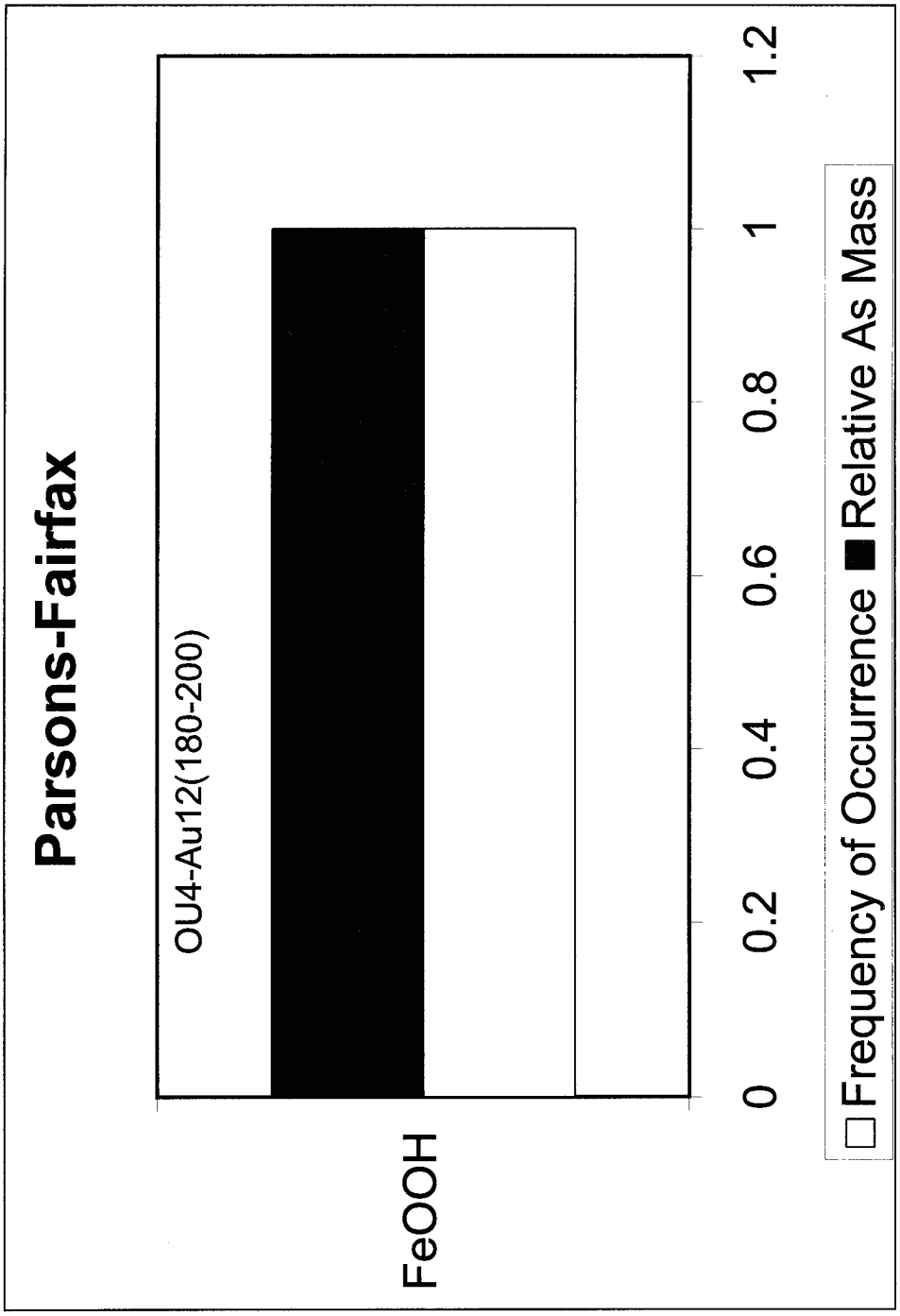
1


Parsons-Fairfax
OU4 AU12 (200-180)
MnOOH
FeOOH
0
0.2
0.4
0.6
0.8
1
1.2
Frequency of Occurrence
Relative As Mass

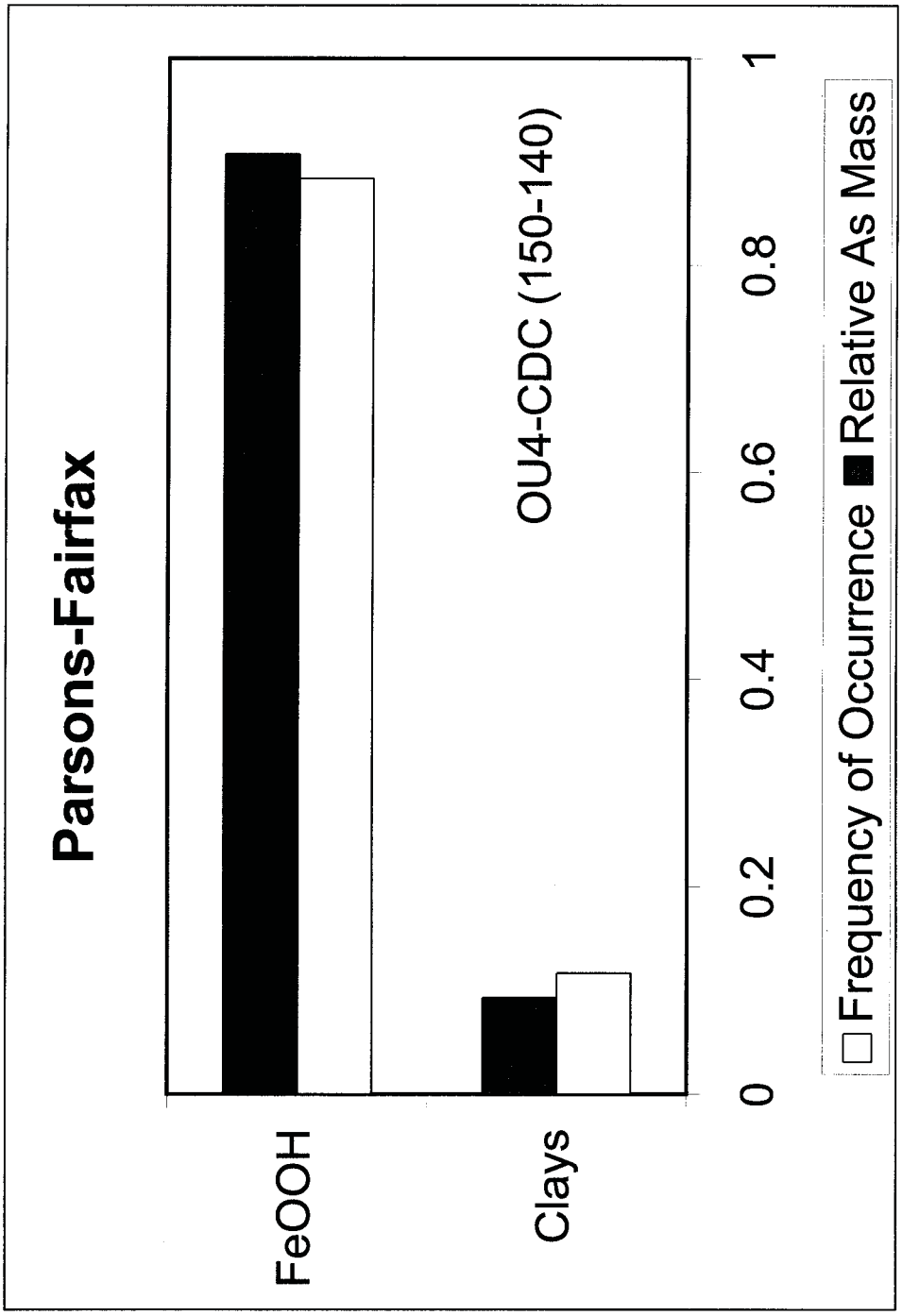
1


Parsons-Fairfax
FeOOH
OU4-CDC (160-150)
0
0.2
0.4
0.6
0.8
1
1.2
Frequency of Occurrence
Relative As Mass

1


Parsons-Fairfax
OU4-Au12(180-200)
FeOOH
0
0.2
0.4
0.6
0.8
1
1.2
Frequency of Occurrence
Relative As Mass

1


Parsons-Fairfax
OU4-CDC (150-140)
FeOOH
Clays
0
0.2
0.4
0.6
0.8
1
Frequency of Occurrence
Relative As Mass

1

METHODS

The arsenic-bearing particle analysis was conducted on a JOEL 8600 electron microprobe (EMPA) at the Laboratory for Geological Studies at the University of Colorado following the laboratory's SOP. The only exception to the SOP was that the complete sample was used for analysis. Representative backscatter photomicrographs (BSPM) illustrating sample characteristics were acquired.

Data from EMPA will be summarized using two methods. The first method is the determination of FREQUENCY OF OCCURRENCE. This is calculated by summing the longest dimension of all the arsenic-bearing phases observed and then dividing each phase by the total. Equation 1.0 will serve as an example to the calculation for an arsenic bearing compound.

F_{As} - Frequency of occurrence of arsenic in a single phase.

PLD - An individual particles longest dimension

$$F_{As} \text{ in phase-1} = \frac{\sum (PLD)_{\text{phase-1}}}{\sum (PLD)_{\text{phase-1}} + \sum (PLD)_{\text{phase-2}} + \sum (PLD)_{\text{phase-n}}}$$

$$\%F_{As} \text{ in phase-1} = F_{As} \text{ in phase-1} * 100$$

This data thus illustrates which arsenic-bearing phase(s) are the most commonly observed in the sample or relative volume percent.

The second calculation used in this report is the determination of RELATIVE MASS of a metal-bearing phase. These data are calculated (using arsenic as an example) by substituting the PLD term in the equation above with the value of MAS. This term is calculated as defined below.

MAS Mass of arsenic in a phase

SG Specific Gravity of a phase

PPM As - Concentration in ppm of arsenic in phase

$$M_{AS} = F_{AS} * SG * ppm_{AS}$$

The advantage in reviewing the RELATIVE ARSENIC MASS determinations is that it gives one information as to which metal-bearing phase(s) in a sample are likely to control the total bulk concentration for arsenic. As an example, PHASE- I may by relative volume comprise 98% of the sample, however it has a low specific gravity and contains only 1000 ppm arsenic, while PHASE-2 comprises 2% of the sample, has a high specific gravity and contains 850,000 ppm of arsenic. In this example it is PHASE-2 that is the dominant source of arsenic to the sample.

Sample Preparation

1) Logging the samples of which polished mounts will be prepared

2) Inspection of all plastic cups, making sure each is clean and dry

3) Labeling each "mold" with its corresponding sample number.

4) All samples will be split to produce a homogeneous 1-4 gram sample.

5) Mixing epoxy resin and hardener according to manufacturer's directions.

6) Pour 1 gram of sample into mold. Double checking to make sure sample numbers on mold and sample match. Pouring epoxy into mold to just cover sample grains.

7) Using a new wood stirring stick with each sample, carefully blend epoxy and grains so as to coat all grains with epoxy.

8) Setting molds to cure at **ROOM TEMPERATURE** in a clean restricted area. Adding labels with sample numbers and covering with more epoxy resin. Leaving to cure completely at room temperature.

9) One at a time, removing each sample from its mold and grinding flat the back side of the mount.

10) Using 600 grit wet abrasive paper stretched across a grinding wheel for removing the bottom layer and exposing as many mineral grains as possible. Follow with 1000 grit paper.

11) Start polishing with 15A oil based diamond paste on a polishing paper fixed to a lap. Using paper instead of cloth minimizes relief.

12) Next use 6 A diamond polish on a similar lap.

13) Finally polish the sample with 1A oil based diamond past on polishing paper. Followed by .05 μ alumina in water suspension. The quality should be checked after each step. Typical polishing times are 30 minutes for 15μ, 20 minutes for 6μ, 15 minutes for 1μ and 10 minutes for .05μ.

NOTE: Use low speed on the polishing laps to avoid "plucking" of sample grains.

14) Samples should be completely cleaned in an ultrasonic cleaner with isopropyl alcohol or similar solvent to remove oil and finger prints.

15) To ensure that no particles of arsenic are being cross contaminated with sample preparation procedures, a blank (epoxy only) mold will be made every 50th sample following all of the above procedures. This mold will then be speciated along with the other samples.

16) Each sample be carbon coated. Once coated the samples should be stored in a clean, dry environment with the carbon surface protected from scratches or handling.

POINT COUNTING

Counts are made by traversing each sample from left-to-right and top-to-bottom. The amount of vertical movement for each traverse would depend on magnification and CRT (cathode-ray

tube) size. This movement should be minimized so that NO portion of the sample is missed when the end of a traverse is reached. Two magnification settings should be used. One ranging from 40-1 OOX and a second from 300-60OX. The last setting will allow one to find the smallest identifiable (1-2 micron) phases.

The portion of the sample examined in the second pass, under the higher magnification, will depend on the time available, the number of arsenic-bearing particles, and the complexity of metal mineralogy. A maximum of 8 hours will be spent per sample.

INVITRO PROCEDURE

Bioavailabilty was conducted using the method developed at the University of Colorado, Boulder and calibrated to EPA's Region VIII Swine Model Medlin and Drexler, 1996, Medlin, 1997, Drexler, 1997. The method has a high level of correlation to the Swine Model for lead (r-0.96), however, at present the correlation for arsenic is not as good (r-0.82). Based on these data it is recommended that one interpret arsenic bioavailability results with greater caution.

The method follows a carefully designed laboratory SOP, which is available on request. The procedure uses 1.0 grams of the <250/.tm size fraction, this material is placed in 125ml wide-mouth HDPE bottles along with 100ml of 1.5 pH stomach solution. The mixture is rotated end-on-end at 37 degrees C in a water bath for one hour. After one hour 10 ml of sample is removed, filtered (0.454m), and analyzed for lead and/or arsenic following Methods 601 OB, 6020, or 706 IA. Results from this extraction procedure are then used to calculated bioavailable lead and/or arsenic from the bulk <250jzm concentrations.

PRECISION AND ACCURACY

The precision of the EMPA data will be determined based on sample duplicates run every 20 samples. The accuracy of the analysis will be estimated from a statistical evaluation of point counting data based on the method of Mosimann (1965).

Quantitative elemental analysis, primarily performed on slag or other phases that have variable metal contents, will have precision and accuracy evaluated on counting statistics and standard reproducibility.

Quality control for the in vitro bioavailability procedure will consist of:

Regent Blank 1: 10
Bottle Spike 1:20
Blank Spike 1:20
Duplicate Sample 1: 10
Matrix Spikes 1: 10
LCS 1:20

TECHNICAL MEMORANDUM

SYNTHETIC PRECIPITATION LEACHING PROCEDURE (SPLP) ARSENIC SAMPLING

SPRING VALLEY OPERABLE UNIT 3 AND 4
WASHINGTON, DC

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared by:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

JANUARY 25, 2002

1.0 INTRODUCTION

1.0.1 The purpose of this Technical Memorandum is to discuss the results of the Synthetic Precipitation Leaching Procedure (SPLP) arsenic study for the Spring Valley investigation. The SPLP sampling was performed in support of the Operable Unit (OU) 3 Engineering Evaluation/Cost Analysis (EE/CA) and the OU-4 Remedial Investigation/Feasibility Study (RI/FS). The objective is to help evaluate the potential leachability of arsenic from the soil to groundwater. Specifically, the objective is to determine the concentration of arsenic in soil that, upon leaching from soil to groundwater, will not result in an arsenic concentration that exceeds the groundwater Maximum Contaminant Level (MCL).

2.0 BACKGROUND

2.0.1 In November 1999, Parsons collected surficial soil samples from a grid system that overlaid the property at 4801 Glenbrook Road, adjacent to American University (AU). This grid covered the area between the former location of circa 1918 buildings associated with the Former American University Experiment Station (AUES) and the two disposal pits (Anomalies 1 and 2) of the OU-3 investigation. The grid also covered those areas where elevated levels of arsenic were detected in the surficial soils during United States Environmental Protection Agency (USEPA) soil sampling events. The objective of the November 1999 sampling event was to determine the presence of localized areas containing elevated levels of arsenic.

2.0.2 On February 22 through 24, 2000 and May 8 and 9, 2000, Parsons collected additional soil samples at 4801 Glenbrook Road in support of the OU-3 EE/CA. SPLP samples were collected from grids of 4801 Glenbrook during the May 2000 event. All sampling for the OU-3 EE/CA was performed in accordance with *Change 05, Revised Sampling and Analysis Plan, 4801 Glenbrook Road, May 2000*. Five different soil types were represented by all the SPLP samples collected.

2.0.3 The RI/FS investigation addresses Spring Valley Operable Unit 4 (OU-4). As part of this investigation, grid soil sampling was performed by Parsons ES on a portion of the AU campus designated AU Lot 12. AU Lot 12 contains the Child Development Center (CDC). The sampling was performed to determine the extent and concentrations of arsenic (As) in surface soils on AU Lot 12 and the CDC. All sampling at the CDC was performed in accordance with the Work Management Plan (WMP) for OU-4, (*Parsons ES, August 14, 2000,* and Amendment 1 to the WMP *(February 19, 2001).*

2.0.4 The 4801 Glenbrook Road property and the CDC are approximately 400 feet apart.

3.0 SPLP METHODS

3.0.1 According to USEPA guidance (USEPA, 1996), a leach test may be more useful than a soil/water partition equation, depending on the constituents of the soil. This guidance suggests using the USEPA SPLP method (USEPA, 1994) which is appropriate for a contaminated soil scenario. The procedure is more appropriate to help evaluate the potential leachability of arsenic from the soil to groundwater.

3.0.2 USEPA guidance (USEPA, 1995) states that the SPLP was originally designed as an alternative to the Toxicity Characteristic Leaching Procedure (TCLP). Like the TCLP, the SPLP is designed to determine the mobility of both organic and inorganic contaminants contained in wastes. The SPLP is intended to simulate the effect of acid rain on land-disposed wastes. The specific procedures for conducting the test are similar in many ways to the procedures employed for the TCLP (e.g., where solids are being tested, particle size must be reduced and a liquid extract obtained using a leaching medium). The primary difference between the two tests is the composition of the leaching medium. While the TCLP relies on extraction fluids that simulate the organic acids that would form from decomposing wastes in a landfill, the SPLP requires the use of extraction fluids that simulate acid rain.

4.0 SAMPLE COLLECTION

4.0.1 Parsons collected soil samples at 4801 Glenbrook Road on May 8 and 9, 2000. Of the samples collected, 38 were designated for SPLP analysis. SPLP samples from varying depths were collected from eleven grids at 4801 Glenbrook as shown on Figure 1-1. Table 1.1 indicates the sample designation, or identification number, and depth of each of these 38 samples along with the 4 duplicate samples, for a total of 42 samples. Sample depth was important for arsenic vertical extent determinations; SPLP results were not expected to be a function of depth.

4.0.2 On January 4 and 5, 2001, surface samples were collected from the grids located at AU Lot 12 and the grids at the CDC and submitted for arsenic (As) analysis. On February 21, 2001, composited 0-2 foot intervals from the grids with the highest 5% of As concentrations (4 total samples) within the CDC were analyzed for SPLP arsenic. These four samples were collected from the center of the grid where the original surface sample was taken. The locations of these samples are shown on Figure 1-2 (note that the structures in the playground shown in Figure 1-2 were removed following remediation of this area).

4.0.3 The soil types and sample descriptions are indicated on Table 1.2. The soil type/description is provided since the physical characteristics of the soils may affect leachability (e.g., clay soils are usually less susceptible to leaching than sandy soils). However, SPLP samples were collected based on arsenic content, not specific soil types; no correlation is drawn between samples from different soil types and the SPLP results. For the 4801 samples, only the samples that had detectable SPLP arsenic are shown.

5.0 RESULTS AND UNCERTAINTY DISCUSSION

5.0.1 SPLP results are shown in Table 1.1. The CDC arsenic results are from discrete samples collected from 0-6 inches while the SPLP result is a composite of 0-24 inches from that same location. Of the 46 samples (43 samples and 3 duplicates) analyzed for SPLP As, 39 samples did not contain detectable amounts of leachable arsenic. Of the seven samples that contained detectable leachable arsenic, two were from the CDC and five were from 4801 Glenbrook soil.

5.0.2 The objective of the study is to determine the concentration of arsenic in soil that, upon leaching from soil to groundwater, will not result in an arsenic concentration that exceeds the groundwater Maximum Contaminant Level (MCL). Six of the seven samples (total arsenic of 11.5, 25.9, 16, 66.2, 217, and 668 mg/kg) with detectable arsenic in leachate had a high correlation between soil concentration and leachability. The correlation coefficient for these six samples is 0.99. When the seventh detected sample (total arsenic of 498 mg/kg) is included in

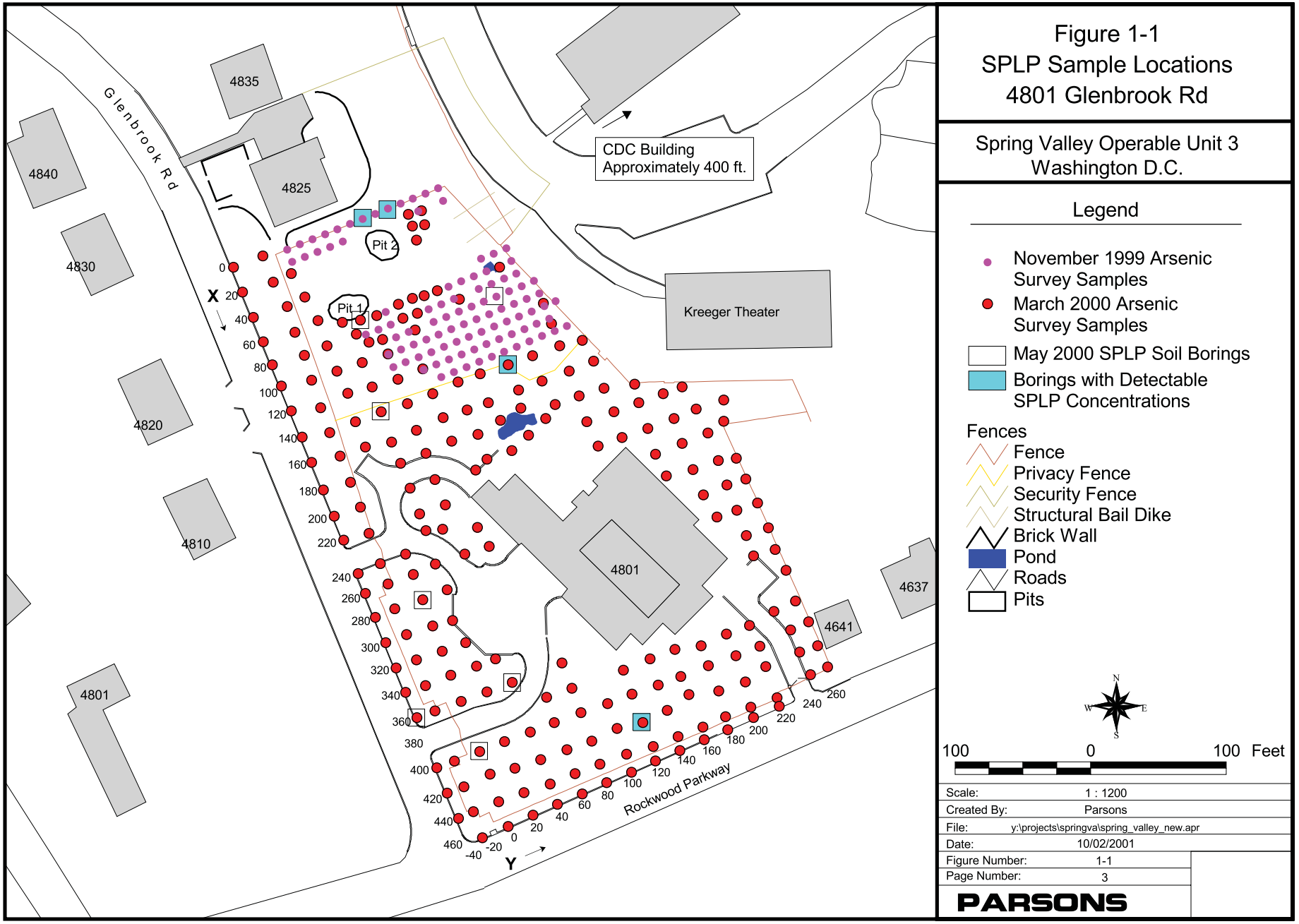


Figure 1-1
SPLP Sample Locations
4801 Glenbrook Rd

Spring Valley Operable Unit 3
Washington D.C.

Legend

- November 1999 Arsenic Survey Samples
- March 2000 Arsenic Survey Samples
- May 2000 SPLP Soil Borings
- Borings with Detectable SPLP Concentrations

Fences
- Fence
- Privacy Fence
- Security Fence
- Structural Bail Dike
- Brick Wall

- Pond
- Roads
- Pits

N
W
E
S

100 0 100 Feet

Scale:	1 : 1200
Created By:	Parsons
File:	y:\projects\springva\spring_valley_new.apr
Date:	10/02/2001
Figure Number:	1-1
Page Number:	3

PARSONS

Table 1.1
SPLP Results for 4801 Glenbrook Road and CDC Sampling
Spring Valley Operable Units 3 and 4

SAMPLE ID[1]	COLLECTION DATE	MATRIX	SAMPLE LOCATION	DEPTH (ft)	PARAMETER		SOIL TYPE
					Arsenic mg/kg	Arsenic (SPLP) µg/L	
OU3-MTLSB-70,40	5/8/2000	Soil	70,40	0 - 2	14.2 J[1]	50 U[1]	ULMg
OU3-MTLSB-70,40	5/8/2000	Soil	70,40	2 - 4	4.7 J	50 U	ULMg
OU3-MTLSB-90,140	5/8/2000	Soil	90,140	0 - 2	25.7 J	50 U	ULMg
OU3-MTLSB-90,140	5/8/2000	Soil	90,140	2 - 4	5.0 J	50 U	ULMg
OU3-MTLSB-0,90[2]	5/9/2000	Soil	90,140	2 - 4	2.9	50 U	ULMg
OU3-MTLSB-90,140	5/8/2000	Soil	90,140	4 - 6	2.9 J	50 U	Sapr
OU3-MTLSB-0,100	5/8/2000	Soil	0,100	0 - 2	66.2 J	9.7 J	ULSC
OU3-MTLSB-0,100	5/8/2000	Soil	0,100	2 - 4	14.5 J	50 U	ULSC
OU3-MTLSB-0,100	5/8/2000	Soil	0,100	4 - 6	11.5 J	4.7 J	Sapr
OU3-MTLSB-140,20	5/8/2000	Soil	140,20	0 - 2	4.8 J	50 U	ULMg
OU3-MTLSB-140,20	5/8/2000	Soil	140,20	2 - 4	6.5 J	50 U	ULMg
OU3-MTLSB-0,70[2]	5/8/2000	Soil	140,20	2 - 4	6.3	--	ULMg
OU3-MTLSB-140,20	5/8/2000	Soil	140,20	4 - 6	2.8 J	50 U	ULMg
OU3-MTLSB-140,120	5/8/2000	Soil	140,120	0 - 2	25.9 J	6.3 J	ULB
OU3-MTLSB-140,120	5/8/2000	Soil	140,120	2 - 4	7.9 J	50 U	ULB
OU3-MTLSB-140,120	5/8/2000	Soil	140,120	4 - 6	4.3 J	50 U	ULB
OU3-MTLSB-70,100[2]	5/8/2000	Soil	140,120	4 - 6	2.6	50 U	ULB
OU3-MTLSB-0,80	5/9/2000	Soil	0,80	0 - 2	668	143 J	ULSC
OU3-MTLSB-0,80	5/9/2000	Soil	0,80	2 - 4	12.1	50 U	ULSC
OU3-MTLSB-0,80	5/9/2000	Soil	0,80	4 - 6	6.5	50 U	Sapr
OU3-MTLSB-280,0	5/9/2000	Soil	280,0	0 - 2	2.6	50 U	ULMg
OU3-MTLSB-280,0	5/9/2000	Soil	280,0	2 - 4	2.9	50 U	ULMg
OU3-MTLSB-280,0	5/9/2000	Soil	280,0	4 - 6	2.3	50 U	Sapr
OU3-MTLSB-360,-40	5/9/2000	Soil	360,-40	0 - 2	1.7	50 U	ULMg
OU3-MTLSB-360,-40	5/9/2000	Soil	360,-40	2 - 4	4.0	50 U	ULMg
OU3-MTLSB-360,-40	5/9/2000	Soil	360,-40	4 - 6	1.1	50 U	ULMg
OU3-MTLSB-360,-40	5/9/2000	Soil	360,-40	6 - 8	1.8	50 U	Sapr
OU3-MTLSB-360,-40	5/9/2000	Soil	360,-40	8 - 10	2.3	50 U	Sapr
OU3-MTLSB-70,70[2]	5/9/2000	Soil	360,-40	8 - 10	1.7	50 U	Sapr
OU3-MTLSB-360,-40	5/9/2000	Soil	360,-40	10 - 12	1.5	50 U	Sapr
OU3-MTLSB-360,40	5/9/2000	Soil	360,40	0 - 2	4.4	50 U	ULMg
OU3-MTLSB-360,40	5/9/2000	Soil	360,40	2 - 4	1.3	50 U	ULMg
OU3-MTLSB-360,40	5/9/2000	Soil	360,40	4 - 6	1.3	50 U	Sapr
OU3-MTLSB-360,40	5/9/2000	Soil	360,40	6 - 8	1.5	50 U	Sapr
OU3-MTLSB-360,40	5/9/2000	Soil	360,40	8 - 10	2.6	50 U	Sapr
OU3-MTLSB-360,40	5/9/2000	Soil	360,40	10 - 12	1.5	50 U	Sapr
OU3-MTLSB-400,0	5/9/2000	Soil	400,0	0 - 2	2.4	50 U	ULMg
OU3-MTLSB-400,0	5/9/2000	Soil	400,0	2 - 4	1.6	50 U	ULMg
OU3-MTLSB-400,0	5/9/2000	Soil	400,0	4 - 6	1.5	50 U	Sapr
OU3-MTLSB-420,120	5/9/2000	Soil	420,120	0 - 2	6.2	50 U	ULMg
OU3-MTLSB-420,120	5/9/2000	Soil	420,120	2 - 4	16.0	6.4 J	ULMg
OU3-MTLSB-420,120	5/9/2000	Soil	420,120	4 - 6	4.8	50 U	ULMg
OU4-CDC-(130,140)[3]	2/21/2001	Soil	130,140	0 - 2	278	50 U	ULMg
OU4-CDC-(140, 160)[3]	2/21/2001	Soil	140, 160	0 - 2	217	32.7 J	ULMg
OU4-CDC-(150, 140)[3]	2/21/2001	Soil	150, 140	0 - 2	498	871	Mg
OU4-CDC-(160, 150)[3]	2/21/2001	Soil	160, 150	0 - 2	246	50 U	ULB
CDC-TCRA (140,120)-11	9/12/2001	Soil	140,120	10.5-11	4.6 U	50 U	Sapr

[1] U = nondetect; J = estimated value

[2] - Duplicate Sample.

[3] - Total arsenic samples at the CDC were collected on 01/05/2001, at a depth of 0-6".

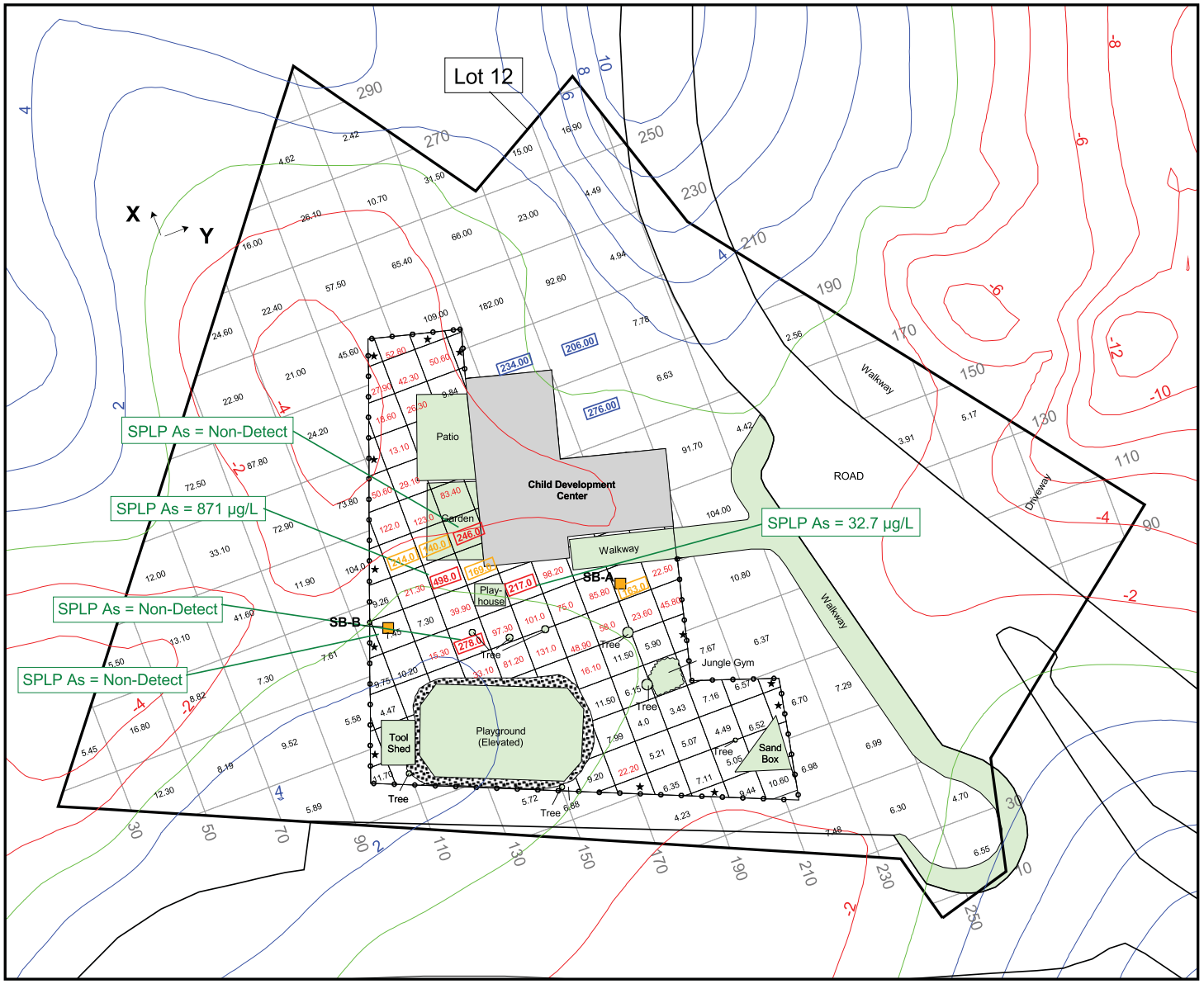


Figure 1-2
Grid Sample Results and SPLP Locations
Child Development Center / AU Lot 12

Spring Valley Operable Unit 4
Washington D.C.

Legend

- Boring Locations
- Cut and Fill, 1917-2000 (2 foot contours)
  - Level
  - Fill
  - Cut
- Fence
- AU Lot 12
- 10' Grid
- 20' Grid
- Physical Obstruction (Grid could not be sampled)
- Gravel
- ★ Sample Collected Outside Fence in 20' AU Lot 12 Grid

Note:
Sample results are Arsenic in Parts per Million.
Results in red are over 13 ppm inside the CDC.

- 498.0 The highest 5% arsenic levels inside the CDC
- 276.0 The 3 highest arsenic values outside the CDC
- 163.0 The next 5% highest arsenic values

30 0 30 Feet

1 inch = 30 feet

Scale:	1 : 360
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.APR
Date:	10/02/2001
Figure Number:	1-2
Page Number:	5

PARSONS

Table 1.2
Soil Types for CDC Samples and 4801 Detectable SPLP As Samples
Spring Valley Operable Units 3 and 4

OU4-CDC-(130,140)	Reddish brown to rusty brown clay with sand grains/quartz.	**Urban Land Manor Glenelg (ULMg)**
OU4-CDC-(140,160)	Brown to yellow brown clay	**Urban Land Manor Glenelg (ULMg)**
OU4-CDC-(150,140)	Brown to tan silty sand.	**Manor Glenelg (Mg)**
OU4-CDC-(160,150)	Brown silty sand with some quartz and rocks	**Urban Land Brandywine (ULB)**
OU3-MTLSB-0,100 (0-2')	Brown clay with pebbles.	**Urban Land Sassafras Chillum (ULSC)**
OU3-MTLSB-0,100 (4-6')	Brown sandy clay to weathered rock with mica and remnant structures.	**Saprolite**
OU3-MTLSB-140,120 (0-2')	Dark brown silty sand to brown clayey sand.	**Urban Land Brandywine (ULB)**
OU3-MTLSB-0,80 (0-2')	Brown silty soil with quartz to brown clay	**Urban Land Sassafras Chillum (ULSC)**
OU3-MTLSB-420,120 (2-4')	Black wet fine silt. Silt from stream.	**Urban Land Manor Glenelg (ULMg)**

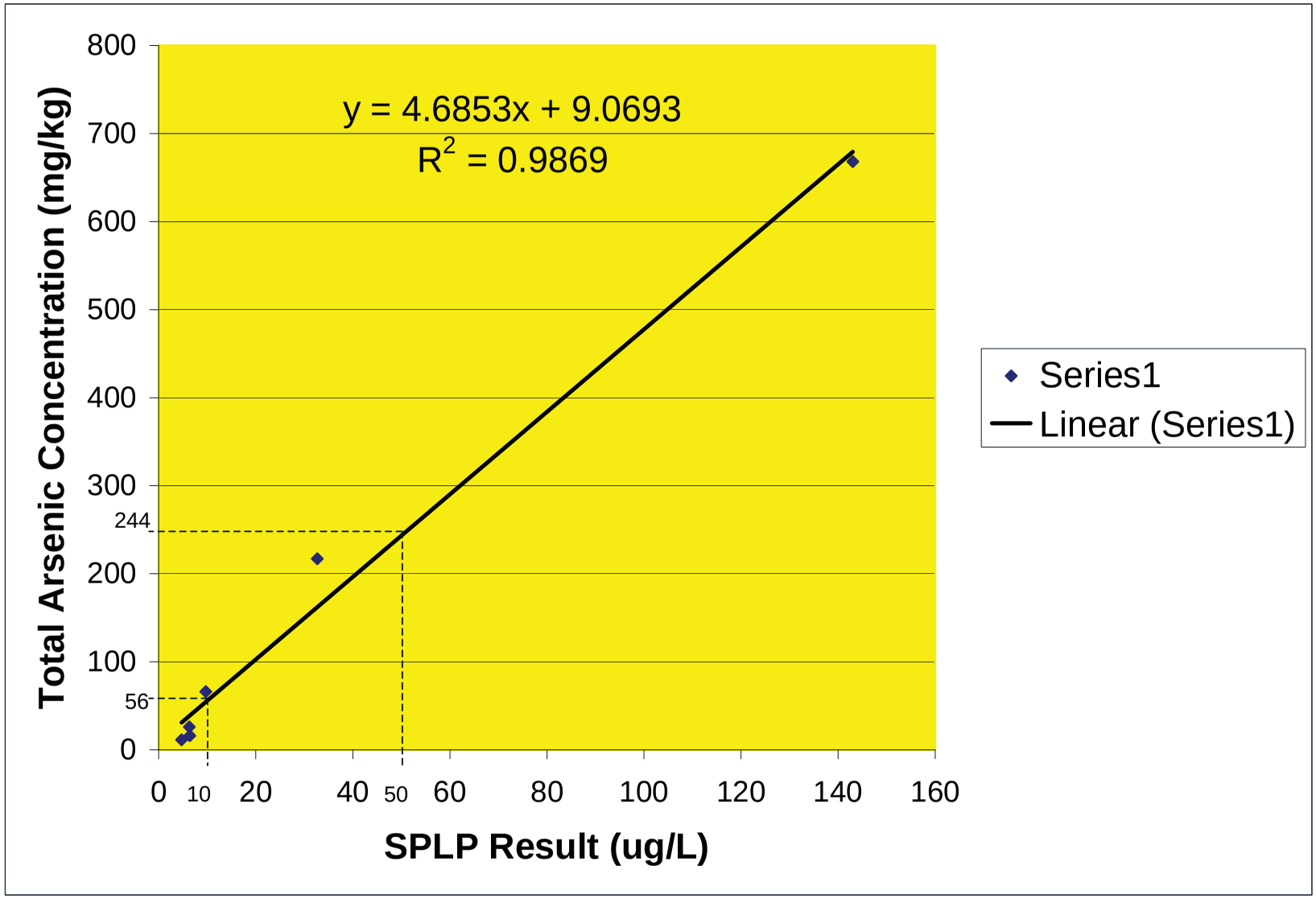
the data set the correlation coefficient drops to 0.36. It is not known why the results of this sample resulted in such an anomalously high leachate concentration (i.e., 871 ug/L). A possible explanation may be that this sample was Manor Glenelg soil, which in general has a higher sand content and thus may leach arsenic more readily. However, the field description did not indicate a particularly sandy specimen and there are not enough samples collected from this soil type to make this determination. As shown in Figure 1-3, the linear regression equation ($y = 4.69X + 9.07$, where y = soil concentration in mg/kg and x = predicted leachate concentration in ug/L) produced by the other six samples results in an estimated leachate concentration of only 104 ug/L from a soil concentration of 498 mg/kg.

5.0.3 Using the linear regression equation from the six samples with high correlation indicates that concentrations in soils up to 244 mg/kg would not result in an exceedance of the MCL of 50 ug/L. Using these data, the highest measured concentration that did not produce an SPLP result that exceeded the MCL was 217 mg/kg.

5.0.4 Figure 1-4 indicates that if the anomalously high SPLP result is used, the response is no longer linear. In this case, the data indicate that the highest arsenic concentration that did not exceed the MCL of 50 ug/L was 217 mg/kg.

5.0.5 One uncertainty to address is the reduction of the MCL in the near future (http://www.epa.gov/epahome/headline_110101.htm). A revised MCL of 10 ug/L was proposed in the Federal Register (66 FR 6975) on January 22, 2001, and subsequently delayed on March 23, 2001 (66 FR 16134). The USEPA announced on October 31, 2001 in a letter to a congressional committee that this change will be made; the effective date for this rule change will not be known until formal notice appears in the Federal Register. Based on this, the data were re-evaluated using the methods discussed above. Using the linear regression equation from the six samples with high correlation results in a calculated soil concentration of 56 mg/kg to reach the MCL of 10 ug/L (Figure 1-3). Using all the data points (non-linear response shown on Figure 1-4), the highest measured concentration that did not produce an SPLP result that exceeded the MCL of 10 ug/L was 66.2 mg/kg.

Figure 1-3
(High SPLP result discarded)



5.0.6 An additional uncertainty involves the qualification of some of the total arsenic data following the validation process. Some data were flagged as estimated (J) either because the reported value was less than the practical quantitation limit or some other minor QC problem was identified. However, 'J' flagged data are still considered usable for most decision-making purposes.

5.0.7 Finally, the recommendations are based on the assumption of removal actions for arsenic contaminated soil (greater than 20 mg/kg). Arsenic in soil greater than 217 mg/kg or 66.2 mg/kg that has been present for many years may require a groundwater investigation to determine whether leaching of arsenic in significant concentrations has occurred.

6.0 CONCLUSION

6.0.1 USEPA Method 1312, SPLP, was used to evaluate the potential for arsenic to leach from soils into ground and surface water. This method is intended to provide a realistic assessment of metal mobility under actual field conditions, (i.e., when it snows or rains). A total of 46 samples (42 original samples and 4 from the CDC) were collected and subjected to the procedure. Of these 46 samples, only seven resulted in detectable concentrations of arsenic in the leachate.

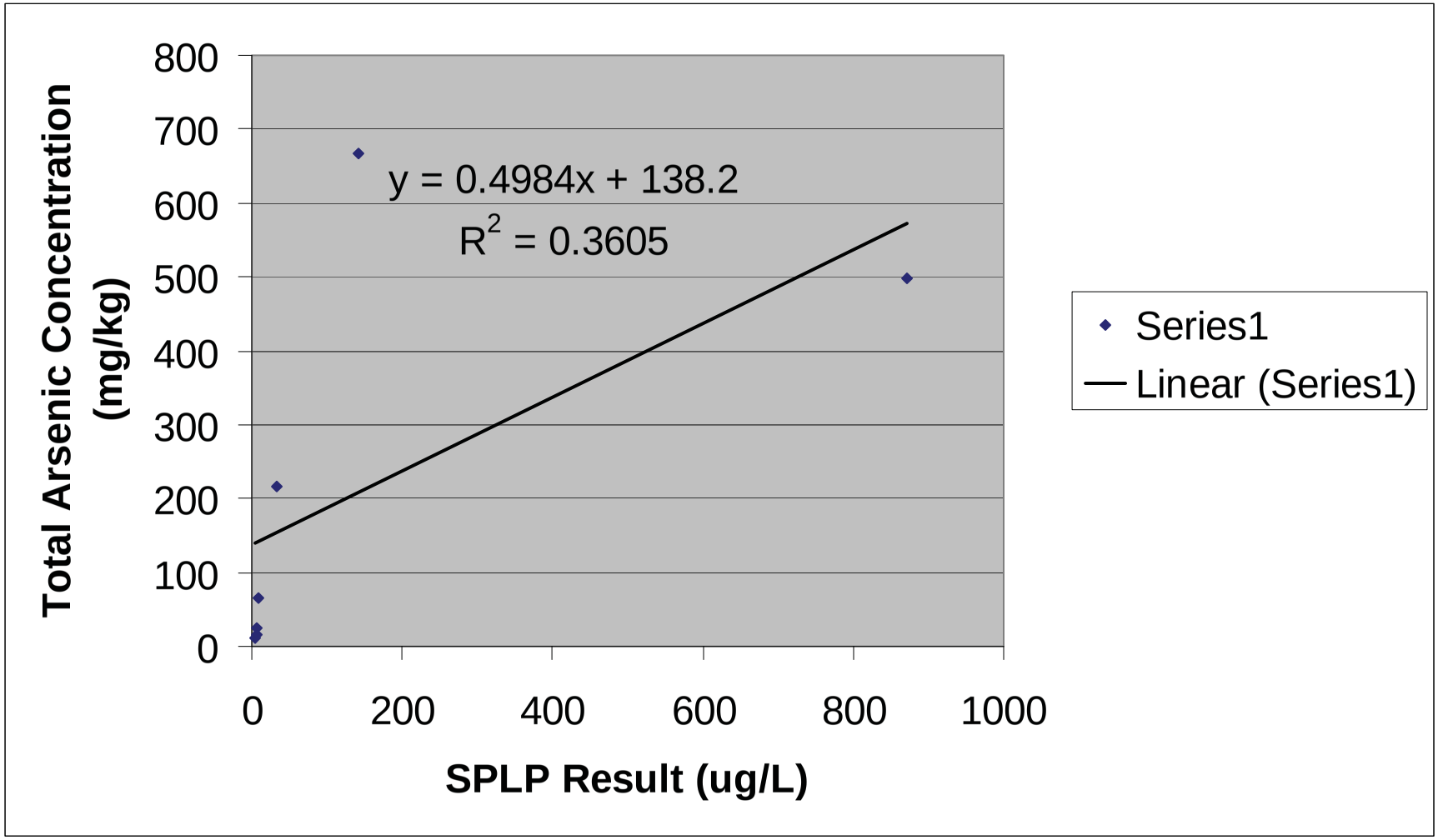
6.0.2 Using all the data points, a soil concentration of 217 mg/kg arsenic was the highest that did not exceed the 50 ug/L MCL. Using all the data points, a soil concentration of 66.2 mg/kg arsenic was the highest that did not exceed the proposed 10 ug/L MCL.

6.0.3 Using the linear regression equation from the six samples with high correlation indicates that concentrations in soils up to 244 mg/kg would not result in an exceedance of the MCL of 50 ug/L. Using the same linear regression equation from the six samples with high correlation, a soil concentration of up to 56 mg/kg would not exceed the proposed MCL of 10 ug/L.

6.0.4 In conclusion, it is recommended that a concentration of 217 mg/kg arsenic in soil be used to screen soil samples for protection of groundwater with an MCL of 50 ug/L. When the MCL is lowered to 10 ug/L, a concentration of 66.2 mg/kg is recommended for screening purposes. These screening concentrations suggest that arsenic leaching to groundwater does not appear to be a significant pathway since the screening concentrations for protection of groundwater are greater than the current screening concentrations proposed for direct contact with soil pathway (i.e., 23.5 mg/kg) or the remediation endpoint developed by the Spring Valley Partners (20 mg/kg). It is further recommended that the screening concentrations be applied to all soil types since the background data (as described in other Spring Valley investigations) indicate little difference between arsenic concentrations among the four soil types.

6.0.5 Please note that the arsenic SPLP findings were not relied upon to make Spring Valley project decisions. Neither the 12.6 ppm arsenic screening level nor the 20 ppm arsenic remediation endpoint was based on the results of this study. Also note that a groundwater investigation will be performed to obtain site-specific data to characterize whether arsenic has leached to the groundwater from site soils.

Figure 1-4
(Using all data points)



7.0 REFERENCES

USEPA, 1996. Soil Screening Guidance: User's Guide, Publication 9355.4-23, Washington, D.C.

USEPA, 1995. Technical Background Document Supporting the Supplemental Proposed Rule Applying Phase IV Land Disposal Restrictions to Newly Identified Mineral Processing Wastes, Washington, DC.

USEPA, 1994. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), Third Edition, Revision 2, Washington, DC.

USACE, 1999. Final Site Safety Submission, Volume I Work Plan, Spring Valley Operable Unit 3, Washington D.C., (SSS) (*Parsons ES, March 1999).*

USACE, 2000. Change 05 to the Site Safety Submission, Revised Sampling and Analysis Plan, 4801 Glenbrook Road, *May 2000*.

USACE, 2000. Work Management Plan (WMP) for OU-4, (*Parsons ES, August 14, 2000,* and Amendment 1 to the WMP *(February 19, 2001).*

REPORT OF ANALYTICAL RESULTS -

American University Experiment Station (AUES)
List Of Chemicals

3819 48th STREET, 4710 QUEBEC STREET, 4625 ROCKWOOD PARKWAY AND 4633 ROCKWOOD PARKWAY

SPRING VALLEY OPERABLE UNIT 4,
WASHINGTON, D.C.

TASK ORDER TO NATIONAL GUARD BUREAU
CONTRACT NO. DAHA90-94-D-0010, TASK ORDER DA01
DERP-FUDS HTRW PROJECT NUMBER C03DC091802

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared By:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

This document was originally published on MAY 8, 2002
but has since been updated with revised RBC data.

REPORT OF ANALYTICAL RESULTS -

American University Experiment Station (AUES)
List Of Chemicals

3819 48th STREET, 4710 QUEBEC STREET
4625 ROCKWOOD PARKWAY AND 4633 ROCKWOOD PARKWAY

SPRING VALLEY OPERABLE UNIT 4,
WASHINGTON, D.C.

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared By:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

This document was originally published on MAY 8, 2002
but has since been updated with revised RBC data.

Overview

In accordance with the *Revised Final Work Management Plan for Follow-on Sampling for OU-4 Residential Lots, Amendment 2 (Parsons, April 2001),* Parsons collected soil samples from four OU-4 residences to assess for the presence of the American University Experiment Station (AUES) list of chemicals. The effort included three AUES List samples each from 4710 Quebec Street, 4625 Rockwood Parkway, and 4633 Rockwood Parkway, and four AUES List samples from 3819 48th Street, for a total of 13 AUES List samples. All samples were analyzed by the Southwest Research Institute (SwRI), with the exception of mustard and adamsite, which were analyzed by the US Army's Edgewood Chemical and Biological Center (ECBC) Laboratory. This submittal is organized as follows:

Figure 1 shows the sample locations and the **Analytical Plan table** shows the number and depths of the samples. The results are compiled on five tables.

Table 1 is the comprehensive list of compounds analyzed. These include the routine Target Compound List and Target Analyte List constituents and the Chemical Warfare Materiel (CWM) compounds and CWM breakdown products that were analyzed to make determinations of whether the AUES List chemicals were present. Therefore, the table contains all compounds analyzed, whether they were actually on the AUES list or not.

Table 1A is the comprehensive list detections. It is a subset of Table 1. These are the compounds shown on Table 1 that were present in concentrations above the detection limit.

Table 2 is the AUES list of compounds. It is also a subset of Table 1, showing the results for those AUES chemicals that could be directly analyzed. Additionally, CWM breakdown products and the indicator compounds used in Table 3, although not actually AUES list compounds, are included. They are indicated on the table as either a 'breakdown product' or 'indicator' compound.

Table 2A is the AUES list detections. It is a subset of Table 2. These are the compounds shown on Table 2 that were present in concentrations above the detection limit. Additionally, CWM breakdown products and the indicator compounds, although not actually AUES list compounds, are included.

Table 3 is the AUES list scan results. These are the AUES chemicals that did not have routine analytical methodologies. The presence or absence of these chemicals was inferred by the presence or absence of indicator compounds for each AUES chemical.

RBC Key contains the rationale for the RBCs shown for those chemicals that did not have RBCs.

Attachment A contains the Quality Assurance or Data Validation Report of the sampling effort.

Attachment B contains the AUES Chemicals list and the organization of the analytical effort, i.e., which compounds could be analyzed and by what methods (presented at the end of the Sedgwick Trench section).

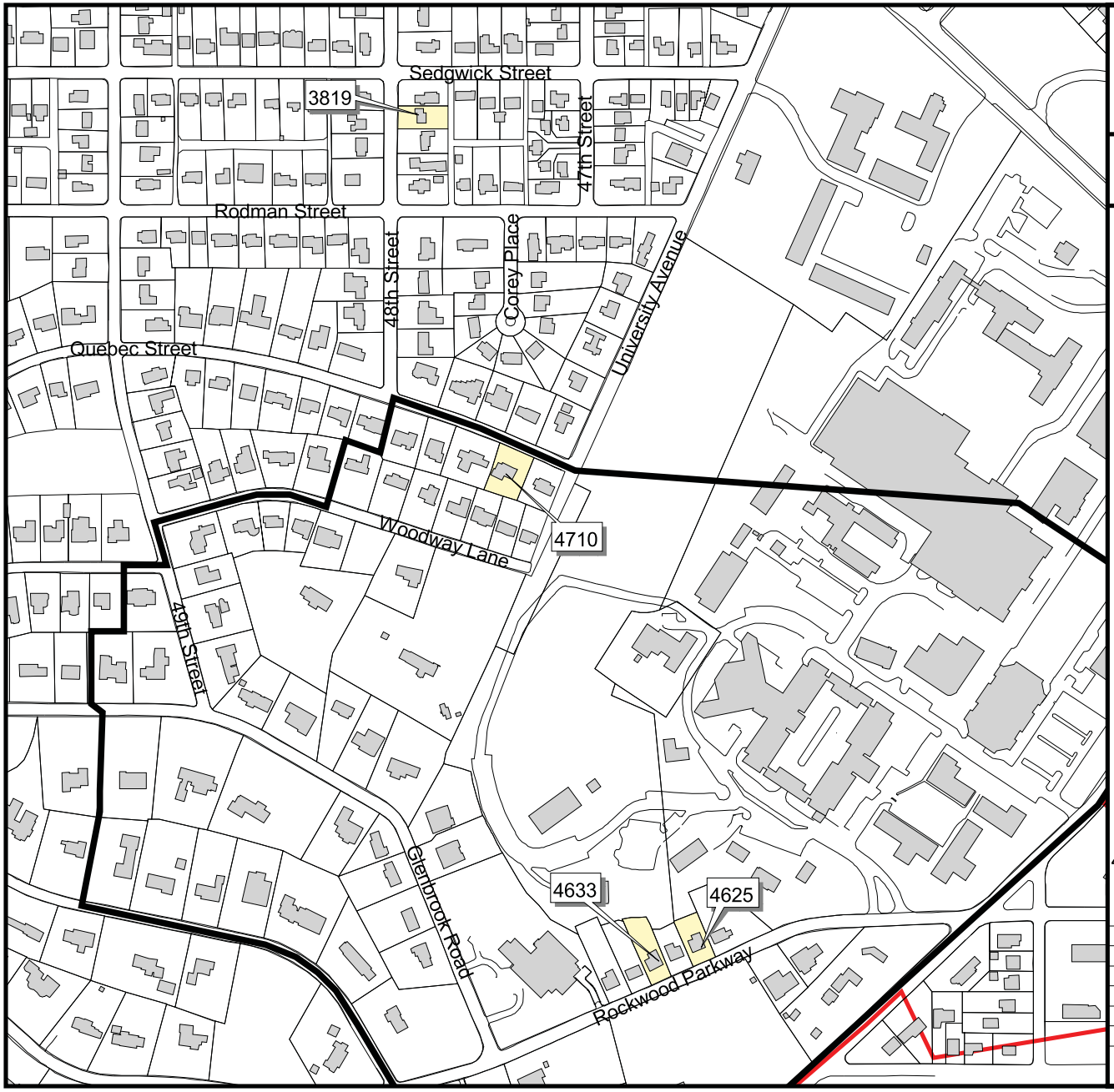


Figure 1
AUES List of Chemicals Sample Locations

Spring Valley Operable Unit 5
Washington D.C.

Legend

- Operable Unit 4
- Roads
- Buildings
- Parcels
- AUES Sample Locations
- SV Boundary

N
W E
S

400 0 400 Feet

1 inch = 400 feet

Scale:	1 : 4800
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.apr
Date:	02/12/2002
Figure Number:	1
Page Number:	X-X

PARSONS

Spring Valley OU-4
Selected OU-4 Residences
AUES List Analytical Plan

	Location	Depth (inches)	No. of Sx Collected	TAL Metals	TCL VOCs	TCL SVOCs	CWM/ ABPs	AUES List
Property								
3819 48th Street	\a	9-15	4	X	X	X	X	X
4710 Quebec Street	\b	0-6	3	X	X	X	X	X
4625 Rockwood Parkway	\c	0-6	3	X	X	X	X	X
4633 Rockwood Parkway	\d	0-6*	3	X	X	X	X	X
Totals	13		13	13	13	13	13	13

\a one sample in each of four quadrants.
\b one sample each in quadrants 1, 3, and 4.
\c two samples in quadrant 3, one in quadrant 4.
\d one sample each in quadrant 1, 2, and at the original boring location.
* 4633RP-SB was 0-12"

Notes:

CWM/ABPs = Includes Adamsite, and Mustard and Lewisite Agent Breakdown Products (the two Rockwood Parkway properties did not get Mustard analysis).

Table 1

Comprehensive Sample Results for Selected OU-4 Residences

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)[1]																
Volatile Organic Compounds - SW8260B (UG/KG)																	
1,1,1-TRICHLOROETHANE	2,200,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,1,2,2,-TETRACHLOROETHANE	3,200	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	230,000,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,1,2-TRICHLOROETHANE	11,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,1-DICHLOROETHANE	780,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,1-DICHLOROETHENE	390,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,2,4-TRICHLOROBENZENE	78,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,2-DIBROMO-3-CHLOROPROPANE	460	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,2-DIBROMOETHANE	7.5	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,2-DICHLOROBENZENE	700,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,2-DICHLOROETHANE	7,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,2-DICHLOROPROPANE	9,400	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,3-DICHLOROBENZENE	230,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
1,4-DICHLOROBENZENE	27,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		4		4		4		3		8		6		6	
2-HEXANONE	310,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
ACETONE	780,000	N		27	J	27	J	28	J	27		56	J	39	J	57	J
ACETONITRILE	NA			5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
ACROLEIN	160,000	N		5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
BENZENE	12,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
BENZYL BROMIDE	NA			5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
BENZYL CHLORIDE	3,800	C		5	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
BROMODICHLOROMETHANE	10,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
BROMOFORM	81,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
BROMOMETHANE	11,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CARBON DISULFIDE	780,000	N		11		11		38	J	11		11		8		26	
CARBON TETRACHLORIDE	4,900	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROBENZENE	160,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROETHANE	220,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROFORM	78,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROMETHANE	NA			1	J	1	J	1	J	2		2		2		1	
CHLOROPICRIN	NA			27	U	27	U	28	U	25	U	25	U	24	U	26	U
CIS-1,2-DICHLOROETHENE	78,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CIS-1,3-DICHLOROPROPENE	6,400 ‡	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CYCLOHEXANE	470,000 ‡	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
DIBROMOCHLOROMETHANE	7,600	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
DICHLORODIFLUOROMETHANE	1,600,000	N		67	J	67	J	160	J	1	U	1	U	130	J	99	J
ETHYLBENZENE	780,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
ISOPROPYLBENZENE (CUMENE)	780,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
M&P-XYLENE	1,600,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
METHYL ACETATE	7,800,000	N		1.1	U	1.1	U	1.1	U	1	U	3		0.97	U	2	
METHYL TERT-BUTYL ETHER	160,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
METHYLCYCLOHEXANE	470,000 ‡	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
METHYLENE CHLORIDE	85,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
O-XYLENE	1,600,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
STYRENE	1,600,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[12]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)[11]																
TETRACHLOROETHENE	32,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
TOLUENE	1,600,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
TRANS-1,2-DICHLOROETHENE	160,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
TRANS-1,3-DICHLOROPROPENE	6,400 ‡	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
TRICHLOROETHENE	1,600	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
TRICHLOROFLUOROMETHANE	2,300,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
VINYL CHLORIDE	90	C		1.1	UJ	1.1	UJ	1.1	UJ	1	UJ	1	UJ	0.97	UJ	1	UJ
VOC Tentatively Identified Compounds (UG/KG)																	
1-HEXENE, 4-METHYL	NA				*		*		*		*		*		*		*
1-OCTANOL, 2,7-DIMETHYL-	NA				*		*		*		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)	NA				*		*		*		*		*		*	3	NJ
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)	NA				*		*	6	NJ	2	NJ	10	NJ	10	NJ	6	NJ
2-BUTENE, (Z)-	NA				*		*		*		*		*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)	NA				*		*		*		*		*		*		*
2-HEXENE, (Z)-	NA				*		*		*		*		*		*		*
2-OCTENE, (E)-	NA			50	NJ	30	NJ	60	NJ	20	NJ	20	NJ	10	NJ	10	NJ
ACETALDEHYDE (CAS# 75-07-0)	NA			10	NJ	5	NJ	6	NJ	4	NJ	20	NJ	10	NJ	7	NJ
ALCOHOL	NA				*		*		*		*		*		*		*
ALLYL ALCOHOL	NA				*		*		*		*		*		*		*
BENZALDEHYDE (CAS# 100-52-7)	780,000	N			*		*		*		*		*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N			*		*		*		*		*		*		*
BENZENE, 1-METHYL-3-(1-METHYL	NA				*		*		*		*		*		*		*
BENZYL IODIDE	NA				*		*		*		*		*		*		*
BICYCLO 2.2.1 HEPTANE, 7,7-D	NA				*	6	NJ		*		*		*		*		*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL	NA				*	10	NJ		*		*		*		*		*
BROMOACETONE	780,000 ‡	N			*		*		*		*		*		*		*
BROMOBENZENE	NA				*		*		*		*		*		*		*
BROMOMETHYL ETHER	NA				*		*		*		*		*		*		*
BUTANAL (CAS# 123-72-8)	NA				*		*		*		*		*		*		*
BUTANE	NA				*		*		*		*		*		*		*
BUTYL MERCAPTAN	NA				*		*		*		*		*		*		*
CARBON OXIDE SULFIDE (Carbonyl Sulfide, CAS# 463-58-1)	NA			8	NJ		*	6	NJ		*	10	NJ	8	NJ		*
CHLORINATED ACETONE	NA				*		*		*		*		*		*		*
CHLORINATED CARBON DISULFIDE	780,000 ‡	N			*		*		*		*		*		*		*
CHLOROACETONE	780,000 ‡	N			*		*		*		*		*		*		*
CHLOROACETONITRILE	NA				*		*		*		*		*		*		*
CHLOROMETHYL ETHER	NA				*		*		*		*		*		*		*
CHLOROMETHYL ETHYL ETHER	NA				*		*		*		*		*		*		*
CROTONALDEHYDE	340	C			*		*		*		*		*		*		*
CYCLOHEXENE, 1-METHYL-4-(1-METHYLTHENYL)-,®	NA				*		*		*		*		*		*		*
CYCLOPROPANE, 1,2-DIMETHYL-, TRANS	NA				*		*		*		*		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA				*	10	NJ		*	4	NJ	10	NJ	10	NJ	3	NJ
DODECANAL	NA				*		*		*		*		*		*		*
ETHANETHIOL	NA				*		*		*		*		*		*		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA				*		*		*		*		*		*		*
ETHYL BROMOACETATE	7,000,000 ‡	N			*		*		*		*		*		*		*
ETHYL CHLOROFORMATE	NA				*		*		*		*		*		*		*
ETHYL DIBROMOACETATE	7,000,000 ‡	N			*		*		*		*		*		*		*
ETHYL MERCAPTAN	NA				*		*		*		*		*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA			10	NJ	6	NJ	10	NJ	6	NJ		*		*		*
HEXANAL (CAS# 66-25-1)	NA			40	NJ	10	NJ	10	NJ	10	NJ	100	NJ	40	NJ	60	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA				*		*	5	NJ		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[12]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)[11]																
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA			7	NJ	*		*		3	NJ	10	NJ	6	NJ	3	NJ
HEXANE (CAS# 110543)	470,000	N		*		*		*		*		*		*		*	
METHYL BROMOACETATE	NA			*		*		*		*		*		*		*	
METHYL CHLOROACETATE	NA			*		*		*		*		*		*		*	
METHYL CHLOROFORMATE	NA			*		*		*		*		*		*		*	
METHYL CHLOROSULFONATE	NA			*		*		*		*		*		*		*	
NONANAL	NA			*		*		*		*		10	NJ			*	
OCTANAL (CAS# 124-13-0)	NA			8	NJ	*		*		4	NJ	20	NJ	6	NJ	4	NJ
OCTANE (CAS# 111-65-9)	NA			20	NJ	9	NJ	20	NJ	8	NJ	*		*		*	
PENTANAL ISOMER 1	NA			10	NJ	4	NJ	4	NJ	3	NJ	30	NJ	10	NJ	9	NJ
PENTANAL ISOMER 2	NA			*		*		*		*		*		6	NJ	*	
PENTANE (CAS# 109-66-0)	NA			*		*		*		*		*		*		*	
PERCHLOROMETHYLMERCAPTAN	NA			*		*		*		*		*		*		*	
PROPANAL, 2-METHYL-	NA			*		*		*		*		*		*		*	
PROPANE, 1,1-OXYBIS-'	NA			*		*		*		*		*		*		*	
THIOPHENE	NA			*		*		*		*		*		*		*	
TRICHLOROACETONITRILE	NA			*		*		*		*		*		*		*	
Semivolatile Organic Compounds - SW8270C (UG/KG)																	
1,2,4-TRICHLOROBENZENE	78,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
1,2-DICHLOROBENZENE	700,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
1,3-DICHLOROBENZENE	230,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
1,4-DICHLOROBENZENE	27,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2,4,5-TRICHLOROPHENOL	780,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2,4,6-TRICHLOROPHENOL	58,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2,4-DICHLOROPHENOL	23,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2,4-DIMETHYLPHENOL	160,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2,4-DINITROPHENOL	16,000	N		240	U	230	U	250	U	240	U	240	U	240	U	250	U
2,4-DINITROTOLUENE	16,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2,6-DINITROTOLUENE	7,800	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2-CHLOROPHENOL	39,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2-METHYLPHENOL	390,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
2-NITROANILINE	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
2-NITROPHENOL	63,000 ‡	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
3,3-DICHLOROBENZIDINE'	1,400	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
3-NITROANILINE (CAS# 99092)	2,300	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
4,6-DINITRO-2-METHYLPHENOL	780	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-BROMOPHENYL-PHENYLETHER	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-CHLORO-3-METHYLPHENOL	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-CHLOROANILINE	31,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-CHLOROPHENYL-PHENYLETHER	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-METHYLPHENOL	39,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-NITROANILINE	32,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-NITROPHENOL	63,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
ACENAPHTHENE	470,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
ACENAPHTHYLENE	470,000 ‡	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
ANTHRACENE	2,300,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
BENZO[A]ANTHRACENE	870	C		82	U	78	U	83	U	81	U	81	U	62	J	12	J

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[12]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)[11]																
BENZO[A]PYRENE	87	C		82	U	78	U	83	U	81	U	81	U	28	J	84	U
BENZO[B]FLUORANTHENE	870	C		82	U	78	U	83	U	81	U	81	U	67	J	15	J
BENZO[G,H,I]PERYLENE	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
BENZO[K]FLUORANTHENE	8,700	C		82	U	78	U	83	U	81	U	81	U	20	J	84	U
BENZOIC ACID	31,000,000	N		240	U	230	U	250	U	240	U	20	J	25	J	22	J
BENZYL ALCOHOL	2,300,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
BIS(2-CHLOROETHOXY)METHANE	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
BIS(2-CHLOROISOPROPYL)ETHER	9,100	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		82	U	21	B	13	B	81	U	18	J	12	J	14	J
BUTYLBENZYLPHTHALATE	1,600,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
CARBAZOLE	32,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
CHRYSENE	87,000	C		82	U	78	U	83	U	81	U	81	U	30	J	84	U
DIBENZ[A,H]ANTHRACENE	87	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
DIBENZOFURAN	16,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
DIETHYLPHTHALATE	6,300,000	N		82	U	78	U	250	B	81	U	18	J	21	J	14	J
DIMETHYLPHTHALATE	78,000,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
DI-N-BUTYLPHTHALATE	780,000 ‡	N		25	B	23	B	26	B	29	B	33	B	24	B	32	B
DI-N-OCTYLPHTHALATE	160,000 ‡	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
FLUORANTHENE	310,000	N		82	U	78	U	83	U	81	U	12	J	67	J	17	J
FLUORENE	310,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
HEXACHLOROBENZENE	400	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
HEXACHLOROBUTADIENE	8,200	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
HEXACHLOROCYCLOPENTADIENE	47,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
HEXACHLOROETHANE	46,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
INDENO[1,2,3-CD]PYRENE	870	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
ISOPHORONE	670,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
NAPHTHALENE	160,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
NITROBENZENE	3,900	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
N-NITROSO-DI-N-PROPYLAMINE	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
N-NITROSODIPHENYLAMINE	130,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
O-CHLORONITROBENZENE	26,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
PENTACHLOROPHENOL	5,300	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENANTHRENE	NA			82	U	78	U	83	U	81	U	81	U	18	J	84	U
PHENOL	2,300,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENYL HYDRAZINE	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENYL ISOCYANATE	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENYL ISOTHIOCYANATE	NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
PYRENE	230,000	N		82	U	78	U	83	U	81	U	11	J	56	J	14	J
SVOC Tentatively Identified Compounds (UG/KG)																	
.ALPHA.-LINDANE (CAS# 319846)	100 ‡	C			*		*		*		*		*	180	NJ		*
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA				*		*		*		*		*		*	130	NJ
13-OCTADECENAL	NA				*		*		*		*	1700	NJ		*		*
14-OCTADECENAL	NA				*	180	NJ		*		*		*		*		*
1-EICOSANOL	NA				*	190	NJ		*		*		*		*		*
1-OCTADECANOL	NA				*		*		*		*		*		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N		130	NJ	280	NJ		*		*		*		*		*
5-EICOSENE, (E)-	NA				*		*		*		*		*		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA				*		*		*		*		*		*	97	NJ

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[12]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)[11]																
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA				*		*		*		*	440	NJ		*	140	NJ
BENZENEETANOL, 4-HYDROXY-	NA				*		*		*		*		*		*		*
BENZOTRICHLORIDE	NA				*		*		*		*		*		*		*
BENZYL FLUORIDE	NA				*		*		*		*		*		*		*
CARBOXYLIC ACID ESTER	NA				*		*		*		*		*		*		*
DIPHENYLCHLOROARSINE	NA				*		*		*		*		*		*		*
DOCOSANE	NA				*		*		*		*		*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N			*		*		*		*	240	NJ	240	NJ	220	NJ
HEPTADECANE	NA				*		*		*		*		*		*		*
HEPTADECANE, 9-OCTYL-	NA				*		*		*		*		*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)	NA			110	NJ		*		*		*	670	NJ	140	NJ	160	NJ
NONACOSANE (CAS# 630-03-5)	NA				*		*		*		*		*	1000	NJ	1000	NJ
NONADECANE	NA				*		*		*		*		*		*		*
OCTACOSANE	NA				*		*		*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)	NA			260	NJ		*		*		*	4200	NJ	260	NJ	250	NJ
o-TOLYL ISOCYANIDE	NA				*		*		*		*		*		*		*
PENTADECANE, 8-HEXYL-	NA				*		*		*		*		*	590	NJ		*
PHENANTHRENE,9-METHYL-	NA				*		*		*		*		*		*		*
PHENYL ISOCYANIDE	NA				*		*		*		*		*		*		*
PHENYLDICHLOROARSINE	NA				*		*		*		*		*		*		*
TRICOSANE	NA				*		*		*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)																	
ALUMINUM	7,800	N	**25,798**	24800		27300		36300		26000		18400		21400		29700	
ANTIMONY	**3.1**	N	0.92	0.96	UL	1.1	UL	1.1	UL	1.1	UL	1.1	UL	1.1	UL	1.1	UL
ARSENIC	0.43	C	**12.64**	1.5		1.7		1.4		2.2		36.1		14		12	
BARIUM	**550**	N	298.28	121		156		168		124		69		98		168	
BERYLLIUM	**16**	N	2.35	1.8		1.9		2.4		2.1		1.2		1.6		1.9	
CADMIUM	**7.8**	N	0.32	0.48	U	0.56	U	0.57	U	0.55	U	0.56	U	0.56	U	0.54	U
CALCIUM	NA		**4,207**	707		705		1010		737		868		951		1320	
CHROMIUM	**12,000** ‡	N	97.20	45.6		53.7		192		80.4		46.5		53.3		62.5	
COBALT	**160**	N	22.26	19.5		22.1		27.9		27.6		14.2		21.1		25.7	
COPPER	**310**	N	47.76	28.3		48.7		36.9		48.7		35.4		61.9		116	
IRON	2,300	N	**31,951**	32300		36500		43900		38600		26400		28300		36600	
LEAD	**400** ‡		329.76	13.6		21.5		16.4		15.9		24.6		26.6		24.5	
MAGNESIUM	NA		**7,093**	11700	L	14000	L	22300	L	11700	L	8180	L	10100	L	13100	L
MANGANESE	160	N	**1,251**	401	J	366	J	840	J	516	J	344	J	726	J	512	J
MERCURY (by CVAA)	NA		**0.29**	0.11	U	0.11	U	0.11	U	0.1	U	0.35		0.26		0.29	
NICKEL	**160**	N	40.12	53.3		43.1		87.2		53.6		32.7		41.9		43.9	
PHOSPHORUS	NA		NA	221	J	239	J	296	J	280	J	333	J	357	J	420	J
POTASSIUM	NA		**4,945**	8530	L	12500	L	13900	L	9190	L	5400	L	6650	L	9580	L
SELENIUM	**39**	N	0.88	0.48	UJ	0.56	UJ	0.72	J	0.55	UJ	0.56	UJ	0.58	J	0.54	UJ
SILICON	NA		NA	1510	J	1380	J	1580	J	1300	J	2080	J	2590	J	2300	J
SILVER	**39**	N	0.74	0.48	U	0.56	U	0.57	U	0.55	U	0.56	U	0.56	U	0.54	U
SODIUM	NA		**55.80**	130		134		157		92.6		68		139		112	
STRONTIUM	**4,700**	N	NA	7.5		9.7		7.4		6		5.1		6.8		8.2	
SULFUR	NA		NA	75.8		76.7		103		101		106		81.7		99.4	
THALLIUM	0.55	N	**1.36**	0.96	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.6	
TIN	**4,700**	N	NA	1.9	U	2.4		2.3	U	2.2	U	2.3	U	2.2	U	3.1	
TITANIUM	**31,000**	N	NA	1420		1900		2320		1730		991		1010		1440	
VANADIUM	55	N	**66.76**	62.2		81		108		91.3		47.9		56.9		103	
ZINC	**2,300**	N	308.8	135		114		140		109		73.5		89.9		103	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[\2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)[\1]																
IC Scan - EPA 300M (MG/KG)																	
BROMIDE	NA			1.22	U	1.17	U	1.25	U	1.22	U	1.2	U	1.18	U	1.26	U
CHLORIDE	NA			17.7		4.07		3.88		2.58		4.24		70.1		23.5	
FLUORIDE	NA			1.58		1.17	U	1.25	U	1.22	U	3.55	L	3.91	L	6.66	L
NITRATE-N	13,000	N		1.22	U	1.17	U	1.25	U	1.22	U	2.68		1.18	U	4.06	
NITRITE-N	780	N		1.22	U	1.17	U	1.25	U	1.22	U	1.2	U	1.18	U	1.26	U
PHOSPHATE-P	NA			1.22	U	1.17	U	1.25	U	1.22	U	1.2	UL	1.18	UL	1.26	UL
SULFATE	NA			83.6		46.7		62		58.9		14.7		27.2		19	
Mustard and Mustard Breakdown Products (UG/KG)																	
MUSTARD	10	\3,C		8	U	8	U	8	U	8	U	8	U	8	U	8	U
1,4-OXATHIANE	78,000	\3,N		81	U	82	U	80	U	83	U	78	U	80	U	81	U
1,4-DITHIANE	78,000	N		79	U	79	U	77	U	80	U	76	U	77	U	79	U
THIODIGLYCOL	39,100	\3,N		1056	U	1001	U	1069	U	1039	U	257	J	411	J	1088	U
Lewisite Breakdown Products (UG/KG)																	
TOTAL CVAA & CVAO	890	\3,C		10	U	9	U	10	U	10	U	10	U	10	U	10	U
Other Parameters (MG/KG unless otherwise indicated)																	
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	180	U	180	U	180	U	180	U	180	U	180	U
ADAMSITE**	NA				**		**		**		**	7.7	U		**		**
AMMONIA-N	NA			1.2	U	1.15	U	1.23	U	1.22	U	1.2	U	1.19	U	1.27	U
CYANIDE	160 [‡]	N		0.61	U	0.54	U	0.6	U	0.59	U	0.61	U	0.59	U	0.64	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation. For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:	Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:	(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
Volatile Organic Compounds - SW8260B (UG/KG)															
1,1,1-TRICHLOROETHANE	2,200,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
1,1,2,2,-TETRACHLOROETHANE	3,200	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	230,000,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
1,1,2-TRICHLOROETHANE	11,000	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
1,1-DICHLOROETHANE	780,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
1,1-DICHLOROETHENE	390,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
1,2,4-TRICHLOROBENZENE	78,000	N		0.97	U	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	1.1	UJ
1,2-DIBROMO-3-CHLOROPROPANE	460	C		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	1.1	UJ
1,2-DIBROMOETHANE	7.5	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
1,2-DICHLOROBENZENE	700,000	N		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	1.1	UJ
1,2-DICHLOROETHANE	7,000	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
1,2-DICHLOROPROPANE	9,400	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
1,3-DICHLOROBENZENE	230,000	N		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	1.1	UJ
1,4-DICHLOROBENZENE	27,000	C		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	2	J
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		16		22		25		25		30		9	
2-HEXANONE	310,000	N		1		1.5	U	1.3	U	1		1.4	U	1.1	UJ
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
ACETONE	780,000	N		47	B	120	J	120	J	70	B	62	B	57	J
ACETONITRILE	NA			4.8	U	7.4	U	6.5	U	5	U	7	U	5.5	U
ACROLEIN	160,000	N		4.8	U	16		10		5	U	7	U	7	
BENZENE	12,000	C		4		1.5	U	1.3	U	1	U	1.4	U	1.1	U
BENZYL BROMIDE	NA			4.8	U	7.4	U	6.5	U	16		7	U	5.5	U
BENZYL CHLORIDE	3,800	C		4.8	UJ	7.4	UJ	6.5	UJ	5	UJ	7	UJ	5.5	UJ
BROMODICHLOROMETHANE	10,000	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
BROMOFORM	81,000	C		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	1.1	UJ
BROMOMETHANE	11,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
CARBON DISULFIDE	780,000	N		170	J	8		8		15		8		10	
CARBON TETRACHLORIDE	4,900	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
CHLOROBENZENE	160,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
CHLOROETHANE	220,000	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
CHLOROFORM	78,000	N		0.97	U	1.5	U	1	J	1	U	1.4	U	1.1	U
CHLOROMETHANE	NA			0.97	U	3		3		7		1.4	U	3	
CHLOROPICRIN	NA			24	U	37	U	32	U	25	U	25	U	27	U
CIS-1,2-DICHLOROETHENE	78,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
CIS-1,3-DICHLOROPROPENE	6,400 ‡	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
CYCLOHEXANE	470,000 ‡	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
DIBROMOCHLOROMETHANE	7,600	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
DICHLORODIFLUOROMETHANE	1,600,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
ETHYLBENZENE	780,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
ISOPROPYLBENZENE (CUMENE)	780,000	N		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	1.1	UJ
M&P-XYLENE	1,600,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
METHYL ACETATE	7,800,000	N		15		20		11		11		1.4	U	2	
METHYL TERT-BUTYL ETHER	160,000	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
METHYLCYCLOHEXANE	470,000 ‡	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
METHYLENE CHLORIDE	85,000	C		24		1.5	U	1.3	U	1	U	1.4	U	1.1	U
O-XYLENE	1,600,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
STYRENE	1,600,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
TETRACHLOROETHENE		32,000	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
TOLUENE		1,600,000	N		3		1.5	U	1	J	2		1.4	U	8	J
TRANS-1,2-DICHLOROETHENE		160,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
TRANS-1,3-DICHLOROPROPENE		6,400 ‡	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
TRICHLOROETHENE		1,600	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
TRICHLOROFLUOROMETHANE		2,300,000	N		9		1.5	U	1.3	U	1	U	1.4	U	1.1	U
VINYL CHLORIDE		90	C		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	1.1	UJ
VOC Tentatively Identified Compounds (UG/KG)																
1-HEXENE, 4-METHYL		NA			10	NJ		*		*		*		*		*
1-OCTANOL, 2,7-DIMETHYL-		NA				*	10	NJ		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA				*		*		*		*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA				*	40	NJ	20	NJ	4	NJ		*		*
2-BUTENE, (Z)-		NA				*		*		*		*	3	NJ		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA				*		*	10	NJ		*		*		*
2-HEXENE, (Z)-		NA			10	NJ		*		*		*		*		*
2-OCTENE, (E)-		NA			50	NJ		*	7	NJ	10	NJ	60	NJ	10	NJ
ACETALDEHYDE (CAS# 75-07-0)		NA			10	NJ	30	NJ	40	NJ	20	NJ		*		*
ALCOHOL		NA				*		*		*		*		*		*
ALLYL ALCOHOL		NA				*		*		*		*		*		*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N		10	NJ		*		*	10	NJ	5	NJ		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N			*		*		*	5	NJ		*		*
BENZENE, 1-METHYL-3-(1-METHYL		NA				*		*		*		*		*	30	NJ
BENZYL IODIDE		NA				*		*		*		*		*		*
BICYCLO 2.2.1 HEPTANE, 7,7-D		NA				*		*		*		*		*	50	NJ
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL		NA				*		*		*		*		*	80	NJ
BROMOACETONE		780,000 ‡	N			*		*		*		*		*		*
BROMOBENZENE		NA				*		*		*		*		*		*
BROMOMETHYL ETHER		NA				*		*		*		*		*		*
BUTANAL (CAS# 123-72-8)		NA				*	9	NJ		*	5	NJ		*		*
BUTANE		NA				*		*		*		*	1	NJ		*
BUTYL MERCAPTAN		NA				*		*		*		*		*		*
CARBON OXIDE SULFIDE (Carbonyl Sulfide, CAS# 463-58-1)		NA				*		*		*		*		*		*
CHLORINATED ACETONE		NA				*		*		*		*		*		*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*		*		*		*		*		*
CHLOROACETONE		780,000 ‡	N			*		*		*		*		*		*
CHLOROACETONITRILE		NA				*		*		*		*		*		*
CHLOROMETHYL ETHER		NA				*		*		*		*		*		*
CHLOROMETHYL ETHYL ETHER		NA				*		*		*		*		*		*
CROTONALDEHYDE		340	C			*		*		*		*		*		*
CYCLOHEXENE, 1-METHYL-4-(1-METHYLTHENYL)-,®-		NA				*		*		*		*		*	10	NJ
CYCLOPROPANE, 1,2-DIMETHYL-, TRANS		NA			10	NJ		*		*		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA				*		*	3	NJ		*		*		*
DODECANAL		NA				*		*	7	NJ		*		*		*
ETHANETHIOL		NA				*		*		*		*	10	NJ		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA			20	NJ		*		*		*		*		*
ETHYL BROMOACETATE		7,000,000 ‡	N			*		*		*		*		*		*
ETHYL CHLOROFORMATE		NA				*		*		*		*		*		*
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*		*		*		*		*		*
ETHYL MERCAPTAN		NA				*		*		*		*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA				*		*		*		*	10	NJ		*
HEXANAL (CAS# 66-25-1)		NA			30	NJ	100	NJ	40	NJ	60	NJ		*	100	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA				*		*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA				*	10	NJ		*		*		*		*
HEXANE (CAS# 110543)		470,000	N			*		*		*		*	4	NJ		*
METHYL BROMOACETATE		NA				*		*		*		*		*		*
METHYL CHLOROACETATE		NA				*		*		*		*		*		*
METHYL CHLOROFORMATE		NA				*		*		*		*		*		*
METHYL CHLOROSULFONATE		NA				*		*		*		*		*		*
NONANAL		NA				*	10	NJ		*		*		*		*
OCTANAL (CAS# 124-13-0)		NA				*	20	NJ	10	NJ		*		*	10	NJ
OCTANE (CAS# 111-65-9)		NA				*		*		*		*	10	NJ		*
PENTANAL ISOMER 1		NA				*	20	NJ		*	8	NJ		*	20	NJ
PENTANAL ISOMER 2		NA				*		*		*		*		*		*
PENTANE (CAS# 109-66-0)		NA				*	20	NJ	8	NJ	9	NJ	5	NJ	20	NJ
PERCHLOROMETHYLMERCAPTAN		NA				*		*		*		*		*		*
PROPANAL, 2-METHYL-		NA				*		*	8	NJ		*		*		*
PROPANE, 1,1-OXYBIS-'		NA			10	NJ		*		*		*		*		*
THIOPHENE		NA				*		*		*		*		*		*
TRICHLOROACETONITRILE		NA				*		*		*		*		*		*
Semivolatile Organic Compounds - SW8270C (UG/KG)																
1,2,4-TRICHLOROBENZENE		78,000	N		76	U	93	U	86	U	88	U	90	U	86	U
1,2-DICHLOROBENZENE		700,000	N		76	U	93	U	86	U	88	U	90	U	86	U
1,3-DICHLOROBENZENE		230,000	N		76	U	93	U	86	U	88	U	90	U	86	U
1,4-DICHLOROBENZENE		27,000	C		76	U	93	U	86	U	88	U	90	U	86	U
2,4,5-TRICHLOROPHENOL		780,000	N		76	U	93	U	86	U	88	U	90	U	86	U
2,4,6-TRICHLOROPHENOL		58,000	C		76	U	93	U	86	U	88	U	90	U	86	U
2,4-DICHLOROPHENOL		23,000	N		76	U	93	U	86	U	88	U	90	U	86	U
2,4-DIMETHYLPHENOL		160,000	N		76	U	93	U	86	U	88	U	90	U	86	U
2,4-DINITROPHENOL		16,000	N		230	U	280	U	260	U	260	U	270	U	260	U
2,4-DINITROTOLUENE		16,000	N		76	U	93	U	86	U	88	U	90	U	86	U
2,6-DINITROTOLUENE		7,800	N		76	U	93	U	86	U	88	U	90	U	86	U
2-CHLORONAPHTHALENE (CAS# 91587)		630,000 ‡	N		76	U	93	U	86	U	88	U	90	U	86	U
2-CHLOROPHENOL		39,000	N		76	U	93	U	86	U	88	U	90	U	86	U
2-METHYLNAPHTHALENE (CAS# 91576)		160,000	N		76	U	18	J	14	J	88	U	90	U	86	U
2-METHYLPHENOL		390,000	N		76	U	93	U	86	U	88	U	90	U	86	U
2-NITROANILINE		NA			76	U	93	U	86	U	88	U	90	U	86	U
2-NITROPHENOL		63,000 ‡	N		76	U	93	U	86	U	88	U	90	U	86	U
3,3-DICHLOROBENZIDINE'		1,400	C		76	U	93	U	86	U	88	U	90	U	86	U
3-NITROANILINE (CAS# 99092)		2,300	N		76	U	93	U	86	U	88	U	90	U	86	U
4,6-DINITRO-2-METHYLPHENOL		780	N		76	U	93	U	86	U	88	U	90	U	86	U
4-BROMOPHENYL-PHENYLETHER		NA			76	U	93	U	86	U	88	U	90	U	86	U
4-CHLORO-3-METHYLPHENOL		NA			76	U	93	U	86	U	88	U	90	U	86	U
4-CHLOROANILINE		31,000	N		76	U	93	U	86	U	88	U	90	U	86	U
4-CHLOROPHENYL-PHENYLETHER		NA			76	U	93	U	86	U	88	U	90	U	86	U
4-METHYLPHENOL		39,000	N		76	U	93	U	13	J	88	U	90	U	86	U
4-NITROANILINE		32,000	C		76	U	93	U	86	U	88	U	90	U	86	U
4-NITROPHENOL		63,000	N		76	U	93	U	86	U	88	U	90	U	86	U
ACENAPHTHENE		470,000	N		76	U	93	U	86	U	88	U	90	U	86	U
ACENAPHTHYLENE		470,000 ‡	N		18	J	91	J	230		12	J	13	J	86	U
ANTHRACENE		2,300,000	N		19	J	34	J	62	J	13	J	14	J	86	U
BENZO[A]ANTHRACENE		870	C		250		620		1100		88	J	110		48	J

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
BENZO[A]PYRENE		87	C		160		440		720	J	49	J	58	J	41	J
BENZO[B]FLUORANTHENE		870	C		350		900		1800	J	130	J	180	J	62	J
BENZO[G,H,I]PERYLENE		NA			87		230		350	J	88	UJ	23	J	86	UJ
BENZO[K]FLUORANTHENE		8,700	C		150		350		800	J	82	J	83	J	34	J
BENZOIC ACID		31,000,000	N		36	J	61	J	41	J	28	J	28	J	260	U
BENZYL ALCOHOL		2,300,000	N		76	U	93	U	86	U	88	U	27	J	86	U
BIS(2-CHLOROETHOXY)METHANE		NA			76	U	93	U	86	U	88	U	90	U	86	U
BIS(2-CHLOROISOPROPYL)ETHER		9,100	C		76	U	93	U	86	U	88	U	90	U	86	U
BIS(2-ETHYLHEXYL)PHTHALATE		46,000	C		79	B	110	B	120	B	230	B	170	B	23	B
BUTYLBENZYLPHTHALATE		1,600,000	N		76	U	15	J	22	J	12	J	90	U	86	U
CARBAZOLE		32,000	C		15	J	23	J	33	J	88	U	90	U	86	U
CHRYSENE		87,000	C		160		360		620		66	J	78	J	49	J
DIBENZ[A,H]ANTHRACENE		87	C		37	J	76	J	140	J	88	UJ	90	UJ	86	UJ
DIBENZOFURAN		16,000	N		76	U	93	U	14	J	88	U	90	U	86	U
DIETHYLPHTHALATE		6,300,000	N		42	B	93	U	86	U	14	B	90	U	86	U
DIMETHYLPHTHALATE		78,000,000	N		76	U	93	U	86	UJ	88	UJ	90	UJ	86	UJ
DI-N-BUTYLPHTHALATE		780,000 ‡	N		28	B	29	B	28	B	27	B	22	B	22	B
DI-N-OCTYLPHTHALATE		160,000 ‡	N		76	U	93	U	86	UJ	88	UJ	90	UJ	86	UJ
FLUORANTHENE		310,000	N		440		700		1200		110		140		87	
FLUORENE		310,000	N		76	U	20	J	24	J	88	U	90	U	86	U
HEXACHLOROBENZENE		400	C		76	U	93	U	86	U	88	U	90	U	86	U
HEXACHLOROBUTADIENE		8,200	C		76	U	93	U	86	U	88	U	90	U	86	U
HEXACHLOROCYCLOPENTADIENE		47,000	N		76	U	93	U	86	U	88	U	90	U	86	U
HEXACHLOROETHANE		46,000	C		76	U	93	U	86	U	88	U	90	U	86	U
INDENO[1,2,3-CD]PYRENE		870	C		120		320		660	J	88	UJ	32	J	86	UJ
ISOPHORONE		670,000	C		76	U	93	U	86	U	88	U	90	U	86	U
NAPHTHALENE		160,000	N		12	J	24	J	27	J	88	U	90	U	86	U
NITROBENZENE		3,900	N		76	U	93	U	86	U	88	U	90	U	86	U
N-NITROSO-DI-N-PROPYLAMINE		NA			76	U	93	U	86	U	88	U	90	U	86	U
N-NITROSODIPHENYLAMINE		130,000	C		76	U	93	U	86	U	88	U	90	U	86	U
O-CHLORONITROBENZENE		26,000	C		76	U	93	U	86	U	88	U	90	U	86	U
PENTACHLOROPHENOL		5,300	C		76	U	93	U	86	U	88	U	90	U	86	U
PHENANTHRENE		NA			170		230		300		33	J	49	J	38	J
PHENOL		2,300,000	N		76	U	93	U	86	U	88	U	90	U	86	U
PHENYL HYDRAZINE		NA			76	U	93	U	86	U	88	U	90	U	86	U
PHENYL ISOCYANATE		NA			76	U	93	U	86	U	88	U	90	U	86	U
PHENYL ISOTHIOCYANATE		NA			76	U	93	U	86	U	88	U	90	U	86	U
PYRENE		230,000	N		440		1100		1800		170		210		130	
SVOC Tentatively Identified Compounds (UG/KG)																
.ALPHA.-LINDANE (CAS# 319846)		100 ‡	C			*		*		*		*		*		*
.GAMMA.-SITOSTEROL (CAS# 83-47-6)		NA				*		*		*		*		*		*
13-OCTADECENAL		NA				*		*		*		*		*		*
14-OCTADECENAL		NA				*		*		*		*		*		*
1-EICOSANOL		NA			200	NJ		*		*		*		*		*
1-OCTADECANOL		NA				*		*		*	5000	NJ		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)		39,000	N		100	NJ		*		*		*		*	160	NJ
5-EICOSENE, (E)-		NA				*		*		*	950	NJ		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)		NA				*		*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:	Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:	(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA				*		*		*		*		*		*
BENZENEETANOL, 4-HYDROXY-	NA				*		*		*		*	290	NJ		*
BENZOTRICHLORIDE	NA				*		*		*		*		*		*
BENZYL FLUORIDE	NA				*		*		*		*		*		*
CARBOXYLIC ACID ESTER	NA				*		*		*	360	NJ		*		*
DIPHENYLCHLOROARSINE	NA				*		*		*		*		*		*
DOCOSANE	NA				*		*		*		*	570	NJ		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N			*		*		*		*		*		*
HEPTADECANE	NA				*		*		*		*	790	NJ		*
HEPTADECANE, 9-OCTYL-	NA				*		*		*	450	NJ	2000	NJ		*
HEXADECANOIC ACID (CAS# 57-10-3)	NA			120	NJ	440	NJ	89	NJ		*		*		*
NONACOSANE (CAS# 630-03-5)	NA			870	NJ		*		*		*	1800	NJ	840	NJ
NONADECANE	NA				*		*	160	NJ	430	NJ		*		*
OCTACOSANE	NA			500	NJ		*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)	NA			140	NJ		*		*	130	NJ	190	NJ		*
o-TOLYL ISOCYANIDE	NA				*		*		*		*		*		*
PENTADECANE, 8-HEXYL-	NA				*		*		*		*		*		*
PHENANTHRENE,9-METHYL-	NA			230	NJ		*		*		*		*		*
PHENYL ISOCYANIDE	NA				*		*		*		*		*		*
PHENYLDICHLOROARSINE	NA				*		*		*		*		*		*
TRICOSANE	NA				*		*		*		*	570	NJ		*
ICP Inorganic Analyses - SW6010B (MG/KG)															
ALUMINUM	7,800	N	**25,798**	12400		15500		12500		8520		7020		13500	
ANTIMONY	**3.1**	N	0.92	1.1	UL	1.3	UL	1.2	UL	1.2	UL	1.2	UL	1.1	UL
ARSENIC	0.43	C	**12.64**	53.9		133		107		4.4		6.3		2	
BARIUM	**550**	N	298.28	73.3		109		108		53.4		44.9		54.6	
BERYLLIUM	**16**	N	2.35	0.68		0.87		0.78		0.6	U	0.59	U	0.67	
CADMIUM	**7.8**	N	0.32	0.57	U	0.65	U	0.62	U	0.6	U	0.59	U	0.56	U
CALCIUM	NA		**4,207**	1580		2520		3250		2860		9240		1810	
CHROMIUM	**12,000** ‡	N	97.20	56.9		54.8		40.9		87.6		50.4		68.2	
COBALT	**160**	N	22.26	13.1		18.5		15.1		7.1		5.4		14.9	
COPPER	**310**	N	47.76	32.9		47.6		34		54.3		27		26.6	
IRON	2,300	N	**31,951**	30500		34200		26900		18300		16700		25200	
LEAD	**400** ‡		329.76	64.3		71.9		72		65.6		62.5		20.6	
MAGNESIUM	NA		**7,093**	1360	L	3940	L	2520	L	1850	L	5350	L	4830	L
MANGANESE	160	N	**1,251**	571	J	800	J	695	J	216	J	231	J	342	J
MERCURY (by CVAA)	NA		**0.29**	0.41		0.54		0.15		0.16		0.13		0.1	U
NICKEL	**160**	N	40.12	13.7		19.9		13.5		14.4		10.7		31.4	
PHOSPHORUS	NA		NA	792	J	850	J	921	J	1530	J	1320	J	205	J
POTASSIUM	NA		**4,945**	514	L	888	L	890	L	704	L	625	L	859	L
SELENIUM	**39**	N	0.88	1.2	J	0.71	J	0.62	UJ	0.6	UJ	0.59	UJ	0.56	UJ
SILICON	NA		NA	1290	J	1850	J	1370	J	1300	J	1400	J	1350	J
SILVER	**39**	N	0.74	2		1.3		0.73		0.85		0.59	U	0.56	U
SODIUM	NA		**55.80**	57.2	U	65	U	61.6	U	59.9	U	58.7	U	55.5	U
STRONTIUM	**4,700**	N	NA	8.1		11.8		13		12.9		11		8.5	
SULFUR	NA		NA	212		293		313		387		422		73.9	
THALLIUM	0.55	N	**1.36**	1.1	U	1.3	U	1.2	U	1.2	U	1.2	U	1.1	U
TIN	**4,700**	N	NA	3.8		3.4		2.7		4.5		2.3	U	2.2	U
TITANIUM	**31,000**	N	NA	252		445		378		253		199		272	
VANADIUM	55	N	**66.76**	52		85.8		55.8		37.6		33.7		47.6	
ZINC	**2,300**	N	308.8	73.5		88.8		76.9		86.1		80.2		33.1	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:	Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:	(adjusted		ground[\2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute	downward)[\1]														
IC Scan - EPA 300M (MG/KG)															
BROMIDE	NA			1.23	U	1.39	U	1.3	U	1.32	U	1.4	U	1.2	U
CHLORIDE	NA			3		7.36		4.49		2.2		2.21		3.39	
FLUORIDE	NA			4.86	L	4.86	L	3.35		4.83		4.61		4.76	
NITRATE-N	13,000	N		3.28		5.47		6.68		10.3		11.6		1.2	U
NITRITE-N	780	N		1.23	U	1.39	U	1.3	U	1.32	U	1.4	U	1.2	U
PHOSPHATE-P	NA			3.84	L	4	L	5.07		37.5		34		2.36	
SULFATE	NA			9.6		9.3		8.62		8.38		10.6		11.2	
Mustard and Mustard Breakdown Products (UG/KG)															
MUSTARD	10	\3,C		NS		NS		NS		NS		NS		NS	
1,4-OXATHIANE	78,000	\3,N		78	U	78	U	83	U	83	U	81	U	84	U
1,4-DITHIANE	78,000	N		76	U	76	U	81	U	81	U	79	U	82	U
THIODIGLYCOL	39,100	\3,N		985	U	813	J	1117	U	1130	U	1156	U	1105	U
Lewisite Breakdown Products (UG/KG)															
TOTAL CVAA & CVAO	890	\3,C		9	U	11	U	11	U	11	U	11	U	10	U
Other Parameters (MG/KG unless otherwise indicated)															
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	180	U	180	U	180	U	180	U	180	U
ADAMSITE**	NA				**	7.7	U	7.7	U		**		**		**
AMMONIA-N	NA			1.25	U	1.38	U	1.29	U	1.3	U	1.41	U	1.18	U
CYANIDE	160 [‡]	N		0.58	U	0.68	U	0.62	U	1.19		0.68	U	0.54	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation. For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

Table 1A

Comprehensive List Detections for Selected OU-4 Residences

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:		Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:		RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute		downward)[1]																
Volatile Organic Compounds - SW8260B (UG/KG)																		
1,4-DICHLOROBENZENE		27,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		4		4		4		3		8		6		6	
2-HEXANONE		310,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
ACETONE		780,000	N		27	J	27	J	28	J	27		56	J	39	J	57	J
ACROLEIN		160,000	N		5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
BENZENE		12,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
BENZYL BROMIDE		NA			5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
CARBON DISULFIDE		780,000	N		11		11		38	J	11		11		8		26	
CHLOROFORM		78,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROMETHANE		NA			1	J	1	J	1	J	2		2		2		1	
DICHLORODIFLUOROMETHANE		1,600,000	N		67	J	67	J	160	J	1	U	1	U	130	J	99	J
METHYL ACETATE		7,800,000	N		1.1	U	1.1	U	1.1	U	1	U	3		0.97	U	2	
METHYLENE CHLORIDE		85,000	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
TOLUENE		1,600,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
TRICHLOROFLUOROMETHANE		2,300,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
VOC Tentatively Identified Compounds (UG/KG)																		
1-HEXENE, 4-METHYL		NA				*		*		*		*		*		*		*
1-OCTANOL, 2,7-DIMETHYL-		NA				*		*		*		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA				*		*		*		*		*		*	3	NJ
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA				*		*	6	NJ	2	NJ	10	NJ	10	NJ	6	NJ
2-BUTENE, (Z)-		NA				*		*		*		*		*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA				*		*		*		*		*		*		*
2-HEXENE, (Z)-		NA				*		*		*		*		*		*		*
2-OCTENE, (E)-		NA			50	NJ	30	NJ	60	NJ	20	NJ	20	NJ	10	NJ	10	NJ
ACETALDEHYDE (CAS# 75-07-0)		NA			10	NJ	5	NJ	6	NJ	4	NJ	20	NJ	10	NJ	7	NJ
BENZALDEHYDE (CAS# 100-52-7)		780,000	N			*		*		*		*		*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N			*		*		*		*		*		*		*
BENZENE, 1-METHYL-3-(1-METHYL		NA				*		*		*		*		*		*		*
BICYCLO 2.2.1 HEPTANE, 7,7-D		NA				*	6	NJ		*		*		*		*		*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL		NA				*	10	NJ		*		*		*		*		*
BUTANAL (CAS# 123-72-8)		NA				*		*		*		*		*		*		*
BUTANE		NA				*		*		*		*		*		*		*
CARBON OXIDE SULFIDE (Carbonyl Sulfide, CAS# 463-58-1		NA			8	NJ		*	6	NJ		*	10	NJ	8	NJ		*
CYCLOHEXENE, 1-METHYL-4-(1-METHYLTHENYL)-,®		NA				*		*		*		*		*		*		*
CYCLOPROPANE, 1,2-DIMETHYL-, TRANS		NA				*		*		*		*		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA				*	10	NJ		*	4	NJ	10	NJ	10	NJ	3	NJ
DODECANAL		NA				*		*		*		*		*		*		*
ETHANETHIOL		NA				*		*		*		*		*		*		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA				*		*		*		*		*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA			10	NJ	6	NJ	10	NJ	6	NJ		*		*		*
HEXANAL (CAS# 66-25-1)		NA			40	NJ	10	NJ	10	NJ	10	NJ	100	NJ	40	NJ	60	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA				*		*	5	NJ		*		*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA			7	NJ		*		*	3	NJ	10	NJ	6	NJ	3	NJ
HEXANE (CAS# 110543)		470,000	N			*		*		*		*		*		*		*
NONANAL		NA				*		*		*		*	10	NJ		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:		Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:		RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute		downward)[1]																
OCTANAL (CAS# 124-13-0)		NA			8	NJ	*		*		4	NJ	20	NJ	6	NJ	4	NJ
OCTANE (CAS# 111-65-9)		NA			20	NJ	9	NJ	20	NJ	8	NJ	*		*		*	
PENTANAL ISOMER 1		NA			10	NJ	4	NJ	4	NJ	3	NJ	30	NJ	10	NJ	9	NJ
PENTANAL ISOMER 2		NA			*		*		*		*		*		6	NJ	*	
PENTANE (CAS# 109-66-0)		NA			*		*		*		*		*		*		*	
PROPANAL, 2-METHYL-		NA			*		*		*		*		*		*		*	
PROPANE, 1,1-OXYBIS-'		NA			*		*		*		*		*		*		*	
Semivolatile Organic Compounds - SW8270C (UG/KG)																		
2-METHYLNAPHTHALENE (CAS# 91576)		160,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
4-METHYLPHENOL		39,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
ACENAPHTHYLENE		470,000 ‡	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
ANTHRACENE		2,300,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
BENZO[A]ANTHRACENE		870	C		82	U	78	U	83	U	81	U	81	U	62	J	12	J
BENZO[A]PYRENE		87	C		82	U	78	U	83	U	81	U	81	U	28	J	84	U
BENZO[B]FLUORANTHENE		870	C		82	U	78	U	83	U	81	U	81	U	67	J	15	J
BENZO[G,H,I]PERYLENE		NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
BENZO[K]FLUORANTHENE		8,700	C		82	U	78	U	83	U	81	U	81	U	20	J	84	U
BENZOIC ACID		31,000,000	N		240	U	230	U	250	U	240	U	20	J	25	J	22	J
BENZYL ALCOHOL		2,300,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
BIS(2-ETHYLHEXYL)PHTHALATE		46,000	C		82	U	21	B	13	B	81	U	18	J	12	J	14	J
BUTYLBENZYLPHTHALATE		1,600,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
CARBAZOLE		32,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
CHRYSENE		87,000	C		82	U	78	U	83	U	81	U	81	U	30	J	84	U
DIBENZ[A,H]ANTHRACENE		87	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
DIBENZOFURAN		16,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
DIETHYLPHTHALATE		6,300,000	N		82	U	78	U	250	B	81	U	18	J	21	J	14	J
DI-N-BUTYLPHTHALATE		780,000 ‡	N		25	B	23	B	26	B	29	B	33	B	24	B	32	B
FLUORANTHENE		310,000	N		82	U	78	U	83	U	81	U	12	J	67	J	17	J
FLUORENE		310,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
INDENO[1,2,3-CD]PYRENE		870	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
NAPHTHALENE		160,000	N		82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENANTHRENE		NA			82	U	78	U	83	U	81	U	81	U	18	J	84	U
PYRENE		230,000	N		82	U	78	U	83	U	81	U	11	J	56	J	14	J
SVOC Tentatively Identified Compounds (UG/KG)																		
.ALPHA.-LINDANE (CAS# 319846)		100 ‡	C		*		*		*		*		*		180	NJ	*	
.GAMMA.-SITOSTEROL (CAS# 83-47-6)		NA			*		*		*		*		*		*		130	NJ
13-OCTADECENAL		NA			*		*		*		*		1700	NJ	*		*	
14-OCTADECENAL		NA			*		180	NJ	*		*		*		*		*	
1-EICOSANOL		NA			*		190	NJ	*		*		*		*		*	
1-OCTADECANOL		NA			*		*		*		*		*		*		*	
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)		39,000	N		130	NJ	280	NJ	*		*		*		*		*	
5-EICOSENE, (E)-		NA			*		*		*		*		*		*		*	
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)		NA			*		*		*		*		*		*		97	NJ
9-HEXADECENOIC ACID (CAS# 002091-29-4)		NA			*		*		*		*		440	NJ	*		140	NJ
BENZENEETANOL, 4-HYDROXY-		NA			*		*		*		*		*		*		*	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:		Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:		RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute		downward)[1]																
CARBOXYLIC ACID ESTER		NA				*		*		*		*		*		*		*
DOCOSANE		NA				*		*		*		*		*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)		16,000,000	N			*		*		*		*	240	NJ	240	NJ	220	NJ
HEPTADECANE		NA				*		*		*		*		*		*		*
HEPTADECANE, 9-OCTYL-		NA				*		*		*		*		*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)		NA			110	NJ		*		*		*	670	NJ	140	NJ	160	NJ
NONACOSANE (CAS# 630-03-5)		NA				*		*		*		*		*	1000	NJ	1000	NJ
NONADECANE		NA				*		*		*		*		*		*		*
OCTACOSANE		NA				*		*		*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			260	NJ		*		*		*	4200	NJ	260	NJ	250	NJ
PENTADECANE, 8-HEXYL-		NA				*		*		*		*		*	590	NJ		*
PHENANTHRENE,9-METHYL-		NA				*		*		*		*		*		*		*
TRICOSANE		NA				*		*		*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)																		
ALUMINUM		7,800	N	**25,798**	24800		27300		36300		26000		18400		21400		29700	
ARSENIC		0.43	C	**12.64**	1.5		1.7		1.4		2.2		36.1		14		12	
BARIUM		**550**	N	298.28	121		156		168		124		69		98		168	
BERYLLIUM		**16**	N	2.35	1.8		1.9		2.4		2.1		1.2		1.6		1.9	
CALCIUM		NA		**4,207**	707		705		1010		737		868		951		1320	
CHROMIUM		**12,000** [‡]	N	97.20	45.6		53.7		192		80.4		46.5		53.3		62.5	
COBALT		**160**	N	22.26	19.5		22.1		27.9		27.6		14.2		21.1		25.7	
COPPER		**310**	N	47.76	28.3		48.7		36.9		48.7		35.4		61.9		116	
IRON		2,300	N	**31,951**	32300		36500		43900		38600		26400		28300		36600	
LEAD		**400** [‡]		329.76	13.6		21.5		16.4		15.9		24.6		26.6		24.5	
MAGNESIUM		NA		**7,093**	11700	L	14000	L	22300	L	11700	L	8180	L	10100	L	13100	L
MANGANESE		160	N	**1,251**	401	J	366	J	840	J	516	J	344	J	726	J	512	J
MERCURY (by CVAA)		NA		**0.29**	0.11	U	0.11	U	0.11	U	0.1	U	0.35		0.26		0.29	
NICKEL		**160**	N	40.12	53.3		43.1		87.2		53.6		32.7		41.9		43.9	
PHOSPHORUS		NA		NA	221	J	239	J	296	J	280	J	333	J	357	J	420	J
POTASSIUM		NA		**4,945**	8530	L	12500	L	13900	L	9190	L	5400	L	6650	L	9580	L
SELENIUM		**39**	N	0.88	0.48	UJ	0.56	UJ	0.72	J	0.55	UJ	0.56	UJ	0.58	J	0.54	UJ
SILICON		NA		NA	1510	J	1380	J	1580	J	1300	J	2080	J	2590	J	2300	J
SILVER		**39**	N	0.74	0.48	U	0.56	U	0.57	U	0.55	U	0.56	U	0.56	U	0.54	U
SODIUM		NA		**55.80**	130		134		157		92.6		68		139		112	
STRONTIUM		**4,700**	N	NA	7.5		9.7		7.4		6		5.1		6.8		8.2	
SULFUR		NA		NA	75.8		76.7		103		101		106		81.7		99.4	
THALLIUM		0.55	N	**1.36**	0.96	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.6	
TIN		**4,700**	N	NA	1.9	U	2.4		2.3	U	2.2	U	2.3	U	2.2	U	3.1	
TITANIUM		**31,000**	N	NA	1420		1900		2320		1730		991		1010		1440	
VANADIUM		55	N	**66.76**	62.2		81		108		91.3		47.9		56.9		103	
ZINC		**2,300**	N	308.8	135		114		140		109		73.5		89.9		103	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground\2	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)\1																
IC Scan - EPA 300M (MG/KG)																	
CHLORIDE	NA			17.7		4.07		3.88		2.58		4.24		70.1		23.5	
FLUORIDE	NA			1.58		1.17	U	1.25	U	1.22	U	3.55	L	3.91	L	6.66	L
NITRATE-N	13,000	N		1.22	U	1.17	U	1.25	U	1.22	U	2.68		1.18	U	4.06	
PHOSPHATE-P	NA			1.22	U	1.17	U	1.25	U	1.22	U	1.2	UL	1.18	UL	1.26	UL
SULFATE	NA			83.6		46.7		62		58.9		14.7		27.2		19	
Mustard and Mustard Breakdown Products (UG/KG)																	
THIODIGLYCOL	39,100	\3,N		1056	U	1001	U	1069	U	1039	U	257	J	411	J	1088	U
Other Parameters (MG/KG unless otherwise indicated)																	
CYANIDE	160 ‡	N		0.61	U	0.54	U	0.6	U	0.59	U	0.61	U	0.59	U	0.64	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.

C = Carcinogen as listed on the USEPA RBC table.

NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
Volatile Organic Compounds - SW8260B (UG/KG)																
1,4-DICHLOROBENZENE		27,000	C		0.97	UJ	1.5	UJ	1.3	UJ	1	UJ	1.4	UJ	2	J
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		16		22		25		25		30		9	
2-HEXANONE		310,000	N		1		1.5	U	1.3	U	1		1.4	U	1.1	UJ
ACETONE		780,000	N		47	B	120	J	120	J	70	B	62	B	57	J
ACROLEIN		160,000	N		4.8	U	16		10		5	U	7	U	7	
BENZENE		12,000	C		4		1.5	U	1.3	U	1	U	1.4	U	1.1	U
BENZYL BROMIDE		NA			4.8	U	7.4	U	6.5	U	16		7	U	5.5	U
CARBON DISULFIDE		780,000	N		170	J	8		8		15		8		10	
CHLOROFORM		78,000	N		0.97	U	1.5	U	1	J	1	U	1.4	U	1.1	U
CHLOROMETHANE		NA			0.97	U	3		3		7		1.4	U	3	
DICHLORODIFLUOROMETHANE		1,600,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
METHYL ACETATE		7,800,000	N		15		20		11		11		1.4	U	2	
METHYLENE CHLORIDE		85,000	C		24		1.5	U	1.3	U	1	U	1.4	U	1.1	U
TOLUENE		1,600,000	N		3		1.5	U	1	J	2		1.4	U	8	J
TRICHLOROFLUOROMETHANE		2,300,000	N		9		1.5	U	1.3	U	1	U	1.4	U	1.1	U
VOC Tentatively Identified Compounds (UG/KG)																
1-HEXENE, 4-METHYL		NA			10	NJ		*		*		*		*		*
1-OCTANOL, 2,7-DIMETHYL-		NA				*	10	NJ		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA				*		*		*		*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA				*	40	NJ	20	NJ	4	NJ		*		*
2-BUTENE, (Z)-		NA				*		*		*		*	3	NJ		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA				*		*	10	NJ		*		*		*
2-HEXENE, (Z)-		NA			10	NJ		*		*		*		*		*
2-OCTENE, (E)-		NA			50	NJ		*	7	NJ	10	NJ	60	NJ	10	NJ
ACETALDEHYDE (CAS# 75-07-0)		NA			10	NJ	30	NJ	40	NJ	20	NJ		*		*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N		10	NJ		*		*	10	NJ	5	NJ		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N			*		*		*	5	NJ		*		*
BENZENE, 1-METHYL-3-(1-METHYL		NA				*		*		*		*		*	30	NJ
BICYCLO 2.2.1 HEPTANE, 7,7-D		NA				*		*		*		*		*	50	NJ
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL		NA				*		*		*		*		*	80	NJ
BUTANAL (CAS# 123-72-8)		NA				*	9	NJ		*	5	NJ		*		*
BUTANE		NA				*		*		*		*	1	NJ		*
CARBON OXIDE SULFIDE (Carbonyl Sulfide, CAS# 463-58-1		NA				*		*		*		*		*		*
CYCLOHEXENE, 1-METHYL-4-(1-METHYLTHENYL)-,®		NA				*		*		*		*		*	10	NJ
CYCLOPROPANE, 1,2-DIMETHYL-, TRANS		NA			10	NJ		*		*		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA				*		*	3	NJ		*		*		*
DODECANAL		NA				*		*	7	NJ		*		*		*
ETHANETHIOL		NA				*		*		*		*	10	NJ		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA			20	NJ		*		*		*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA				*		*		*		*	10	NJ		*
HEXANAL (CAS# 66-25-1)		NA			30	NJ	100	NJ	40	NJ	60	NJ		*	100	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA				*		*		*		*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA				*	10	NJ		*		*		*		*
HEXANE (CAS# 110543)		470,000	N			*		*		*		*	4	NJ		*
NONANAL		NA				*	10	NJ		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:	Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:	(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
OCTANAL (CAS# 124-13-0)	NA				*	20	NJ	10	NJ		*		*	10	NJ
OCTANE (CAS# 111-65-9)	NA				*		*		*		*	10	NJ		*
PENTANAL ISOMER 1	NA				*	20	NJ		*	8	NJ		*	20	NJ
PENTANAL ISOMER 2	NA				*		*		*		*		*		*
PENTANE (CAS# 109-66-0)	NA				*	20	NJ	8	NJ	9	NJ	5	NJ	20	NJ
PROPANAL, 2-METHYL-	NA				*		*	8	NJ		*		*		*
PROPANE, 1,1-OXYBIS-'	NA			10	NJ		*		*		*		*		*
Semivolatile Organic Compounds - SW8270C (UG/KG)															
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		76	U	18	J	14	J	88	U	90	U	86	U
4-METHYLPHENOL	39,000	N		76	U	93	U	13	J	88	U	90	U	86	U
ACENAPHTHYLENE	470,000 ‡	N		18	J	91	J	230		12	J	13	J	86	U
ANTHRACENE	2,300,000	N		19	J	34	J	62	J	13	J	14	J	86	U
BENZO[A]ANTHRACENE	870	C		250		620		1100		88	J	110		48	J
BENZO[A]PYRENE	87	C		160		440		720	J	49	J	58	J	41	J
BENZO[B]FLUORANTHENE	870	C		350		900		1800	J	130	J	180	J	62	J
BENZO[G,H,I]PERYLENE	NA			87		230		350	J	88	UJ	23	J	86	UJ
BENZO[K]FLUORANTHENE	8,700	C		150		350		800	J	82	J	83	J	34	J
BENZOIC ACID	31,000,000	N		36	J	61	J	41	J	28	J	28	J	260	U
BENZYL ALCOHOL	2,300,000	N		76	U	93	U	86	U	88	U	27	J	86	U
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		79	B	110	B	120	B	230	B	170	B	23	B
BUTYLBENZYLPHTHALATE	1,600,000	N		76	U	15	J	22	J	12	J	90	U	86	U
CARBAZOLE	32,000	C		15	J	23	J	33	J	88	U	90	U	86	U
CHRYSENE	87,000	C		160		360		620		66	J	78	J	49	J
DIBENZ[A,H]ANTHRACENE	87	C		37	J	76	J	140	J	88	UJ	90	UJ	86	UJ
DIBENZOFURAN	16,000	N		76	U	93	U	14	J	88	U	90	U	86	U
DIETHYLPHTHALATE	6,300,000	N		42	B	93	U	86	U	14	B	90	U	86	U
DI-N-BUTYLPHTHALATE	780,000 ‡	N		28	B	29	B	28	B	27	B	22	B	22	B
FLUORANTHENE	310,000	N		440		700		1200		110		140		87	
FLUORENE	310,000	N		76	U	20	J	24	J	88	U	90	U	86	U
INDENO[1,2,3-CD]PYRENE	870	C		120		320		660	J	88	UJ	32	J	86	UJ
NAPHTHALENE	160,000	N		12	J	24	J	27	J	88	U	90	U	86	U
PHENANTHRENE	NA			170		230		300		33	J	49	J	38	J
PYRENE	230,000	N		440		1100		1800		170		210		130	
SVOC Tentatively Identified Compounds (UG/KG)															
.ALPHA.-LINDANE (CAS# 319846)	100 ‡	C			*		*		*		*		*		*
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA				*		*		*		*		*		*
13-OCTADECENAL	NA				*		*		*		*		*		*
14-OCTADECENAL	NA				*		*		*		*		*		*
1-EICOSANOL	NA			200	NJ		*		*		*		*		*
1-OCTADECANOL	NA				*		*		*	5000	NJ		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N		100	NJ		*		*		*		*	160	NJ
5-EICOSENE, (E)-	NA				*		*		*	950	NJ		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA				*		*		*		*		*		*
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA				*		*		*		*		*		*
BENZENEETANOL, 4-HYDROXY-	NA				*		*		*		*	290	NJ		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
CARBOXYLIC ACID ESTER		NA				*		*		*	360	NJ		*		*
DOCOSANE		NA				*		*		*		*	570	NJ		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)		16,000,000	N			*		*		*		*		*		*
HEPTADECANE		NA				*		*		*		*	790	NJ		*
HEPTADECANE, 9-OCTYL-		NA				*		*		*	450	NJ	2000	NJ		*
HEXADECANOIC ACID (CAS# 57-10-3)		NA			120	NJ	440	NJ	89	NJ		*		*		*
NONACOSANE (CAS# 630-03-5)		NA			870	NJ		*		*		*	1800	NJ	840	NJ
NONADECANE		NA				*		*	160	NJ	430	NJ		*		*
OCTACOSANE		NA			500	NJ		*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			140	NJ		*		*	130	NJ	190	NJ		*
PENTADECANE, 8-HEXYL-		NA				*		*		*		*		*		*
PHENANTHRENE,9-METHYL-		NA			230	NJ		*		*		*		*		*
TRICOSANE		NA				*		*		*		*	570	NJ		*
ICP Inorganic Analyses - SW6010B (MG/KG)																
ALUMINUM		7,800	N	**25,798**	12400		15500		12500		8520		7020		13500	
ARSENIC		0.43	C	**12.64**	53.9		133		107		4.4		6.3		2	
BARIUM		**550**	N	298.28	73.3		109		108		53.4		44.9		54.6	
BERYLLIUM		**16**	N	2.35	0.68		0.87		0.78		0.6	U	0.59	U	0.67	
CALCIUM		NA		**4,207**	1580		2520		3250		2860		9240		1810	
CHROMIUM		**12,000** ‡	N	97.20	56.9		54.8		40.9		87.6		50.4		68.2	
COBALT		**160**	N	22.26	13.1		18.5		15.1		7.1		5.4		14.9	
COPPER		**310**	N	47.76	32.9		47.6		34		54.3		27		26.6	
IRON		2,300	N	**31,951**	30500		34200		26900		18300		16700		25200	
LEAD		**400** ‡		329.76	64.3		71.9		72		65.6		62.5		20.6	
MAGNESIUM		NA		**7,093**	1360	L	3940	L	2520	L	1850	L	5350	L	4830	L
MANGANESE		160	N	**1,251**	571	J	800	J	695	J	216	J	231	J	342	J
MERCURY (by CVAA)		NA		**0.29**	0.41		0.54		0.15		0.16		0.13		0.1	U
NICKEL		**160**	N	40.12	13.7		19.9		13.5		14.4		10.7		31.4	
PHOSPHORUS		NA		NA	792	J	850	J	921	J	1530	J	1320	J	205	J
POTASSIUM		NA		**4,945**	514	L	888	L	890	L	704	L	625	L	859	L
SELENIUM		**39**	N	0.88	1.2	J	0.71	J	0.62	UJ	0.6	UJ	0.59	UJ	0.56	UJ
SILICON		NA		NA	1290	J	1850	J	1370	J	1300	J	1400	J	1350	J
SILVER		**39**	N	0.74	2		1.3		0.73		0.85		0.59	U	0.56	U
SODIUM		NA		**55.80**	57.2	U	65	U	61.6	U	59.9	U	58.7	U	55.5	U
STRONTIUM		**4,700**	N	NA	8.1		11.8		13		12.9		11		8.5	
SULFUR		NA		NA	212		293		313		387		422		73.9	
THALLIUM		0.55	N	**1.36**	1.1	U	1.3	U	1.2	U	1.2	U	1.2	U	1.1	U
TIN		**4,700**	N	NA	3.8		3.4		2.7		4.5		2.3	U	2.2	U
TITANIUM		**31,000**	N	NA	252		445		378		253		199		272	
VANADIUM		55	N	**66.76**	52		85.8		55.8		37.6		33.7		47.6	
ZINC		**2,300**	N	308.8	73.5		88.8		76.9		86.1		80.2		33.1	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:	Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:	(adjusted		ground\2	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute	downward)\1														
IC Scan - EPA 300M (MG/KG)															
CHLORIDE	NA			3		7.36		4.49		2.2		2.21		3.39	
FLUORIDE	NA			4.86	L	4.86	L	3.35		4.83		4.61		4.76	
NITRATE-N	13,000	N		3.28		5.47		6.68		10.3		11.6		1.2	U
PHOSPHATE-P	NA			3.84	L	4	L	5.07		37.5		34		2.36	
SULFATE	NA			9.6		9.3		8.62		8.38		10.6		11.2	
Mustard and Mustard Breakdown Products (UG/KG)															
THIODIGLYCOL	39,100	\3,N		985	U	813	J	1117	U	1130	U	1156	U	1105	U
Other Parameters (MG/KG unless otherwise indicated)															
CYANIDE	160 ‡	N		0.58	U	0.68	U	0.62	U	1.19		0.68	U	0.54	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation
For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

Table 2

AUES List of Compounds for Selected OU-4 Residence Samples (Includes Indicator and Agent Breakdown Compounds)

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:		Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:		RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute		downward)[1]																
Volatile Organic Compounds - SW8260B (UG/KG)																		
ACETONITRILE		NA			5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
ACROLEIN		160,000	N		5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
BENZYL BROMIDE		NA			5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
BENZYL CHLORIDE		3,800	C		5	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
CARBON DISULFIDE		780,000	N		11		11		38	J	11		11		8		26	
CARBON TETRACHLORIDE		4,900	C		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROBENZENE		160,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROFORM		78,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
CHLOROPICRIN		NA			27	U	27	U	28	U	25	U	25	U	24	U	26	U
VOC Tentatively Identified Compounds (UG/KG)																		
ALCOHOL		NA				*		*		*		*		*		*		*
ALLYL ALCOHOL		NA				*		*		*		*		*		*		*
BENZYL IODIDE		NA				*		*		*		*		*		*		*
BROMOACETONE		780,000 ‡	N			*		*		*		*		*		*		*
BROMOBENZENE		NA				*		*		*		*		*		*		*
BROMOMETHYL ETHER		NA				*		*		*		*		*		*		*
BUTYL MERCAPTAN		NA				*		*		*		*		*		*		*
CHLORINATED ACETONE		NA				*		*		*		*		*		*		*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*		*		*		*		*		*		*
CHLOROACETONE		780,000 ‡	N			*		*		*		*		*		*		*
CHLOROACETONITRILE		NA				*		*		*		*		*		*		*
CHLOROMETHYL ETHER		NA				*		*		*		*		*		*		*
CHLOROMETHYL ETHYL ETHER		NA				*		*		*		*		*		*		*
CROTONALDEHYDE		340	C			*		*		*		*		*		*		*
ETHYL BROMOACETATE		7,000,000 ‡	N			*		*		*		*		*		*		*
ETHYL CHLOROFORMATE		NA				*		*		*		*		*		*		*
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*		*		*		*		*		*		*
ETHYL MERCAPTAN		NA				*		*		*		*		*		*		*
METHYL BROMOACETATE		NA				*		*		*		*		*		*		*
METHYL CHLOROACETATE		NA				*		*		*		*		*		*		*
METHYL CHLOROFORMATE		NA				*		*		*		*		*		*		*
METHYL CHLOROSULFONATE		NA				*		*		*		*		*		*		*
PERCHLOROMETHYLMERCAPTAN		NA				*		*		*		*		*		*		*
THIOPHENE		NA				*		*		*		*		*		*		*
TRICHLOROACETONITRILE		NA				*		*		*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:		Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:		RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute		downward)[1]																
Semivolatile Organic Compounds - SW8270C (UG/KG)																		
HEXACHLOROETHANE		46,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
O-CHLORONITROBENZENE		26,000	C		82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENYL HYDRAZINE		NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENYL ISOCYANATE		NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
PHENYL ISOTHIOCYANATE		NA			82	U	78	U	83	U	81	U	81	U	80	U	84	U
SVOC Tentatively Identified Compounds (UG/KG)																		
BENZOTRICHLORIDE		NA				*		*		*		*		*		*		*
BENZYL FLUORIDE		NA				*		*		*		*		*		*		*
DIPHENYLCHLOROARSINE		NA				*		*		*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			260	NJ		*		*		*	4200	NJ	260	NJ	250	NJ
o-TOLYL ISOCYANIDE		NA				*		*		*		*		*		*		*
PHENYL ISOCYANIDE		NA				*		*		*		*		*		*		*
PHENYLDICHLOROARSINE		NA				*		*		*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)																		
ALUMINUM		7,800	N	**25,798**	24800		27300		36300		26000		18400		21400		29700	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	1.5		1.7		1.4		2.2		36.1		14		12	
BARIUM *(Indicator only)*		**550**	N	298.28	121		156		168		124		69		98		168	
CADMIUM *(Indicator only)*		**7.8**	N	0.32	0.48	U	0.56	U	0.57	U	0.55	U	0.56	U	0.56	U	0.54	U
CALCIUM *(Indicator only)*		NA		**4,207**	707		705		1010		737		868		951		1320	
IRON		2,300	N	**31,951**	32300		36500		43900		38600		26400		28300		36600	
LEAD *(Indicator only)*		**400** [‡]		329.76	13.6		21.5		16.4		15.9		24.6		26.6		24.5	
MAGNESIUM		NA		**7,093**	11700	L	14000	L	22300	L	11700	L	8180	L	10100	L	13100	L
MANGANESE *(Indicator only)*		160	N	**1,251**	401	J	366	J	840	J	516	J	344	J	726	J	512	J
NICKEL *(Indicator only)*		**160**	N	40.12	53.3		43.1		87.2		53.6		32.7		41.9		43.9	
PHOSPHORUS		NA		NA	221	J	239	J	296	J	280	J	333	J	357	J	420	J
POTASSIUM *(Indicator only)*		NA		**4,945**	8530	L	12500	L	13900	L	9190	L	5400	L	6650	L	9580	L
SELENIUM *(Indicator only)*		**39**	N	0.88	0.48	UJ	0.56	UJ	0.72	J	0.55	UJ	0.56	UJ	0.58	J	0.54	UJ
SILICON		NA		NA	1510	J	1380	J	1580	J	1300	J	2080	J	2590	J	2300	J
SODIUM		NA		**55.80**	130		134		157		92.6		68		139		112	
SULFUR		NA		NA	75.8		76.7		103		101		106		81.7		99.4	
TIN *(Indicator only)*		**4,700**	N	NA	1.9	U	2.4		2.3	U	2.2	U	2.3	U	2.2	U	3.1	
TITANIUM *(Indicator only)*		**31,000**	N	NA	1420		1900		2320		1730		991		1010		1440	
ZINC		**2,300**	N	308.8	135		114		140		109		73.5		89.9		103	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[\2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)[\1]																
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)																	
BROMIDE	NA			1.22	U	1.17	U	1.25	U	1.22	U	1.2	U	1.18	U	1.26	U
CHLORIDE	NA			17.7		4.07		3.88		2.58		4.24		70.1		23.5	
FLUORIDE	NA			1.58		1.17	U	1.25	U	1.22	U	3.55	L	3.91	L	6.66	L
NITRATE-N	13,000	N		1.22	U	1.17	U	1.25	U	1.22	U	2.68		1.18	U	4.06	
SULFATE	NA			83.6		46.7		62		58.9		14.7		27.2		19	
Mustard and Mustard Breakdown Products (UG/KG)																	
MUSTARD	10	\3,C		8	U	8	U	8	U	8	U	8	U	8	U	8	U
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		81	U	82	U	80	U	83	U	78	U	80	U	81	U
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		79	U	79	U	77	U	80	U	76	U	77	U	79	U
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		1056	U	1001	U	1069	U	1039	U	257	J	411	J	1088	U
Lewisite Breakdown Products (UG/KG)																	
CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		10	U	9	U	10	U	10	U	10	U	10	U	10	U
Other Parameters (MG/KG unless otherwise indicated)																	
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	180	U	180	U	180	U	180	U	180	U	180	U
ADAMSITE **	NA				**		**		**		**	7.7	U		**		**
AMMONIA-N	NA			1.2	U	1.15	U	1.23	U	1.22	U	1.2	U	1.19	U	1.27	U
CYANIDE *(Indicator only)*	160 ‡	N		0.61	U	0.54	U	0.6	U	0.59	U	0.61	U	0.59	U	0.64	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
Volatile Organic Compounds - SW8260B (UG/KG)																
ACETONITRILE		NA			4.8	U	7.4	U	6.5	U	5	U	7	U	5.5	U
ACROLEIN		160,000	N		4.8	U	16		10		5	U	7	U	7	
BENZYL BROMIDE		NA			4.8	U	7.4	U	6.5	U	16		7	U	5.5	U
BENZYL CHLORIDE		3,800	C		4.8	UJ	7.4	UJ	6.5	UJ	5	UJ	7	UJ	5.5	UJ
CARBON DISULFIDE		780,000	N		170	J	8		8		15		8		10	
CARBON TETRACHLORIDE		4,900	C		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	U
CHLOROBENZENE		160,000	N		0.97	U	1.5	U	1.3	U	1	U	1.4	U	1.1	UJ
CHLOROFORM		78,000	N		0.97	U	1.5	U	1	J	1	U	1.4	U	1.1	U
CHLOROPICRIN		NA			24	U	37	U	32	U	25	U	25	U	27	U
VOC Tentatively Identified Compounds (UG/KG)																
ALCOHOL		NA				*		*		*		*		*		*
ALLYL ALCOHOL		NA				*		*		*		*		*		*
BENZYL IODIDE		NA				*		*		*		*		*		*
BROMOACETONE		780,000 ‡	N			*		*		*		*		*		*
BROMOBENZENE		NA				*		*		*		*		*		*
BROMOMETHYL ETHER		NA				*		*		*		*		*		*
BUTYL MERCAPTAN		NA				*		*		*		*		*		*
CHLORINATED ACETONE		NA				*		*		*		*		*		*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*		*		*		*		*		*
CHLOROACETONE		780,000 ‡	N			*		*		*		*		*		*
CHLOROACETONITRILE		NA				*		*		*		*		*		*
CHLOROMETHYL ETHER		NA				*		*		*		*		*		*
CHLOROMETHYL ETHYL ETHER		NA				*		*		*		*		*		*
CROTONALDEHYDE		340	C			*		*		*		*		*		*
ETHYL BROMOACETATE		7,000,000 ‡	N			*		*		*		*		*		*
ETHYL CHLOROFORMATE		NA				*		*		*		*		*		*
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*		*		*		*		*		*
ETHYL MERCAPTAN		NA				*		*		*		*		*		*
METHYL BROMOACETATE		NA				*		*		*		*		*		*
METHYL CHLOROACETATE		NA				*		*		*		*		*		*
METHYL CHLOROFORMATE		NA				*		*		*		*		*		*
METHYL CHLOROSULFONATE		NA				*		*		*		*		*		*
PERCHLOROMETHYLMERCAPTAN		NA				*		*		*		*		*		*
THIOPHENE		NA				*		*		*		*		*		*
TRICHLOROACETONITRILE		NA				*		*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:	Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:	(adjusted		ground[2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
Semivolatile Organic Compounds - SW8270C (UG/KG)															
HEXACHLOROETHANE	46,000	C		76	U	93	U	86	U	88	U	90	U	86	U
O-CHLORONITROBENZENE	26,000	C		76	U	93	U	86	U	88	U	90	U	86	U
PHENYL HYDRAZINE	NA			76	U	93	U	86	U	88	U	90	U	86	U
PHENYL ISOCYANATE	NA			76	U	93	U	86	U	88	U	90	U	86	U
PHENYL ISOTHIOCYANATE	NA			76	U	93	U	86	U	88	U	90	U	86	U
SVOC Tentatively Identified Compounds (UG/KG)															
BENZOTRICHLORIDE	NA				*		*		*		*		*		*
BENZYL FLUORIDE	NA				*		*		*		*		*		*
DIPHENYLCHLOROARSINE	NA				*		*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)	NA			140	NJ		*		*	130	NJ	190	NJ		*
o-TOLYL ISOCYANIDE	NA				*		*		*		*		*		*
PHENYL ISOCYANIDE	NA				*		*		*		*		*		*
PHENYLDICHLOROARSINE	NA				*		*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)															
ALUMINUM	7,800	N	**25,798**	12400		15500		12500		8520		7020		13500	
ARSENIC *(Indicator only)*	0.43	C	**12.64**	53.9		133		107		4.4		6.3		2	
BARIUM *(Indicator only)*	**550**	N	298.28	73.3		109		108		53.4		44.9		54.6	
CADMIUM *(Indicator only)*	**7.8**	N	0.32	0.57	U	0.65	U	0.62	U	0.6	U	0.59	U	0.56	U
CALCIUM *(Indicator only)*	NA		**4,207**	1580		2520		3250		2860		9240		1810	
IRON	2,300	N	**31,951**	30500		34200		26900		18300		16700		25200	
LEAD *(Indicator only)*	**400** [‡]		329.76	64.3		71.9		72		65.6		62.5		20.6	
MAGNESIUM	NA		**7,093**	1360	L	3940	L	2520	L	1850	L	5350	L	4830	L
MANGANESE *(Indicator only)*	160	N	**1,251**	571	J	800	J	695	J	216	J	231	J	342	J
NICKEL *(Indicator only)*	**160**	N	40.12	13.7		19.9		13.5		14.4		10.7		31.4	
PHOSPHORUS	NA		NA	792	J	850	J	921	J	1530	J	1320	J	205	J
POTASSIUM *(Indicator only)*	NA		**4,945**	514	L	888	L	890	L	704	L	625	L	859	L
SELENIUM *(Indicator only)*	**39**	N	0.88	1.2	J	0.71	J	0.62	UJ	0.6	UJ	0.59	UJ	0.56	UJ
SILICON	NA		NA	1290	J	1850	J	1370	J	1300	J	1400	J	1350	J
SODIUM	NA		**55.80**	57.2	U	65	U	61.6	U	59.9	U	58.7	U	55.5	U
SULFUR	NA		NA	212		293		313		387		422		73.9	
TIN *(Indicator only)*	**4,700**	N	NA	3.8		3.4		2.7		4.5		2.3	U	2.2	U
TITANIUM *(Indicator only)*	**31,000**	N	NA	252		445		378		253		199		272	
ZINC	**2,300**	N	308.8	73.5		88.8		76.9		86.1		80.2		33.1	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground\2	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		downward)\1														
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)																
BROMIDE		NA			1.23	U	1.39	U	1.3	U	1.32	U	1.4	U	1.2	U
CHLORIDE		NA			3		7.36		4.49		2.2		2.21		3.39	
FLUORIDE		NA			4.86	L	4.86	L	3.35		4.83		4.61		4.76	
NITRATE-N		13,000	N		3.28		5.47		6.68		10.3		11.6		1.2	U
SULFATE		NA			9.6		9.3		8.62		8.38		10.6		11.2	
Mustard and Mustard Breakdown Products (UG/KG)																
MUSTARD		10	\3,C		NS		NS		NS		NS		NS		NS	
1,4-OXATHIANE *(Agent Breakdown Product only)*		78,000	\3,N		78	U	78	U	83	U	83	U	81	U	84	U
1,4-DITHIANE *(Agent Breakdown Product only)*		78,000	N		76	U	76	U	81	U	81	U	79	U	82	U
THIODIGLYCOL *(Agent Breakdown Product only)*		39,100	\3,N		985	U	813	J	1117	U	1130	U	1156	U	1105	U
Lewisite Breakdown Products (UG/KG)																
CVAA & CVAO *(Agent Breakdown Product only)*		890	\3,C		9	U	11	U	11	U	11	U	11	U	10	U
Other Parameters (MG/KG unless otherwise indicated)																
2,4,6-TRINITROTOLUENE (UG/KG)		21,000	C		180	U	180	U	180	U	180	U	180	U	180	U
ADAMSITE **		NA				**	7.7	U	7.7	U		**		**		**
AMMONIA-N		NA			1.25	U	1.38	U	1.29	U	1.3	U	1.41	U	1.18	U
CYANIDE *(Indicator only)*		160 ‡	N		0.58	U	0.68	U	0.62	U	1.19		0.68	U	0.54	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

Table 2A

AUES List Detections for Selected OU-4 Residence Samples (Includes Indicator and Agent Breakdown Compounds)

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:		Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:		RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute		downward)[1]																
Volatile Organic Compounds - SW8260B (UG/KG)																		
ACROLEIN		160,000	N		5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
BENZYL BROMIDE		NA			5.3	U	5.4	U	5.6	U	5	U	5	U	4.8	U	5.2	U
CARBON DISULFIDE		780,000	N		11		11		38	J	11		11		8		26	
CHLOROFORM		78,000	N		1.1	U	1.1	U	1.1	U	1	U	1	U	0.97	U	1	U
SVOC Tentatively Identified Compounds (UG/KG)																		
OLEIC ACID (CAS# 112-80-1)		NA			260	NJ		*		*		*	4200	NJ	260	NJ	250	NJ
ICP Inorganic Analyses - SW6010B (MG/KG)																		
ALUMINUM		7,800	N	**25,798**	24800		27300		36300		26000		18400		21400		29700	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	1.5		1.7		1.4		2.2		36.1		14		12	
BARIUM *(Indicator only)*		**550**	N	298.28	121		156		168		124		69		98		168	
CALCIUM *(Indicator only)*		NA		**4,207**	707		705		1010		737		868		951		1320	
IRON		2,300	N	**31,951**	32300		36500		43900		38600		26400		28300		36600	
LEAD *(Indicator only)*		**400** [‡]		329.76	13.6		21.5		16.4		15.9		24.6		26.6		24.5	
MAGNESIUM		NA		**7,093**	11700	L	14000	L	22300	L	11700	L	8180	L	10100	L	13100	L
MANGANESE *(Indicator only)*		160	N	**1,251**	401	J	366	J	840	J	516	J	344	J	726	J	512	J
NICKEL *(Indicator only)*		**160**	N	40.12	53.3		43.1		87.2		53.6		32.7		41.9		43.9	
PHOSPHORUS		NA		NA	221	J	239	J	296	J	280	J	333	J	357	J	420	J
POTASSIUM *(Indicator only)*		NA		**4,945**	8530	L	12500	L	13900	L	9190	L	5400	L	6650	L	9580	L
SELENIUM *(Indicator only)*		**39**	N	0.88	0.48	UJ	0.56	UJ	0.72	J	0.55	UJ	0.56	UJ	0.58	J	0.54	UJ
SILICON		NA		NA	1510	J	1380	J	1580	J	1300	J	2080	J	2590	J	2300	J
SODIUM		NA		**55.80**	130		134		157		92.6		68		139		112	
SULFUR		NA		NA	75.8		76.7		103		101		106		81.7		99.4	
TIN *(Indicator only)*		**4,700**	N	NA	1.9	U	2.4		2.3	U	2.2	U	2.3	U	2.2	U	3.1	
TITANIUM *(Indicator only)*		**31,000**	N	NA	1420		1900		2320		1730		991		1010		1440	
ZINC		**2,300**	N	308.8	135		114		140		109		73.5		89.9		103	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-3819(48th)-1		OU4-3819(48th)-2		OU4-3819(48th)-3		OU4-3819(48th)-4		OU4-4710QS-1		OU4-4710QS-3		OU4-4710QS-4	
TYPE or LOCATION:	Residential		Metals	Quadrant 1		Quadrant 2		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 3		Quadrant 4	
SAMPLE DEPTH:	RBC		Back-	9-15"		9-15"		9-15"		9-15"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground\2	2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001		2/8/2001	
Analyses performed by Southwest Research Institute	downward)\1																
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)																	
CHLORIDE	NA			17.7		4.07		3.88		2.58		4.24		70.1		23.5	
FLUORIDE	NA			1.58		1.17	U	1.25	U	1.22	U	3.55	L	3.91	L	6.66	L
NITRATE-N	13,000	N		1.22	U	1.17	U	1.25	U	1.22	U	2.68		1.18	U	4.06	
SULFATE	NA			83.6		46.7		62		58.9		14.7		27.2		19	
Mustard and Mustard Breakdown Products (UG/KG)																	
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		1056	U	1001	U	1069	U	1039	U	257	J	411	J	1088	U
Other Parameters (MG/KG unless otherwise indicated)																	
CYANIDE *(Indicator only)*	160 ‡	N		0.61	U	0.54	U	0.6	U	0.59	U	0.61	U	0.59	U	0.64	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table.

(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10

C = Carcinogen as listed on the USEPA RBC table.

NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:		REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:		Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:		(adjusted		ground[12]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute		**downward)[11]**														
Volatile Organic Compounds - SW8260B (UG/KG)																
ACROLEIN		160,000	N		4.8	U	16		10		5	U	7	U	7	
BENZYL BROMIDE		NA			4.8	U	7.4	U	6.5	U	16		7	U	5.5	U
CARBON DISULFIDE		780,000	N		170	J	8		8		15		8		10	
CHLOROFORM		78,000	N		0.97	U	1.5	U	1	J	1	U	1.4	U	1.1	U
SVOC Tentatively Identified Compounds (UG/KG)																
OLEIC ACID (CAS# 112-80-1)		NA			140	NJ		*		*	130	NJ	190	NJ		*
ICP Inorganic Analyses - SW6010B (MG/KG)																
ALUMINUM		7,800	N	**25,798**	12400		15500		12500		8520		7020		13500	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	53.9		133		107		4.4		6.3		2	
BARIUM *(Indicator only)*		**550**	N	298.28	73.3		109		108		53.4		44.9		54.6	
CALCIUM *(Indicator only)*		NA		**4,207**	1580		2520		3250		2860		9240		1810	
IRON		2,300	N	**31,951**	30500		34200		26900		18300		16700		25200	
LEAD *(Indicator only)*		**400** [‡]		329.76	64.3		71.9		72		65.6		62.5		20.6	
MAGNESIUM		NA		**7,093**	1360	L	3940	L	2520	L	1850	L	5350	L	4830	L
MANGANESE *(Indicator only)*		160	N	**1,251**	571	J	800	J	695	J	216	J	231	J	342	J
NICKEL *(Indicator only)*		**160**	N	40.12	13.7		19.9		13.5		14.4		10.7		31.4	
PHOSPHORUS		NA		NA	792	J	850	J	921	J	1530	J	1320	J	205	J
POTASSIUM *(Indicator only)*		NA		**4,945**	514	L	888	L	890	L	704	L	625	L	859	L
SELENIUM *(Indicator only)*		**39**	N	0.88	1.2	J	0.71	J	0.62	UJ	0.6	UJ	0.59	UJ	0.56	UJ
SILICON		NA		NA	1290	J	1850	J	1370	J	1300	J	1400	J	1350	J
SODIUM		NA		**55.80**	57.2	U	65	U	61.6	U	59.9	U	58.7	U	55.5	U
SULFUR		NA		NA	212		293		313		387		422		73.9	
TIN *(Indicator only)*		**4,700**	N	NA	3.8		3.4		2.7		4.5		2.3	U	2.2	U
TITANIUM *(Indicator only)*		**31,000**	N	NA	252		445		378		253		199		272	
ZINC		**2,300**	N	308.8	73.5		88.8		76.9		86.1		80.2		33.1	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

Selected OU-4 Residences

SAMPLE ID:	REGION III			OU4-4625RP-3A		OU4-4625RP-3B		OU4-4625RP-4		OU4-4633RP-1		OU4-4633RP-2		OU4-4633RP-SB	
TYPE or LOCATION:	Residential		Metals	Quadrant 3		Quadrant 3		Quadrant 4		Quadrant 1		Quadrant 2		Quad 2 at Boring	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"		0-12"	
SAMPLING DATE:	(adjusted		ground[\2]	2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001		2/13/2001	
Analyses performed by Southwest Research Institute	downward)[\1]														
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)															
CHLORIDE	NA			3		7.36		4.49		2.2		2.21		3.39	
FLUORIDE	NA			4.86	L	4.86	L	3.35		4.83		4.61		4.76	
NITRATE-N	13,000	N		3.28		5.47		6.68		10.3		11.6		1.2	U
SULFATE	NA			9.6		9.3		8.62		8.38		10.6		11.2	
Mustard and Mustard Breakdown Products (UG/KG)															
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		985	U	813	J	1117	U	1130	U	1156	U	1105	U
Other Parameters (MG/KG unless otherwise indicated)															
CYANIDE *(Indicator only)*	160 [‡]	N		0.58	U	0.68	U	0.62	U	1.19		0.68	U	0.54	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table.

(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10

C = Carcinogen as listed on the USEPA RBC table.

NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

Table 3

AUES List Scan Results for Selected OU-4 Residence Samples

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

Selected OU-4 Residences

Analyses performed by Southwest Research Institute			**OU4-3819-1**	**OU4-3819-2**	**OU4-3819-3**	**OU4-3819-4**	**OU4-4710QS-1**	**OU4-4710QS-3**	**OU4-4710QS-4**
COMPOUND	Chemical Abstract Service (CAS) No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
Acetyl Fluoride	557-99-3	*fluoride*	YES	NO	NO	NO	YES	YES	YES
Allyl Isocyanide		*cyanide*	NO	NO	NO	NO	NO	NO	NO
Allyl Isothiocyanate	57-06-7	*cyanide*	NO	NO	NO	NO	NO	NO	NO
Aluminium Selenide	1302-82-5	*aluminum*, selenium*	NO	NO	YES	NO	NO	YES	NO
Ammonium Chloride	12125-02-09	*chloride, ammonia*	NO	NO	NO	NO	NO	NO	NO
Ammonium Cyanide		*ammonia, cyanide*	NO	NO	NO	NO	NO	NO	NO
Ammonium Nitrate	6484-52-2	*nitrate, ammonia*	NO	NO	NO	NO	NO	NO	NO
Ammonium Picrate	131-74-8	*ammonia*	NO	NO	NO	NO	NO	NO	NO
Arsenic Trichloride	7784-34-1	*chloride, arsenic**	YES	YES	YES	YES	YES	YES	YES
Arsenic Trifluoride	7784-35-2	*fluoride, arsenic**	YES	NO	NO	NO	YES	YES	YES
Arsenic Trioxide	1327-53-3	*arsenic**	YES	YES	YES	YES	YES	YES	YES
Arsine	7784-42-1	*arsenic**	YES	YES	YES	YES	YES	YES	YES
Barium Peroxide	1304-29-6	*barium*	YES	YES	YES	YES	YES	YES	YES
Bromine	7726-95-6	*bromide*	NO	NO	NO	NO	NO	NO	NO
Bromoketone	593-95-3	*bromide*	NO	NO	NO	NO	NO	NO	NO
Bromoacetyl Bromide	598-21-0	*bromide*	NO	NO	NO	NO	NO	NO	NO
Bromobenzyl Cyanide	5798-79-8	*bromide, cyanide*	NO	NO	NO	NO	NO	NO	NO
Bromoxylyl Cyanide		*bromide, cyanide*	NO	NO	NO	NO	NO	NO	NO
Cacodyl	144-21-8	*sodium*, arsenic**	YES	YES	YES	YES	YES	YES	YES
Cacodyl Bromide		*bromide*	NO	NO	NO	NO	NO	NO	NO
Cacodyl Chloride		*chloride*	YES	YES	YES	YES	YES	YES	YES
Cacodyl Cyanide		*cyanide*	NO	NO	NO	NO	NO	NO	NO
Cadmium Methyl		*cadmium*	NO	NO	NO	NO	NO	NO	NO
Calcium Carbonate	471-34-1	*calcium**	YES	YES	YES	YES	YES	YES	YES
Calcium Sulfate	7778-18-9	*sulfate, calcium**	YES	YES	YES	YES	YES	YES	YES
Chlorine	7782-50-5	*chloride*	YES	YES	YES	YES	YES	YES	YES
Cyanogen	460-19-5	*cyanide*	NO	NO	NO	NO	NO	NO	NO
Cyanogen Bromide	506-68-3	*bromide, cyanide*	NO	NO	NO	NO	NO	NO	NO
Cyanogen Chloride	506-77-4	*chloride, cyanide*	NO	NO	NO	NO	NO	NO	NO
Dichloromethyl Ether	542-88-1	*chloride*	YES	YES	YES	YES	YES	YES	YES
Dichloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES	YES	YES
Dichloropropyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES	YES	YES
Dimethylarsine	593-57-7	*arsenic**	YES	YES	YES	YES	YES	YES	YES
Ethyl Sulfide	352-93-2	*sulfur*	YES	YES	YES	YES	YES	YES	YES
Hydrochloric Acid	7647-01-0	*chloride*	YES	YES	YES	YES	YES	YES	YES
Hydrocyanic Acid	74-90-8	*cyanide*	NO	NO	NO	NO	NO	NO	NO
Hydrofluoric Acid	7664-39-3	*fluoride*	YES	NO	NO	NO	YES	YES	YES
Hydrogen Selenide	7/5/7783	*selenium*	NO	NO	YES	NO	NO	YES	NO
Lead Ferrocyanide		*lead, iron, cyanide*	NO	NO	NO	NO	NO	NO	NO
Lead Peroxide	1309-60-0	*lead*	YES	YES	YES	YES	YES	YES	YES
Lead Thiocyanate	592-87-0	*lead, cyanide*	NO	NO	NO	NO	NO	NO	NO

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

Selected OU-4 Residences

Analyses performed by Southwest Research Institute			**OU4-3819-1**	**OU4-3819-2**	**OU4-3819-3**	**OU4-3819-4**	**OU4-4710QS-1**	**OU4-4710QS-3**	**OU4-4710QS-4**
COMPOUND	Chemical Abstract Service (CAS) No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
Magnesium Arsenide		*magnesium*, arsenic**	YES	YES	YES	YES	YES	YES	YES
Magnesium Carbonate	546-93-0	*magnesium**	YES	YES	YES	YES	YES	YES	YES
Magnesium Oxide	1309-48-4	*magnesium**	YES	YES	YES	YES	YES	YES	YES
Methyl Chloroarsine		*chloride, arsenic**	YES	YES	YES	YES	YES	YES	YES
Methyl Isocyanide	593-75-9	*cyanide*	NO	NO	NO	NO	NO	NO	NO
Methyl Selenide	593-79-3	*selenium*	NO	NO	YES	NO	NO	YES	NO
Nickel Carbonyl	13463-39-3	*nickel*	YES	YES	YES	YES	YES	YES	YES
Oxalyl Chloride	79-37-8	*chloride*	YES	YES	YES	YES	YES	YES	YES
Phenylcarbylamine Chloride	622-44-6	*chloride*	YES	YES	YES	YES	YES	YES	YES
Phosgene	75-44-5	*chloride*	YES	YES	YES	YES	YES	YES	YES
Potassium Chlorate	3811-04-9	*chloride, potassium**	YES	YES	YES	YES	YES	YES	YES
Potassium Nitrate	7757-79-1	*nitrate, potassium**	NO	NO	NO	NO	YES	NO	YES
Potassium Perchlorate	7778-74-7	*potassium**	YES	YES	YES	YES	YES	YES	YES
Potassium Permanganate	7722-64-7	*manganese, potassium**	YES	YES	YES	YES	YES	YES	YES
Silicon	7440-21-3	*silicon*	YES	YES	YES	YES	YES	YES	YES
Silicon Tetrachloride	409-21-2	*chloride, silicon*	YES	YES	YES	YES	YES	YES	YES
Sodium Bicarbonate	144-55-8	*sodium**	YES	YES	YES	YES	YES	YES	YES
Sodium Chlorate	7775-09-9	*chloride, sodium**	YES	YES	YES	YES	YES	YES	YES
Sodium Cyanide	143-33-9	*sodium, cyanide*	NO	NO	NO	NO	NO	NO	NO
Sodium Hydroxide	1310-73-2	*sodium**	YES	YES	YES	YES	YES	YES	YES
Sodium Nitrate	7631-99-4	*nitrate, sodium**	NO	NO	NO	NO	YES	NO	YES
Sodium Oleate	143-19-1	*sodium**	YES	YES	YES	YES	YES	YES	YES
Sodium Silicate	6834-92-0	*sodium*, silicon*	YES	YES	YES	YES	YES	YES	YES
Sodium Stearate	822-16-2	*sodium**	YES	YES	YES	YES	YES	YES	YES
Stannic Chloride (Tin Tetrachloride)	7646-78-8	*chloride, tin*	NO	YES	NO	NO	NO	NO	YES
Sulfur Chloride	10025-67-9	*chloride, sulfur*	YES	YES	YES	YES	YES	YES	YES
Sulfur Trioxide	7446-11-9	*sulfur*	YES	YES	YES	YES	YES	YES	YES
Sulfuryl Chloride	7791-25-5	*chloride, sulfur*	YES	YES	YES	YES	YES	YES	YES
Tetrachloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES	YES	YES
Thermite		*aluminum*, iron**	YES	YES	YES	YES	YES	YES	YES
Thiophosgene	463-71-8	*chloride, sulfur*	YES	YES	YES	YES	YES	YES	YES
Titanium Tetrachloride	7550-45-0	*chloride, titanium*	YES	YES	YES	YES	YES	YES	YES
Trichloroacetyl Chloride	76-02-8	*chloride*	YES	YES	YES	YES	YES	YES	YES
Trichloroacetyl Cyanide		*chloride, cyanide*	NO	NO	NO	NO	NO	NO	NO
Trichlorohydrin	96-18-4	*chloride*	YES	YES	YES	YES	YES	YES	YES
Xylyl Bromide	35884-77-6	*bromide*	NO	NO	NO	NO	NO	NO	NO
Zinc Chloride mixture	7646-85-7	*chloride, zinc*	YES	YES	YES	YES	YES	YES	YES
Zinc Oxide	1314-13-2	*zinc*	YES	YES	YES	YES	YES	YES	YES

YES — **Presence of this compound cannot be ruled out.**

NO — **Presence of this compound not indicated.**

Shading indicates an exceedance of the RBC or background of at least one of the indicator compounds if all were detected. The asterisk shows which indicator compound exceeded.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

Selected OU-4 Residences

Analyses performed by Southwest Research Institute			**OU4-4625-3A**	**OU4-4625-3B**	**OU4-4625-4**	**OU4-4633-1**	**OU4-4633-2**	**OU4-4633-SB**
COMPOUND	Chemical Abstract Service (CAS) No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
Acetyl Fluoride	557-99-3	*fluoride*	YES	YES	YES	YES	YES	YES
Allyl Isocyanide		*cyanide*	NO	NO	NO	YES	NO	NO
Allyl Isothiocyanate	57-06-7	*cyanide*	NO	NO	NO	YES	NO	NO
Aluminium Selenide	1302-82-5	*aluminum*, selenium*	YES	YES	NO	NO	NO	NO
Ammonium Chloride	12125-02-09	*chloride, ammonia*	NO	NO	NO	NO	NO	NO
Ammonium Cyanide		*ammonia, cyanide*	NO	NO	NO	NO	NO	NO
Ammonium Nitrate	6484-52-2	*nitrate, ammonia*	NO	NO	NO	NO	NO	NO
Ammonium Picrate	131-74-8	*ammonia*	NO	NO	NO	NO	NO	NO
Arsenic Trichloride	7784-34-1	*chloride, arsenic**	YES	YES	YES	YES	YES	YES
Arsenic Trifluoride	7784-35-2	*fluoride, arsenic**	YES	YES	YES	YES	YES	YES
Arsenic Trioxide	1327-53-3	*arsenic**	YES	YES	YES	YES	YES	YES
Arsine	7784-42-1	*arsenic**	YES	YES	YES	YES	YES	YES
Barium Peroxide	1304-29-6	*barium*	YES	YES	YES	YES	YES	YES
Bromine	7726-95-6	*bromide*	NO	NO	NO	NO	NO	NO
Bromoketone	593-95-3	*bromide*	NO	NO	NO	NO	NO	NO
Bromoacetyl Bromide	598-21-0	*bromide*	NO	NO	NO	NO	NO	NO
Bromobenzyl Cyanide	5798-79-8	*bromide, cyanide*	NO	NO	NO	NO	NO	NO
Bromoxylyl Cyanide		*bromide, cyanide*	NO	NO	NO	NO	NO	NO
Cacodyl	144-21-8	*sodium*, arsenic**	NO	NO	NO	NO	NO	NO
Cacodyl Bromide		*bromide*	NO	NO	NO	NO	NO	NO
Cacodyl Chloride		*chloride*	YES	YES	YES	YES	YES	YES
Cacodyl Cyanide		*cyanide*	NO	NO	NO	YES	NO	NO
Cadmium Methyl		*cadmium*	NO	NO	NO	NO	NO	NO
Calcium Carbonate	471-34-1	*calcium**	YES	YES	YES	YES	YES	YES
Calcium Sulfate	7778-18-9	*sulfate, calcium**	YES	YES	YES	YES	YES	YES
Chlorine	7782-50-5	*chloride*	YES	YES	YES	YES	YES	YES
Cyanogen	460-19-5	*cyanide*	NO	NO	NO	YES	NO	NO
Cyanogen Bromide	506-68-3	*bromide, cyanide*	NO	NO	NO	NO	NO	NO
Cyanogen Chloride	506-77-4	*chloride, cyanide*	NO	NO	NO	YES	NO	NO
Dichloromethyl Ether	542-88-1	*chloride*	YES	YES	YES	YES	YES	YES
Dichloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES	YES
Dichloropropyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES	YES
Dimethylarsine	593-57-7	*arsenic**	YES	YES	YES	YES	YES	YES
Ethyl Sulfide	352-93-2	*sulfur*	YES	YES	YES	YES	YES	YES
Hydrochloric Acid	7647-01-0	*chloride*	YES	YES	YES	YES	YES	YES
Hydrocyanic Acid	74-90-8	*cyanide*	NO	NO	NO	YES	NO	NO
Hydrofluoric Acid	7664-39-3	*fluoride*	YES	YES	YES	YES	YES	YES
Hydrogen Selenide	7/5/7783	*selenium*	YES	YES	NO	NO	NO	NO
Lead Ferrocyanide		*lead, iron, cyanide*	NO	NO	NO	YES	NO	NO
Lead Peroxide	1309-60-0	*lead*	YES	YES	YES	YES	YES	YES
Lead Thiocyanate	592-87-0	*lead, cyanide*	NO	NO	NO	YES	NO	NO

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

Selected OU-4 Residences

Analyses performed by Southwest Research Institute			**OU4-4625-3A**	**OU4-4625-3B**	**OU4-4625-4**	**OU4-4633-1**	**OU4-4633-2**	**OU4-4633-SB**
COMPOUND	Chemical Abstract Service (CAS) No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
Magnesium Arsenide		*magnesium*, arsenic**	YES	YES	YES	YES	YES	YES
Magnesium Carbonate	546-93-0	*magnesium**	YES	YES	YES	YES	YES	YES
Magnesium Oxide	1309-48-4	*magnesium**	YES	YES	YES	YES	YES	YES
Methyl Chloroarsine		*chloride, arsenic**	YES	YES	YES	YES	YES	YES
Methyl Isocyanide	593-75-9	*cyanide*	NO	NO	NO	YES	NO	NO
Methyl Selenide	593-79-3	*selenium*	YES	YES	NO	NO	NO	NO
Nickel Carbonyl	13463-39-3	*nickel*	YES	YES	YES	YES	YES	YES
Oxalyl Chloride	79-37-8	*chloride*	YES	YES	YES	YES	YES	YES
Phenylcarbylamine Chloride	622-44-6	*chloride*	YES	YES	YES	YES	YES	YES
Phosgene	75-44-5	*chloride*	YES	YES	YES	YES	YES	YES
Potassium Chlorate	3811-04-9	*chloride, potassium**	YES	YES	YES	YES	YES	YES
Potassium Nitrate	7757-79-1	*nitrate, potassium**	YES	YES	YES	YES	YES	NO
Potassium Perchlorate	7778-74-7	*potassium**	YES	YES	YES	YES	YES	YES
Potassium Permanganate	7722-64-7	*manganese, potassium**	YES	YES	YES	YES	YES	YES
Silicon	7440-21-3	*silicon*	YES	YES	YES	YES	YES	YES
Silicon Tetrachloride	409-21-2	*chloride, silicon*	YES	YES	YES	YES	YES	YES
Sodium Bicarbonate	144-55-8	*sodium**	NO	NO	NO	NO	NO	NO
Sodium Chlorate	7775-09-9	*chloride, sodium**	NO	NO	NO	NO	NO	NO
Sodium Cyanide	143-33-9	*sodium, cyanide*	NO	NO	NO	NO	NO	NO
Sodium Hydroxide	1310-73-2	*sodium**	NO	NO	NO	NO	NO	NO
Sodium Nitrate	7631-99-4	*nitrate, sodium**	NO	NO	NO	NO	NO	NO
Sodium Oleate	143-19-1	*sodium**	NO	NO	NO	NO	NO	NO
Sodium Silicate	6834-92-0	*sodium*, silicon*	NO	NO	NO	NO	NO	NO
Sodium Stearate	822-16-2	*sodium**	NO	NO	NO	NO	NO	NO
Stannic Chloride (Tin Tetrachloride)	7646-78-8	*chloride, tin*	YES	YES	YES	YES	NO	NO
Sulfur Chloride	10025-67-9	*chloride, sulfur*	YES	YES	YES	YES	YES	YES
Sulfur Trioxide	7446-11-9	*sulfur*	YES	YES	YES	YES	YES	YES
Sulfuryl Chloride	7791-25-5	*chloride, sulfur*	YES	YES	YES	YES	YES	YES
Tetrachloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES	YES
Thermite		*aluminum*, iron**	YES	YES	YES	YES	YES	YES
Thiophosgene	463-71-8	*chloride, sulfur*	YES	YES	YES	YES	YES	YES
Titanium Tetrachloride	7550-45-0	*chloride, titanium*	YES	YES	YES	YES	YES	YES
Trichloroacetyl Chloride	76-02-8	*chloride*	YES	YES	YES	YES	YES	YES
Trichloroacetyl Cyanide		*chloride, cyanide*	NO	NO	NO	YES	NO	NO
Trichlorohydrin	96-18-4	*chloride*	YES	YES	YES	YES	YES	YES
Xylyl Bromide	35884-77-6	*bromide*	NO	NO	NO	NO	NO	NO
Zinc Chloride mixture	7646-85-7	*chloride, zinc*	YES	YES	YES	YES	YES	YES
Zinc Oxide	1314-13-2	*zinc*	YES	YES	YES	YES	YES	YES

YES — **Presence of this compound cannot be ruled out.**

NO — **Presence of this compound not indicated.**

Shading indicates an exceedance of the RBC or background of at least one of the indicator compounds if all were detected. The asterisk shows which indicator compound exceeded.

RBC KEY

Note: In accordance with standard Risk Assessment practice, Risk-Based Concentrations (RBCs) for structurally, chemically, or toxicologically similar chemicals were used for those chemicals that did not have RBCs. For this investigation, these included the following:

RBC for 1,3-Dichloropropene was used for CIS and TRANS-1,3-Dichloropropene
RBC for Hexane was used for Cyclohexane and Methylcyclohexane
RBC for Acetone was used for Bromoacetone and Chloroacetone
RBC for Carbon Disulfide was used for Chlorinated Carbon Disulfide
RBC for Ethyl Acetate was used for Ethyl Bromoacetate and Ethyl Dibromoacetate
RBC for Beta-Chloronaphthalene was used for 2-Chloronaphthalene (same chemical)
RBC for 4-Nitrophenol was used for 2-Nitrophenol
RBC for Acenapthene was used for Acenaphthylene
RBC for Dibutylphthalate was used for Di-N-Butylphthalate (same chemical)
RBC for Dioctylphthalate was used for Di-N-Octylphthalate (same chemical)
RBC for Alpha-HCH was used for Alpha-Lindane (same chemical)
RBC for Chromium III was used for Chromium
RBC for Cyanide (Free) was used for Cyanide
For Lead, the USEPA recommended residential land use screening level of 400 ppm was used.

Attachment A

Quality Assurance Report

QUALITY ASSURANCE SUMMARY REPORT FOR

SOIL SAMPLES ASSOCIATED WITH SPRING VALLEY OU-4 FOLLOW-ON RESIDENTIAL AUES LIST SAMPLING (WMP AMENDMENT 2)

INTRODUCTION

This data validation summary report covers environmental soil samples collected from selected Spring Valley OU-4 locations (4710 Quebec Street, 3819 48th Street, 4625 Rockwood Parkway and 4633 Rockwood Parkway) in Washington, DC. These samples were included in laboratory Sample Delivery Group 156670. The samples were analyzed for Full Scan Parameters including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Adamsite, Mustard, Mustard degradation or breakdown products, lewisite degradation products, trinitrotoluene, metals, ions (bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate) and selected wet chemistry parameters (ammonia and total cyanide). VOC and SVOC analyses included tentatively identified compounds (TICs).

All work was performed in accordance with the Work Management Plan (WMP) prepared by Parsons ES and as amended (Revised Final Amendment 2, April 2001). The WMP included a Quality Assurance Project Plan (QAPJP) that was also prepared and approved for use to ensure generation of legally defensible data. Southwest Research Institute of San Antonio, Texas, following procedures outlined in the QAPjP and the WMP, performed all analyses with the exception of Mustard and Adamsite, which were analyzed by the Army's Edgewood Chemical and Biological Command (ECBC) laboratory.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and validated following the guidelines described in the QAPjP and consistent with Region III modifications to the USEPA Functional Guidelines for Evaluating Organic and Inorganic Data. All information included in the data packages have been reviewed and validated including

sample results, laboratory quality control results, chain-of-custody forms and all supporting raw data.

This report addresses only those problems affecting the usability of the data. A discussion of data validation qualifiers (flags) applied to the data and reasons for the qualifiers is also presented.

Deviations from the QAPjP or the analytical methods and a discussion of the overall usability of the data are also presented in the summary section of this report. QC problems leading to qualifying of data as unusable or rejected are presented in the Major Problems section. QA/QC problems leading to qualifying of data as estimated or not detected are presented in the Minor Problems section. Details concerning samples and target analytes affected are also presented.

SUMMARY

This section of this report discusses deviations from the QAPjP, other laboratory problems, QC problems leading to qualifying of data as rejected, estimated or not detected and the overall usability of the data.

Except as indicated in this report, the samples were collected, prepared and analyzed following the procedures described in the WMP and the QAPjP. Except as indicated in this report, all samples were prepared and analyzed within the specified holding times using the EPA-approved analytical procedures. The types and number of field and laboratory QC samples collected and analyzed met the QA objectives specified in the QAPP.

No major QC problems leading to rejection of data were found during validation of the data for the samples in this SDG.

The data as submitted by the laboratory and qualified following data validation are usable for the purposes of this project. The overall completeness for the sampling event is 100 percent since no data have been rejected and reported in the data tables.

Minor QC problems leading to qualifying of data as estimated or not detected included: laboratory blank contamination; accuracy (% recovery) outliers, surrogate outliers, internal standard outliers and reported detections less than the project reporting limit (PRL). Details concerning these QC problems are presented in the Minor Problems section.

MAJOR PROBLEMS

As indicated above no major problems were found during validation of the data for this SDG. No reported results have been qualified as rejected or unusable. All reported results should be considered usable as qualified in the data summary tables.

MINOR PROBLEMS

This section of the QA summary report discusses QC problems leading to qualifying of data as estimated. The "J" qualifier is used to indicate estimated results. The flag indicates that the analyte was positively identified but the associated value may be imprecise due to QC problems.

As indicated above, QC problems leading to qualifying of data as estimated included: laboratory and field blank contamination; accuracy outliers, surrogate outliers, internal standard outliers and reported detections less than the PRL. Details concerning these problems are presented below by analytical parameter.

Volatile Organic Compounds (VOCs)

- The reported results for the following VOC target analytes were less than the PRL and should be considered estimated (flagged 'J'): chloromethane and chloroform.
- The laboratory reported internal standard area outliers for the following soil samples: OU4-4625-3A, OU4-4625-3B, OU4-4625-4, OU4-4633-1, OU4-4633-2 and OU4-4633-SB. All reported results for the samples have been qualified as estimated (flagged 'UJ/J').
- The laboratory reported that several samples contained target VOCs at concentrations above the calibration range for the method. The affected

samples were diluted and reanalyzed to obtain better results. Validation of the results for the reanalyses revealed serious problems including gross holding time violations and use of an unpreserved sample. The results for the reanalyses were rejected and have not been included in the data summary tables. The affected 'original' results have been qualified as estimated and flagged 'J'. The target VOCs affected are dichlorodifluoromethane, acetone and carbon disulfide**.**

- Target VOC acetone was detected in at least one blank associated with some of the samples. Some reported results for acetone in associated samples have been requalified as estimated and flagged 'B'.

Semivolatile Organic Compounds (SVOCs)

- Reported results less than the PRL has been qualified as estimated and flagged "J". Target analytes affected include 2-methylnaphthalene, acenaphthylene, benzyl alcohol, naphthalene, benzoic acid, diethylphthalate, phenanthrene, fluoranthene, pyrene, benzo (a) anthracene, chrysene, bis (2-ethylhexyl) phthalate, di-n-octylphthalate, benzo (b) fluoranthene, benzo (k) fluoranthene and benzo (a) pyrene.
- The laboratory reported internal standard outliers for the following samples OU4-4625-4, OU4-4633-1, OU4-4633-2 and OU4-4633-SB. The reported results for the affected sample have been qualified as estimated and flagged 'UJ/J' due to the internal standard outliers. Only the target SVOCs quantitated using the affected internal standard have been qualified.
- Several target SVOCs were detected in the laboratory blanks associated with some of the soil samples. The affected SVOCs are diethylphthalate, di-n-butylphthalate and bis (2-ethylhexyl) phthalate. Reported results for these analytes in the associated samples have been requalified as estimated and flagged 'B' due to the blank contamination.

Mustard Degradation Products

- Some reported results, for target analyte thiodiglycol, are less than the PRL and have been qualified as estimated and flagged "J".

Metals

- Accuracy (matrix spike percent recovery) outliers were reported for target metals antimony, magnesium and potassium. The reported results for these metals in the affected soil samples have been qualified as estimated and flagged 'L/UL'. The 'L' qualifier indicates a low bias meaning the actual result or PRL may be higher than the reported result. The reported data is usable for most purposes, including risk assessment.

- Precision (relative percent difference) outliers were reported for the following target metals: phosphorus, potassium, selenium, manganese and silicon. The reported results for these metals in the affected samples have been qualified as estimated and flagged 'J/UJ'.

Wet Chemistry Parameters

- Accuracy outliers were reported for fluoride and phosphate for the MS/MSDs associated with some of the samples. The reported results for these analytes in the associated samples have been qualified as estimated and flagged 'L/UL'. The 'L' qualifier indicates a low bias meaning the true result may be higher than the reported result. The reported data is usable for most purposes, including risk assessment.

DATA VALIDATION QUALIFIERS

U = The compound was analyzed for and is not present. The associated numerical value (Practical Quantitation Limit - PQL) indicates the approximate concentration necessary to quantify the compound in the sample.

UJ = A combination of the "U" and "J" flags. The compound was analyzed for and is not present. The associated numerical value (Practical Quantitation Limit - PQL) has been qualified as estimated due to a QC anomaly.

J = The compound was detected in the sample, but the reported result is “estimated” (could not be accurately quantified) either because the reported value is less than the PQL or at least one minor Quality Control (QC) problem was found during validation. Data with a "J" qualifier is considered usable for most decision-making purposes, including risk assessment.

K = The analyte was detected in the sample. The reported result is considered estimated and may be biased high due to a minor QA/QC problem. The true concentration present in the sample may be lower than the reported result. The data is considered estimated and usable for most decision-making purposes, including risk assessment.

L = The analyte was detected in the sample. The reported result is considered estimated and may be biased low due to a minor QA/QC problem. The true concentration present in the sample may be higher than the reported result. The data is considered estimated and usable for most decision-making purposes, including risk assessment.

NJ = This flag indicates presumptive evidence of a compound. It is only used for Tentatively Identified Compounds (TICs), where identification is based on a mass spectral library search. The 'N' is not applied to generic descriptions of a TIC, such as "unknown hydrocarbon". The "J" flag indicates the reported numerical result is estimated.

JNB = This is a combination of the 'NJ' and 'B' flags. The 'B' indicates the compound was detected in a laboratory or field blank associated with the sample. The reported result should be considered estimated and biased high due to blank contamination.

R = The reported result is considered unusable and unreliable due to a major problem associated with the analysis of the sample or analyte. This qualifier implies no confidence in the reported result due to the problem found during validation. Resampling is recommended if the compound affected is critical to the decision-making process.

B = The analyte was also detected in a laboratory or field blank associated with the sample. The reported result is considered estimated and biased high due to the blank contamination.

Attachment B

AUES Chemicals List
(Presented at the end of the Sedgwick Trench Section)

REPORT OF ANALYTICAL RESULTS -

American University Experiment Station (AUES)
List Of Chemicals

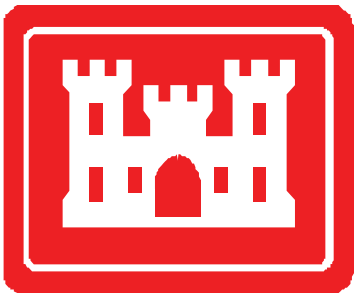
CHILD DEVELOPMENT CENTER AND AMERICAN UNIVERSITY LOT 12

SPRING VALLEY OPERABLE UNIT 4,
WASHINGTON, D.C.

TASK ORDER TO NATIONAL GUARD BUREAU
CONTRACT NO. DAHA90-94-D-0010, TASK ORDER DA01
DERP-FUDS HTRW PROJECT NUMBER C03DC091802

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT



Prepared By:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

This document was originally published on APRIL 18, 2002
but has since been updated with revised RBC data.

REPORT OF ANALYTICAL RESULTS

American University Experiment Station (AUES)
List Of Chemicals

CHILD DEVELOPMENT CENTER
&
AMERICAN UNIVERSITY LOT 12

SPRING VALLEY OPERABLE UNIT 4,
WASHINGTON, D.C.

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared By:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

This document was originally published on APRIL 18, 2002
but has since been updated with revised RBC data.

Overview

In accordance with the *Revised Final Work Management Plan, Amendment 1, AU Lot 12/Child Development Center (Parsons, February 2001),* Parsons collected 32 soil samples from the American University (AU) Lot 12 and the Child Development Center to assess for the presence of the American University Experiment Station (AUES) list of chemicals. Of the 32 samples, 16 were analyzed directly for the AUES chemicals. All samples were analyzed by the Southwest Research Institute (SwRI), with the exception of adamsite, which was analyzed by the US Army's Edgewood Chemical and Biological Command (ECBC) Laboratory. This submittal is organized as follows:

Figure 1 shows the sample locations and the **Analytical Plan table** shows the number of samples submitted and parameters analyzed. The results are compiled on five tables.

Table 1 is the comprehensive list of compounds analyzed. These include the routine Target Compound List and Target Analyte List constituents and the Chemical Warfare Materiel (CWM) compounds and CWM breakdown products that were analyzed to make determinations of whether the AUES List chemicals were present. Therefore, the table contains all compounds analyzed, whether they were actually on the AUES list or not.

Table 1A is the comprehensive list detections. It is a subset of Table 1. These are the compounds shown on Table 1 that were present in concentrations above the detection limit.

Table 2 is the AUES list of compounds. It is also a subset of Table 1, showing the results for those AUES chemicals that could be directly analyzed. Additionally, CWM breakdown products and the indicator compounds used in Table 3, although not actually AUES list compounds, are included. They are indicated on the table as either a 'breakdown product' or 'indicator' compound.

Table 2A is the AUES list detections. It is a subset of Table 2. These are the compounds shown on Table 2 that were present in concentrations above the detection limit. Additionally, CWM breakdown products and the indicator compounds, although not actually AUES list compounds, are included.

Table 3 is the AUES list scan results. These are the AUES chemicals that did not have routine analytical methodologies. The presence or absence of these chemicals was inferred by the presence or absence of indicator compounds for each AUES chemical.

RBC Key contains the rationale for the RBCs shown for those chemicals that did not have RBCs.

Attachment A contains the Quality Assurance or Data Validation Report of the sampling effort.

Attachment B contains the full AUES Chemicals list and the organization of the analytical effort, i.e., which compounds could be analyzed and by what methods (presented at the end of the Sedgwick Trench section).

Figure 1
Child Development Center / AU Lot 12
Sample Locations

Spring Valley Operable Unit 4
Washington D.C.

Legend

- Boring Location
- Random Samples
  - CDC
    - Random Grids 1 - 4
    - Random Grids 5 - 8
  - AU 12
    - 3 Random Grids
- Cut and Fill, 1917-2000 (2 foot contours)
  - Cut
  - Level
  - Fill
  - Fence
- AU Lot 12
- 10' Grid
- 20' Grid
- Full AUES List Sample
- Physical Obstruction (Grid could not be sampled)
- Gravel
- ★ Sample Collected Outside Fence in 20' AU Lot 12 Grid

Note:
Sample results are in Parts per Million.
Results in red are over 13 ppm inside the CDC.

498.0 The highest 5% arsenic levels inside the CDC
163.0 The next 5% highest arsenic values inside the CDC
276.0 The 3 highest arsenic values outside the CDC

Random Grids were selected by creating random X and Y grid coordinates in ESRI's ArcView GIS (command MakeRandom in the Avenue programming language).

30 0 30 Feet

1 inch = 30 feet

Scale:	1 : 360
Created By:	Parsons ES
File:	Y:\Projects\Fed\Usace\springva\springva.APR
Date:	02/12/2002
Figure Number:	1
Page Number:	X-X

PARSONS

Spring Valley OU-4
AU Lot 12/CDC
AUES List Analytical Plan

	No. of Sx Collected	TAL Metals	TCL VOCs	TCL SVOCs	ABPs	AUES List
CDC						
Mulch in 5% highest As grids	2	X				
0-1" in the 5% highest As grids	4	X				
0-6" in the 5% highest As grids	4	X	X	X	X	X
0-6" in the next 5% highest As grids	4	X	X	X		
0-6" in Random Grids (1 through 4)	4	X	X	X	X	X
0-6" in Random Grids (5 through 8)	4	X	X	X		
2 Borings:						
1 ft depth	2	X				
4 ft depth	2	X	X	X	X	X
AU Lot 12						
0-6" in the 3 highest As grids	3	X	X	X	X	X
0-6" in 3 Random Grids	3	X	X	X	X	X
Totals	32	32	24	24	16	16*

Notes:

* Of the 32 total samples, these 16 were run for the full AUES List.

ABPs = Agent Breakdown Products

Random grids were selected using the GIS "MakeRandom" command.

Table does not include the original quadrant and grid arsenic analyses.

Table 1

Comprehensive Sample Results for AU 12/CDC

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
Volatile Organic Compounds - SW8260B (UG/KG)															
1,1,1-TRICHLOROETHANE	2,200,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
1,1,2,2,-TETRACHLOROETHANE	3,200	C		NS		1.2	UJ	NS			R	1	U	1	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	230,000,000	N		NS		1.2	U	NS		1.1	U	1	U	1	U
1,1,2-TRICHLOROETHANE	11,000	C		NS		1.2	UJ	NS			R	1	U	1	U
1,1-DICHLOROETHANE	780,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
1,1-DICHLOROETHENE	390,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
1,2,4-TRICHLOROBENZENE	78,000	N		NS		1.2	UJ	NS			R	1	UJ	1	UJ
1,2-DIBROMO-3-CHLOROPROPANE	460	C		NS		1.2	UJ	NS			R	1	UJ	1	UJ
1,2-DIBROMOETHANE	7.5	C		NS		1.2	UJ	NS			R	1	U	1	U
1,2-DICHLOROBENZENE	700,000	N		NS		1.2	UJ	NS			R	1	UJ	1	UJ
1,2-DICHLOROETHANE	7,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
1,2-DICHLOROPROPANE	9,400	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
1,3-DICHLOROBENZENE	230,000	N		NS		1.2	UJ	NS			R	1	UJ	1	UJ
1,4-DICHLOROBENZENE	27,000	C		NS		1.2	UJ	NS			R	1	UJ	1	UJ
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		NS		1.2	U	NS		1.1	UJ	19		13	
2-HEXANONE	310,000	N		NS		1.2	UJ	NS			R	1	U	1	U
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
ACETONE	780,000	N		NS		6		NS		5	J	91	J	59	J
ACETONITRILE	NA			NS		5.8	U	NS		5.6	UJ	6	U	9	
ACROLEIN	160,000	N		NS		5.8	U	NS		5.6	UJ	7		6	U
BENZENE	12,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
BENZYL BROMIDE	NA			NS		5.8	UJ	NS			R	6	UJ	6	UJ
BENZYL CHLORIDE	3,800	C		NS		5.8	UJ	NS			R	6	UJ	6	UJ
BROMODICHLOROMETHANE	10,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
BROMOFORM	81,000	C		NS		1.2	UJ	NS			R	1	UJ	1	UJ
BROMOMETHANE	11,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CARBON DISULFIDE	780,000	N		NS		12		NS		11	J	9		9	
CARBON TETRACHLORIDE	4,900	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CHLOROBENZENE	160,000	N		NS		1.2	UJ	NS			R	1	U	1	U
CHLOROETHANE	220,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CHLOROFORM	78,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CHLOROMETHANE	NA			NS		2		NS		5	J	4		3	
CHLOROPICRIN	NA			NS		29	U	NS		28	UJ	30	U	29	U
CIS-1,2-DICHLOROETHENE	78,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CIS-1,3-DICHLOROPROPENE	6,400 ‡	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CYCLOHEXANE	470,000 ‡	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
DIBROMOCHLOROMETHANE	7,600	C		NS		1.2	UJ	NS			R	1	U	1	U
DICHLORODIFLUOROMETHANE	1,600,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
ETHYLBENZENE	780,000	N		NS		1.2	UJ	NS			R	1	U	1	U
ISOPROPYLBENZENE (CUMENE)	780,000	N		NS		1.2	UJ	NS			R	1	UJ	1	UJ
M&P-XYLENE	1,600,000	N		NS		1.2	UJ	NS			R	1	U	1	U
METHYL ACETATE	7,800,000	N		NS		1.2	U	NS		1.1	UJ	11		3	
METHYL TERT-BUTYL ETHER	160,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
METHYLCYCLOHEXANE	470,000 ‡	N		NS		1.2	U	NS		1.1	UJ	2		1	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
METHYLENE CHLORIDE	85,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
O-XYLENE	1,600,000	N		NS		1.2	UJ	NS			R	1	U	1	U
STYRENE	1,600,000	N		NS		1.2	UJ	NS			R	1	U	1	U
TETRACHLOROETHENE	32,000	C		NS		1.2	UJ	NS			R	1	U	1	U
TOLUENE	1,600,000	N		NS		1.2	UJ	NS			R	1	U	1	U
TRANS-1,2-DICHLOROETHENE	160,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
TRANS-1,3-DICHLOROPROPENE	6,400 ‡	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
TRICHLOROETHENE	1,600	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
TRICHLOROFLUOROMETHANE	2,300,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
VINYL CHLORIDE	90	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
VOC Tentatively Identified Compounds (UG/KG)															
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)	NA			NS			*	NS			*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)	NA			NS		2	NJ	NS			*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)	NA			NS			*	NS			*	20	NJ	6	NJ
2-DECENE, 4-METHYL-,(Z)-	NA			NS			*	NS			*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)	NA			NS			*	NS			*		*		*
2-OCTENE, (E)- ISOMER	NA			NS		10	NJ	NS		10	NJ		*	10	NJ
2-OCTENE, (E)- ISOMER	NA			NS			*	NS			*		*	10	NJ
2-OCTENE, (Z)- ISOMER	NA			NS			*	NS			*		*		*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)	NA			NS			*	NS			*	60	NJ		*
2-PROPANOL (CAS# 67-63-0)	NA			NS			*	NS			*	40	NJ	100	NJ
3-OCTENE, (E)-	NA			NS			*	NS			*		*		*
ACETALDEHYDE (CAS# 75-07-0)	NA			NS			*	NS			*	40	NJ	10	NJ
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)	7,000,000	N		NS			*	NS			*	30	NJ		*
ALCOHOL	NA			NS			*	NS			*		*		*
ALLYL ALCOHOL	NA			NS			*	NS			*		*		*
BENZALDEHYDE (CAS# 100-52-7)	780,000	N		NS			*	NS			*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N		NS			*	NS			*		*		*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-	NA			NS			*	NS			*		*		*
BENZYL IODIDE	NA			NS			*	NS			*		*		*
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL	NA			NS			*	NS			*		*		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-	NA			NS			*	NS			*		*		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-	NA			NS			*	NS			*		*		*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL	NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-	NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPT-2-ENE,2,	NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-D	NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-	NA			NS			*	NS			*		*		*
BROMOACETONE	780,000 ‡	N		NS			*	NS			*		*		*
BROMOBENZENE	NA			NS			*	NS			*		*		*
BROMOMETHYL ETHER	NA			NS			*	NS			*		*		*
BUTANAL (CAS# 123-72-8)	NA			NS			*	NS			*		*		*
BUTANAL, 3-METHYL-	NA			NS			*	NS			*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
BUTYL MERCAPTAN	NA			NS			*	NS			*		*		*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)	NA			NS			*	NS			*		*		*
CHLORINATED ACETONE	NA			NS			*	NS			*		*		*
CHLORINATED CARBON DISULFIDE	780,000 ‡	N		NS			*	NS			*		*		*
CHLOROACETONE	780,000 ‡	N		NS			*	NS			*		*		*
CHLOROACETONITRILE	NA			NS			*	NS			*		*		*
CHLOROMETHYL ETHER	NA			NS			*	NS			*		*		*
CHLOROMETHYL ETHYL ETHER	NA			NS			*	NS			*		*		*
CROTONALDEHYDE	340	C		NS			*	NS			*		*		*
CYCLOBUTANOL (CAS# 2919-23-5)	NA			NS			*	NS			*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA			NS		9	NJ	NS		10	NJ		*		*
DECANAL (CAS# 112-31-2)	NA			NS			*	NS			*		*		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA			NS			*	NS		4	NJ		*		*
ETHYL BROMOACETATE	7,000,000 ‡	N		NS			*	NS			*		*		*
ETHYL CHLOROFORMATE	NA			NS			*	NS			*		*		*
ETHYL DIBROMOACETATE	7,000,000 ‡	N		NS			*	NS			*		*		*
ETHYL MERCAPTAN	NA			NS			*	NS			*		*		*
HEPTANAL (CAS# 111-71-7)	NA			NS			*	NS			*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA			NS		2	NJ	NS			*		*		*
HEXANAL (CAS# 66-25-1)	NA			NS		5	NJ	NS		20	NJ	200	NJ	100	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA			NS		1	NJ	NS			*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA			NS		0.6	NJ	NS			*	10	NJ	6	NJ
METHYL BROMOACETATE	NA			NS			*	NS			*		*		*
METHYL CHLOROACETATE	NA			NS			*	NS			*		*		*
METHYL CHLOROFORMATE	NA			NS			*	NS			*		*		*
METHYL CHLOROSULFONATE	NA			NS			*	NS			*		*		*
OCTANAL (CAS# 124-13-0)	NA			NS			*	NS			*	20	NJ	6	NJ
OCTANE (CAS# 111-65-9)	NA			NS			*	NS			*		*		*
PENTANAL ISOMER	NA			NS		0.8	NJ	NS		2	NJ	60	NJ	20	NJ
PENTANAL ISOMER	NA			NS			*	NS			*		*	10	NJ
PENTANAL, 2-METHYL- (CAS# 123-15-9)	NA			NS			*	NS			*		*		*
PENTANE (CAS# 109-66-0)	NA			NS			*	NS		3	NJ	40	NJ		*
PERCHLOROMETHYLMERCAPTAN	NA			NS			*	NS			*		*		*
PROPANE, 2-METHYL- (CAS# 72-28-5)	NA			NS			*	NS			*		*		*
THIOPHENE	NA			NS			*	NS			*		*		*
TRICHLOROACETONITRILE	NA			NS			*	NS			*		*		*
UNDECANE (CAS# 1120-21-4)	NA			NS			*	NS			*		*		*
Semivolatile Organic Compounds - SW8270C (UG/KG															
1,2,4-TRICHLOROBENZENE	78,000	N		NS		89	U	NS		79	U	80	U	86	U
1,2-DICHLOROBENZENE	700,000	N		NS		89	U	NS		79	U	80	U	86	U
1,3-DICHLOROBENZENE	230,000	N		NS		89	U	NS		79	U	80	U	86	U
1,4-DICHLOROBENZENE	27,000	C		NS		89	U	NS		79	U	80	U	86	U
2,4,5-TRICHLOROPHENOL	780,000	N		NS		89	U	NS		79	U	80	U	86	U
2,4,6-TRICHLOROPHENOL	58,000	C		NS		89	U	NS		79	U	80	U	86	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
2,4-DICHLOROPHENOL	23,000	N		NS		89	U	NS		79	U	80	U	86	U
2,4-DIMETHYLPHENOL	160,000	N		NS		89	U	NS		79	U	80	U	86	U
2,4-DINITROPHENOL	16,000	N		NS		270	U	NS		240	U	240	U	260	U
2,4-DINITROTOLUENE	16,000	N		NS		89	U	NS		79	U	80	U	86	U
2,6-DINITROTOLUENE	7,800	N		NS		89	U	NS		79	U	80	U	86	U
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		NS		89	U	NS		79	U	80	U	86	U
2-CHLOROPHENOL	39,000	N		NS		89	U	NS		79	U	80	U	86	U
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		NS		89	U	NS		79	U	80	U	86	U
2-METHYLPHENOL	390,000	N		NS		89	U	NS		79	U	80	U	86	U
2-NITROANILINE	NA			NS		89	U	NS		79	U	80	U	86	U
2-NITROPHENOL	63,000 ‡	N		NS		89	U	NS		79	U	80	U	86	U
3,3-DICHLOROBENZIDINE'	1,400	C		NS		89	U	NS		79	U	80	U	86	U
3-NITROANILINE (CAS# 99092)	2,300	N		NS		89	U	NS		79	U	80	U	86	U
4,6-DINITRO-2-METHYLPHENOL	780	N		NS		89	U	NS		79	U	80	U	86	U
4-BROMOPHENYL-PHENYLETHER	NA			NS		89	U	NS		79	U	80	U	86	U
4-CHLORO-3-METHYLPHENOL	NA			NS		89	U	NS		79	U	80	U	86	U
4-CHLOROANILINE	31,000	N		NS		89	U	NS		79	U	80	U	86	U
4-CHLOROPHENYL-PHENYLETHER	NA			NS		89	U	NS		79	U	80	U	86	U
4-METHYLPHENOL	39,000	N		NS		89	U	NS		79	U	80	U	86	U
4-NITROANILINE	32,000	C		NS		89	U	NS		79	U	80	U	86	U
4-NITROPHENOL	63,000	N		NS		89	U	NS		79	U	80	U	86	U
ACENAPHTHENE	470,000	N		NS		89	U	NS		79	U	80	U	18	J
ACENAPHTHYLENE	470,000 ‡	N		NS		89	U	NS		79	U	80	U	86	U
ANTHRACENE	2,300,000	N		NS		89	U	NS		79	U	80	U	46	J
BENZO[A]ANTHRACENE	870	C		NS		89	U	NS		31	J	36	J	200	
BENZO[A]PYRENE	87	C		NS		89	U	NS		23	J	19	J	110	J
BENZO[B]FLUORANTHENE	870	C		NS		89	U	NS		54	J	64	J	280	J
BENZO[G,H,I]PERYLENE	NA			NS		89	U	NS		79	U	80	UJ	35	J
BENZO[K]FLUORANTHENE	8,700	C		NS		89	U	NS		21	J	11	J	76	J
BENZOIC ACID	31,000,000	N		NS		270	U	NS		18	J	36	J	25	J
BENZYL ALCOHOL	2,300,000	N		NS		89	U	NS		79	U	80	U	86	U
BIS(2-CHLOROETHOXY)METHANE	NA			NS		89	U	NS		79	U	80	U	86	U
BIS(2-CHLOROISOPROPYL)ETHER	9,100	C		NS		89	U	NS		79	U	80	U	86	U
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		NS		17	J	NS		15	J	37	J	590	
BUTYLBENZYLPHTHALATE	1,600,000	N		NS		89	U	NS		79	U	80	U	86	U
CARBAZOLE	32,000	C		NS		89	U	NS		79	U	80	U	20	J
CHRYSENE	87,000	C		NS		89	U	NS		30	J	18	J	110	
DIBENZ[A,H]ANTHRACENE	87	C		NS		89	U	NS		79	U	80	UJ	86	UJ
DIBENZOFURAN	16,000	N		NS		89	U	NS		79	U	80	U	86	U
DIETHYLPHTHALATE	6,300,000	N		NS		21	J	NS		14	J	12	J	14	J
DIMETHYLPHTHALATE	78,000,000	N		NS		89	U	NS		79	U	80	U	86	U
DI-N-BUTYLPHTHALATE	780,000 ‡	N		NS		33	JB	NS		22	JB	28	JB	26	JB
DI-N-OCTYLPHTHALATE	160,000 ‡	N		NS		89	U	NS		79	U	80	UJ	86	UJ
FLUORANTHENE	310,000	N		NS		89	U	NS		45	J	56	J	310	
FLUORENE	310,000	N		NS		89	U	NS		79	U	80	U	21	J
HEXACHLOROBENZENE	400	C		NS		89	U	NS		79	U	80	U	86	U
HEXACHLOROBUTADIENE	8,200	C		NS		89	U	NS		79	U	80	U	86	U
HEXACHLOROCYCLOPENTADIENE	47,000	N		NS		89	U	NS		79	U	80	U	86	U
HEXACHLOROETHANE	46,000	C		NS		89	U	NS		79	U	80	U	86	U
INDENO[1,2,3-CD]PYRENE	870	C		NS		89	U	NS		11	J	80	UJ	49	J
ISOPHORONE	670,000	C		NS		89	U	NS		79	U	80	U	86	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
NAPHTHALENE	160,000	N		NS		89	U	NS		79	U	80	U	86	U
NITROBENZENE	3,900	N		NS		89	U	NS		79	U	80	U	86	U
N-NITROSO-DI-N-PROPYLAMINE	NA			NS		89	U	NS		79	U	80	U	86	U
N-NITROSODIPHENYLAMINE	130,000	C		NS		89	U	NS		79	U	80	U	86	U
O-CHLORONITROBENZENE	26,000	C		NS		89	U	NS		79	U	80	U	86	U
PENTACHLOROPHENOL	5,300	C		NS		89	U	NS		79	U	80	U	86	U
PHENANTHRENE	NA			NS		89	U	NS		18	J	28	J	240	
PHENOL	2,300,000	N		NS		89	U	NS		79	U	80	U	86	U
PHENYL HYDRAZINE	NA			NS		89	U	NS		79	U	80	U	86	U
PHENYL ISOCYANATE	NA			NS		89	U	NS		79	U	80	U	86	U
PHENYL ISOTHIOCYANATE	NA			NS		89	U	NS		79	U	80	U	86	U
PYRENE	230,000	N		NS		89	U	NS		49	J	52	J	360	
SVOC Tentatively Identified Compounds (UG/KG)															
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA			NS			*	NS			*		*		*
.ALPHA.-PINENE (CAS # 80-56-8)	NA			NS			*	NS			*		*		*
.BETA.-PINENE (CAS# 127-91-3)	NA			NS			*	NS			*		*		*
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA			NS			*	NS			*		*		*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA			NS			*	NS			*		*		*
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA			NS			*	NS			*		*		*
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA			NS			*	NS			*		*		*
1H-CYCLOPROP[E]AZULENE, 1A,2,3,4,4A,5,6,7B-OCTAHYDRO-1,1,4,7-TETRAMETHYL-, [1AR-(1A.ALPHA., 4.ALPHA., 4A.BETA., 7B.ALPHA.)]- (CAS# 489-40-7)	NA			NS			*	NS			*		*		*
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA			NS			*	NS			*		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N		NS			*	NS		450	NJ		*		*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA			NS			*	NS			*		*		*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA			NS			*	NS			*		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA			NS			*	NS			*		*		*
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			NS			*	NS			*		*		*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA			NS			*	NS			*		*		*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA			NS			*	NS			*		*		*
BENZYL FLUORIDE	NA			NS			*	NS			*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
BENZO(E)PYRENE (CAS# 192-97-2)	NA			NS			*	NS			*		*		*
BENZOTRICHLORIDE	NA			NS			*	NS			*		*		*
BORNYL ACETATE (CAS# 76-49-3)	NA			NS			*	NS			*		*		*
CARYOPHYLLENE (CAS# 87-44-5)	NA			NS			*	NS			*		*		*
CHOLESTEROL (CAS # 57-88-5)	NA			NS			*	NS			*	1600	NJ		*
COPAENE (CAS# 3856-25-5)	NA			NS			*	NS			*		*		*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)	NA			NS			*	NS			*		*		*
DIPHENYLCHLOROARSINE	NA			NS			*	NS			*		*		*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)	NA			NS			*	NS			*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N		NS			*	NS			*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)	NA			NS			*	NS			*	550	NJ	94	NJ
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)	NA			NS			*	NS			*		*		*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)	NA			NS			*	NS			*		*		*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)	NA			NS			*	NS			*		*		*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)	NA			NS			*	NS			*		*		*
NONACOSANE (CAS# 630-03-5)	NA			NS			*	NS			*		*		*
OLEIC ACID (CAS# 112-80-1)	NA			NS			*	NS			*		*		*
o-TOLYL ISOCYANIDE	NA			NS			*	NS			*		*		*
PENTADECANOIC ACID (CAS# 1002-84-2)	NA			NS			*	NS			*		*		*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)	NA			NS			*	NS			*		*		*
PHENYLDICHLOROARSINE	NA			NS			*	NS			*		*		*
PHENYL ISOCYANIDE	NA			NS			*	NS			*		*		*
PYRENE, 2-METHYL- (CAS# 3442-78-2)	NA			NS			*	NS			*		*		*
SEPTUM BLEED	NA			NS		230	NJ	NS		220	NJ		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
ICP Inorganic Analyses - SW6010B (MG/KG)															
ALUMINUM	7,800	N	**25,798**	7440		9060		10400		8380		7040		9160	
ANTIMONY	**3.1**	N	0.92	1.2	L	1.2	UL	1	UL	1.2	UL	1.2	UL	1.2	UL
ARSENIC	0.43	C	**12.64**	262	J	11.4	J	5.7	J	3.1	J	198	J	27.1	J
BARIUM	**550**	N	298.28	47.4	J	6.6	J	31.1	J	13.3	J	36.1		78.4	
BERYLLIUM	**16**	N	2.35	0.52	J	0.59	UJ	0.52	UJ	0.58	UJ	0.83		0.72	
CADMIUM	**7.8**	N	0.32	0.52	U	0.59	U	0.52	U	0.58	U	0.61	U	0.59	U
CALCIUM	NA		**4,207**	1230		421		715		855		1060		1920	
CHROMIUM	**12,000** ‡	N	97.20	24.4		34.6		32.5		30.5		41.1	K	31.6	K
COBALT	**160**	N	22.26	27.8	L	0.91	L	2.1	L	1.4	L	12.5		8.1	
COPPER	**310**	N	47.76	12.1		9.3		10.3		8.4		20.1		23.8	
IRON	2,300	N	**31,951**	30300	J	26700	J	25800	J	27300	J	41700		20200	
LEAD	**400** ‡		329.76	28.4	J	6.6	J	19.5	J	10.4	J	29.4	K	25.6	K
MAGNESIUM	NA		**7,093**	687		389		412		253		922		3940	
MANGANESE	160	N	**1,251**	321	J	26.1	J	79	J	33.2	J	311	J	274	J
MERCURY (by CVAA)	NA		**0.29**	0.11		0.07	U	0.11		0.06		0.05		0.19	
NICKEL	**160**	N	40.12	5.6		1.3		4.3		3.8		8.6		16.6	
PHOSPHORUS	NA		NA	273		145		200		157		488		358	
POTASSIUM	NA		**4,945**	591		363		301		259		1180		2690	
SELENIUM	**39**	N	0.88	1.7		1.2		0.89		0.58	U	0.81		0.59	U
SILICON	NA		NA	2010		2670		2520		1940		2130		2560	
SILVER	**39**	N	0.74	0.52	U	0.59	U	0.52	U	0.58	U	0.61	U	0.59	U
SODIUM	NA		**55.80**	51.9	U	58.9	U	51.6	U	57.7	U	60.6	U	58.5	U
STRONTIUM	**4,700**	N	NA	7.9		3.8		4.2		5		5.1		9.5	
SULFUR	NA		NA	78.2	L	284	L	90.7	L	60.2	L	228		195	
THALLIUM	0.55	N	**1.36**	1	U	1.2	U	1	U	1.2	U	1.2	UJ	1.2	UJ
TIN	**4,700**	N	NA	2.5		2.4		3.3		2.7		5.5		2.3	U
TITANIUM	**31,000**	N	NA	135		72		170		119		150		483	
VANADIUM	55	N	**66.76**	29.7		50.8		54.3		50.2		47.4		33	
ZINC	**2,300**	N	308.8	31.7		7		17.7		10.7		57.4		61.9	
IC Scan - EPA 300M (MG/KG)															
BROMIDE	NA			NS		1.21	U	NS		1.15	U	1.2	U	1.33	U
CHLORIDE	NA			NS		24.8		NS		1.15	U	10.1		3.56	
FLUORIDE	NA			NS			R	NS			R	2.04	L	3.68	L
NITRATE-N	13,000	N		NS		1.21	U	NS		1.15	U	6.16		4.05	
NITRITE-N	780	N		NS		1.21	U	NS		1.15	U	1.2	U	1.33	U
PHOSPHATE-P	NA			NS			R	NS			R		R	2.92	JL
SULFATE	NA			NS		141	K	NS		15.3	K	19.3	K	7.39	K

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)\1														
Mustard Breakdown Products (UG/KG)															
1,4-DITHIANE	78,000	N		NS		111	U	NS		99	U	97	U	106	U
1,4-OXATHIANE	78,000	\3,N		NS		113	U	NS		102	U	99	U	108	U
THIODIGLYCOL	39,100	\3,N		NS		1147	U	NS		1018	U	280	J	300	J
Lewisite Breakdown Products (UG/KG)															
TOTAL CVAA & CVAO	890	\3,C		NS		11	U	NS		10	U	10	U	10	U
Other Parameters (MG/KG, unless otherwise indicated)															
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		180	U	NS		180	U	180	U	180	U
ADAMSITE **	NA			NS			**	NS			**	7.7	U		**
AMMONIA-N	NA			NS		1.18	U	NS		1.17	U	1.18	U	1.36	U
CYANIDE	160 ‡	N		NS		0.61	U	NS		0.57	U	0.61	U	0.66	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds
Source is the April 25, 2003 USEPA RBC Table
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation

N = Non-carcinogen. This RBC was adjusted down by a factor of 10
C = Carcinogen as listed on the USEPA RBC table
NA = NOT AVAILABLE
NS = NOT SAMPLED

* Sample was scanned using GC/MS unit and the analyte was not identifie using the mass spectral library search

Shading indicates result exceeds higher (bolded) of RBC or background.

** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
Volatile Organic Compounds - SW8260B (UG/KG)														
1,1,1-TRICHLOROETHANE		2,200,000	N		1	U	1	U	1	U	NS		1	U
1,1,2,2,-TETRACHLOROETHANE		3,200	C		1	U	1	U	1	UJ	NS		1	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		230,000,000	N		1	U	1	U	1	U	NS		1	U
1,1,2-TRICHLOROETHANE		11,000	C		1	U	1	U	1	UJ	NS		1	U
1,1-DICHLOROETHANE		780,000	N		1	U	1	U	1	U	NS		1	U
1,1-DICHLOROETHENE		390,000	N		1	U	1	U	1	U	NS		1	U
1,2,4-TRICHLOROBENZENE		78,000	N		1	UJ	1	UJ		R	NS		1	UJ
1,2-DIBROMO-3-CHLOROPROPANE		460	C		1	UJ	1	UJ		R	NS		1	UJ
1,2-DIBROMOETHANE		7.5	C		1	U	1	U	1	UJ	NS		1	U
1,2-DICHLOROBENZENE		700,000	N		1	UJ	1	UJ		R	NS		1	UJ
1,2-DICHLOROETHANE		7,000	C		1	U	1	U	1	U	NS		1	U
1,2-DICHLOROPROPANE		9,400	C		1	U	1	U	1	U	NS		1	U
1,3-DICHLOROBENZENE		230,000	N		1	UJ	1	UJ		R	NS		1	UJ
1,4-DICHLOROBENZENE		27,000	C		1	UJ	1	UJ		R	NS		1	UJ
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		10		16		10		NS		4	
2-HEXANONE		310,000	N		1	U	1	U	1	UJ	NS		1	U
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)		630,000	N		1	U	1	U	1	U	NS		1	U
ACETONE		780,000	N		51	J	75	J	43	J	NS		27	B
ACETONITRILE		NA			5	U	6	U	6	U	NS		6	U
ACROLEIN		160,000	N		5	U	6	U	6	U	NS		6	U
BENZENE		12,000	C		1	U	1	U	1	U	NS		1	U
BENZYL BROMIDE		NA			5	UJ	6	UJ		R	NS		6	UJ
BENZYL CHLORIDE		3,800	C		5	UJ	6	UJ		R	NS		6	UJ
BROMODICHLOROMETHANE		10,000	C		1	U	1	U	1	U	NS		1	U
BROMOFORM		81,000	C		1	UJ	1	UJ		R	NS		1	UJ
BROMOMETHANE		11,000	N		1	U	1	U	1	U	NS		1	U
CARBON DISULFIDE		780,000	N		7		8		11		NS		6	
CARBON TETRACHLORIDE		4,900	C		1	U	1	U	1	U	NS		1	U
CHLOROBENZENE		160,000	N		1	U	1	U	1	UJ	NS		1	U
CHLOROETHANE		220,000	C		1	U	1	U	1	U	NS		1	U
CHLOROFORM		78,000	N		1	U	1	U	1	UJ	NS		1	UJ
CHLOROMETHANE		NA			2		4		7		NS		4	
CHLOROPICRIN		NA			27	U	27	U	32	U	NS		29	U
CIS-1,2-DICHLOROETHENE		78,000	N		1	U	1	U	1	U	NS		1	U
CIS-1,3-DICHLOROPROPENE		6,400 ‡	C		1	U	1	U	1	U	NS		1	U
CYCLOHEXANE		470,000 ‡	N		1	U	1	U	1	U	NS		1	U
DIBROMOCHLOROMETHANE		7,600	C		1	U	1	U	1	UJ	NS		1	U
DICHLORODIFLUOROMETHANE		1,600,000	N		1	U	1	U	1	U	NS		1	U
ETHYLBENZENE		780,000	N		1	U	1	U	1	UJ	NS		1	U
ISOPROPYLBENZENE (CUMENE)		780,000	N		1	UJ	1	UJ		R	NS		1	UJ
M&P-XYLENE		1,600,000	N		1	U	1	U	1	UJ	NS		1	U
METHYL ACETATE		7,800,000	N		1	J	6		6		NS		1	J
METHYL TERT-BUTYL ETHER		160,000	C		1	U	1	U	1	U	NS		1	U
METHYLCYCLOHEXANE		470,000 ‡	N		1	U	1	U	1	U	NS		1	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
METHYLENE CHLORIDE		85,000	C		1	U	1	U	1	U	NS		1	U
O-XYLENE		1,600,000	N		1	U	1	U	1	UJ	NS		1	U
STYRENE		1,600,000	N		1	U	1	U	1	UJ	NS		1	U
TETRACHLOROETHENE		32,000	C		1	U	1	U	1	UJ	NS		1	U
TOLUENE		1,600,000	N		1	U	1	U	1	UJ	NS		4	J
TRANS-1,2-DICHLOROETHENE		160,000	N		1	U	1	U	1	U	NS		1	U
TRANS-1,3-DICHLOROPROPENE		6,400 ‡	C		1	U	1	U	1	U	NS		1	U
TRICHLOROETHENE		1,600	C		1	U	1	U	1	U	NS		1	U
TRICHLOROFLUOROMETHANE		2,300,000	N		1	U	1	U	1	U	NS		1	U
VINYL CHLORIDE		90	C		1	U	1	U	1	U	NS		1	U
VOC Tentatively Identified Compounds (UG/KG)														
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)		NA				*		*		*	NS		100	NJ
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA				*		*		*	NS			*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA			5	NJ	10	NJ		*	NS			*
2-DECENE, 4-METHYL-,(Z)-		NA				*		*		*	NS			*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA				*		*		*	NS			*
2-OCTENE, (E)- ISOMER		NA			10	NJ	10	NJ	20	NJ	NS			*
2-OCTENE, (E)- ISOMER		NA				*		*		*	NS			*
2-OCTENE, (Z)- ISOMER		NA				*		*		*	NS			*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)		NA				*		*	30	NJ	NS			*
2-PROPANOL (CAS# 67-63-0)		NA			10	NJ		*		*	NS			*
3-OCTENE, (E)-		NA				*		*		*	NS			*
ACETALDEHYDE (CAS# 75-07-0)		NA			7	NJ	20	NJ	20	NJ	NS			*
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)		7,000,000	N			*		*		*	NS			*
ALCOHOL		NA				*		*		*	NS			*
ALLYL ALCOHOL		NA				*		*		*	NS			*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N			*		*		*	NS			*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N			*	10	NJ		*	NS			*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-		NA				*		*		*	NS		60	NJ
BENZYL IODIDE		NA				*		*		*	NS			*
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL		NA				*		*		*	NS		200	NJ
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-		NA				*		*		*	NS		200	NJ
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-		NA				*		*		*	NS			*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL		NA				*		*		*	NS			*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-		NA				*		*		*	NS			*
BICYCLO 3.1.1 HEPT-2-ENE,2,		NA				*		*		*	NS		100	NJ
BICYCLO 3.1.1 HEPTANE, 6,6-D		NA				*		*		*	NS		20	NJ
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-		NA				*		*		*	NS			*
BROMOACETONE		780,000 ‡	N			*		*		*	NS			*
BROMOBENZENE		NA				*		*		*	NS			*
BROMOMETHYL ETHER		NA				*		*		*	NS			*
BUTANAL (CAS# 123-72-8)		NA			6	NJ	6	NJ		*	NS			*
BUTANAL, 3-METHYL-		NA				*		*	9	NJ	NS			*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
BUTYL MERCAPTAN		NA				*		*		*	NS			*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)		NA				*		*		*	NS			*
CHLORINATED ACETONE		NA				*		*		*	NS			*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*		*		*	NS			*
CHLOROACETONE		780,000 ‡	N			*		*		*	NS			*
CHLOROACETONITRILE		NA				*		*		*	NS			*
CHLOROMETHYL ETHER		NA				*		*		*	NS			*
CHLOROMETHYL ETHYL ETHER		NA				*		*		*	NS			*
CROTONALDEHYDE		340	C			*		*		*	NS			*
CYCLOBUTANOL (CAS# 2919-23-5)		NA				*		*		*	NS			*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA				*		*	20	NJ	NS			*
DECANAL (CAS# 112-31-2)		NA				*		*		*	NS			*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA				*		*		*	NS			*
ETHYL BROMOACETATE		7,000,000 ‡	N			*		*		*	NS			*
ETHYL CHLOROFORMATE		NA				*		*		*	NS			*
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*		*		*	NS			*
ETHYL MERCAPTAN		NA				*		*		*	NS			*
HEPTANAL (CAS# 111-71-7)		NA				*		*		*	NS			*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA				*		*		*	NS			*
HEXANAL (CAS# 66-25-1)		NA			100	NJ	90	NJ	300	NJ	NS		90	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA				*		*		*	NS			*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA			7	NJ	7	NJ	10	NJ	NS			*
METHYL BROMOACETATE		NA				*		*		*	NS			*
METHYL CHLOROACETATE		NA				*		*		*	NS			*
METHYL CHLOROFORMATE		NA				*		*		*	NS			*
METHYL CHLOROSULFONATE		NA				*		*		*	NS			*
OCTANAL (CAS# 124-13-0)		NA			7	NJ	10	NJ	20	NJ	NS			*
OCTANE (CAS# 111-65-9)		NA				*		*		*	NS			*
PENTANAL ISOMER		NA			20	NJ	20	NJ	30	NJ	NS			*
PENTANAL ISOMER		NA				*	8	NJ		*	NS			*
PENTANAL, 2-METHYL- (CAS# 123-15-9)		NA				*		*		*	NS			*
PENTANE (CAS# 109-66-0)		NA			7	NJ		*	30	NJ	NS			*
PERCHLOROMETHYLMERCAPTAN		NA				*		*		*	NS			*
PROPANE, 2-METHYL- (CAS# 72-28-5)		NA				*		*		*	NS			*
THIOPHENE		NA				*		*		*	NS			*
TRICHLOROACETONITRILE		NA				*		*		*	NS			*
UNDECANE (CAS# 1120-21-4)		NA				*		*		*	NS			*
Semivolatile Organic Compounds - SW8270C (UG/KG)														
1,2,4-TRICHLOROBENZENE		78,000	N		81	U	86	U	92	U	NS		86	U
1,2-DICHLOROBENZENE		700,000	N		81	U	86	U	92	U	NS		86	U
1,3-DICHLOROBENZENE		230,000	N		81	U	86	U	92	U	NS		86	U
1,4-DICHLOROBENZENE		27,000	C		81	U	86	U	92	U	NS		86	U
2,4,5-TRICHLOROPHENOL		780,000	N		81	U	86	U	92	U	NS		86	U
2,4,6-TRICHLOROPHENOL		58,000	C		81	U	86	U	92	U	NS		86	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
2,4-DICHLOROPHENOL		23,000	N		81	U	86	U	92	U	NS		86	U
2,4-DIMETHYLPHENOL		160,000	N		81	U	86	U	92	U	NS		86	U
2,4-DINITROPHENOL		16,000	N		240	U	260	U	280	U	NS		260	U
2,4-DINITROTOLUENE		16,000	N		81	U	86	U	92	U	NS		86	U
2,6-DINITROTOLUENE		7,800	N		81	U	86	U	92	U	NS		86	U
2-CHLORONAPHTHALENE (CAS# 91587)		630,000 ‡	N		81	U	86	U	92	U	NS		86	U
2-CHLOROPHENOL		39,000	N		81	U	86	U	92	U	NS		86	U
2-METHYLNAPHTHALENE (CAS# 91576)		160,000	N		81	U	86	U	92	U	NS		46	J
2-METHYLPHENOL		390,000	N		81	U	86	U	92	U	NS		86	U
2-NITROANILINE		NA			81	U	86	U	92	U	NS		86	U
2-NITROPHENOL		63,000 ‡	N		81	U	86	U	92	U	NS		86	U
3,3-DICHLOROBENZIDINE'		1,400	C		81	U	86	U	92	U	NS		86	U
3-NITROANILINE (CAS# 99092)		2,300	N		81	U	86	U	92	U	NS		86	U
4,6-DINITRO-2-METHYLPHENOL		780	N		81	U	86	U	92	U	NS		86	U
4-BROMOPHENYL-PHENYLETHER		NA			81	U	86	U	92	U	NS		86	U
4-CHLORO-3-METHYLPHENOL		NA			81	U	86	U	92	U	NS		86	U
4-CHLOROANILINE		31,000	N		81	U	86	U	92	U	NS		86	U
4-CHLOROPHENYL-PHENYLETHER		NA			81	U	86	U	92	U	NS		86	U
4-METHYLPHENOL		39,000	N		81	U	86	U	92	U	NS		86	U
4-NITROANILINE		32,000	C		81	U	86	U	92	U	NS		86	U
4-NITROPHENOL		63,000	N		81	U	86	U	92	U	NS		86	U
ACENAPHTHENE		470,000	N		81	U	22	J	92	U	NS		120	
ACENAPHTHYLENE		470,000 ‡	N		81	U	86	U	92	U	NS		100	
ANTHRACENE		2,300,000	N		81	U	27	J	92	U	NS		270	
BENZO[A]ANTHRACENE		870	C		18	J	120		60	J	NS		2000	
BENZO[A]PYRENE		87	C		13	J	40	J	32	J	NS		1100	J
BENZO[B]FLUORANTHENE		870	C		39	J	110		81	J	NS		2300	J
BENZO[G,H,I]PERYLENE		NA			81	U	34	J	18	J	NS		680	J
BENZO[K]FLUORANTHENE		8,700	C		11	J	42	J	26	J	NS		1300	J
BENZOIC ACID		31,000,000	N		18	J	25	J	40	J	NS		210	J
BENZYL ALCOHOL		2,300,000	N		81	U	86	U	92	U	NS		86	U
BIS(2-CHLOROETHOXY)METHANE		NA			81	U	86	U	92	U	NS		86	U
BIS(2-CHLOROISOPROPYL)ETHER		9,100	C		81	U	86	U	92	U	NS		86	U
BIS(2-ETHYLHEXYL)PHTHALATE		46,000	C		12	J	28	J	40	J	NS		29	J
BUTYLBENZYLPHTHALATE		1,600,000	N		81	U	86	U	92	U	NS		86	U
CARBAZOLE		32,000	C		81	U	11	J	92	U	NS		67	J
CHRYSENE		87,000	C		12	J	42	J	31	J	NS		1100	
DIBENZ[A,H]ANTHRACENE		87	C		81	U	86	U	92	U	NS		330	J
DIBENZOFURAN		16,000	N		81	U	16	J	92	U	NS		68	J
DIETHYLPHTHALATE		6,300,000	N		10	J	14	J	13	J	NS		18	J
DIMETHYLPHTHALATE		78,000,000	N		81	U	86	U	92	U	NS		86	U
DI-N-BUTYLPHTHALATE		780,000 ‡	N		20	JB	27	JB	26	JB	NS		26	JB
DI-N-OCTYLPHTHALATE		160,000 ‡	N		81	U	86	U	92	U	NS		86	UJ
FLUORANTHENE		310,000	N		31	J	220		93		NS		3500	D
FLUORENE		310,000	N		81	U	18	J	92	U	NS		110	
HEXACHLOROBENZENE		400	C		81	U	86	U	92	U	NS		86	U
HEXACHLOROBUTADIENE		8,200	C		81	U	86	U	92	U	NS		86	U
HEXACHLOROCYCLOPENTADIENE		47,000	N		81	U	86	U	92	U	NS		86	U
HEXACHLOROETHANE		46,000	C		81	U	86	U	92	U	NS		86	U
INDENO[1,2,3-CD]PYRENE		870	C		81	U	39	J	21	J	NS		1100	J
ISOPHORONE		670,000	C		81	U	86	U	92	U	NS		86	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
NAPHTHALENE	160,000	N		81	U	11	J	92	U	NS		82	J
NITROBENZENE	3,900	N		81	U	86	U	92	U	NS		86	U
N-NITROSO-DI-N-PROPYLAMINE	NA			81	U	86	U	92	U	NS		86	U
N-NITROSODIPHENYLAMINE	130,000	C		81	U	86	U	92	U	NS		86	U
O-CHLORONITROBENZENE	26,000	C		81	U	86	U	92	U	NS		86	U
PENTACHLOROPHENOL	5,300	C		81	U	86	U	92	U	NS		86	U
PHENANTHRENE	NA			15	J	200		46	J	NS		1600	
PHENOL	2,300,000	N		81	U	86	U	92	U	NS		86	U
PHENYL HYDRAZINE	NA			81	U	86	U	92	U	NS		86	U
PHENYL ISOCYANATE	NA			81	U	86	U	92	U	NS		86	U
PHENYL ISOTHIOCYANATE	NA			81	U	86	U	92	U	NS		86	U
PYRENE	230,000	N		27	J	160		72	J	NS		3200	D
SVOC Tentatively Identified Compounds (UG/KG)													
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA				*		*		*	NS		880	NJ
.ALPHA.-PINENE (CAS # 80-56-8)	NA				*		*		*	NS		1000	NJ
.BETA.-PINENE (CAS# 127-91-3)	NA				*		*		*	NS		2100	NJ
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA			120	NJ		*	290	NJ	NS			*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA				*		*		*	NS		120	NJ
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA				*		*		*	NS		160	NJ
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA				*		*		*	NS			*
1H-CYCLOPROP[E]AZULENE, 1A,2,3,4,4A,5,6,7B-OCTAHYDRO-1,1,4,7-TETRAMETHYL-, [1AR-(1A.ALPHA., 4.ALPHA., 4A.BETA., 7B.ALPHA.)]- (CAS# 489-40-7)	NA				*		*		*	NS			*
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA			140	NJ		*		*	NS			*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N			*		*	320	NJ	NS			*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA				*	1100	NJ		*	NS			*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA				*		*		*	NS			*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA				*	1200	NJ	460	NJ	NS		96	NJ
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA				*	490	NJ	650	NJ	NS			*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7-(1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA				*		*		*	NS			*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA				*		*		*	NS			*
BENZYL FLUORIDE	NA				*		*		*	NS			*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
BENZO(E)PYRENE (CAS# 192-97-2)		NA				*		*		*	NS		330	DNJ
BENZOTRICHLORIDE		NA				*		*		*	NS			*
BORNYL ACETATE (CAS# 76-49-3)		NA				*		*		*	NS			*
CARYOPHYLLENE (CAS# 87-44-5)		NA				*		*		*	NS		540	NJ
CHOLESTEROL (CAS # 57-88-5)		NA				*	2200	NJ		*	NS			*
COPAENE (CAS# 3856-25-5)		NA				*		*		*	NS			*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)		NA				*		*		*	NS			*
DIPHENYLCHLOROARSINE		NA				*		*		*	NS			*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)		NA				*		*		*	NS			*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)		16,000,000	N		100	NJ		*		*	NS			*
HEXADECANOIC ACID (CAS# 57-10-3)		NA				*	88	NJ	310	NJ	NS			*
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)		NA				*		*		*	NS			*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)		NA				*		*		*	NS			*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1 (1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)		NA				*		*		*	NS			*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)		NA				*		*		*	NS			*
NONACOSANE (CAS# 630-03-5)		NA				*		*		*	NS		220	DNJ
OLEIC ACID (CAS# 112-80-1)		NA				*	1800	NJ		*	NS			*
o-TOLYL ISOCYANIDE		NA				*		*		*	NS			*
PENTADECANOIC ACID (CAS# 1002-84-2)		NA				*		*	390	NJ	NS			*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)		NA				*		*		*	NS		240	NJ
PHENYLDICHLOROARSINE		NA				*		*		*	NS			*
PHENYL ISOCYANIDE		NA				*		*		*	NS			*
PYRENE, 2-METHYL- (CAS# 3442-78-2)		NA				*		*		*	NS		210	DNJ
SEPTUM BLEED		NA				*		*		*	NS			*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	9480		7140		13000		9040		7430	
ANTIMONY		**3.1**	N	0.92	1	UL	1.1	UL	1	UL	1.3	UL	1.1	UL
ARSENIC		0.43	C	**12.64**	81.8	J	210	J	31.3	J	12.9	J	8.9	J
BARIUM		**550**	N	298.28	67.6		37.7		76.3		47.5		38.5	
BERYLLIUM		**16**	N	2.35	0.8		0.62		0.78		0.63	U	0.55	U
CADMIUM		**7.8**	N	0.32	0.5	U	0.57	U	0.52	U	0.63	U	0.55	U
CALCIUM		NA		**4,207**	1230		667		4620		2190		4790	
CHROMIUM		**12,000** ‡	N	97.20	41.3	K	23.2	K	44.1	K	42.4	K	32	K
COBALT		**160**	N	22.26	7.1		11.2		11.8		4.8		3.4	
COPPER		**310**	N	47.76	29.5		19.1		56.9		19.1		14.3	
IRON		2,300	N	**31,951**	29500		33300		32700		27800		23600	
LEAD		**400** ‡		329.76	14.7	K	17.6	K	26.5	K	44	K	34	K
MAGNESIUM		NA		**7,093**	2770		908		5700		1320		2770	
MANGANESE		160	N	**1,251**	288	J	303	J	392	J	158	J	104	J
MERCURY (by CVAA)		NA		**0.29**	0.06	U	0.1		0.24		0.75		0.37	
NICKEL		**160**	N	40.12	12.3		7.6		24.8		15.4		15.5	
PHOSPHORUS		NA		NA	417		353		514		294		218	
POTASSIUM		NA		**4,945**	2520		743		2560		629		514	
SELENIUM		**39**	N	0.88	0.5	U	0.7		0.72		0.63	U	0.55	U
SILICON		NA		NA	2400		1610		2360		1820		1890	
SILVER		**39**	N	0.74	0.5	U	0.57	U	0.52	U	0.63	U	0.55	U
SODIUM		NA		**55.80**	49.8	U	57.1	U	52	U	63	U	55.3	U
STRONTIUM		**4,700**	N	NA	6.7		3.5		8.9		10.7		10.3	
SULFUR		NA		NA	154		150		236		162		113	
THALLIUM		0.55	N	**1.36**	1	UJ	1.1	UJ	1.4	J	1.3	UJ	1.4	J
TIN		**4,700**	N	NA	2	U	2.3	U	2.3		5.5		5.7	
TITANIUM		**31,000**	N	NA	296		176		423		235		187	
VANADIUM		55	N	**66.76**	66.9		40.4		78.6		56.8		45.6	
ZINC		**2,300**	N	308.8	43.2		31.3		69.4		53.9		36.3	
IC Scan - EPA 300M (MG/KG)														
BROMIDE		NA			1.21	U	1.18	U	1.34	U	NS		1.26	U
CHLORIDE		NA			6.13		7.74		6.93		NS		4.64	
FLUORIDE		NA			2.46	L	2.4	L	4.43	L	NS		6.7	L
NITRATE-N		13,000	N		3.12		1.18	U	9.73		NS		1.26	U
NITRITE-N		780	N		1.21	U	1.18	U	1.34	U	NS		1.26	U
PHOSPHATE-P		NA				R		R		R	NS			R
SULFATE		NA			14	K	30	K	8.22	L	NS		4.94	K

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[\1]												
Mustard Breakdown Products (UG/KG)														
1,4-DITHIANE		78,000	N		101	U	103	U	113	U	NS		102	U
1,4-OXATHIANE		78,000	\3,N		104	U	106	U	116	U	NS		105	U
THIODIGLYCOL		39,100	\3,N		1039	U	1095	U	1187	U	NS		257	J
Lewisite Breakdown Products (UG/KG)														
TOTAL CVAA & CVAO		890	\3,C		10	U	10	U	11	U	NS		10	U
Other Parameters (MG/KG, unless otherwise indicated)														
2,4,6-TRINITROTOLUENE (UG/KG)		21,000	C		180	U	180	U	180	U	NS		180	U
ADAMSITE **		NA			7.7	U	7.7	U		**	NS			**
AMMONIA-N		NA			1.19	U	2.47		1.36	U	NS		1.21	U
CYANIDE		160 [‡]	N		0.58	U	0.51	U	0.62	U	NS		0.58	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds
Source is the April 25, 2003 USEPA RBC Table
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation

N = Non-carcinogen. This RBC was adjusted down by a factor of 10
C = Carcinogen as listed on the USEPA RBC table
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identifie using the mass spectral library search**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
Volatile Organic Compounds - SW8260B (UG/KG)												
1,1,1-TRICHLOROETHANE	2,200,000	N		1	U	NS		NS		1	U	NS
1,1,2,2,-TETRACHLOROETHANE	3,200	C		1	U	NS		NS		1	U	NS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	230,000,000	N		1	U	NS		NS		1	U	NS
1,1,2-TRICHLOROETHANE	11,000	C		1	U	NS		NS		1	U	NS
1,1-DICHLOROETHANE	780,000	N		1	U	NS		NS		1	U	NS
1,1-DICHLOROETHENE	390,000	N		1	U	NS		NS		1	U	NS
1,2,4-TRICHLOROBENZENE	78,000	N			R	NS		NS			R	NS
1,2-DIBROMO-3-CHLOROPROPANE	460	C			R	NS		NS			R	NS
1,2-DIBROMOETHANE	7.5	C		1	U	NS		NS		1	U	NS
1,2-DICHLOROBENZENE	700,000	N			R	NS		NS			R	NS
1,2-DICHLOROETHANE	7,000	C		1	U	NS		NS		1	U	NS
1,2-DICHLOROPROPANE	9,400	C		1	U	NS		NS		1	U	NS
1,3-DICHLOROBENZENE	230,000	N			R	NS		NS			R	NS
1,4-DICHLOROBENZENE	27,000	C		2	J	NS		NS			R	NS
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		7		NS		NS		22		NS
2-HEXANONE	310,000	N		1	U	NS		NS		2		NS
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		1	U	NS		NS		1	U	NS
ACETONE	780,000	N		21	B	NS		NS		150	J	NS
ACETONITRILE	NA			5	U	NS		NS		8		NS
ACROLEIN	160,000	N		5	U	NS		NS		7		NS
BENZENE	12,000	C		1	U	NS		NS		1	U	NS
BENZYL BROMIDE	NA				R	NS		NS			R	NS
BENZYL CHLORIDE	3,800	C			R	NS		NS			R	NS
BROMODICHLOROMETHANE	10,000	C		1	U	NS		NS		1	U	NS
BROMOFORM	81,000	C			R	NS		NS			R	NS
BROMOMETHANE	11,000	N		1	U	NS		NS		1	U	NS
CARBON DISULFIDE	780,000	N		6		NS		NS		11		NS
CARBON TETRACHLORIDE	4,900	C		1	U	NS		NS		1	U	NS
CHLOROBENZENE	160,000	N		1	U	NS		NS		1	U	NS
CHLOROETHANE	220,000	C		1	U	NS		NS		1	U	NS
CHLOROFORM	78,000	N		1	U	NS		NS		3		NS
CHLOROMETHANE	NA			4		NS		NS		12		NS
CHLOROPICRIN	NA			26	UJ	NS		NS		31	U	NS
CIS-1,2-DICHLOROETHENE	78,000	N		1	U	NS		NS		1	U	NS
CIS-1,3-DICHLOROPROPENE	6,400 ‡	C		1	U	NS		NS		1	U	NS
CYCLOHEXANE	470,000 ‡	N		1	U	NS		NS		1	U	NS
DIBROMOCHLOROMETHANE	7,600	C		1	U	NS		NS		1	U	NS
DICHLORODIFLUOROMETHANE	1,600,000	N		1	U	NS		NS		1	U	NS
ETHYLBENZENE	780,000	N		1	U	NS		NS		1	U	NS
ISOPROPYLBENZENE (CUMENE)	780,000	N			R	NS		NS			R	NS
M&P-XYLENE	1,600,000	N		1	U	NS		NS		1	U	NS
METHYL ACETATE	7,800,000	N		9		NS		NS		47	J	NS
METHYL TERT-BUTYL ETHER	160,000	C		1	U	NS		NS		1	U	NS
METHYLCYCLOHEXANE	470,000 ‡	N		1	U	NS		NS		3		NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)	CDC-(140,160)(0-1")	CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch	High As Grid	High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"	0-1"	0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001	2/21/2001	2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]									
METHYLENE CHLORIDE	85,000	C		1	U	NS	NS	1	U	NS
O-XYLENE	1,600,000	N		1	U	NS	NS	1	U	NS
STYRENE	1,600,000	N		1	U	NS	NS	1	U	NS
TETRACHLOROETHENE	32,000	C		1	U	NS	NS	1	U	NS
TOLUENE	1,600,000	N		2	J	NS	NS	4		NS
TRANS-1,2-DICHLOROETHENE	160,000	N		1	U	NS	NS	1	U	NS
TRANS-1,3-DICHLOROPROPENE	6,400 ‡	C		1	U	NS	NS	1	U	NS
TRICHLOROETHENE	1,600	C		1	U	NS	NS	1	U	NS
TRICHLOROFLUOROMETHANE	2,300,000	N		1	U	NS	NS	1	U	NS
VINYL CHLORIDE	90	C		1	U	NS	NS	1	U	NS
VOC Tentatively Identified Compounds (UG/KG)										
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)	NA				*	NS	NS		*	NS
2,4-HEXANEDIONE (CAS# 3002-24-2)	NA			2	NJ	NS	NS		*	NS
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)	NA			6	NJ	NS	NS	40	NJ	NS
2-DECENE, 4-METHYL-,(Z)-	NA				*	NS	NS		*	NS
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)	NA				*	NS	NS		*	NS
2-OCTENE, (E)- ISOMER	NA			8	NJ	NS	NS	10	NJ	NS
2-OCTENE, (E)- ISOMER	NA				*	NS	NS		*	NS
2-OCTENE, (Z)- ISOMER	NA				*	NS	NS		*	NS
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)	NA				*	NS	NS		*	NS
2-PROPANOL (CAS# 67-63-0)	NA				*	NS	NS		*	NS
3-OCTENE, (E)-	NA				*	NS	NS		*	NS
ACETALDEHYDE (CAS# 75-07-0)	NA				*	NS	NS	10	NJ	NS
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)	7,000,000	N			*	NS	NS		*	NS
ALCOHOL	NA				*	NS	NS		*	NS
ALLYL ALCOHOL	NA				*	NS	NS		*	NS
BENZALDEHYDE (CAS# 100-52-7)	780,000	N			*	NS	NS		*	NS
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N			*	NS	NS		*	NS
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-	NA				*	NS	NS		*	NS
BENZYL IODIDE	NA				*	NS	NS		*	NS
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL	NA			2	NJ	NS	NS		*	NS
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-	NA			3	NJ	NS	NS		*	NS
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-	NA				*	NS	NS		*	NS
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL	NA				*	NS	NS		*	NS
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-	NA				*	NS	NS		*	NS
BICYCLO 3.1.1 HEPT-2-ENE,2,	NA				*	NS	NS		*	NS
BICYCLO 3.1.1 HEPTANE, 6,6-D	NA				*	NS	NS		*	NS
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-	NA				*	NS	NS		*	NS
BROMOACETONE	780,000 ‡	N			*	NS	NS		*	NS
BROMOBENZENE	NA				*	NS	NS		*	NS
BROMOMETHYL ETHER	NA				*	NS	NS		*	NS
BUTANAL (CAS# 123-72-8)	NA			6	NJ	NS	NS	10	NJ	NS
BUTANAL, 3-METHYL-	NA				*	NS	NS		*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:		Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:		RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute		downward)[1]											
BUTYL MERCAPTAN		NA				*	NS		NS			*	NS
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)		NA				*	NS		NS			*	NS
CHLORINATED ACETONE		NA				*	NS		NS			*	NS
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*	NS		NS			*	NS
CHLOROACETONE		780,000 ‡	N			*	NS		NS			*	NS
CHLOROACETONITRILE		NA				*	NS		NS			*	NS
CHLOROMETHYL ETHER		NA				*	NS		NS			*	NS
CHLOROMETHYL ETHYL ETHER		NA				*	NS		NS			*	NS
CROTONALDEHYDE		340	C			*	NS		NS			*	NS
CYCLOBUTANOL (CAS# 2919-23-5)		NA				*	NS		NS			*	NS
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA				*	NS		NS			*	NS
DECANAL (CAS# 112-31-2)		NA				*	NS		NS			*	NS
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA				*	NS		NS			*	NS
ETHYL BROMOACETATE		7,000,000 ‡	N			*	NS		NS			*	NS
ETHYL CHLOROFORMATE		NA				*	NS		NS			*	NS
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*	NS		NS			*	NS
ETHYL MERCAPTAN		NA				*	NS		NS			*	NS
HEPTANAL (CAS# 111-71-7)		NA				*	NS		NS			*	NS
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA				*	NS		NS			*	NS
HEXANAL (CAS# 66-25-1)		NA			200	NJ	NS		NS		300	NJ	NS
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA				*	NS		NS			*	NS
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA				*	NS		NS		10	NJ	NS
METHYL BROMOACETATE		NA				*	NS		NS			*	NS
METHYL CHLOROACETATE		NA				*	NS		NS			*	NS
METHYL CHLOROFORMATE		NA				*	NS		NS			*	NS
METHYL CHLOROSULFONATE		NA				*	NS		NS			*	NS
OCTANAL (CAS# 124-13-0)		NA				*	NS		NS		20	NJ	NS
OCTANE (CAS# 111-65-9)		NA				*	NS		NS			*	NS
PENTANAL ISOMER		NA			20	NJ	NS		NS		70	NJ	NS
PENTANAL ISOMER		NA			3	NJ	NS		NS			*	NS
PENTANAL, 2-METHYL- (CAS# 123-15-9)		NA				*	NS		NS			*	NS
PENTANE (CAS# 109-66-0)		NA			10	NJ	NS		NS		100	NJ	NS
PERCHLOROMETHYLMERCAPTAN		NA				*	NS		NS			*	NS
PROPANE, 2-METHYL- (CAS# 72-28-5)		NA				*	NS		NS			*	NS
THIOPHENE		NA				*	NS		NS			*	NS
TRICHLOROACETONITRILE		NA				*	NS		NS			*	NS
UNDECANE (CAS# 1120-21-4)		NA				*	NS		NS			*	NS
Semivolatile Organic Compounds - SW8270C (UG/KG)													
1,2,4-TRICHLOROBENZENE		78,000	N		78	U	NS		NS		83	U	NS
1,2-DICHLOROBENZENE		700,000	N		78	U	NS		NS		83	U	NS
1,3-DICHLOROBENZENE		230,000	N		78	U	NS		NS		83	U	NS
1,4-DICHLOROBENZENE		27,000	C		78	U	NS		NS		83	U	NS
2,4,5-TRICHLOROPHENOL		780,000	N		78	U	NS		NS		83	U	NS
2,4,6-TRICHLOROPHENOL		58,000	C		78	U	NS		NS		83	U	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
2,4-DICHLOROPHENOL	23,000	N		78	U	NS		NS		83	U	NS
2,4-DIMETHYLPHENOL	160,000	N		78	U	NS		NS		83	U	NS
2,4-DINITROPHENOL	16,000	N		230	U	NS		NS		250	U	NS
2,4-DINITROTOLUENE	16,000	N		78	U	NS		NS		83	U	NS
2,6-DINITROTOLUENE	7,800	N		78	U	NS		NS		83	U	NS
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		78	U	NS		NS		83	U	NS
2-CHLOROPHENOL	39,000	N		78	U	NS		NS		83	U	NS
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		78	U	NS		NS		83	U	NS
2-METHYLPHENOL	390,000	N		78	U	NS		NS		83	U	NS
2-NITROANILINE	NA			78	U	NS		NS		83	U	NS
2-NITROPHENOL	63,000 ‡	N		78	U	NS		NS		83	U	NS
3,3-DICHLOROBENZIDINE'	1,400	C		78	UJ	NS		NS		83	U	NS
3-NITROANILINE (CAS# 99092)	2,300	N		78	U	NS		NS		83	U	NS
4,6-DINITRO-2-METHYLPHENOL	780	N		78	U	NS		NS		83	U	NS
4-BROMOPHENYL-PHENYLETHER	NA			78	U	NS		NS		83	U	NS
4-CHLORO-3-METHYLPHENOL	NA			78	U	NS		NS		83	U	NS
4-CHLOROANILINE	31,000	N		78	U	NS		NS		83	U	NS
4-CHLOROPHENYL-PHENYLETHER	NA			78	U	NS		NS		83	U	NS
4-METHYLPHENOL	39,000	N		78	U	NS		NS		83	U	NS
4-NITROANILINE	32,000	C		78	U	NS		NS		83	U	NS
4-NITROPHENOL	63,000	N		78	U	NS		NS		83	U	NS
ACENAPHTHENE	470,000	N		78	U	NS		NS		83	U	NS
ACENAPHTHYLENE	470,000 ‡	N		78	U	NS		NS		83	U	NS
ANTHRACENE	2,300,000	N		78	U	NS		NS		83	U	NS
BENZO[A]ANTHRACENE	870	C		53	J	NS		NS		73	J	NS
BENZO[A]PYRENE	87	C		78	UJ	NS		NS		46	J	NS
BENZO[B]FLUORANTHENE	870	C		64	J	NS		NS		110	J	NS
BENZO[G,H,I]PERYLENE	NA			78	UJ	NS		NS		24	J	NS
BENZO[K]FLUORANTHENE	8,700	C		43	J	NS		NS		32	J	NS
BENZOIC ACID	31,000,000	N		21	J	NS		NS		18	J	NS
BENZYL ALCOHOL	2,300,000	N		78	U	NS		NS		83	U	NS
BIS(2-CHLOROETHOXY)METHANE	NA			78	U	NS		NS		83	U	NS
BIS(2-CHLOROISOPROPYL)ETHER	9,100	C		78	U	NS		NS		83	U	NS
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		190	J	NS		NS		71	J	NS
BUTYLBENZYLPHTHALATE	1,600,000	N		62	J	NS		NS		22	J	NS
CARBAZOLE	32,000	C		78	U	NS		NS		83	U	NS
CHRYSENE	87,000	C		38	J	NS		NS		39	J	NS
DIBENZ[A,H]ANTHRACENE	87	C		78	UJ	NS		NS		83	UJ	NS
DIBENZOFURAN	16,000	N		78	U	NS		NS		83	U	NS
DIETHYLPHTHALATE	6,300,000	N		10	J	NS		NS		14	J	NS
DIMETHYLPHTHALATE	78,000,000	N		78	U	NS		NS		83	U	NS
DI-N-BUTYLPHTHALATE	780,000 ‡	N		38	JB	NS		NS		28	JB	NS
DI-N-OCTYLPHTHALATE	160,000 ‡	N		78	UJ	NS		NS		83	UJ	NS
FLUORANTHENE	310,000	N		78	J	NS		NS		110		NS
FLUORENE	310,000	N		78	U	NS		NS		83	U	NS
HEXACHLOROBENZENE	400	C		78	U	NS		NS		83	U	NS
HEXACHLOROBUTADIENE	8,200	C		78	U	NS		NS		83	U	NS
HEXACHLOROCYCLOPENTADIENE	47,000	N		78	U	NS		NS		83	U	NS
HEXACHLOROETHANE	46,000	C		78	U	NS		NS		83	U	NS
INDENO[1,2,3-CD]PYRENE	870	C		78	UJ	NS		NS		30	J	NS
ISOPHORONE	670,000	C		78	U	NS		NS		83	U	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
NAPHTHALENE	160,000	N		78	U	NS		NS		83	U	NS
NITROBENZENE	3,900	N		78	U	NS		NS		83	U	NS
N-NITROSO-DI-N-PROPYLAMINE	NA			78	U	NS		NS		83	U	NS
N-NITROSODIPHENYLAMINE	130,000	C		78	U	NS		NS		83	U	NS
O-CHLORONITROBENZENE	26,000	C		78	U	NS		NS		83	U	NS
PENTACHLOROPHENOL	5,300	C		78	U	NS		NS		83	U	NS
PHENANTHRENE	NA			44	J	NS		NS		48	J	NS
PHENOL	2,300,000	N		78	U	NS		NS		83	U	NS
PHENYL HYDRAZINE	NA			78	UJ	NS		NS		83	U	NS
PHENYL ISOCYANATE	NA			78	U	NS		NS		83	U	NS
PHENYL ISOTHIOCYANATE	NA			78	U	NS		NS		83	U	NS
PYRENE	230,000	N		140	J	NS		NS		110		NS
SVOC Tentatively Identified Compounds (UG/KG)												
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA				*	NS		NS		390	NJ	NS
.ALPHA.-PINENE (CAS # 80-56-8)	NA				*	NS		NS			*	NS
.BETA.-PINENE (CAS# 127-91-3)	NA				*	NS		NS			*	NS
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA				*	NS		NS			*	NS
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA				*	NS		NS			*	NS
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA				*	NS		NS			*	NS
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA				*	NS		NS			*	NS
1H-CYCLOPROP[E]AZULENE, 1A,2,3,4,4A,5,6,7B-OCTAHYDRO-1,1,4,7-TETRAMETHYL-, [1AR-(1A.ALPHA., 4.ALPHA., 4A.BETA., 7B.ALPHA.)]- (CAS# 489-40-7)	NA				*	NS		NS			*	NS
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA				*	NS		NS			*	NS
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N			*	NS		NS		270	NJ	NS
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA				*	NS		NS			*	NS
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA				*	NS		NS			*	NS
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA			400	NJ	NS		NS		460	NJ	NS
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			120	NJ	NS		NS		320	NJ	NS
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7-(1-METHYLETHENYL)- [1S-(1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA				*	NS		NS			*	NS
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA				*	NS		NS		140	NJ	NS
BENZYL FLUORIDE	NA				*	NS		NS			*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
BENZO(E)PYRENE (CAS# 192-97-2)	NA				*	NS		NS			*	NS
BENZOTRICHLORIDE	NA				*	NS		NS			*	NS
BORNYL ACETATE (CAS# 76-49-3)	NA				*	NS		NS			*	NS
CARYOPHYLLENE (CAS# 87-44-5)	NA				*	NS		NS		130	NJ	NS
CHOLESTEROL (CAS # 57-88-5)	NA				*	NS		NS			*	NS
COPAENE (CAS# 3856-25-5)	NA				*	NS		NS			*	NS
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)	NA				*	NS		NS			*	NS
DIPHENYLCHLOROARSINE	NA				*	NS		NS			*	NS
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)	NA				*	NS		NS			*	NS
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N			*	NS		NS			*	NS
HEXADECANOIC ACID (CAS# 57-10-3)	NA			240	NJ	NS		NS		320	NJ	NS
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)	NA				*	NS		NS			*	NS
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)	NA				*	NS		NS			*	NS
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1 (1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)	NA				*	NS		NS			*	NS
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)	NA				*	NS		NS			*	NS
NONACOSANE (CAS# 630-03-5)	NA				*	NS		NS			*	NS
OLEIC ACID (CAS# 112-80-1)	NA				*	NS		NS		350	NJ	NS
o-TOLYL ISOCYANIDE	NA				*	NS		NS			*	NS
PENTADECANOIC ACID (CAS# 1002-84-2)	NA			120	NJ	NS		NS			*	NS
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)	NA				*	NS		NS			*	NS
PHENYLDICHLOROARSINE	NA				*	NS		NS			*	NS
PHENYL ISOCYANIDE	NA				*	NS		NS			*	NS
PYRENE, 2-METHYL- (CAS# 3442-78-2)	NA				*	NS		NS			*	NS
SEPTUM BLEED	NA				*	NS		NS			*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")	
TYPE or LOCATION:		Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	5970		1890		7670		7450		1850	
ANTIMONY		**3.1**	N	0.92	1.2	L	2.6	UL	1.1	UL	1	UL	1.1	UL
ARSENIC		0.43	C	**12.64**	122	J	1.3	UJ	161	J	109	J	50.3	J
BARIUM		**550**	N	298.28	61.5		88.2		45.6		60.5		19.1	
BERYLLIUM		**16**	N	2.35	0.57	U	1.3	U	0.53	U	0.61		0.53	U
CADMIUM		**7.8**	N	0.32	0.57	U	1.3	U	0.53	U	0.5	U	0.53	U
CALCIUM		NA		**4,207**	1830		8660		1470		6050		3070	
CHROMIUM		**12,000** ‡	N	97.20	25.5	K	5.2	K	26.6	K	20.5	K	17.7	K
COBALT		**160**	N	22.26	6.4		2.7		8.5		7.5		5.2	
COPPER		**310**	N	47.76	16.3		6.8		16.9		15.5		6.5	
IRON		2,300	N	**31,951**	23500		4180		33600		23300		7380	
LEAD		**400** ‡		329.76	35.2	K	4.6	K	21.2	K	24	K	7.8	K
MAGNESIUM		NA		**7,093**	1350		998		1020		1850		3590	
MANGANESE		160	N	**1,251**	263	J	312	J	180	J	456	J	161	J
MERCURY (by CVAA)		NA		**0.29**	0.12		0.12	U	0.1		0.16		0.05	U
NICKEL		**160**	N	40.12	16.7		4.5		9		9.9		66	
PHOSPHORUS		NA		NA	311		214		319		240		112	
POTASSIUM		NA		**4,945**	631		687		709		766		224	
SELENIUM		**39**	N	0.88	0.57	U	1.3	U	0.87		0.5	U	0.53	U
SILICON		NA		NA	1700		1040		1130		2440		665	
SILVER		**39**	N	0.74	0.57	U	1.3	U	0.53	U	0.5	U	0.53	U
SODIUM		NA		**55.80**	56.5	U	138		52.7	U	68.7		146	
STRONTIUM		**4,700**	N	NA	11.7		34.8		8.5		17.7		4.6	
SULFUR		NA		NA	139		286		114		157		84	
THALLIUM		0.55	N	**1.36**	1.1	UJ	2.6	UJ	1.1	UJ	1	UJ	1.1	UJ
TIN		**4,700**	N	NA	2.5		5.2	U	2.4		2		2.1	U
TITANIUM		**31,000**	N	NA	144		74.9		149		200		43.5	
VANADIUM		55	N	**66.76**	28.3		6.3		35.8		28.8		7.9	
ZINC		**2,300**	N	308.8	50.2		18.2		80.2		60.1		40.9	
IC Scan - EPA 300M (MG/KG)														
BROMIDE		NA			NS		NS		NS		1.16	U	NS	
CHLORIDE		NA			NS		NS		NS		7.37		NS	
FLUORIDE		NA			NS		NS		NS		6.47	L	NS	
NITRATE-N		13,000	N		NS		NS		NS		1.16	U	NS	
NITRITE-N		780	N		NS		NS		NS		1.16	U	NS	
PHOSPHATE-P		NA			NS		NS		NS			R	NS	
SULFATE		NA			NS		NS		NS		16	K	NS	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[\1]											
Mustard Breakdown Products (UG/KG)												
1,4-DITHIANE	78,000	N		NS		NS		NS		99	U	NS
1,4-OXATHIANE	78,000	\3,N		NS		NS		NS		102	U	NS
THIODIGLYCOL	39,100	\3,N		NS		NS		NS		1069	U	NS
Lewisite Breakdown Products (UG/KG)												
TOTAL CVAA & CVAO	890	\3,C		NS		NS		NS		10	U	NS
Other Parameters (MG/KG, unless otherwise indicated)												
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		NS		NS		180	U	NS
ADAMSITE **	NA			NS		NS		NS		7.7	U	NS
AMMONIA-N	NA			NS		NS		NS		1.19	U	NS
CYANIDE	160 ‡	N		NS		NS		NS		0.57	U	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds
Source is the April 25, 2003 USEPA RBC Table
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation

N = Non-carcinogen. This RBC was adjusted down by a factor of 10
C = Carcinogen as listed on the USEPA RBC table
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identifie using the mass spectral library search**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
Volatile Organic Compounds - SW8260B (UG/KG)												
1,1,1-TRICHLOROETHANE	2,200,000	N		2	U	1	U	2	U	1	UJ	NS
1,1,2,2,-TETRACHLOROETHANE	3,200	C		2	UJ	1	U	2	UJ		R	NS
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	230,000,000	N		2	U	1	U	2	U	1	UJ	NS
1,1,2-TRICHLOROETHANE	11,000	C		2	UJ	1	U	2	UJ	1	UJ	NS
1,1-DICHLOROETHANE	780,000	N		2	U	1	U	2	U	1	UJ	NS
1,1-DICHLOROETHENE	390,000	N		2	U	1	U	2	U	1	UJ	NS
1,2,4-TRICHLOROBENZENE	78,000	N			R	1	UJ		R		R	NS
1,2-DIBROMO-3-CHLOROPROPANE	460	C			R	1	UJ		R		R	NS
1,2-DIBROMOETHANE	7.5	C		2	UJ	1	U	2	UJ		R	NS
1,2-DICHLOROBENZENE	700,000	N			R	1	UJ		R		R	NS
1,2-DICHLOROETHANE	7,000	C		2	U	1	U	2	U	1	UJ	NS
1,2-DICHLOROPROPANE	9,400	C		2	U	1	U	2	U	1	UJ	NS
1,3-DICHLOROBENZENE	230,000	N			R	1	UJ		R		R	NS
1,4-DICHLOROBENZENE	27,000	C			R	1	UJ		R		R	NS
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		58	J	12		43	J	21	J	NS
2-HEXANONE	310,000	N		4	J	1	U	2	J	2	J	NS
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		2		1	U	2	U	1	UJ	NS
ACETONE	780,000	N		360	J	78	J	200	J	100	J	NS
ACETONITRILE	NA			9		6	U	8	U	7	J	NS
ACROLEIN	160,000	N		13		6	U	12		7	UJ	NS
BENZENE	12,000	C		2	U	1	U	2	U	2	J	NS
BENZYL BROMIDE	NA				R	6	UJ		R		R	NS
BENZYL CHLORIDE	3,800	C			R	6	UJ		R		R	NS
BROMODICHLOROMETHANE	10,000	C		2	U	1	U	2	U	1	UJ	NS
BROMOFORM	81,000	C			R	1	UJ		R		R	NS
BROMOMETHANE	11,000	N		2	U	1	U	2	U	1	UJ	NS
CARBON DISULFIDE	780,000	N		14		7		31		15	J	NS
CARBON TETRACHLORIDE	4,900	C		2	U	1	U	2	U	1	UJ	NS
CHLOROBENZENE	160,000	N		2	UJ	1	U	2	UJ		R	NS
CHLOROETHANE	220,000	C		2	U	1	U	2	U	1	UJ	NS
CHLOROFORM	78,000	N		2	U	1	U	2	U	1	UJ	NS
CHLOROMETHANE	NA			23		7		11		18	J	NS
CHLOROPICRIN	NA			45	UJ	30	U	38	U	33	UJ	NS
CIS-1,2-DICHLOROETHENE	78,000	N		2	U	1	U	2	U	1	UJ	NS
CIS-1,3-DICHLOROPROPENE	6,400 ‡	C		2	U	1	U	2	U	1	UJ	NS
CYCLOHEXANE	470,000 ‡	N		2	U	1	U	2	U	1	UJ	NS
DIBROMOCHLOROMETHANE	7,600	C		2	U	1	U	2	U	1	UJ	NS
DICHLORODIFLUOROMETHANE	1,600,000	N		2	U	1	U	2	U	1	UJ	NS
ETHYLBENZENE	780,000	N		2	UJ	1	U	2	UJ		R	NS
ISOPROPYLBENZENE (CUMENE)	780,000	N			R	1	UJ	2	J		R	NS
M&P-XYLENE	1,600,000	N		2	UJ	1	U	2	UJ		R	NS
METHYL ACETATE	7,800,000	N		190	J	29	J	70	J	32	J	NS
METHYL TERT-BUTYL ETHER	160,000	C		2	U	1	U	2	U	1	UJ	NS
METHYLCYCLOHEXANE	470,000 ‡	N		3	J	1	U	3	J	1	UJ	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
METHYLENE CHLORIDE	85,000	C		2	U	1	U	2		1	UJ	NS	
O-XYLENE	1,600,000	N		2	UJ	1	U	2	UJ		R	NS	
STYRENE	1,600,000	N		2	UJ	1	U	2	UJ		R	NS	
TETRACHLOROETHENE	32,000	C		2	UJ	1	U	2	J		R	NS	
TOLUENE	1,600,000	N		12	J	1	J	5	J	9	J	NS	
TRANS-1,2-DICHLOROETHENE	160,000	N		2	U	1	U	2	U	1	UJ	NS	
TRANS-1,3-DICHLOROPROPENE	6,400 ‡	C		2	U	1	U	2	U	1	UJ	NS	
TRICHLOROETHENE	1,600	C		2	U	1	U	2	U	1	UJ	NS	
TRICHLOROFLUOROMETHANE	2,300,000	N		2	U	1	U	2	U	1	UJ	NS	
VINYL CHLORIDE	90	C		2	U	1	U	2	U	1	UJ	NS	
VOC Tentatively Identified Compounds (UG/KG)													
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)	NA				*		*		*		*	NS	
2,4-HEXANEDIONE (CAS# 3002-24-2)	NA				*		*		*		*	NS	
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)	NA			50	NJ	9	NJ	40	NJ	30	NJ	NS	
2-DECENE, 4-METHYL-,(Z)-	NA				*	7	NJ		*		*	NS	
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)	NA				*		*		*		*	NS	
2-OCTENE, (E)- ISOMER	NA			20	NJ		*		*	40	NJ	NS	
2-OCTENE, (E)- ISOMER	NA				*		*		*		*	NS	
2-OCTENE, (Z)- ISOMER	NA				*	6	NJ	20	NJ		*	NS	
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)	NA				*		*		*		*	NS	
2-PROPANOL (CAS# 67-63-0)	NA				*		*		*		*	NS	
3-OCTENE, (E)-	NA				*		*		*		*	NS	
ACETALDEHYDE (CAS# 75-07-0)	NA			50	NJ	10	NJ	40	NJ	20	NJ	NS	
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)	7,000,000	N			*		*		*		*	NS	
ALCOHOL	NA				*		*		*		*	NS	
ALLYL ALCOHOL	NA				*		*		*		*	NS	
BENZALDEHYDE (CAS# 100-52-7)	780,000	N		20	NJ		*		*		*	NS	
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N			*		*		*		*	NS	
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-	NA				*		*		*		*	NS	
BENZYL IODIDE	NA				*		*		*		*	NS	
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL	NA				*		*		*		*	NS	
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-	NA				*		*		*		*	NS	
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-	NA				*		*		*		*	NS	
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL	NA				*		*		*		*	NS	
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-	NA				*		*		*		*	NS	
BICYCLO 3.1.1 HEPT-2-ENE,2,	NA				*		*		*		*	NS	
BICYCLO 3.1.1 HEPTANE, 6,6-D	NA				*		*		*		*	NS	
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-	NA				*		*		*		*	NS	
BROMOACETONE	780,000 ‡	N			*		*		*		*	NS	
BROMOBENZENE	NA				*		*		*		*	NS	
BROMOMETHYL ETHER	NA				*		*		*		*	NS	
BUTANAL (CAS# 123-72-8)	NA				*	8	NJ	20	NJ		*	NS	
BUTANAL, 3-METHYL-	NA				*		*		*		*	NS	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
BUTYL MERCAPTAN	NA				*		*		*		*	NS
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)	NA				*		*		*	40	NJ	NS
CHLORINATED ACETONE	NA				*		*		*		*	NS
CHLORINATED CARBON DISULFIDE	780,000 ‡	N			*		*		*		*	NS
CHLOROACETONE	780,000 ‡	N			*		*		*		*	NS
CHLOROACETONITRILE	NA				*		*		*		*	NS
CHLOROMETHYL ETHER	NA				*		*		*		*	NS
CHLOROMETHYL ETHYL ETHER	NA				*		*		*		*	NS
CROTONALDEHYDE	340	C			*		*		*		*	NS
CYCLOBUTANOL (CAS# 2919-23-5)	NA				*		*		*		*	NS
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA			30	NJ		*		*		*	NS
DECANAL (CAS# 112-31-2)	NA				*		*		*		*	NS
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA				*		*		*		*	NS
ETHYL BROMOACETATE	7,000,000 ‡	N			*		*		*		*	NS
ETHYL CHLOROFORMATE	NA				*		*		*		*	NS
ETHYL DIBROMOACETATE	7,000,000 ‡	N			*		*		*		*	NS
ETHYL MERCAPTAN	NA				*		*		*		*	NS
HEPTANAL (CAS# 111-71-7)	NA				*		*		*		*	NS
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA				*		*		*		*	NS
HEXANAL (CAS# 66-25-1)	NA			300	NJ	100	NJ	400	NJ	400	NJ	NS
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA				*		*		*		*	NS
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA				*		*	20	NJ	10	NJ	NS
METHYL BROMOACETATE	NA				*		*		*		*	NS
METHYL CHLOROACETATE	NA				*		*		*		*	NS
METHYL CHLOROFORMATE	NA				*		*		*		*	NS
METHYL CHLOROSULFONATE	NA				*		*		*		*	NS
OCTANAL (CAS# 124-13-0)	NA			30	NJ	7	NJ	20	NJ		*	NS
OCTANE (CAS# 111-65-9)	NA				*		*		*		*	NS
PENTANAL ISOMER	NA			20	NJ	40	NJ	100	NJ	80	NJ	NS
PENTANAL ISOMER	NA			60	NJ	7	NJ	20	NJ	20	NJ	NS
PENTANAL, 2-METHYL- (CAS# 123-15-9)	NA				*		*		*	10	NJ	NS
PENTANE (CAS# 109-66-0)	NA			100	NJ	30	NJ	60	NJ	100	NJ	NS
PERCHLOROMETHYLMERCAPTAN	NA				*		*		*		*	NS
PROPANE, 2-METHYL- (CAS# 72-28-5)	NA				*		*		*		*	NS
THIOPHENE	NA				*		*		*		*	NS
TRICHLOROACETONITRILE	NA				*		*		*		*	NS
UNDECANE (CAS# 1120-21-4)	NA				*		*		*		*	NS
Semivolatile Organic Compounds - SW8270C (UG/KG												
1,2,4-TRICHLOROBENZENE	78,000	N		120	U	86	U	93	U	95	U	NS
1,2-DICHLOROBENZENE	700,000	N		120	U	86	U	93	U	95	U	NS
1,3-DICHLOROBENZENE	230,000	N		120	U	86	U	93	U	95	U	NS
1,4-DICHLOROBENZENE	27,000	C		120	U	86	U	93	U	95	U	NS
2,4,5-TRICHLOROPHENOL	780,000	N		120	U	86	U	93	U	95	U	NS
2,4,6-TRICHLOROPHENOL	58,000	C		120	U	86	U	93	U	95	U	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
2,4-DICHLOROPHENOL	23,000	N		120	U	86	U	93	U	95	U	NS
2,4-DIMETHYLPHENOL	160,000	N		120	U	86	U	93	U	95	U	NS
2,4-DINITROPHENOL	16,000	N		350	U	260	U	280	U	280	U	NS
2,4-DINITROTOLUENE	16,000	N		120	U	86	U	93	U	95	U	NS
2,6-DINITROTOLUENE	7,800	N		120	U	86	U	93	U	95	U	NS
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		120	U	86	U	93	U	95	U	NS
2-CHLOROPHENOL	39,000	N		120	U	86	U	93	U	95	U	NS
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		120	U	86	U	93	U	95	U	NS
2-METHYLPHENOL	390,000	N		120	U	86	U	93	U	95	U	NS
2-NITROANILINE	NA			120	U	86	U	93	U	95	U	NS
2-NITROPHENOL	63,000 ‡	N		120	U	86	U	93	U	95	U	NS
3,3-DICHLOROBENZIDINE'	1,400	C		120	UJ	86	UJ	93	UJ	95	UJ	NS
3-NITROANILINE (CAS# 99092)	2,300	N		120	U	86	U	93	U	95	U	NS
4,6-DINITRO-2-METHYLPHENOL	780	N		120	U	86	U	93	U	95	U	NS
4-BROMOPHENYL-PHENYLETHER	NA			120	U	86	U	93	U	95	U	NS
4-CHLORO-3-METHYLPHENOL	NA			120	U	86	U	93	U	95	U	NS
4-CHLOROANILINE	31,000	N		120	U	86	U	93	U	95	U	NS
4-CHLOROPHENYL-PHENYLETHER	NA			120	U	86	U	93	U	95	U	NS
4-METHYLPHENOL	39,000	N		120	U	86	U	93	U	95	U	NS
4-NITROANILINE	32,000	C		120	U	86	U	93	U	95	U	NS
4-NITROPHENOL	63,000	N		120	U	86	U	93	U	95	U	NS
ACENAPHTHENE	470,000	N		120	U	20	J	93	U	20	J	NS
ACENAPHTHYLENE	470,000 ‡	N		120	U	86	U	93	U	95	U	NS
ANTHRACENE	2,300,000	N		18	J	59	J	22	J	33	J	NS
BENZO[A]ANTHRACENE	870	C		77	J	320	J	140	J	140	J	NS
BENZO[A]PYRENE	87	C		120	UJ	240	J	110	J	82	J	NS
BENZO[B]FLUORANTHENE	870	C		92	J	400	J	170	J	200	J	NS
BENZO[G,H,I]PERYLENE	NA			120	UJ	67	J		R		R	NS
BENZO[K]FLUORANTHENE	8,700	C		33	J	220	J	100	J		R	NS
BENZOIC ACID	31,000,000	N		41	J	35	J	25	J	38	J	NS
BENZYL ALCOHOL	2,300,000	N		120	U	86	U	93	U	95	U	NS
BIS(2-CHLOROETHOXY)METHANE	NA			120	U	86	U	93	U	95	U	NS
BIS(2-CHLOROISOPROPYL)ETHER	9,100	C		120	U	86	U	93	U	95	U	NS
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		360	J	190	J	300	J	130	J	NS
BUTYLBENZYLPHTHALATE	1,600,000	N		44	J	86	UJ	51	J	46	J	NS
CARBAZOLE	32,000	C		120	U	22	J	93	U	95	U	NS
CHRYSENE	87,000	C		52	J	210	J	110	J	100	J	NS
DIBENZ[A,H]ANTHRACENE	87	C		120	UJ	86	UJ		R		R	NS
DIBENZOFURAN	16,000	N		120	U	86	U	93	U	95	U	NS
DIETHYLPHTHALATE	6,300,000	N		24	J	21	J	13	J	16	J	NS
DIMETHYLPHTHALATE	78,000,000	N		120	U	86	U	93	U	95	U	NS
DI-N-BUTYLPHTHALATE	780,000 ‡	N		48	JB	32	JB	93	U	40	JB	NS
DI-N-OCTYLPHTHALATE	160,000 ‡	N		120	UJ	86	UJ		R		R	NS
FLUORANTHENE	310,000	N		120	J	470		190		180		NS
FLUORENE	310,000	N		120	U	15	J	93	U	95	U	NS
HEXACHLOROBENZENE	400	C		120	U	86	U	93	U	95	U	NS
HEXACHLOROBUTADIENE	8,200	C		120	U	86	U	93	U	95	U	NS
HEXACHLOROCYCLOPENTADIENE	47,000	N		120	U	86	U	93	U	95	U	NS
HEXACHLOROETHANE	46,000	C		120	U	86	U	93	U	95	U	NS
INDENO[1,2,3-CD]PYRENE	870	C		120	UJ	91	J		R		R	NS
ISOPHORONE	670,000	C		120	U	86	U	93	U	95	U	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
NAPHTHALENE	160,000	N		120	U	12	J	93	U	95	U	NS
NITROBENZENE	3,900	N		120	U	86	U	93	U	95	U	NS
N-NITROSO-DI-N-PROPYLAMINE	NA			120	U	86	U	93	U	95	U	NS
N-NITROSODIPHENYLAMINE	130,000	C		120	U	86	U	93	U	95	U	NS
O-CHLORONITROBENZENE	26,000	C		120	U	86	U	93	U	95	U	NS
PENTACHLOROPHENOL	5,300	C		120	U	86	U	93	U	95	U	NS
PHENANTHRENE	NA			82	J	260		100		160		NS
PHENOL	2,300,000	N		120	U	86	U	93	U	95	U	NS
PHENYL HYDRAZINE	NA			120	UJ	86	UJ	93	UJ	95	UJ	NS
PHENYL ISOCYANATE	NA			120	U	86	U	93	U	95	U	NS
PHENYL ISOTHIOCYANATE	NA			120	U	86	U	93	U	95	U	NS
PYRENE	230,000	N		230	J	910	J	390	J	430	J	NS
SVOC Tentatively Identified Compounds (UG/KG)												
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA			560	NJ		*	160	NJ	760	NJ	NS
.ALPHA.-PINENE (CAS # 80-56-8)	NA				*		*		*		*	NS
.BETA.-PINENE (CAS# 127-91-3)	NA				*		*	140	NJ		*	NS
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA				*		*		*		*	NS
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA				*		*		*		*	NS
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA				*		*		*		*	NS
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA				*		*		*		*	NS
1H-CYCLOPROP[E]AZULENE, 1A,2,3,4,4A,5,6,7B-OCTAHYDRO-1,1,4,7-TETRAMETHYL-, [1AR-(1A.ALPHA., 4.ALPHA., 4A.BETA., 7B.ALPHA.)]- (CAS# 489-40-7)	NA				*		*		*		*	NS
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA				*		*		*		*	NS
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N		410	NJ		*		*		*	NS
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA				*		*		*		*	NS
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA				*		*		*		*	NS
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA			1500	NJ				*		*	NS
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			1100	NJ	480	NJ		*		*	NS
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA				*		*		*		*	NS
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA				*		*		*		*	NS
BENZYL FLUORIDE	NA				*		*		*		*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
BENZO(E)PYRENE (CAS# 192-97-2)	NA				*		*		*		*	NS
BENZOTRICHLORIDE	NA				*		*		*		*	NS
BORNYL ACETATE (CAS# 76-49-3)	NA				*		*		*	190	NJ	NS
CARYOPHYLLENE (CAS# 87-44-5)	NA			200	NJ		*		*	260	NJ	NS
CHOLESTEROL (CAS # 57-88-5)	NA				*		*		*		*	NS
COPAENE (CAS# 3856-25-5)	NA				*		*		*		*	NS
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)	NA				*		*		*		*	NS
DIPHENYLCHLOROARSINE	NA				*		*		*		*	NS
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)	NA				*		*		*		*	NS
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N			*		*		*		*	NS
HEXADECANOIC ACID (CAS# 57-10-3)	NA			250	NJ	380	NJ	270	NJ	190	NJ	NS
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)	NA				*		*		*		*	NS
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)	NA				*		*		*		*	NS
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)	NA				*		*		*		*	NS
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)	NA				*		*		*		*	NS
NONACOSANE (CAS# 630-03-5)	NA				*		*		*		*	NS
OLEIC ACID (CAS# 112-80-1)	NA			1500	NJ		*	110	NJ		*	NS
o-TOLYL ISOCYANIDE	NA				*		*		*		*	NS
PENTADECANOIC ACID (CAS# 1002-84-2)	NA				*		*		*		*	NS
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)	NA				*		*		*		*	NS
PHENYLDICHLOROARSINE	NA				*		*		*		*	NS
PHENYL ISOCYANIDE	NA				*				*		*	NS
PYRENE, 2-METHYL- (CAS# 3442-78-2)	NA				*		*		*		*	NS
SEPTUM BLEED	NA				*		*		*		*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	2970		7420		7740		5560		2220	
ANTIMONY		**3.1**	N	0.92	1.5	UL	0.98	UL	1.3	UL	2.1	L	2.1	UL
ARSENIC		0.43	C	**12.64**	91.1	J	173	J	145	J	399	J	5.6	J
BARIUM		**550**	N	298.28	49.6		58.9		76.9		64.9		97	
BERYLLIUM		**16**	N	2.35	0.73	U	0.59		0.65	U	0.62	U	1	U
CADMIUM		**7.8**	N	0.32	0.73	U	0.49	U	0.65	U	0.62	U	1	U
CALCIUM		NA		**4,207**	2930		2450		3170		3390		8440	
CHROMIUM		**12,000** [‡]	N	97.20	20.4	K	32.8	K	25.3	K	19.2	K	7.7	K
COBALT		**160**	N	22.26	4.9		8		8		6.6		3.1	
COPPER		**310**	N	47.76	11.1		20.2		17.7		22.5		7.9	
IRON		2,300	N	**31,951**	11300		27400		22200		20200		4920	
LEAD		**400** [‡]		329.76	16.4	K	28.2	K	43.4	K	37.4	K	6.1	K
MAGNESIUM		NA		**7,093**	2750		1630		1520		1600		1050	
MANGANESE		160	N	**1,251**	205	J	271	J	435	J	270	J	338	J
MERCURY (by CVAA)		NA		**0.29**	0.15		0.23		0.17		0.2		0.1	U
NICKEL		**160**	N	40.12	61.2		14.8		14.9		12.1		9.6	
PHOSPHORUS		NA		NA	273		391		466		384		252	
POTASSIUM		NA		**4,945**	418		1180		647		942		944	
SELENIUM		**39**	N	0.88	0.73	U	0.58		0.65	U	0.62	U	1	U
SILICON		NA		NA	967		1930		1820		1600		1060	
SILVER		**39**	N	0.74	0.73	U	0.49	U	0.65	U	0.62	U	1	U
SODIUM		NA		**55.80**	73.5	U	49.1	U	64.7	U	61.8	U	190	
STRONTIUM		**4,700**	N	NA	13		11.2		15.6		15.6		35.6	
SULFUR		NA		NA	235		163		332		257		310	
THALLIUM		0.55	N	**1.36**	1.5	UJ	0.98	UJ	1.3	UJ	1.2	UJ	2.1	UJ
TIN		**4,700**	N	NA	2.9	U	2.6		4.1		2.9		4.2	U
TITANIUM		**31,000**	N	NA	95.9		169		185		204		84.1	
VANADIUM		55	N	**66.76**	13.6		34.9		35.8		27.8		7.6	
ZINC		**2,300**	N	308.8	49.6		85.7		70.5		73.3		23	
IC Scan - EPA 300M (MG/KG)														
BROMIDE		NA			1.59	U	NS		NS		NS		NS	
CHLORIDE		NA			4.48		NS		NS		NS		NS	
FLUORIDE		NA			2.81	L	NS		NS		NS		NS	
NITRATE-N		13,000	N		1.59	U	NS		NS		NS		NS	
NITRITE-N		780	N		1.59	U	NS		NS		NS		NS	
PHOSPHATE-P		NA				R	NS		NS		NS		NS	
SULFATE		NA			6.9	K	NS		NS		NS		NS	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")	CDC-(160,140)(0-6")	CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid	High As Grid	Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"	0-6"	0-1"
SAMPLING DATE:	(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001	2/21/2001	2/21/2001
Analyses performed by Southwest Research Institute	downward)[\1]									
Mustard Breakdown Products (UG/KG)										
1,4-DITHIANE	78,000	N		137	U	NS		NS	NS	NS
1,4-OXATHIANE	78,000	\3,N		140	U	NS		NS	NS	NS
THIODIGLYCOL	39,100	\3,N		732	J	NS		NS	NS	NS
Lewisite Breakdown Products (UG/KG)										
TOTAL CVAA & CVAO	890	\3,C		14	U	NS		NS	NS	NS
Other Parameters (MG/KG, unless otherwise indicated)										
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	NS		NS	NS	NS
ADAMSITE **	NA			7.7	U	NS		NS	NS	NS
AMMONIA-N	NA			1.54	U	NS		NS	NS	NS
CYANIDE	160 ‡	N		0.5	U	NS		NS	NS	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds
Source is the April 25, 2003 USEPA RBC Table
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation

N = Non-carcinogen. This RBC was adjusted down by a factor of 10
C = Carcinogen as listed on the USEPA RBC table
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
Volatile Organic Compounds - SW8260B (UG/KG)																
1,1,1-TRICHLOROETHANE		2,200,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
1,1,2,2,-TETRACHLOROETHANE		3,200	C		NS			R		R		R		R		R
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		230,000,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	UJ
1,1,2-TRICHLOROETHANE		11,000	C		NS			R		R		R		R		R
1,1-DICHLOROETHANE		780,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
1,1-DICHLOROETHENE		390,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
1,2,4-TRICHLOROBENZENE		78,000	N		NS			R		R		R		R		R
1,2-DIBROMO-3-CHLOROPROPANE		460	C		NS			R		R		R		R		R
1,2-DIBROMOETHANE		7.5	C		NS			R		R		R		R		R
1,2-DICHLOROBENZENE		700,000	N		NS			R		R		R		R		R
1,2-DICHLOROETHANE		7,000	C		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
1,2-DICHLOROPROPANE		9,400	C		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
1,3-DICHLOROBENZENE		230,000	N		NS			R		R		R		R		R
1,4-DICHLOROBENZENE		27,000	C		NS			R		R		R		R		R
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		NS		20	J	14		8		42	J	17	
2-HEXANONE		310,000	N		NS			R		R		R	4	J		R
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)		630,000	N		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
ACETONE		780,000	N		NS		120	J	69	J	55	J	330	J	80	J
ACETONITRILE		NA			NS		10	J	7	U	5.4	U	33	J	6.1	U
ACROLEIN		160,000	N		NS		12		7	U	5.4	U	8.7	UJ	6.1	UJ
BENZENE		12,000	C		NS		2	J	3		1.1	UJ	1.7	UJ	1.2	UJ
BENZYL BROMIDE		NA			NS			R		R		R		R		R
BENZYL CHLORIDE		3,800	C		NS			R		R		R		R		R
BROMODICHLOROMETHANE		10,000	C		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
BROMOFORM		81,000	C		NS			R		R		R		R		R
BROMOMETHANE		11,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
CARBON DISULFIDE		780,000	N		NS		12	J	10		9		32	J	10	
CARBON TETRACHLORIDE		4,900	C		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
CHLOROBENZENE		160,000	N		NS			R		R		R		R		R
CHLOROETHANE		220,000	C		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
CHLOROFORM		78,000	N		NS		1	UJ	1	UJ	1.1	U	2	J	1.2	U
CHLOROMETHANE		NA			NS		14	J	10		11		16	J	9	
CHLOROPICRIN		NA			NS		35	UJ	33	U	27	U	44	UJ	30	U
CIS-1,2-DICHLOROETHENE		78,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
CIS-1,3-DICHLOROPROPENE		6,400 ‡	C		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
CYCLOHEXANE		470,000 ‡	N		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
DIBROMOCHLOROMETHANE		7,600	C		NS			R		R		R		R		R
DICHLORODIFLUOROMETHANE		1,600,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
ETHYLBENZENE		780,000	N		NS			R		R		R		R		R
ISOPROPYLBENZENE (CUMENE)		780,000	N		NS		2	J		R		R	2	J		R
M&P-XYLENE		1,600,000	N		NS			R		R		R		R		R
METHYL ACETATE		7,800,000	N		NS		24	J	25		26		83	J	35	J
METHYL TERT-BUTYL ETHER		160,000	C		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
METHYLCYCLOHEXANE		470,000 ‡	N		NS			R		R		R	1.7	UJ	1.2	UJ

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
METHYLENE CHLORIDE	85,000	C		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
O-XYLENE	1,600,000	N		NS			R		R		R		R		R
STYRENE	1,600,000	N		NS			R		R		R		R		R
TETRACHLOROETHENE	32,000	C		NS			R		R		R		R		R
TOLUENE	1,600,000	N		NS		12	J	8	J	1.1	U	36	J	2	J
TRANS-1,2-DICHLOROETHENE	160,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
TRANS-1,3-DICHLOROPROPENE	6,400 ‡	C		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
TRICHLOROETHENE	1,600	C		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
TRICHLOROFLUOROMETHANE	2,300,000	N		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
VINYL CHLORIDE	90	C		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
VOC Tentatively Identified Compounds (UG/KG)															
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)	NA			NS			*		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)	NA			NS			*		*		*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)	NA			NS		20	NJ	10	NJ	10	NJ		*	20	NJ
2-DECENE, 4-METHYL-,(Z)-	NA			NS			*		*		*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)	NA			NS			*		*		*		*		*
2-OCTENE, (E)- ISOMER	NA			NS		30	NJ	20	NJ	40	NJ		*	20	NJ
2-OCTENE, (E)- ISOMER	NA			NS		30	NJ		*		*		*		*
2-OCTENE, (Z)- ISOMER	NA			NS			*		*		*		*		*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)	NA			NS			*		*		*		*		*
2-PROPANOL (CAS# 67-63-0)	NA			NS			*		*		*		*		*
3-OCTENE, (E)-	NA			NS			*		*		*		*		*
ACETALDEHYDE (CAS# 75-07-0)	NA			NS			*		*		*		*		*
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)	7,000,000	N		NS			*		*		*		*		*
ALCOHOL	NA			NS			*		*		*		*		*
ALLYL ALCOHOL	NA			NS			*		*		*		*		*
BENZALDEHYDE (CAS# 100-52-7)	780,000	N		NS			*		*		*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N		NS			*		*		*		*		*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-	NA			NS			*		*		*	400	NJ		*
BENZYL IODIDE	NA			NS			*		*		*		*		*
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL	NA			NS			*		*		*	3000	NJ		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-	NA			NS			*		*		*	3000	NJ		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-	NA			NS			*		*		*	600	NJ		*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL	NA			NS			*		*		*		*		*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-	NA			NS		30	NJ		*		*	5000	NJ		*
BICYCLO 3.1.1 HEPT-2-ENE,2,	NA			NS			*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-D	NA			NS			*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-	NA			NS			*		*		*	400	NJ		*
BROMOACETONE	780,000 ‡	N		NS			*		*		*		*		*
BROMOBENZENE	NA			NS			*		*		*		*		*
BROMOMETHYL ETHER	NA			NS			*		*		*		*		*
BUTANAL (CAS# 123-72-8)	NA			NS			*		*		*		*	10	NJ
BUTANAL, 3-METHYL-	NA			NS			*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")	CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid	High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1"	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001	2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]													
BUTYL MERCAPTAN	NA			NS		*		*		*		*		*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)	NA			NS	40	NJ	50	NJ		*		*		*
CHLORINATED ACETONE	NA			NS		*		*		*		*		*
CHLORINATED CARBON DISULFIDE	780,000 ‡	N		NS		*		*		*		*		*
CHLOROACETONE	780,000 ‡	N		NS		*		*		*		*		*
CHLOROACETONITRILE	NA			NS		*		*		*		*		*
CHLOROMETHYL ETHER	NA			NS		*		*		*		*		*
CHLOROMETHYL ETHYL ETHER	NA			NS		*		*		*		*		*
CROTONALDEHYDE	340	C		NS		*		*		*		*		*
CYCLOBUTANOL (CAS# 2919-23-5)	NA			NS		*	9	NJ		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA			NS		*	30	NJ	10	NJ		*		*
DECANAL (CAS# 112-31-2)	NA			NS		*		*		*		*		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA			NS		*		*		*		*		*
ETHYL BROMOACETATE	7,000,000 ‡	N		NS		*		*		*		*		*
ETHYL CHLOROFORMATE	NA			NS		*		*		*		*		*
ETHYL DIBROMOACETATE	7,000,000 ‡	N		NS		*		*		*		*		*
ETHYL MERCAPTAN	NA			NS		*		*		*		*		*
HEPTANAL (CAS# 111-71-7)	NA			NS		*		*		*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA			NS		*		*	7	NJ		*		*
HEXANAL (CAS# 66-25-1)	NA			NS	500	NJ	300	NJ	300	NJ	1000	NJ	500	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA			NS		*		*		*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA			NS	20	NJ	10	NJ	10	NJ		*	20	NJ
METHYL BROMOACETATE	NA			NS		*		*		*		*		*
METHYL CHLOROACETATE	NA			NS		*		*		*		*		*
METHYL CHLOROFORMATE	NA			NS		*		*		*		*		*
METHYL CHLOROSULFONATE	NA			NS		*		*		*		*		*
OCTANAL (CAS# 124-13-0)	NA			NS		*		*		*		*	10	NJ
OCTANE (CAS# 111-65-9)	NA			NS		*		*	9	NJ		*		*
PENTANAL ISOMER	NA			NS	100	NJ	40	NJ		*		*		*
PENTANAL ISOMER	NA			NS	20	NJ	8	NJ	30	NJ	400	NJ	60	NJ
PENTANAL, 2-METHYL- (CAS# 123-15-9)	NA			NS		*				*		*		*
PENTANE (CAS# 109-66-0)	NA			NS	100	NJ	80	NJ	10	NJ	600	NJ	30	NJ
PERCHLOROMETHYLMERCAPTAN	NA			NS		*		*		*		*		*
PROPANE, 2-METHYL- (CAS# 72-28-5)	NA			NS		*		*		*		*		*
THIOPHENE	NA			NS		*		*		*		*		*
TRICHLOROACETONITRILE	NA			NS		*		*		*		*		*
UNDECANE (CAS# 1120-21-4)	NA			NS		*		*		*	500	NJ		*
Semivolatile Organic Compounds - SW8270C (UG/KG)														
1,2,4-TRICHLOROBENZENE	78,000	N		NS	91	U	93	U	80	U	160	U	85	U
1,2-DICHLOROBENZENE	700,000	N		NS	91	U	93	U	80	U	160	U	85	U
1,3-DICHLOROBENZENE	230,000	N		NS	91	U	93	U	80	U	160	U	85	U
1,4-DICHLOROBENZENE	27,000	C		NS	91	U	93	U	80	U	160	U	85	U
2,4,5-TRICHLOROPHENOL	780,000	N		NS	91	U	93	U	80	U	160	U	85	U
2,4,6-TRICHLOROPHENOL	58,000	C		NS	91	U	93	U	80	U	160	U	85	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
2,4-DICHLOROPHENOL	23,000	N		NS		91	U	93	U	80	U	160	U	85	U
2,4-DIMETHYLPHENOL	160,000	N		NS		91	U	93	U	80	U	160	U	85	U
2,4-DINITROPHENOL	16,000	N		NS		270	U	280	U	240	U	480	U	250	U
2,4-DINITROTOLUENE	16,000	N		NS		91	U	93	U	80	U	160	U	85	U
2,6-DINITROTOLUENE	7,800	N		NS		91	U	93	U	80	U	160	U	85	U
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		NS		91	U	93	U	80	U	160	U	85	U
2-CHLOROPHENOL	39,000	N		NS		91	U	93	U	80	U	160	U	85	U
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		NS		91	U	93	U	32	J	160	U	17	J
2-METHYLPHENOL	390,000	N		NS		91	U	93	U	80	U	160	U	85	U
2-NITROANILINE	NA			NS		91	U	93	U	80	U	160	U	85	U
2-NITROPHENOL	63,000 ‡	N		NS		91	U	93	U	80	U	160	U	85	U
3,3-DICHLOROBENZIDINE'	1,400	C		NS		91	U	93	UJ	80	U	160	U	85	U
3-NITROANILINE (CAS# 99092)	2,300	N		NS		91	U	93	U	80	U	160	U	85	U
4,6-DINITRO-2-METHYLPHENOL	780	N		NS		91	U	93	U	80	U	160	U	85	U
4-BROMOPHENYL-PHENYLETHER	NA			NS		91	U	93	U	80	U	160	U	85	U
4-CHLORO-3-METHYLPHENOL	NA			NS		91	U	93	U	80	U	160	U	85	U
4-CHLOROANILINE	31,000	N		NS		91	U	93	U	80	U	160	U	85	U
4-CHLOROPHENYL-PHENYLETHER	NA			NS		91	U	93	U	80	U	160	U	85	U
4-METHYLPHENOL	39,000	N		NS		91	U	93	U	80	U	160	U	85	U
4-NITROANILINE	32,000	C		NS		91	U	93	U	80	U	160	U	85	U
4-NITROPHENOL	63,000	N		NS		91	U	93	U	80	U	160	U	85	U
ACENAPHTHENE	470,000	N		NS		91	U	93	U	80	U	160	U	23	J
ACENAPHTHYLENE	470,000 ‡	N		NS		91	U	93	U	25	J	160	U	13	J
ANTHRACENE	2,300,000	N		NS		91	U	59	J	17	J	160	U	39	J
BENZO[A]ANTHRACENE	870	C		NS		80	J	450	J	190		100	J	200	
BENZO[A]PYRENE	87	C		NS		34	J	370	J	120		65	J	180	J
BENZO[B]FLUORANTHENE	870	C		NS		92	J	620	J	250		74	J	240	J
BENZO[G,H,I]PERYLENE	NA			NS		91	UJ	63	J	62	J	160	U	37	J
BENZO[K]FLUORANTHENE	8,700	C		NS		28	J	290	J	110		79	J	220	J
BENZOIC ACID	31,000,000	N		NS		28	J	15	J	240	U	130	J	180	J
BENZYL ALCOHOL	2,300,000	N		NS		91	U	93	U	80	U	160	U	85	U
BIS(2-CHLOROETHOXY)METHANE	NA			NS		91	U	93	U	80	U	160	U	85	U
BIS(2-CHLOROISOPROPYL)ETHER	9,100	C		NS		91	U	93	U	80	U	160	U	85	U
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		NS		120		120	J	83		280	B	68	JB
BUTYLBENZYLPHTHALATE	1,600,000	N		NS		27	J	93	UJ	80	U	190		11	J
CARBAZOLE	32,000	C		NS		91	U	93	U	15	J	160	U	19	J
CHRYSENE	87,000	C		NS		38	J	300	J	120		64	J	140	
DIBENZ[A,H]ANTHRACENE	87	C		NS		91	UJ		R	80	U	160	U		R
DIBENZOFURAN	16,000	N		NS		91	U	93	U	80	U	160	U	14	J
DIETHYLPHTHALATE	6,300,000	N		NS		19	J	16	J	13	J	160	U	85	U
DIMETHYLPHTHALATE	78,000,000	N		NS		91	U	93	U	80	U	160	U	85	U
DI-N-BUTYLPHTHALATE	780,000 ‡	N		NS		32	JB	37	JB	16	JB	39	JB	22	JB
DI-N-OCTYLPHTHALATE	160,000 ‡	N		NS		91	UJ		R	80	U	160	U		R
FLUORANTHENE	310,000	N		NS		120		550		280		120	J	260	
FLUORENE	310,000	N		NS		91	U	93	U	80	U	160	U	85	U
HEXACHLOROBENZENE	400	C		NS		91	U	93	U	80	U	160	U	85	U
HEXACHLOROBUTADIENE	8,200	C		NS		91	U	93	U	80	U	160	U	85	U
HEXACHLOROCYCLOPENTADIENE	47,000	N		NS		91	U	93	U	80	U	160	U	85	U
HEXACHLOROETHANE	46,000	C		NS		91	U	93	U	80	U	160	U	85	U
INDENO[1,2,3-CD]PYRENE	870	C		NS		91	UJ	96	J	80		160	U	57	J
ISOPHORONE	670,000	C		NS		91	U	93	U	80	U	160	U	85	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
NAPHTHALENE	160,000	N		NS		91	U	93	U	22	J	160	U	22	J
NITROBENZENE	3,900	N		NS		91	U	93	U	80	U	160	U	85	U
N-NITROSO-DI-N-PROPYLAMINE	NA			NS		91	U	93	U	80	U	160	U	85	U
N-NITROSODIPHENYLAMINE	130,000	C		NS		91	U	93	U	80	U	160	U	85	U
O-CHLORONITROBENZENE	26,000	C		NS		91	U	93	U	80	U	160	U	85	U
PENTACHLOROPHENOL	5,300	C		NS		91	U	93	U	80	U	160	U	85	U
PHENANTHRENE	NA			NS		67	J	280		160		93	J	210	
PHENOL	2,300,000	N		NS		91	U	93	U	80	U	160	U	85	U
PHENYL HYDRAZINE	NA			NS		91	U	93	UJ	80	U	160	U	85	U
PHENYL ISOCYANATE	NA			NS		91	U	93	U	80	U	160	U	85	U
PHENYL ISOTHIOCYANATE	NA			NS		91	U	93	U	80	U	160	U	85	U
PYRENE	230,000	N		NS		160		1200	J	380		270		610	
SVOC Tentatively Identified Compounds (UG/KG)															
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA			NS		360	NJ		*		*	700	NJ	230	NJ
.ALPHA.-PINENE (CAS # 80-56-8)	NA			NS			*		*		*	2500	NJ	840	NJ
.BETA.-PINENE (CAS# 127-91-3)	NA			NS			*		*		*	5100	NJ	2100	NJ
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA			NS			*		*		*		*		*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA			NS			*		*		*		*	280	NJ
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA			NS			*		*		*		*		*
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA			NS		130	NJ		*		*		*		*
1H-CYCLOPROP[E]AZULENE, 1A,2,3,4,4A,5,6,7B-OCTAHYDRO-1,1,4,7-TETRAMETHYL-, [1AR-(1A.ALPHA., 4.ALPHA., 4A.BETA., 7B.ALPHA.)]- (CAS# 489-40-7)	NA			NS			*		*		*		*		*
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA			NS			*		*		*		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N		NS			*		*		*		*		*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA			NS			*		*		*		*		*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA			NS			*		*		*		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA			NS			*		*		*		*		*
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			NS			*		*		*	320	NJ		*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA			NS			*		*		*		*		*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA			NS			*		*		*		*		*
BENZYL FLUORIDE	NA			NS			*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
BENZO(E)PYRENE (CAS# 192-97-2)		NA			NS			*		*		*		*		*
BENZOTRICHLORIDE		NA			NS			*		*		*		*		*
BORNYL ACETATE (CAS# 76-49-3)		NA			NS			*		*		*		*		*
CARYOPHYLLENE (CAS# 87-44-5)		NA			NS		280	NJ		*		*	1800	NJ	520	NJ
CHOLESTEROL (CAS # 57-88-5)		NA			NS			*		*		*		*		*
COPAENE (CAS# 3856-25-5)		NA			NS		200	NJ		*		*		*		*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)		NA			NS			*		*		*		*		*
DIPHENYLCHLOROARSINE		NA			NS			*		*		*		*		*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)		NA			NS		3100	NJ		*		*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)		16,000,000	N		NS			*		*		*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)		NA			NS		1100	NJ		*		*		*		*
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)		NA			NS		500	NJ		*		*		*		*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)		NA			NS		270	NJ		*		*		*		*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1 (1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)		NA			NS		190	NJ		*		*		*		*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)		NA			NS		450	NJ		*		*		*		*
NONACOSANE (CAS# 630-03-5)		NA			NS			*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			NS		18000	NJ		*		*		*		*
o-TOLYL ISOCYANIDE		NA			NS			*		*		*		*		*
PENTADECANOIC ACID (CAS# 1002-84-2)		NA			NS			*		*		*		*		*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)		NA			NS			*		*		*		*		*
PHENYLDICHLOROARSINE		NA			NS			*		*		*		*		*
PHENYL ISOCYANIDE		NA			NS			*		*		*		*		*
PYRENE, 2-METHYL- (CAS# 3442-78-2)		NA			NS			*		*		*		*		*
SEPTUM BLEED		NA			NS			*		*	710	NJ		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
ICP Inorganic Analyses - SW6010B (MG/KG)															
ALUMINUM	7,800	N	**25,798**	5640		6730		5710		6580		5370		9360	
ANTIMONY	**3.1**	N	0.92	1.3	UL	1.2	L	1.3	UL	1	UL	1.1	UL	1.2	UL
ARSENIC	0.43	C	**12.64**	147	J	240	J	159	J	5	J	55.2	J	7.3	J
BARIUM	**550**	N	298.28	54		62.5		50.9		38.8	J	112	J	44.8	J
BERYLLIUM	**16**	N	2.35	0.63	U	0.55	U	0.64	U	0.5	UJ	0.57	UJ	0.6	UJ
CADMIUM	**7.8**	N	0.32	0.63	U	0.55	U	0.64	U	0.5	U	0.57	U	0.6	U
CALCIUM	NA		**4,207**	2610		3650		2140		805		6980		1510	
CHROMIUM	**12,000** ‡	N	97.20	18.9	K	28.5	K	19.1	K	19.3		29.8		31.6	
COBALT	**160**	N	22.26	6		7		5.9		4.1	K	7.4	L	5.2	L
COPPER	**310**	N	47.76	17.5		24.7		18.7		28.5		17.1		15.1	
IRON	2,300	N	**31,951**	19100		27300		18600		28600	J	14500	J	23400	J
LEAD	**400** ‡		329.76	30.7	K	31.2	K	36.7	K	41.6	K	46.7	J	47.2	J
MAGNESIUM	NA		**7,093**	1390		1540		1480		665		3290		1120	
MANGANESE	160	N	**1,251**	266	J	246	J	202	J	136	J	482	J	204	J
MERCURY (by CVAA)	NA		**0.29**	0.21		0.17		0.22		0.12		0.14		0.19	
NICKEL	**160**	N	40.12	9.7		11.4		10.2		8.1		47.9		10.5	
PHOSPHORUS	NA		NA	320		380		323		260		414		434	
POTASSIUM	NA		**4,945**	814		886		897		371		809		785	
SELENIUM	**39**	N	0.88	0.63	U	0.55	U	0.64	U	0.98		1.4		1.2	
SILICON	NA		NA	1650		1790		1700		1700		1630		2290	
SILVER	**39**	N	0.74	0.63	U	0.55	U	0.64	U	0.5	U	0.57	U	0.6	U
SODIUM	NA		**55.80**	63	U	55.3	U	63.6	U	49.9	U	57.2	U	59.7	U
STRONTIUM	**4,700**	N	NA	12.4		15.5		10.1		5.9		31.9		7.6	
SULFUR	NA		NA	197		217		179		214	L	420	L	345	L
THALLIUM	0.55	N	**1.36**	1.3	UJ	1.1	UJ	1.3	UJ	1	U	1.1	U	1.2	U
TIN	**4,700**	N	NA	2.8		2.9		3.6		4.2		3.2		4.1	
TITANIUM	**31,000**	N	NA	190		193		203		173		136		244	
VANADIUM	55	N	**66.76**	25.8		30.3		28.5		34.5		28.8		52.9	
ZINC	**2,300**	N	308.8	59.8		60.6		71.1		41		76.6		48	
IC Scan - EPA 300M (MG/KG)															
BROMIDE	NA			NS		1.37	U	1.44	U	1.23	U	1.22	U	NS	
CHLORIDE	NA			NS		8.64		5.48		2.59		30.6		NS	
FLUORIDE	NA			NS		6.95	L	7.13	L	1.94	L	7.74	L	NS	
NITRATE-N	13,000	N		NS		1.37	U	1.44	U	18.9		4.82		NS	
NITRITE-N	780	N		NS		1.37	U	1.44	U	1.23	U	1.17	U	NS	
PHOSPHATE-P	NA			NS			R		R		R	5.34	L	NS	
SULFATE	NA			NS		6.96	K	7.68	K	14.4	K	36.8	K	NS	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid
SAMPLE DEPTH:	RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"
SAMPLING DATE:	(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001
Analyses performed by Southwest Research Institute	downward)[\1]													
Mustard Breakdown Products (UG/KG)														
1,4-DITHIANE	78,000	N		NS		110	U	111	U	98	U	94	U	NS
1,4-OXATHIANE	78,000	\3,N		NS		113	U	114	U	100	U	96	U	NS
THIODIGLYCOL	39,100	\3,N		NS		313	J	445	J	235	J	463	J	NS
Lewisite Breakdown Products (UG/KG)														
TOTAL CVAA & CVAO	890	\3,C		NS		11	U	11	U	10	U	10	U	NS
Other Parameters (MG/KG, unless otherwise indicated)														
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		180	U	180	U	180	U	180	U	NS
ADAMSITE **	NA			NS		7.7	U	7.7	U		**	7.7	U	NS
AMMONIA-N	NA			NS		1.33	U	1.37	U	1.23	U	1.17	U	NS
CYANIDE	160 ‡	N		NS		0.66	U	0.72	U	0.58	U	0.58	U	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds
Source is the April 25, 2003 USEPA RBC Table
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation

N = Non-carcinogen. This RBC was adjusted down by a factor of 10
C = Carcinogen as listed on the USEPA RBC table
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
Volatile Organic Compounds - SW8260B (UG/KG)													
1,1,1-TRICHLOROETHANE	2,200,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
1,1,2,2,-TETRACHLOROETHANE	3,200	C			R		R		R		R	1.2	UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	230,000,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
1,1,2-TRICHLOROETHANE	11,000	C			R		R		R		R	1.2	UJ
1,1-DICHLOROETHANE	780,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
1,1-DICHLOROETHENE	390,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
1,2,4-TRICHLOROBENZENE	78,000	N			R		R		R		R		R
1,2-DIBROMO-3-CHLOROPROPANE	460	C			R		R		R		R		R
1,2-DIBROMOETHANE	7.5	C			R		R		R		R	1.2	UJ
1,2-DICHLOROBENZENE	700,000	N			R		R		R		R		R
1,2-DICHLOROETHANE	7,000	C		1.2	U	1.2	U	0.82	U	1	U	1.2	U
1,2-DICHLOROPROPANE	9,400	C		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
1,3-DICHLOROBENZENE	230,000	N			R		R		R		R		R
1,4-DICHLOROBENZENE	27,000	C			R		R		R		R		R
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		21		15		9		12		6	
2-HEXANONE	310,000	N			R		R		R		R	1.2	UJ
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
ACETONE	780,000	N		110	J	64	J	56	J	62	J	38	J
ACETONITRILE	NA			8		5.9	U	4.1	U	5.1	U	6	U
ACROLEIN	160,000	N		6	U	7		4.1	U	5.1	U	6	U
BENZENE	12,000	C		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
BENZYL BROMIDE	NA				R		R		R		R		R
BENZYL CHLORIDE	3,800	C			R		R		R		R		R
BROMODICHLOROMETHANE	10,000	C		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
BROMOFORM	81,000	C			R		R		R		R		R
BROMOMETHANE	11,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
CARBON DISULFIDE	780,000	N		22		11		11		17		9	
CARBON TETRACHLORIDE	4,900	C		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
CHLOROBENZENE	160,000	N			R		R		R		R	1.2	UJ
CHLOROETHANE	220,000	C		1.2	U	1.2	U	0.82	U	1	U	1.2	U
CHLOROFORM	78,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
CHLOROMETHANE	NA			9		7		6		6		4	
CHLOROPICRIN	NA			30	U	30	U	21	U	25	U	30	U
CIS-1,2-DICHLOROETHENE	78,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
CIS-1,3-DICHLOROPROPENE	6,400 ‡	C		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
CYCLOHEXANE	470,000 ‡	N		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
DIBROMOCHLOROMETHANE	7,600	C			R		R		R		R	1.2	UJ
DICHLORODIFLUOROMETHANE	1,600,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
ETHYLBENZENE	780,000	N		1.2	U		R		R		R	1.2	UJ
ISOPROPYLBENZENE (CUMENE)	780,000	N			R		R		R		R		R
M&P-XYLENE	1,600,000	N		1.2	U		R		R		R	1.2	UJ
METHYL ACETATE	7,800,000	N		30		27		16		7		7	
METHYL TERT-BUTYL ETHER	160,000	C		1.2	U	1.2	U	0.82	U	1	U	1.2	U
METHYLCYCLOHEXANE	470,000 ‡	N		1.2	U	1.2	UJ	0.82	UJ	1	U	1.2	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
METHYLENE CHLORIDE		85,000	C		1.2	U	1.2	U	0.82	U	1	U	1.2	U
O-XYLENE		1,600,000	N		1.2	U		R		R		R	1.2	UJ
STYRENE		1,600,000	N		1.2	U		R		R		R	1.2	UJ
TETRACHLOROETHENE		32,000	C		1.2	U		R		R		R	1.2	UJ
TOLUENE		1,600,000	N		11		2	J	9	J	3	J	10	J
TRANS-1,2-DICHLOROETHENE		160,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
TRANS-1,3-DICHLOROPROPENE		6,400 ‡	C		1.2	U	1.2	UJ	0.82	UJ	1	U	1.2	U
TRICHLOROETHENE		1,600	C		1.2	U	1.2	UJ	0.82	UJ	1	U	1.2	U
TRICHLOROFLUOROMETHANE		2,300,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
VINYL CHLORIDE		90	C		1.2	U	1.2	U	0.82	U	1	U	1.2	U
VOC Tentatively Identified Compounds (UG/KG)														
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)		NA				*		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA				*		*		*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA			30	NJ	10	NJ	9	NJ	7	NJ		*
2-DECENE, 4-METHYL-,(Z)-		NA				*		*		*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA				*		*		*		*	10	NJ
2-OCTENE, (E)- ISOMER		NA			20	NJ		*	10	NJ		*		*
2-OCTENE, (E)- ISOMER		NA				*		*	20	NJ		*		*
2-OCTENE, (Z)- ISOMER		NA				*		*		*		*		*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)		NA				*		*		*		*		*
2-PROPANOL (CAS# 67-63-0)		NA				*		*		*		*		*
3-OCTENE, (E)-		NA				*		*		*	7	NJ		*
ACETALDEHYDE (CAS# 75-07-0)		NA			10	NJ	9	NJ	6	NJ		*		*
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)		7,000,000	N			*		*		*		*		*
ALCOHOL		NA				*		*		*		*		*
ALLYL ALCOHOL		NA				*		*		*		*		*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N			*		*		*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N			*		*		*		*		*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-		NA				*		*		*		*		*
BENZYL IODIDE		NA				*		*		*		*		*
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL		NA				*		*		*		*		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-		NA				*		*		*		*	100	NJ
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-		NA				*		*		*		*		*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL		NA				*		*		*		*	20	NJ
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-		NA				*		*		*		*		*
BICYCLO 3.1.1 HEPT-2-ENE,2,		NA				*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-D		NA				*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-		NA				*		*		*		*		*
BROMOACETONE		780,000 ‡	N			*		*		*		*		*
BROMOBENZENE		NA				*		*		*		*		*
BROMOMETHYL ETHER		NA				*		*		*		*		*
BUTANAL (CAS# 123-72-8)		NA				*	10	NJ		*		*		*
BUTANAL, 3-METHYL-		NA				*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
BUTYL MERCAPTAN		NA				*		*		*		*		*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)		NA				*		*		*		*		*
CHLORINATED ACETONE		NA				*		*		*		*		*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*		*		*		*		*
CHLOROACETONE		780,000 ‡	N			*		*		*		*		*
CHLOROACETONITRILE		NA				*		*		*		*		*
CHLOROMETHYL ETHER		NA				*		*		*		*		*
CHLOROMETHYL ETHYL ETHER		NA				*		*		*		*		*
CROTONALDEHYDE		340	C			*		*		*		*		*
CYCLOBUTANOL (CAS# 2919-23-5)		NA				*		*		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA			20	NJ	10	NJ		*		*	60	NJ
DECANAL (CAS# 112-31-2)		NA				*		*		*		*	10	NJ
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA				*		*		*		*		*
ETHYL BROMOACETATE		7,000,000 ‡	N			*		*		*		*		*
ETHYL CHLOROFORMATE		NA				*		*		*		*		*
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*		*		*		*		*
ETHYL MERCAPTAN		NA				*		*		*		*		*
HEPTANAL (CAS# 111-71-7)		NA				*		*	7	NJ		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA				*		*		*		*		*
HEXANAL (CAS# 66-25-1)		NA			400	NJ	500	NJ	200	NJ	200	NJ	100	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA				*		*		*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA			20	NJ	20	NJ		*	9	NJ		*
METHYL BROMOACETATE		NA				*		*		*		*		*
METHYL CHLOROACETATE		NA				*		*		*		*		*
METHYL CHLOROFORMATE		NA				*		*		*		*		*
METHYL CHLOROSULFONATE		NA				*		*		*		*		*
OCTANAL (CAS# 124-13-0)		NA				*	10	NJ		*		*		*
OCTANE (CAS# 111-65-9)		NA				*		*		*		*		*
PENTANAL ISOMER		NA			60	NJ	70	NJ	6	NJ	8	NJ		*
PENTANAL ISOMER		NA			10	NJ	10	NJ	20	NJ	20	NJ	20	NJ
PENTANAL, 2-METHYL- (CAS# 123-15-9)		NA			10	NJ		*		*		*		*
PENTANE (CAS# 109-66-0)		NA			60	NJ	40	NJ	20	NJ	60	NJ	10	NJ
PERCHLOROMETHYLMERCAPTAN		NA				*		*		*		*		*
PROPANE, 2-METHYL- (CAS# 72-28-5)		NA				*		*		*	30	NJ		*
THIOPHENE		NA				*		*		*		*		*
TRICHLOROACETONITRILE		NA				*		*		*		*		*
UNDECANE (CAS# 1120-21-4)		NA				*		*		*		*		*
Semivolatile Organic Compounds - SW8270C (UG/KG)														
1,2,4-TRICHLOROBENZENE		78,000	N		84	U	86	U	68	U	80	U	79	U
1,2-DICHLOROBENZENE		700,000	N		84	U	86	U	68	U	80	U	79	U
1,3-DICHLOROBENZENE		230,000	N		84	U	86	U	68	U	80	U	79	U
1,4-DICHLOROBENZENE		27,000	C		84	U	86	U	68	U	80	U	79	U
2,4,5-TRICHLOROPHENOL		780,000	N		84	U	86	U	68	U	80	U	79	U
2,4,6-TRICHLOROPHENOL		58,000	C		84	U	86	U	68	U	80	U	79	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
2,4-DICHLOROPHENOL		23,000	N		84	U	86	U	68	U	80	U	79	U
2,4-DIMETHYLPHENOL		160,000	N		84	U	86	U	68	U	80	U	79	U
2,4-DINITROPHENOL		16,000	N		250	U	260	U	200	U	240	U	240	U
2,4-DINITROTOLUENE		16,000	N		84	U	86	U	68	U	80	U	79	U
2,6-DINITROTOLUENE		7,800	N		84	U	86	U	68	U	80	U	79	U
2-CHLORONAPHTHALENE (CAS# 91587)		630,000 ‡	N		17	J	86	U	68	U	80	U	79	U
2-CHLOROPHENOL		39,000	N		84	U	86	U	68	U	80	U	79	U
2-METHYLNAPHTHALENE (CAS# 91576)		160,000	N		84	U	86	U	68	U	80	U	79	U
2-METHYLPHENOL		390,000	N		84	U	86	U	68	U	80	U	79	U
2-NITROANILINE		NA			84	U	86	U	68	U	80	U	79	U
2-NITROPHENOL		63,000 ‡	N		84	U	86	U	68	U	80	U	79	U
3,3-DICHLOROBENZIDINE'		1,400	C		84	U	86	U	68	U	80	U	79	U
3-NITROANILINE (CAS# 99092)		2,300	N		84	U	86	U	68	U	80	U	79	U
4,6-DINITRO-2-METHYLPHENOL		780	N		84	U	86	U	68	U	80	U	79	U
4-BROMOPHENYL-PHENYLETHER		NA			84	U	86	U	68	U	80	U	79	U
4-CHLORO-3-METHYLPHENOL		NA			84	U	86	U	68	U	80	U	79	U
4-CHLOROANILINE		31,000	N		84	U	86	U	68	U	80	U	79	U
4-CHLOROPHENYL-PHENYLETHER		NA			84	U	86	U	68	U	80	U	79	U
4-METHYLPHENOL		39,000	N		84	U	86	U	190		80	U	79	U
4-NITROANILINE		32,000	C		84	U	86	U	68	U	80	U	79	U
4-NITROPHENOL		63,000	N		15	J	86	U	68	U	80	U	79	U
ACENAPHTHENE		470,000	N		21	J	86	U	68	U	80	U	79	U
ACENAPHTHYLENE		470,000 ‡	N		84	U	86	U	68	U	80	U	79	U
ANTHRACENE		2,300,000	N		39	J	86	U	14	J	80	U	79	U
BENZO[A]ANTHRACENE		870	C		220		15	J	74		80	U	41	J
BENZO[A]PYRENE		87	C		140	J		R	39	J		R	31	J
BENZO[B]FLUORANTHENE		870	C		250	J	12	J	82	J		R	32	J
BENZO[G,H,I]PERYLENE		NA				R		R		R		R		R
BENZO[K]FLUORANTHENE		8,700	C		140	J	14	J	65	J		R	47	J
BENZOIC ACID		31,000,000	N		64	J	32	J	39	J	25	J	38	J
BENZYL ALCOHOL		2,300,000	N		84	U	86	U	68	U	80	U	79	U
BIS(2-CHLOROETHOXY)METHANE		NA			84	U	86	U	68	U	80	U	79	U
BIS(2-CHLOROISOPROPYL)ETHER		9,100	C		84	U	86	U	68	U	80	U	79	U
BIS(2-ETHYLHEXYL)PHTHALATE		46,000	C		210	B	60	JB	100	B	190	B	130	B
BUTYLBENZYLPHTHALATE		1,600,000	N		30	J	86	U	20	J	80	U	22	J
CARBAZOLE		32,000	C		84	U	86	U	12	J	80	U	79	U
CHRYSENE		87,000	C		130		16	J	48	J	80	U	46	J
DIBENZ[A,H]ANTHRACENE		87	C			R		R		R		R		R
DIBENZOFURAN		16,000	N		12	J	86	U	68	U	80	U	79	U
DIETHYLPHTHALATE		6,300,000	N		84	U	86	U	11	J	80	U	14	J
DIMETHYLPHTHALATE		78,000,000	N		84	U	86	U	68	U	80	U	79	U
DI-N-BUTYLPHTHALATE		780,000 ‡	N		26	JB	57	JB	35	JB	22	JB	25	JB
DI-N-OCTYLPHTHALATE		160,000 ‡	N		23	J		R		R	80	U		R
FLUORANTHENE		310,000	N		270		29	J	110		80	U	55	J
FLUORENE		310,000	N		12	J	86	U	68	U	80	U	79	U
HEXACHLOROBENZENE		400	C		84	U	86	U	68	U	80	U	79	U
HEXACHLOROBUTADIENE		8,200	C		84	U	86	U	68	U	80	U	79	U
HEXACHLOROCYCLOPENTADIENE		47,000	N		84	U	86	U	68	U	80	U	79	U
HEXACHLOROETHANE		46,000	C		84	U	86	U	68	U	80	U	79	U
INDENO[1,2,3-CD]PYRENE		870	C			R		R		R		R		R
ISOPHORONE		670,000	C		84	U	86	U	68	U	80	U	79	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
NAPHTHALENE		160,000	N		11	J	86	U	68	U	80	U	79	U
NITROBENZENE		3,900	N		84	U	86	U	68	U	80	U	79	U
N-NITROSO-DI-N-PROPYLAMINE		NA			84	U	86	U	68	U	80	U	79	U
N-NITROSODIPHENYLAMINE		130,000	C		84	U	86	U	68	U	80	U	79	U
O-CHLORONITROBENZENE		26,000	C		84	U	86	U	68	U	80	U	79	U
PENTACHLOROPHENOL		5,300	C		84	U	86	U	68	U	80	U	79	U
PHENANTHRENE		NA			220		18	J	110		80	U	34	J
PHENOL		2,300,000	N		84	U	86	U	68	U	80	U	79	U
PHENYL HYDRAZINE		NA			84	U	86	U	68	U	80	U	79	U
PHENYL ISOCYANATE		NA			84	U	86	U	68	U	80	U	79	U
PHENYL ISOTHIOCYANATE		NA			84	U	86	U	68	U	80	U	79	U
PYRENE		230,000	N		630		59	J	220		20	J	120	
SVOC Tentatively Identified Compounds (UG/KG)														
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)		NA			360	NJ		*		*	810	NJ		*
.ALPHA.-PINENE (CAS # 80-56-8)		NA				*		*		*		*		*
.BETA.-PINENE (CAS# 127-91-3)		NA				*		*		*		*		*
.GAMMA.-SITOSTEROL (CAS# 83-47-6)		NA				*		*		*		*		*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)		NA				*		*		*		*		*
11H-BENZO[B]FLUORENE (CAS# 243-17-4)		NA				*		*		*		*		*
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)		NA			430	NJ		*		*		*		*
1H-CYCLOPROP[E]AZULENE, 1A,2,3,4,4A,5,6,7B-OCTAHYDRO-1,1,4,7-TETRAMETHYL-, [1AR-(1A.ALPHA., 4.ALPHA., 4A.BETA., 7B.ALPHA.)]- (CAS# 489-40-7)		NA				*		*		*		*	260	NJ
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)		NA				*		*		*		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)		39,000	N			*		*		*		*		*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)		NA				*		*		*		*		*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)		NA				*		*	300	NJ		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)		NA				*		*		*		*		*
9-HEXADECENOIC ACID (CAS# 002091-29-4)		NA			250	NJ	140	NJ		*	190	NJ		*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)		NA			230	NJ		*		*		*		*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)		NA				*		*		*		*		*
BENZYL FLUORIDE		NA				*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
BENZO(E)PYRENE (CAS# 192-97-2)		NA				*		*		*		*		*
BENZOTRICHLORIDE		NA				*		*		*		*		*
BORNYL ACETATE (CAS# 76-49-3)		NA				*		*		*		*		*
CARYOPHYLLENE (CAS# 87-44-5)		NA			270	NJ		*		*	310	NJ		*
CHOLESTEROL (CAS # 57-88-5)		NA				*		*		*		*		*
COPAENE (CAS# 3856-25-5)		NA				*		*		*		*		*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)		NA				*		*	830	NJ		*		*
DIPHENYLCHLOROARSINE		NA				*		*		*		*		*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)		NA				*		*		*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)		16,000,000	N			*		*		*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)		NA				*	420	NJ		*		*		*
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)		NA				*		*		*		*		*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)		NA				*		*		*		*		*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1 (1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)		NA				*		*		*		*		*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)		NA			890	NJ		*		*		*		*
NONACOSANE (CAS# 630-03-5)		NA				*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA				*		*		*		*		*
o-TOLYL ISOCYANIDE		NA				*		*		*		*		*
PENTADECANOIC ACID (CAS# 1002-84-2)		NA			160	NJ		*		*		*		*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)		NA				*		*		*		*		*
PHENYLDICHLOROARSINE		NA				*		*		*		*		*
PHENYL ISOCYANIDE		NA				*		*		*		*		*
PYRENE, 2-METHYL- (CAS# 3442-78-2)		NA				*		*		*		*		*
SEPTUM BLEED		NA				*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	4870		12600		6070		2980		6110	
ANTIMONY		**3.1**	N	0.92	1.1	UL	1	UL	1	UL	1.1	UL	0.86	UL
ARSENIC		0.43	C	**12.64**	104	J	35.6	J	4.8	J	3.3	J	6.1	J
BARIUM		**550**	N	298.28	65.9	J	77.8	J	47.8	J	20.5	J	19.5	J
BERYLLIUM		**16**	N	2.35	0.56	UJ	0.68	J	0.5	UJ	0.57	UJ	0.9	J
CADMIUM		**7.8**	N	0.32	0.56	U	0.52	U	0.5	U	0.57	U	0.43	U
CALCIUM		NA		**4,207**	4230		1700		715		8060		1030	
CHROMIUM		**12,000** ‡	N	97.20	37.6		32.4		27		91.4		52.8	
COBALT		**160**	N	22.26	8.5	L	7.6	L	4.3	L	18.5	L	2.5	L
COPPER		**310**	N	47.76	15		34.8		14.2		14		7.1	
IRON		2,300	N	**31,951**	15000	J	34000	J	26100	J	7530	J	23800	J
LEAD		**400** ‡		329.76	25.8	J	31.7	J	64.3	J	5.1	J	13.3	J
MAGNESIUM		NA		**7,093**	5910		2590		868		20500		1520	
MANGANESE		160	N	**1,251**	323	J	247	J	287	J	298	J	98.4	J
MERCURY (by CVAA)		NA		**0.29**	0.2		0.06		0.15		0.06	U	0.08	
NICKEL		**160**	N	40.12	75.4		11.7		6.7		345		7.3	
PHOSPHORUS		NA		NA	392		527		374		194		678	
POTASSIUM		NA		**4,945**	585		1990		450		172		3260	
SELENIUM		**39**	N	0.88	0.62		1.3		1.2		0.69		0.92	
SILICON		NA		NA	1880		2970		1430		1370		1660	
SILVER		**39**	N	0.74	0.56	U	0.52	U	0.5	U	0.57	U	0.43	U
SODIUM		NA		**55.80**	55.7	U	52.1	U	50.1	U	56.6	U	43	U
STRONTIUM		**4,700**	N	NA	16.7		8.1		3.7		8.4		6.6	
SULFUR		NA		NA	327	L	410	L	273	L	256	L	149	L
THALLIUM		0.55	N	**1.36**	1.1	U	1	U	1	U	1.1	U	0.86	U
TIN		**4,700**	N	NA	3.2		2.9		3.6		2.3	U	1.9	
TITANIUM		**31,000**	N	NA	116		340		139		50.4		110	
VANADIUM		55	N	**66.76**	18.8		69.1		30.1		8		46.1	
ZINC		**2,300**	N	308.8	72.8		65		38.7		18.3		46.6	
IC Scan - EPA 300M (MG/KG)														
BROMIDE		NA			NS		NS		1.15	U	NS		1.17	U
CHLORIDE		NA			NS		NS		4.18		NS		5.78	
FLUORIDE		NA			NS		NS		2.07	L	NS		2.7	L
NITRATE-N		13,000	N		NS		NS		18.3		NS		13.5	
NITRITE-N		780	N		NS		NS		1.15	U	NS		1.17	U
PHOSPHATE-P		NA			NS		NS			R	NS		3.78	L
SULFATE		NA			NS		NS		48	K	NS		73.4	K

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
Mustard Breakdown Products (UG/KG)													
1,4-DITHIANE	78,000	N		NS		NS		81	U	NS		99	U
1,4-OXATHIANE	78,000	\3,N		NS		NS		83	U	NS		102	U
THIODIGLYCOL	39,100	\3,N		NS		NS		352	J	NS		300	J
Lewisite Breakdown Products (UG/KG)													
TOTAL CVAA & CVAO	890	\3,C		NS		NS		8.3	U	NS		10	U
Other Parameters (MG/KG, unless otherwise indicated)													
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		NS		180	U	NS		180	U
ADAMSITE **	NA			NS		NS			**	NS			**
AMMONIA-N	NA			NS		NS		1.22	U	NS		1.16	U
CYANIDE	160 ‡	N		NS		NS		0.6		NS		0.57	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds
Source is the April 25, 2003 USEPA RBC Table
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation

N = Non-carcinogen. This RBC was adjusted down by a factor of 10
C = Carcinogen as listed on the USEPA RBC table
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identifie using the mass spectral library search**

Shading indicates result exceeds higher (bolded) of RBC or background.

** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.

Table 1A

Comprehensive List Detections for AU 12/CDC

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:		Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[11]														
Volatile Organic Compounds - SW8260B (UG/KG)																
1,4-DICHLOROBENZENE		27,000	C		NS		1.2	UJ	NS			R	1	UJ	1	UJ
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		NS		1.2	U	NS		1.1	UJ	19		13	
2-HEXANONE		310,000	N		NS		1.2	UJ	NS			R	1	U	1	U
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)		630,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
ACETONE		780,000	N		NS		6		NS		5	J	91	J	59	J
ACETONITRILE		NA			NS		5.8	U	NS		5.6	UJ	6	U	9	
ACROLEIN		160,000	N		NS		5.8	U	NS		5.6	UJ	7		6	U
BENZENE		12,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CARBON DISULFIDE		780,000	N		NS		12		NS		11	J	9		9	
CHLOROFORM		78,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CHLOROMETHANE		NA			NS		2		NS		5	J	4		3	
ISOPROPYLBENZENE (CUMENE)		780,000	N		NS		1.2	UJ	NS			R	1	UJ	1	UJ
METHYL ACETATE		7,800,000	N		NS		1.2	U	NS		1.1	UJ	11		3	
METHYLCYCLOHEXANE		470,000 ‡	N		NS		1.2	U	NS		1.1	UJ	2		1	U
METHYLENE CHLORIDE		85,000	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
TETRACHLOROETHENE		32,000	C		NS		1.2	UJ	NS			R	1	U	1	U
TOLUENE		1,600,000	N		NS		1.2	UJ	NS			R	1	U	1	U
VOC Tentatively Identified Compounds (UG/KG)																
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)		NA			NS			*	NS			*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA			NS		2	NJ	NS			*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA			NS			*	NS			*	20	NJ	6	NJ
2-DECENE, 4-METHYL-,(Z)-		NA			NS			*	NS			*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA			NS			*	NS			*		*		*
2-OCTENE, (E)- ISOMER		NA			NS		10	NJ	NS		10	NJ		*	10	NJ
2-OCTENE, (E)- ISOMER		NA			NS			*	NS			*		*	10	NJ
2-OCTENE, (Z)- ISOMER		NA			NS			*	NS			*		*		*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)		NA			NS			*	NS			*	60	NJ		*
2-PROPANOL (CAS# 67-63-0)		NA			NS			*	NS			*	40	NJ	100	NJ
3-OCTENE, (E)-		NA			NS			*	NS			*		*		*
ACETALDEHYDE (CAS# 75-07-0)		NA			NS			*	NS			*	40	NJ	10	NJ
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)		7,000,000	N		NS			*	NS			*	30	NJ		*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N		NS			*	NS			*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N		NS			*	NS			*		*		*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-		NA			NS			*	NS			*		*		*
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL		NA			NS			*	NS			*		*		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-		NA			NS			*	NS			*		*		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-		NA			NS			*	NS			*		*		*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL		NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-		NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPT-2-ENE,2,		NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-D		NA			NS			*	NS			*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-		NA			NS			*	NS			*		*		*
BUTANAL (CAS# 123-72-8)		NA			NS			*	NS			*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[11]														
BUTANAL, 3-METHYL-	NA			NS			*	NS			*		*		*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)	NA			NS			*	NS			*		*		*
CYCLOBUTANOL (CAS# 2919-23-5)	NA			NS			*	NS			*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA			NS		9	NJ	NS		10	NJ		*		*
DECANAL (CAS# 112-31-2)	NA			NS			*	NS			*		*		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA			NS			*	NS		4	NJ		*		*
HEPTANAL (CAS# 111-71-7)	NA			NS			*	NS			*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA			NS		2	NJ	NS			*		*		*
HEXANAL (CAS# 66-25-1)	NA			NS		5	NJ	NS		20	NJ	200	NJ	100	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA			NS		1	NJ	NS			*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA			NS		0.6	NJ	NS			*	10	NJ	6	NJ
OCTANAL (CAS# 124-13-0)	NA			NS			*	NS			*	20	NJ	6	NJ
OCTANE (CAS# 111-65-9)	NA			NS			*	NS			*		*		*
PENTANAL ISOMER	NA			NS		0.8	NJ	NS		2	NJ	60	NJ	20	NJ
PENTANAL ISOMER	NA			NS			*	NS			*		*	10	NJ
PENTANAL, 2-METHYL- (CAS# 123-15-9)	NA			NS			*	NS			*		*		*
PENTANE (CAS# 109-66-0)	NA			NS			*	NS		3	NJ	40	NJ		*
PROPANE, 2-METHYL- (CAS# 72-28-5)	NA			NS			*	NS			*		*		*
UNDECANE (CAS# 1120-21-4)	NA			NS			*	NS			*		*		*
Semivolatile Organic Compounds - SW8270C (UG/KG)															
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		NS		89	U	NS		79	U	80	U	86	U
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		NS		89	U	NS		79	U	80	U	86	U
4-METHYLPHENOL	39,000	N		NS		89	U	NS		79	U	80	U	86	U
4-NITROPHENOL	63,000	N		NS		89	U	NS		79	U	80	U	86	U
ACENAPHTHENE	470,000	N		NS		89	U	NS		79	U	80	U	18	J
ACENAPHTHYLENE	470,000 ‡	N		NS		89	U	NS		79	U	80	U	86	U
ANTHRACENE	2,300,000	N		NS		89	U	NS		79	U	80	U	46	J
BENZO[A]ANTHRACENE	870	C		NS		89	U	NS		31	J	36	J	200	
BENZO[A]PYRENE	87	C		NS		89	U	NS		23	J	19	J	110	J
BENZO[B]FLUORANTHENE	870	C		NS		89	U	NS		54	J	64	J	280	J
BENZO[G,H,I]PERYLENE	NA			NS		89	U	NS		79	U	80	UJ	35	J
BENZO[K]FLUORANTHENE	8,700	C		NS		89	U	NS		21	J	11	J	76	J
BENZOIC ACID	31,000,000	N		NS		270	U	NS		18	J	36	J	25	J
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		NS		17	J	NS		15	J	37	J	590	
BUTYLBENZYLPHTHALATE	1,600,000	N		NS		89	U	NS		79	U	80	U	86	U
CARBAZOLE	32,000	C		NS		89	U	NS		79	U	80	U	20	J
CHRYSENE	87,000	C		NS		89	U	NS		30	J	18	J	110	
DIBENZ[A,H]ANTHRACENE	87	C		NS		89	U	NS		79	U	80	UJ	86	UJ
DIBENZOFURAN	16,000	N		NS		89	U	NS		79	U	80	U	86	U
DIETHYLPHTHALATE	6,300,000	N		NS		21	J	NS		14	J	12	J	14	J
DI-N-BUTYLPHTHALATE	780,000 ‡	N		NS		33	JB	NS		22	JB	28	JB	26	JB
DI-N-OCTYLPHTHALATE	160,000 ‡	N		NS		89	U	NS		79	U	80	UJ	86	UJ
FLUORANTHENE	310,000	N		NS		89	U	NS		45	J	56	J	310	
FLUORENE	310,000	N		NS		89	U	NS		79	U	80	U	21	J
INDENO[1,2,3-CD]PYRENE	870	C		NS		89	U	NS		11	J	80	UJ	49	J
NAPHTHALENE	160,000	N		NS		89	U	NS		79	U	80	U	86	U
PHENANTHRENE	NA			NS		89	U	NS		18	J	28	J	240	
PYRENE	230,000	N		NS		89	U	NS		49	J	52	J	360	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]														
SVOC Tentatively Identified Compounds (UG/KG)															
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA			NS			*	NS			*		*		*
.ALPHA.-PINENE (CAS # 80-56-8)	NA			NS			*	NS			*		*		*
.BETA.-PINENE (CAS# 127-91-3)	NA			NS			*	NS			*		*		*
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA			NS			*	NS			*		*		*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA			NS			*	NS			*		*		*
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA			NS			*	NS			*		*		*
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA			NS			*	NS			*		*		*
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA			NS			*	NS			*		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N		NS			*	NS		450	NJ		*		*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA			NS			*	NS			*		*		*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA			NS			*	NS			*		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA			NS			*	NS			*		*		*
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			NS			*	NS			*		*		*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA			NS			*	NS			*		*		*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA			NS			*	NS			*		*		*
BENZO(E)PYRENE (CAS# 192-97-2)	NA			NS			*	NS			*		*		*
BORNYL ACETATE (CAS# 76-49-3)	NA			NS			*	NS			*		*		*
CARYOPHYLLENE (CAS# 87-44-5)	NA			NS			*	NS			*		*		*
CHOLESTEROL (CAS # 57-88-5)	NA			NS			*	NS			*	1600	NJ		*
COPAENE (CAS# 3856-25-5)	NA			NS			*	NS			*		*		*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)	NA			NS			*	NS			*		*		*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)	NA			NS			*	NS			*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N		NS			*	NS			*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)	NA			NS			*	NS			*	550	NJ	94	NJ

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:		Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)		NA			NS			*	NS			*		*		*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)		NA			NS			*	NS			*		*		*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)		NA			NS			*	NS			*		*		*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)		NA			NS			*	NS			*		*		*
NONACOSANE (CAS# 630-03-5)		NA			NS			*	NS			*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			NS			*	NS			*		*		*
PENTADECANOIC ACID (CAS# 1002-84-2)		NA			NS			*	NS			*		*		*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)		NA			NS			*	NS			*		*		*
PYRENE, 2-METHYL- (CAS# 3442-78-2)		NA			NS			*	NS			*		*		*
SEPTUM BLEED		NA			NS		230	NJ	NS		220	NJ		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)																
ALUMINUM		7,800	N	**25,798**	7440		9060		10400		8380		7040		9160	
ANTIMONY		**3.1**	N	0.92	1.2	L	1.2	UL	1	UL	1.2	UL	1.2	UL	1.2	UL
ARSENIC		0.43	C	**12.64**	262	J	11.4	J	5.7	J	3.1	J	198	J	27.1	J
BARIUM		**550**	N	298.28	47.4	J	6.6	J	31.1	J	13.3	J	36.1		78.4	
BERYLLIUM		**16**	N	2.35	0.52	J	0.59	UJ	0.52	UJ	0.58	UJ	0.83		0.72	
CALCIUM		NA		**4,207**	1230		421		715		855		1060		1920	
CHROMIUM		**12,000** ‡	N	97.20	24.4		34.6		32.5		30.5		41.1	K	31.6	K
COBALT		**160**	N	22.26	27.8	L	0.91	L	2.1	L	1.4	L	12.5		8.1	
COPPER		**310**	N	47.76	12.1		9.3		10.3		8.4		20.1		23.8	
IRON		2,300	N	**31,951**	30300	J	26700	J	25800	J	27300	J	41700		20200	
LEAD		**400** ‡		329.76	28.4	J	6.6	J	19.5	J	10.4	J	29.4	K	25.6	K
MAGNESIUM		NA		**7,093**	687		389		412		253		922		3940	
MANGANESE		160	N	**1,251**	321	J	26.1	J	79	J	33.2	J	311	J	274	J
MERCURY (by CVAA)		NA		**0.29**	0.11		0.07	U	0.11		0.06		0.05		0.19	
NICKEL		**160**	N	40.12	5.6		1.3		4.3		3.8		8.6		16.6	
PHOSPHORUS		NA		NA	273		145		200		157		488		358	
POTASSIUM		NA		**4,945**	591		363		301		259		1180		2690	
SELENIUM		**39**	N	0.88	1.7		1.2		0.89		0.58	U	0.81		0.59	U
SILICON		NA		NA	2010		2670		2520		1940		2130		2560	
SODIUM		NA		**55.80**	51.9	U	58.9	U	51.6	U	57.7	U	60.6	U	58.5	U
STRONTIUM		**4,700**	N	NA	7.9		3.8		4.2		5		5.1		9.5	
SULFUR		NA		NA	78.2	L	284	L	90.7	L	60.2	L	228		195	
THALLIUM		0.55	N	**1.36**	1	U	1.2	U	1	U	1.2	U	1.2	UJ	1.2	UJ
TIN		**4,700**	N	NA	2.5		2.4		3.3		2.7		5.5		2.3	U
TITANIUM		**31,000**	N	NA	135		72		170		119		150		483	
VANADIUM		55	N	**66.76**	29.7		50.8		54.3		50.2		47.4		33	
ZINC		**2,300**	N	308.8	31.7		7		17.7		10.7		57.4		61.9	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:		Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[\1]														
IC Scan - EPA 300M (MG/KG)																
CHLORIDE		NA			NS		24.8		NS		1.15	U	10.1		3.56	
FLUORIDE		NA			NS			R	NS			R	2.04	L	3.68	L
NITRATE-N		13,000	N		NS		1.21	U	NS		1.15	U	6.16		4.05	
PHOSPHATE-P		NA			NS			R	NS			R		R	2.92	JL
SULFATE		NA			NS		141	K	NS		15.3	K	19.3	K	7.39	K
Mustard Breakdown Products (UG/KG)																
THIODIGLYCOL		39,100	\3,N		NS		1147	U	NS		1018	U	280	J	300	J
Other Parameters (MG/KG)																
AMMONIA-N		NA			NS		1.18	U	NS		1.17	U	1.18	U	1.36	U
CYANIDE		160 ‡	N		NS		0.61	U	NS		0.57	U	0.61	U	0.66	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. This value was calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
Volatile Organic Compounds - SW8260B (UG/KG)														
1,4-DICHLOROBENZENE		27,000	C		1	UJ	1	UJ		R	NS		1	UJ
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		10		16		10		NS		4	
2-HEXANONE		310,000	N		1	U	1	U	1	UJ	NS		1	U
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)		630,000	N		1	U	1	U	1	U	NS		1	U
ACETONE		780,000	N		51	J	75	J	43	J	NS		27	B
ACETONITRILE		NA			5	U	6	U	6	U	NS		6	U
ACROLEIN		160,000	N		5	U	6	U	6	U	NS		6	U
BENZENE		12,000	C		1	U	1	U	1	U	NS		1	U
CARBON DISULFIDE		780,000	N		7		8		11		NS		6	
CHLOROFORM		78,000	N		1	U	1	U	1	UJ	NS		1	UJ
CHLOROMETHANE		NA			2		4		7		NS		4	
ISOPROPYLBENZENE (CUMENE)		780,000	N		1	UJ	1	UJ		R	NS		1	UJ
METHYL ACETATE		7,800,000	N		1	J	6		6		NS		1	J
METHYLCYCLOHEXANE		470,000 ‡	N		1	U	1	U	1	U	NS		1	U
METHYLENE CHLORIDE		85,000	C		1	U	1	U	1	U	NS		1	U
TETRACHLOROETHENE		32,000	C		1	U	1	U	1	UJ	NS		1	U
TOLUENE		1,600,000	N		1	U	1	U	1	UJ	NS		4	J
VOC Tentatively Identified Compounds (UG/KG)														
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)		NA				*		*		*	NS		100	NJ
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA				*		*		*	NS			*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA			5	NJ	10	NJ		*	NS			*
2-DECENE, 4-METHYL-,(Z)-		NA				*		*		*	NS			*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA				*		*		*	NS			*
2-OCTENE, (E)- ISOMER		NA			10	NJ	10	NJ	20	NJ	NS			*
2-OCTENE, (E)- ISOMER		NA				*		*		*	NS			*
2-OCTENE, (Z)- ISOMER		NA				*		*		*	NS			*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)		NA				*		*	30	NJ	NS			*
2-PROPANOL (CAS# 67-63-0)		NA			10	NJ		*		*	NS			*
3-OCTENE, (E)-		NA				*		*		*	NS			*
ACETALDEHYDE (CAS# 75-07-0)		NA			7	NJ	20	NJ	20	NJ	NS			*
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)		7,000,000	N			*		*		*	NS			*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N			*		*		*	NS			*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N			*	10	NJ		*	NS			*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-		NA				*		*		*	NS		60	NJ
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL		NA				*		*		*	NS		200	NJ
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-		NA				*		*		*	NS		200	NJ
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-		NA				*		*		*	NS			*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL		NA				*		*		*	NS			*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-		NA				*		*		*	NS			*
BICYCLO 3.1.1 HEPT-2-ENE,2,		NA				*		*		*	NS		100	NJ
BICYCLO 3.1.1 HEPTANE, 6,6-D		NA				*		*		*	NS		20	NJ
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-		NA				*		*		*	NS			*
BUTANAL (CAS# 123-72-8)		NA			6	NJ	6	NJ		*	NS			*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[11]												
BUTANAL, 3-METHYL-		NA				*		*	9	NJ	NS			*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)		NA				*		*		*	NS			*
CYCLOBUTANOL (CAS# 2919-23-5)		NA				*		*		*	NS			*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA				*		*	20	NJ	NS			*
DECANAL (CAS# 112-31-2)		NA				*		*		*	NS			*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA				*		*		*	NS			*
HEPTANAL (CAS# 111-71-7)		NA				*		*		*	NS			*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA				*		*		*	NS			*
HEXANAL (CAS# 66-25-1)		NA			100	NJ	90	NJ	300	NJ	NS		90	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA				*		*		*	NS			*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA			7	NJ	7	NJ	10	NJ	NS			*
OCTANAL (CAS# 124-13-0)		NA			7	NJ	10	NJ	20	NJ	NS			*
OCTANE (CAS# 111-65-9)		NA				*		*		*	NS			*
PENTANAL ISOMER		NA			20	NJ	20	NJ	30	NJ	NS			*
PENTANAL ISOMER		NA				*	8	NJ		*	NS			*
PENTANAL, 2-METHYL- (CAS# 123-15-9)		NA				*		*		*	NS			*
PENTANE (CAS# 109-66-0)		NA			7	NJ		*	30	NJ	NS			*
PROPANE, 2-METHYL- (CAS# 72-28-5)		NA				*		*		*	NS			*
UNDECANE (CAS# 1120-21-4)		NA				*		*		*	NS			*
Semivolatile Organic Compounds - SW8270C (UG/KG)														
2-CHLORONAPHTHALENE (CAS# 91587)		630,000 ‡	N		81	U	86	U	92	U	NS		86	U
2-METHYLNAPHTHALENE (CAS# 91576)		160,000	N		81	U	86	U	92	U	NS		46	J
4-METHYLPHENOL		39,000	N		81	U	86	U	92	U	NS		86	U
4-NITROPHENOL		63,000	N		81	U	86	U	92	U	NS		86	U
ACENAPHTHENE		470,000	N		81	U	22	J	92	U	NS		120	
ACENAPHTHYLENE		470,000 ‡	N		81	U	86	U	92	U	NS		100	
ANTHRACENE		2,300,000	N		81	U	27	J	92	U	NS		270	
BENZO[A]ANTHRACENE		870	C		18	J	120		60	J	NS		2000	
BENZO[A]PYRENE		87	C		13	J	40	J	32	J	NS		1100	J
BENZO[B]FLUORANTHENE		870	C		39	J	110		81	J	NS		2300	J
BENZO[G,H,I]PERYLENE		NA			81	U	34	J	18	J	NS		680	J
BENZO[K]FLUORANTHENE		8,700	C		11	J	42	J	26	J	NS		1300	J
BENZOIC ACID		31,000,000	N		18	J	25	J	40	J	NS		210	J
BIS(2-ETHYLHEXYL)PHTHALATE		46,000	C		12	J	28	J	40	J	NS		29	J
BUTYLBENZYLPHTHALATE		1,600,000	N		81	U	86	U	92	U	NS		86	U
CARBAZOLE		32,000	C		81	U	11	J	92	U	NS		67	J
CHRYSENE		87,000	C		12	J	42	J	31	J	NS		1100	
DIBENZ[A,H]ANTHRACENE		87	C		81	U	86	U	92	U	NS		330	J
DIBENZOFURAN		16,000	N		81	U	16	J	92	U	NS		68	J
DIETHYLPHTHALATE		6,300,000	N		10	J	14	J	13	J	NS		18	J
DI-N-BUTYLPHTHALATE		780,000 ‡	N		20	JB	27	JB	26	JB	NS		26	JB
DI-N-OCTYLPHTHALATE		160,000 ‡	N		81	U	86	U	92	U	NS		86	UJ
FLUORANTHENE		310,000	N		31	J	220		93		NS		3500	D
FLUORENE		310,000	N		81	U	18	J	92	U	NS		110	
INDENO[1,2,3-CD]PYRENE		870	C		81	U	39	J	21	J	NS		1100	J
NAPHTHALENE		160,000	N		81	U	11	J	92	U	NS		82	J
PHENANTHRENE		NA			15	J	200		46	J	NS		1600	
PYRENE		230,000	N		27	J	160		72	J	NS		3200	D

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
SVOC Tentatively Identified Compounds (UG/KG)														
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)		NA				*		*		*	NS		880	NJ
.ALPHA.-PINENE (CAS # 80-56-8)		NA				*		*		*	NS		1000	NJ
.BETA.-PINENE (CAS# 127-91-3)		NA				*		*		*	NS		2100	NJ
.GAMMA.-SITOSTEROL (CAS# 83-47-6)		NA			120	NJ		*	290	NJ	NS			*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)		NA				*		*		*	NS		120	NJ
11H-BENZO[B]FLUORENE (CAS# 243-17-4)		NA				*		*		*	NS		160	NJ
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)		NA				*		*		*	NS			*
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)		NA			140	NJ		*		*	NS			*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)		39,000	N			*		*	320	NJ	NS			*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)		NA				*	1100	NJ		*	NS			*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)		NA				*		*		*	NS			*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)		NA				*	1200	NJ	460	NJ	NS		96	NJ
9-HEXADECENOIC ACID (CAS# 002091-29-4)		NA				*	490	NJ	650	NJ	NS			*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)		NA				*		*		*	NS			*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)		NA				*		*		*	NS			*
BENZO(E)PYRENE (CAS# 192-97-2)		NA				*		*		*	NS		330	DNJ
BORNYL ACETATE (CAS# 76-49-3)		NA				*		*		*	NS			*
CARYOPHYLLENE (CAS# 87-44-5)		NA				*		*		*	NS		540	NJ
CHOLESTEROL (CAS # 57-88-5)		NA				*	2200	NJ		*	NS			*
COPAENE (CAS# 3856-25-5)		NA				*		*		*	NS			*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)		NA				*		*		*	NS			*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)		NA				*		*		*	NS			*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)		16,000,000	N		100	NJ		*		*	NS			*
HEXADECANOIC ACID (CAS# 57-10-3)		NA				*	88	NJ	310	NJ	NS			*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[11]												
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4 METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)		NA				*		*		*	NS			*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)		NA				*		*		*	NS			*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)		NA				*		*		*	NS			*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)		NA				*		*		*	NS			*
NONACOSANE (CAS# 630-03-5)		NA				*		*		*	NS		220	DNJ
OLEIC ACID (CAS# 112-80-1)		NA				*	1800	NJ		*	NS			*
PENTADECANOIC ACID (CAS# 1002-84-2)		NA				*		*	390	NJ	NS			*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)		NA				*		*		*	NS		240	NJ
PYRENE, 2-METHYL- (CAS# 3442-78-2)		NA				*		*		*	NS		210	DNJ
SEPTUM BLEED		NA				*		*		*	NS			*
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	9480		7140		13000		9040		7430	
ANTIMONY		**3.1**	N	0.92	1	UL	1.1	UL	1	UL	1.3	UL	1.1	UL
ARSENIC		0.43	C	**12.64**	81.8	J	210	J	31.3	J	12.9	J	8.9	J
BARIUM		**550**	N	298.28	67.6		37.7		76.3		47.5		38.5	
BERYLLIUM		**16**	N	2.35	0.8		0.62		0.78		0.63	U	0.55	U
CALCIUM		NA		**4,207**	1230		667		4620		2190		4790	
CHROMIUM		**12,000** ‡	N	97.20	41.3	K	23.2	K	44.1	K	42.4	K	32	K
COBALT		**160**	N	22.26	7.1		11.2		11.8		4.8		3.4	
COPPER		**310**	N	47.76	29.5		19.1		56.9		19.1		14.3	
IRON		2,300	N	**31,951**	29500		33300		32700		27800		23600	
LEAD		**400** ‡		329.76	14.7	K	17.6	K	26.5	K	44	K	34	K
MAGNESIUM		NA		**7,093**	2770		908		5700		1320		2770	
MANGANESE		160	N	**1,251**	288	J	303	J	392	J	158	J	104	J
MERCURY (by CVAA)		NA		**0.29**	0.06	U	0.1		0.24		0.75		0.37	
NICKEL		**160**	N	40.12	12.3		7.6		24.8		15.4		15.5	
PHOSPHORUS		NA		NA	417		353		514		294		218	
POTASSIUM		NA		**4,945**	2520		743		2560		629		514	
SELENIUM		**39**	N	0.88	0.5	U	0.7		0.72		0.63	U	0.55	U
SILICON		NA		NA	2400		1610		2360		1820		1890	
SODIUM		NA		**55.80**	49.8	U	57.1	U	52	U	63	U	55.3	U
STRONTIUM		**4,700**	N	NA	6.7		3.5		8.9		10.7		10.3	
SULFUR		NA		NA	154		150		236		162		113	
THALLIUM		0.55	N	**1.36**	1	UJ	1.1	UJ	1.4	J	1.3	UJ	1.4	J
TIN		**4,700**	N	NA	2	U	2.3	U	2.3		5.5		5.7	
TITANIUM		**31,000**	N	NA	296		176		423		235		187	
VANADIUM		55	N	**66.76**	66.9		40.4		78.6		56.8		45.6	
ZINC		**2,300**	N	308.8	43.2		31.3		69.4		53.9		36.3	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[\1]												
IC Scan - EPA 300M (MG/KG)														
CHLORIDE		NA			6.13		7.74		6.93		NS		4.64	
FLUORIDE		NA			2.46	L	2.4	L	4.43	L	NS		6.7	L
NITRATE-N		13,000	N		3.12		1.18	U	9.73		NS		1.26	U
PHOSPHATE-P		NA				R		R		R	NS			R
SULFATE		NA			14	K	30	K	8.22	L	NS		4.94	K
Mustard Breakdown Products (UG/KG)														
THIODIGLYCOL		39,100	\3,N		1039	U	1095	U	1187	U	NS		257	J
Other Parameters (MG/KG)														
AMMONIA-N		NA			1.19	U	2.47		1.36	U	NS		1.21	U
CYANIDE		160 [‡]	N		0.58	U	0.51	U	0.62	U	NS		0.58	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. This value was calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[11]											
Volatile Organic Compounds - SW8260B (UG/KG)												
1,4-DICHLOROBENZENE	27,000	C		2	J	NS		NS			R	NS
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		7		NS		NS		22		NS
2-HEXANONE	310,000	N		1	U	NS		NS		2		NS
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		1	U	NS		NS		1	U	NS
ACETONE	780,000	N		21	B	NS		NS		150	J	NS
ACETONITRILE	NA			5	U	NS		NS		8		NS
ACROLEIN	160,000	N		5	U	NS		NS		7		NS
BENZENE	12,000	C		1	U	NS		NS		1	U	NS
CARBON DISULFIDE	780,000	N		6		NS		NS		11		NS
CHLOROFORM	78,000	N		1	U	NS		NS		3		NS
CHLOROMETHANE	NA			4		NS		NS		12		NS
ISOPROPYLBENZENE (CUMENE)	780,000	N			R	NS		NS			R	NS
METHYL ACETATE	7,800,000	N		9		NS		NS		47	J	NS
METHYLCYCLOHEXANE	470,000 ‡	N		1	U	NS		NS		3		NS
METHYLENE CHLORIDE	85,000	C		1	U	NS		NS		1	U	NS
TETRACHLOROETHENE	32,000	C		1	U	NS		NS		1	U	NS
TOLUENE	1,600,000	N		2	J	NS		NS		4		NS
VOC Tentatively Identified Compounds (UG/KG)												
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)	NA				*	NS		NS			*	NS
2,4-HEXANEDIONE (CAS# 3002-24-2)	NA			2	NJ	NS		NS			*	NS
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)	NA			6	NJ	NS		NS		40	NJ	NS
2-DECENE, 4-METHYL-,(Z)-	NA				*	NS		NS			*	NS
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)	NA				*	NS		NS			*	NS
2-OCTENE, (E)- ISOMER	NA			8	NJ	NS		NS		10	NJ	NS
2-OCTENE, (E)- ISOMER	NA				*	NS		NS			*	NS
2-OCTENE, (Z)- ISOMER	NA				*	NS		NS			*	NS
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)	NA				*	NS		NS			*	NS
2-PROPANOL (CAS# 67-63-0)	NA				*	NS		NS			*	NS
3-OCTENE, (E)-	NA				*	NS		NS			*	NS
ACETALDEHYDE (CAS# 75-07-0)	NA				*	NS		NS		10	NJ	NS
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)	7,000,000	N			*	NS		NS			*	NS
BENZALDEHYDE (CAS# 100-52-7)	780,000	N			*	NS		NS			*	NS
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N			*	NS		NS			*	NS
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-	NA				*	NS		NS			*	NS
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL	NA			2	NJ	NS		NS			*	NS
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-	NA			3	NJ	NS		NS			*	NS
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-	NA				*	NS		NS			*	NS
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL	NA				*	NS		NS			*	NS
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-	NA				*	NS		NS			*	NS
BICYCLO 3.1.1 HEPT-2-ENE,2,	NA				*	NS		NS			*	NS
BICYCLO 3.1.1 HEPTANE, 6,6-D	NA				*	NS		NS			*	NS
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-	NA				*	NS		NS			*	NS
BUTANAL (CAS# 123-72-8)	NA			6	NJ	NS		NS		10	NJ	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)	CDC-(140,160)(0-1")	CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch	High As Grid	High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"	0-1"	0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[12]	2/21/2001		2/21/2001	2/21/2001	2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[11]									
BUTANAL, 3-METHYL-	NA				*	NS	NS		*	NS
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)	NA				*	NS	NS		*	NS
CYCLOBUTANOL (CAS# 2919-23-5)	NA				*	NS	NS		*	NS
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA				*	NS	NS		*	NS
DECANAL (CAS# 112-31-2)	NA				*	NS	NS		*	NS
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA				*	NS	NS		*	NS
HEPTANAL (CAS# 111-71-7)	NA				*	NS	NS		*	NS
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA				*	NS	NS		*	NS
HEXANAL (CAS# 66-25-1)	NA			200	NJ	NS	NS	300	NJ	NS
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA				*	NS	NS		*	NS
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA				*	NS	NS	10	NJ	NS
OCTANAL (CAS# 124-13-0)	NA				*	NS	NS	20	NJ	NS
OCTANE (CAS# 111-65-9)	NA				*	NS	NS		*	NS
PENTANAL ISOMER	NA			20	NJ	NS	NS	70	NJ	NS
PENTANAL ISOMER	NA			3	NJ	NS	NS		*	NS
PENTANAL, 2-METHYL- (CAS# 123-15-9)	NA				*	NS	NS		*	NS
PENTANE (CAS# 109-66-0)	NA			10	NJ	NS	NS	100	NJ	NS
PROPANE, 2-METHYL- (CAS# 72-28-5)	NA				*	NS	NS		*	NS
UNDECANE (CAS# 1120-21-4)	NA				*	NS	NS		*	NS
Semivolatile Organic Compounds - SW8270C (UG/KG)										
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		78	U	NS	NS	83	U	NS
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		78	U	NS	NS	83	U	NS
4-METHYLPHENOL	39,000	N		78	U	NS	NS	83	U	NS
4-NITROPHENOL	63,000	N		78	U	NS	NS	83	U	NS
ACENAPHTHENE	470,000	N		78	U	NS	NS	83	U	NS
ACENAPHTHYLENE	470,000 ‡	N		78	U	NS	NS	83	U	NS
ANTHRACENE	2,300,000	N		78	U	NS	NS	83	U	NS
BENZO[A]ANTHRACENE	870	C		53	J	NS	NS	73	J	NS
BENZO[A]PYRENE	87	C		78	UJ	NS	NS	46	J	NS
BENZO[B]FLUORANTHENE	870	C		64	J	NS	NS	110	J	NS
BENZO[G,H,I]PERYLENE	NA			78	UJ	NS	NS	24	J	NS
BENZO[K]FLUORANTHENE	8,700	C		43	J	NS	NS	32	J	NS
BENZOIC ACID	31,000,000	N		21	J	NS	NS	18	J	NS
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		190	J	NS	NS	71	J	NS
BUTYLBENZYLPHTHALATE	1,600,000	N		62	J	NS	NS	22	J	NS
CARBAZOLE	32,000	C		78	U	NS	NS	83	U	NS
CHRYSENE	87,000	C		38	J	NS	NS	39	J	NS
DIBENZ[A,H]ANTHRACENE	87	C		78	UJ	NS	NS	83	UJ	NS
DIBENZOFURAN	16,000	N		78	U	NS	NS	83	U	NS
DIETHYLPHTHALATE	6,300,000	N		10	J	NS	NS	14	J	NS
DI-N-BUTYLPHTHALATE	780,000 ‡	N		38	JB	NS	NS	28	JB	NS
DI-N-OCTYLPHTHALATE	160,000 ‡	N		78	UJ	NS	NS	83	UJ	NS
FLUORANTHENE	310,000	N		78	J	NS	NS	110		NS
FLUORENE	310,000	N		78	U	NS	NS	83	U	NS
INDENO[1,2,3-CD]PYRENE	870	C		78	UJ	NS	NS	30	J	NS
NAPHTHALENE	160,000	N		78	U	NS	NS	83	U	NS
PHENANTHRENE	NA			44	J	NS	NS	48	J	NS
PYRENE	230,000	N		140	J	NS	NS	110		NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[11]											
SVOC Tentatively Identified Compounds (UG/KG)												
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA				*	NS		NS		390	NJ	NS
.ALPHA.-PINENE (CAS # 80-56-8)	NA				*	NS		NS			*	NS
.BETA.-PINENE (CAS# 127-91-3)	NA				*	NS		NS			*	NS
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA				*	NS		NS			*	NS
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA				*	NS		NS			*	NS
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA				*	NS		NS			*	NS
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA				*	NS		NS			*	NS
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA				*	NS		NS			*	NS
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N			*	NS		NS		270	NJ	NS
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA				*	NS		NS			*	NS
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA				*	NS		NS			*	NS
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA			400	NJ	NS		NS		460	NJ	NS
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			120	NJ	NS		NS		320	NJ	NS
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA				*	NS		NS			*	NS
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA				*	NS		NS		140	NJ	NS
BENZO(E)PYRENE (CAS# 192-97-2)	NA				*	NS		NS			*	NS
BORNYL ACETATE (CAS# 76-49-3)	NA				*	NS		NS			*	NS
CARYOPHYLLENE (CAS# 87-44-5)	NA				*	NS		NS		130	NJ	NS
CHOLESTEROL (CAS # 57-88-5)	NA				*	NS		NS			*	NS
COPAENE (CAS# 3856-25-5)	NA				*	NS		NS			*	NS
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)	NA				*	NS		NS			*	NS
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)	NA				*	NS		NS			*	NS
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N			*	NS		NS			*	NS
HEXADECANOIC ACID (CAS# 57-10-3)	NA			240	NJ	NS		NS		320	NJ	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")	
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"	
SAMPLING DATE:	(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[11]												
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4 METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)	NA				*	NS		NS			*	NS	
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)	NA				*	NS		NS			*	NS	
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)	NA				*	NS		NS			*	NS	
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)	NA				*	NS		NS			*	NS	
NONACOSANE (CAS# 630-03-5)	NA				*	NS		NS			*	NS	
OLEIC ACID (CAS# 112-80-1)	NA				*	NS		NS		350	NJ	NS	
PENTADECANOIC ACID (CAS# 1002-84-2)	NA			120	NJ	NS		NS			*	NS	
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)	NA				*	NS		NS			*	NS	
PYRENE, 2-METHYL- (CAS# 3442-78-2)	NA				*	NS		NS			*	NS	
SEPTUM BLEED	NA				*	NS		NS			*	NS	
ICP Inorganic Analyses - SW6010B (MG/KG)													
ALUMINUM	7,800	N	**25,798**	5970		1890		7670		7450		1850	
ANTIMONY	**3.1**	N	0.92	1.2	L	2.6	UL	1.1	UL	1	UL	1.1	UL
ARSENIC	0.43	C	**12.64**	122	J	1.3	UJ	161	J	109	J	50.3	J
BARIUM	**550**	N	298.28	61.5		88.2		45.6		60.5		19.1	
BERYLLIUM	**16**	N	2.35	0.57	U	1.3	U	0.53	U	0.61		0.53	U
CALCIUM	NA		**4,207**	1830		8660		1470		6050		3070	
CHROMIUM	**12,000** [‡]	N	97.20	25.5	K	5.2	K	26.6	K	20.5	K	17.7	K
COBALT	**160**	N	22.26	6.4		2.7		8.5		7.5		5.2	
COPPER	**310**	N	47.76	16.3		6.8		16.9		15.5		6.5	
IRON	2,300	N	**31,951**	23500		4180		33600		23300		7380	
LEAD	**400** [‡]		329.76	35.2	K	4.6	K	21.2	K	24	K	7.8	K
MAGNESIUM	NA		**7,093**	1350		998		1020		1850		3590	
MANGANESE	160	N	**1,251**	263	J	312	J	180	J	456	J	161	J
MERCURY (by CVAA)	NA		**0.29**	0.12		0.12	U	0.1		0.16		0.05	U
NICKEL	**160**	N	40.12	16.7		4.5		9		9.9		66	
PHOSPHORUS	NA		NA	311		214		319		240		112	
POTASSIUM	NA		**4,945**	631		687		709		766		224	
SELENIUM	**39**	N	0.88	0.57	U	1.3	U	0.87		0.5	U	0.53	U
SILICON	NA		NA	1700		1040		1130		2440		665	
SODIUM	NA		**55.80**	56.5	U	138		52.7	U	68.7		146	
STRONTIUM	**4,700**	N	NA	11.7		34.8		8.5		17.7		4.6	
SULFUR	NA		NA	139		286		114		157		84	
THALLIUM	0.55	N	**1.36**	1.1	UJ	2.6	UJ	1.1	UJ	1	UJ	1.1	UJ
TIN	**4,700**	N	NA	2.5		5.2	U	2.4		2		2.1	U
TITANIUM	**31,000**	N	NA	144		74.9		149		200		43.5	
VANADIUM	55	N	**66.76**	28.3		6.3		35.8		28.8		7.9	
ZINC	**2,300**	N	308.8	50.2		18.2		80.2		60.1		40.9	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")	CDC-(140,160)	CDC-(140,160)(0-1")	CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid	Mulch	High As Grid	High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"	0-1"	0-1"	0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[\2]	2/21/2001	2/21/2001	2/21/2001	2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[\1]								
IC Scan - EPA 300M (MG/KG)									
CHLORIDE	NA			NS	NS	NS	7.37		NS
FLUORIDE	NA			NS	NS	NS	6.47	L	NS
NITRATE-N	13,000	N		NS	NS	NS	1.16	U	NS
PHOSPHATE-P	NA			NS	NS	NS		R	NS
SULFATE	NA			NS	NS	NS	16	K	NS
Mustard Breakdown Products (UG/KG)									
THIODIGLYCOL	39,100	\3,N		NS	NS	NS	1069	U	NS
Other Parameters (MG/KG)									
AMMONIA-N	NA			NS	NS	NS	1.19	U	NS
CYANIDE	160 ‡	N		NS	NS	NS	0.57	U	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. This value was calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[11]											
Volatile Organic Compounds - SW8260B (UG/KG)												
1,4-DICHLOROBENZENE	27,000	C			R	1	UJ		R		R	NS
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)	4,700,000	N		58	J	12		43	J	21	J	NS
2-HEXANONE	310,000	N		4	J	1	U	2	J	2	J	NS
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		2		1	U	2	U	1	UJ	NS
ACETONE	780,000	N		360	J	78	J	200	J	100	J	NS
ACETONITRILE	NA			9		6	U	8	U	7	J	NS
ACROLEIN	160,000	N		13		6	U	12		7	UJ	NS
BENZENE	12,000	C		2	U	1	U	2	U	2	J	NS
CARBON DISULFIDE	780,000	N		14		7		31		15	J	NS
CHLOROFORM	78,000	N		2	U	1	U	2	U	1	UJ	NS
CHLOROMETHANE	NA			23		7		11		18	J	NS
ISOPROPYLBENZENE (CUMENE)	780,000	N			R	1	UJ	2	J		R	NS
METHYL ACETATE	7,800,000	N		190	J	29	J	70	J	32	J	NS
METHYLCYCLOHEXANE	470,000 ‡	N		3	J	1	U	3	J	1	UJ	NS
METHYLENE CHLORIDE	85,000	C		2	U	1	U	2		1	UJ	NS
TETRACHLOROETHENE	32,000	C		2	UJ	1	U	2	J		R	NS
TOLUENE	1,600,000	N		12	J	1	J	5	J	9	J	NS
VOC Tentatively Identified Compounds (UG/KG)												
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)	NA				*		*		*		*	NS
2,4-HEXANEDIONE (CAS# 3002-24-2)	NA				*		*		*		*	NS
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)	NA			50	NJ	9	NJ	40	NJ	30	NJ	NS
2-DECENE, 4-METHYL-,(Z)-	NA				*	7	NJ		*		*	NS
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)	NA				*		*		*		*	NS
2-OCTENE, (E)- ISOMER	NA			20	NJ		*		*	40	NJ	NS
2-OCTENE, (E)- ISOMER	NA				*		*		*		*	NS
2-OCTENE, (Z)- ISOMER	NA				*	6	NJ	20	NJ		*	NS
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)	NA				*		*		*		*	NS
2-PROPANOL (CAS# 67-63-0)	NA				*		*		*		*	NS
3-OCTENE, (E)-	NA				*		*		*		*	NS
ACETALDEHYDE (CAS# 75-07-0)	NA			50	NJ	10	NJ	40	NJ	20	NJ	NS
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)	7,000,000	N			*		*		*		*	NS
BENZALDEHYDE (CAS# 100-52-7)	780,000	N		20	NJ		*		*		*	NS
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N			*		*		*		*	NS
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-	NA				*		*		*		*	NS
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL	NA				*		*		*		*	NS
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-	NA				*		*		*		*	NS
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-	NA				*		*		*		*	NS
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL	NA				*		*		*		*	NS
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-	NA				*		*		*		*	NS
BICYCLO 3.1.1 HEPT-2-ENE,2,	NA				*		*		*		*	NS
BICYCLO 3.1.1 HEPTANE, 6,6-D	NA				*		*		*		*	NS
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-	NA				*		*		*		*	NS
BUTANAL (CAS# 123-72-8)	NA				*	8	NJ	20	NJ		*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"	
SAMPLING DATE:	(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[11]												
BUTANAL, 3-METHYL-	NA				*		*		*		*	NS	
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)	NA				*		*		*	40	NJ	NS	
CYCLOBUTANOL (CAS# 2919-23-5)	NA				*		*		*		*	NS	
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA			30	NJ		*		*		*	NS	
DECANAL (CAS# 112-31-2)	NA				*		*		*		*	NS	
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA				*		*		*		*	NS	
HEPTANAL (CAS# 111-71-7)	NA				*		*		*		*	NS	
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA				*		*		*		*	NS	
HEXANAL (CAS# 66-25-1)	NA			300	NJ	100	NJ	400	NJ	400	NJ	NS	
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA				*		*		*		*	NS	
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA				*		*	20	NJ	10	NJ	NS	
OCTANAL (CAS# 124-13-0)	NA			30	NJ	7	NJ	20	NJ		*	NS	
OCTANE (CAS# 111-65-9)	NA				*		*		*		*	NS	
PENTANAL ISOMER	NA			20	NJ	40	NJ	100	NJ	80	NJ	NS	
PENTANAL ISOMER	NA			60	NJ	7	NJ	20	NJ	20	NJ	NS	
PENTANAL, 2-METHYL- (CAS# 123-15-9)	NA				*		*		*	10	NJ	NS	
PENTANE (CAS# 109-66-0)	NA			100	NJ	30	NJ	60	NJ	100	NJ	NS	
PROPANE, 2-METHYL- (CAS# 72-28-5)	NA				*		*		*		*	NS	
UNDECANE (CAS# 1120-21-4)	NA				*		*		*		*	NS	
Semivolatile Organic Compounds - SW8270C (UG/KG)													
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		120	U	86	U	93	U	95	U	NS	
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		120	U	86	U	93	U	95	U	NS	
4-METHYLPHENOL	39,000	N		120	U	86	U	93	U	95	U	NS	
4-NITROPHENOL	63,000	N		120	U	86	U	93	U	95	U	NS	
ACENAPHTHENE	470,000	N		120	U	20	J	93	U	20	J	NS	
ACENAPHTHYLENE	470,000 ‡	N		120	U	86	U	93	U	95	U	NS	
ANTHRACENE	2,300,000	N		18	J	59	J	22	J	33	J	NS	
BENZO[A]ANTHRACENE	870	C		77	J	320	J	140	J	140	J	NS	
BENZO[A]PYRENE	87	C		120	UJ	240	J	110	J	82	J	NS	
BENZO[B]FLUORANTHENE	870	C		92	J	400	J	170	J	200	J	NS	
BENZO[G,H,I]PERYLENE	NA			120	UJ	67	J		R		R	NS	
BENZO[K]FLUORANTHENE	8,700	C		33	J	220	J	100	J		R	NS	
BENZOIC ACID	31,000,000	N		41	J	35	J	25	J	38	J	NS	
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		360	J	190	J	300	J	130	J	NS	
BUTYLBENZYLPHTHALATE	1,600,000	N		44	J	86	UJ	51	J	46	J	NS	
CARBAZOLE	32,000	C		120	U	22	J	93	U	95	U	NS	
CHRYSENE	87,000	C		52	J	210	J	110	J	100	J	NS	
DIBENZ[A,H]ANTHRACENE	87	C		120	UJ	86	UJ		R		R	NS	
DIBENZOFURAN	16,000	N		120	U	86	U	93	U	95	U	NS	
DIETHYLPHTHALATE	6,300,000	N		24	J	21	J	13	J	16	J	NS	
DI-N-BUTYLPHTHALATE	780,000 ‡	N		48	JB	32	JB	93	U	40	JB	NS	
DI-N-OCTYLPHTHALATE	160,000 ‡	N		120	UJ	86	UJ		R		R	NS	
FLUORANTHENE	310,000	N		120	J	470		190		180		NS	
FLUORENE	310,000	N		120	U	15	J	93	U	95	U	NS	
INDENO[1,2,3-CD]PYRENE	870	C		120	UJ	91	J		R		R	NS	
NAPHTHALENE	160,000	N		120	U	12	J	93	U	95	U	NS	
PHENANTHRENE	NA			82	J	260		100		160		NS	
PYRENE	230,000	N		230	J	910	J	390	J	430	J	NS	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
SVOC Tentatively Identified Compounds (UG/KG)													
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA			560	NJ		*	160	NJ	760	NJ	NS	
.ALPHA.-PINENE (CAS # 80-56-8)	NA				*		*		*		*	NS	
.BETA.-PINENE (CAS# 127-91-3)	NA				*		*	140	NJ		*	NS	
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA				*		*		*		*	NS	
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA				*		*		*		*	NS	
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA				*		*		*		*	NS	
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA				*		*		*		*	NS	
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA				*		*		*		*	NS	
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N		410	JNB		*		*		*	NS	
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA				*		*		*		*	NS	
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA				*		*		*		*	NS	
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA			1500	NJ				*		*	NS	
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			1100	NJ	480	NJ		*		*	NS	
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA				*		*		*		*	NS	
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA				*		*		*		*	NS	
BENZO(E)PYRENE (CAS# 192-97-2)	NA				*		*		*		*	NS	
BORNYL ACETATE (CAS# 76-49-3)	NA				*		*		*	190	NJ	NS	
CARYOPHYLLENE (CAS# 87-44-5)	NA			200	NJ		*		*	260	NJ	NS	
CHOLESTEROL (CAS # 57-88-5)	NA				*		*		*		*	NS	
COPAENE (CAS# 3856-25-5)	NA				*		*		*		*	NS	
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)	NA				*		*		*		*	NS	
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)	NA				*		*		*		*	NS	
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N			*		*		*		*	NS	
HEXADECANOIC ACID (CAS# 57-10-3)	NA			250	NJ	380	NJ	270	NJ	190	NJ	NS	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)	
TYPE or LOCATION:	**Residential**		**Metals**	**High As Grid**		**High As Grid**		**High As Grid**		**High As Grid**		**Mulch**	
SAMPLE DEPTH:	**RBC**		**Back-**	**0-6"**		**0-6"**		**0-6"**		**0-6"**		**0-1"**	
SAMPLING DATE:	**(adjusted**		**ground**[12]	**2/21/2001**		**2/21/2001**		**2/21/2001**		**2/21/2001**		**2/21/2001**	
Analyses performed by Southwest Research Institute	**downward)**[11]												
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)	NA				*		*		*		*	NS	
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)	NA				*		*		*		*	NS	
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)	NA				*		*		*		*	NS	
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)	NA				*		*		*		*	NS	
NONACOSANE (CAS# 630-03-5)	NA				*		*		*		*	NS	
OLEIC ACID (CAS# 112-80-1)	NA			1500	NJ		*	110	NJ		*	NS	
PENTADECANOIC ACID (CAS# 1002-84-2)	NA				*		*		*		*	NS	
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)	NA				*		*		*		*	NS	
PYRENE, 2-METHYL- (CAS# 3442-78-2)	NA				*		*		*		*	NS	
SEPTUM BLEED	NA				*		*		*		*	NS	
ICP Inorganic Analyses - SW6010B (MG/KG)													
ALUMINUM	7,800	N	**25,798**	2970		7420		7740		5560		2220	
ANTIMONY	**3.1**	N	0.92	1.5	UL	0.98	UL	1.3	UL	2.1	L	2.1	UL
ARSENIC	0.43	C	**12.64**	91.1	J	173	J	145	J	399	J	5.6	J
BARIUM	**550**	N	298.28	49.6		58.9		76.9		64.9		97	
BERYLLIUM	**16**	N	2.35	0.73	U	0.59		0.65	U	0.62	U	1	U
CALCIUM	NA		**4,207**	2930		2450		3170		3390		8440	
CHROMIUM	**12,000** ‡	N	97.20	20.4	K	32.8	K	25.3	K	19.2	K	7.7	K
COBALT	**160**	N	22.26	4.9		8		8		6.6		3.1	
COPPER	**310**	N	47.76	11.1		20.2		17.7		22.5		7.9	
IRON	2,300	N	**31,951**	11300		27400		22200		20200		4920	
LEAD	**400** ‡		329.76	16.4	K	28.2	K	43.4	K	37.4	K	6.1	K
MAGNESIUM	NA		**7,093**	2750		1630		1520		1600		1050	
MANGANESE	160	N	**1,251**	205	J	271	J	435	J	270	J	338	J
MERCURY (by CVAA)	NA		**0.29**	0.15		0.23		0.17		0.2		0.1	U
NICKEL	**160**	N	40.12	61.2		14.8		14.9		12.1		9.6	
PHOSPHORUS	NA		NA	273		391		466		384		252	
POTASSIUM	NA		**4,945**	418		1180		647		942		944	
SELENIUM	**39**	N	0.88	0.73	U	0.58		0.65	U	0.62	U	1	U
SILICON	NA		NA	967		1930		1820		1600		1060	
SODIUM	NA		**55.80**	73.5	U	49.1	U	64.7	U	61.8	U	190	
STRONTIUM	**4,700**	N	NA	13		11.2		15.6		15.6		35.6	
SULFUR	NA		NA	235		163		332		257		310	
THALLIUM	0.55	N	**1.36**	1.5	UJ	0.98	UJ	1.3	UJ	1.2	UJ	2.1	UJ
TIN	**4,700**	N	NA	2.9	U	2.6		4.1		2.9		4.2	U
TITANIUM	**31,000**	N	NA	95.9		169		185		204		84.1	
VANADIUM	55	N	**66.76**	13.6		34.9		35.8		27.8		7.6	
ZINC	**2,300**	N	308.8	49.6		85.7		70.5		73.3		23	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")	CDC-(160,140)(0-6")	CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid	High As Grid	Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"	0-6"	0-1"
SAMPLING DATE:	(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001	2/21/2001	2/21/2001
Analyses performed by Southwest Research Institute	downward)[\1]									
IC Scan - EPA 300M (MG/KG)										
CHLORIDE	NA			4.48		NS		NS	NS	NS
FLUORIDE	NA			2.81	L	NS		NS	NS	NS
NITRATE-N	13,000	N		1.59	U	NS		NS	NS	NS
PHOSPHATE-P	NA				R	NS		NS	NS	NS
SULFATE	NA			6.9	K	NS		NS	NS	NS
Mustard Breakdown Products (UG/KG)										
THIODIGLYCOL	39,100	\3,N		732	J	NS		NS	NS	NS
Other Parameters (MG/KG)										
AMMONIA-N	NA			1.54	U	NS		NS	NS	NS
CYANIDE	160 ‡	N		0.5	U	NS		NS	NS	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. This value was calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
Volatile Organic Compounds - SW8260B (UG/KG)																
1,4-DICHLOROBENZENE		27,000	C		NS			R		R		R		R		R
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		NS		20	J	14		8		42	J	17	
2-HEXANONE		310,000	N		NS			R		R		R	4	J		R
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)		630,000	N		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
ACETONE		780,000	N		NS		120	J	69	J	55	J	330	J	80	J
ACETONITRILE		NA			NS		10	J	7	U	5.4	U	33	J	6.1	U
ACROLEIN		160,000	N		NS		12		7	U	5.4	U	8.7	UJ	6.1	UJ
BENZENE		12,000	C		NS		2	J	3		1.1	UJ	1.7	UJ	1.2	UJ
CARBON DISULFIDE		780,000	N		NS		12	J	10		9		32	J	10	
CHLOROFORM		78,000	N		NS		1	UJ	1	UJ	1.1	U	2	J	1.2	U
CHLOROMETHANE		NA			NS		14	J	10		11		16	J	9	
ISOPROPYLBENZENE (CUMENE)		780,000	N		NS		2	J		R		R	2	J		R
METHYL ACETATE		7,800,000	N		NS		24	J	25		26		83	J	35	J
METHYLCYCLOHEXANE		470,000 ‡	N		NS			R		R		R	1.7	UJ	1.2	UJ
METHYLENE CHLORIDE		85,000	C		NS		1	UJ	1	U	1.1	U	1.7	UJ	1.2	U
TETRACHLOROETHENE		32,000	C		NS			R		R		R		R		R
TOLUENE		1,600,000	N		NS		12	J	8	J	1.1	U	36	J	2	J
VOC Tentatively Identified Compounds (UG/KG)																
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)		NA			NS			*		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA			NS			*		*		*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA			NS		20	NJ	10	NJ	10	NJ		*	20	NJ
2-DECENE, 4-METHYL-,(Z)-		NA			NS			*		*		*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA			NS			*		*		*		*		*
2-OCTENE, (E)- ISOMER		NA			NS		30	NJ	20	NJ	40	NJ		*	20	NJ
2-OCTENE, (E)- ISOMER		NA			NS		30	NJ		*		*		*		*
2-OCTENE, (Z)- ISOMER		NA			NS			*		*		*		*		*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)		NA			NS			*		*		*		*		*
2-PROPANOL (CAS# 67-63-0)		NA			NS			*		*		*		*		*
3-OCTENE, (E)-		NA			NS			*		*		*		*		*
ACETALDEHYDE (CAS# 75-07-0)		NA			NS			*		*		*		*		*
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)		7,000,000	N		NS			*		*		*		*		*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N		NS			*		*		*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N		NS			*		*		*		*		*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-		NA			NS			*		*		*	400	NJ		*
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL		NA			NS			*		*		*	3000	NJ		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-		NA			NS			*		*		*	3000	NJ		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-		NA			NS			*		*		*	600	NJ		*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL		NA			NS			*		*		*		*		*
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-		NA			NS		30	NJ		*		*	5000	NJ		*
BICYCLO 3.1.1 HEPT-2-ENE,2,		NA			NS			*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-D		NA			NS			*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-		NA			NS			*		*		*	400	NJ		*
BUTANAL (CAS# 123-72-8)		NA			NS			*		*		*		*	10	NJ

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
BUTANAL, 3-METHYL-		NA			NS			*		*		*		*		*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)		NA			NS		40	NJ	50	NJ		*		*		*
CYCLOBUTANOL (CAS# 2919-23-5)		NA			NS			*	9	NJ		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)		NA			NS			*	30	NJ	10	NJ		*		*
DECANAL (CAS# 112-31-2)		NA			NS			*		*		*		*		*
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)		NA			NS			*		*		*		*		*
HEPTANAL (CAS# 111-71-7)		NA			NS			*		*		*		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)		NA			NS			*		*	7	NJ		*		*
HEXANAL (CAS# 66-25-1)		NA			NS		500	NJ	300	NJ	300	NJ	1000	NJ	500	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)		NA			NS			*		*		*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)		NA			NS		20	NJ	10	NJ	10	NJ		*	20	NJ
OCTANAL (CAS# 124-13-0)		NA			NS			*		*		*		*	10	NJ
OCTANE (CAS# 111-65-9)		NA			NS			*		*	9	NJ		*		*
PENTANAL ISOMER		NA			NS		100	NJ	40	NJ		*		*		*
PENTANAL ISOMER		NA			NS		20	NJ	8	NJ	30	NJ	400	NJ	60	NJ
PENTANAL, 2-METHYL- (CAS# 123-15-9)		NA			NS			*				*		*		*
PENTANE (CAS# 109-66-0)		NA			NS		100	NJ	80	NJ	10	NJ	600	NJ	30	NJ
PROPANE, 2-METHYL- (CAS# 72-28-5)		NA			NS			*		*		*		*		*
UNDECANE (CAS# 1120-21-4)		NA			NS			*		*		*	500	NJ		*
Semivolatile Organic Compounds - SW8270C (UG/KG)																
2-CHLORONAPHTHALENE (CAS# 91587)		630,000 ‡	N		NS		91	U	93	U	80	U	160	U	85	U
2-METHYLNAPHTHALENE (CAS# 91576)		160,000	N		NS		91	U	93	U	32	J	160	U	17	J
4-METHYLPHENOL		39,000	N		NS		91	U	93	U	80	U	160	U	85	U
4-NITROPHENOL		63,000	N		NS		91	U	93	U	80	U	160	U	85	U
ACENAPHTHENE		470,000	N		NS		91	U	93	U	80	U	160	U	23	J
ACENAPHTHYLENE		470,000 ‡	N		NS		91	U	93	U	25	J	160	U	13	J
ANTHRACENE		2,300,000	N		NS		91	U	59	J	17	J	160	U	39	J
BENZO[A]ANTHRACENE		870	C		NS		80	J	450	J	190		100	J	200	
BENZO[A]PYRENE		87	C		NS		34	J	370	J	120		65	J	180	J
BENZO[B]FLUORANTHENE		870	C		NS		92	J	620	J	250		74	J	240	J
BENZO[G,H,I]PERYLENE		NA			NS		91	UJ	63	J	62	J	160	U	37	J
BENZO[K]FLUORANTHENE		8,700	C		NS		28	J	290	J	110		79	J	220	J
BENZOIC ACID		31,000,000	N		NS		28	J	15	J	240	U	130	J	180	J
BIS(2-ETHYLHEXYL)PHTHALATE		46,000	C		NS		120		120	J	83		280	B	68	JB
BUTYLBENZYLPHTHALATE		1,600,000	N		NS		27	J	93	UJ	80	U	190		11	J
CARBAZOLE		32,000	C		NS		91	U	93	U	15	J	160	U	19	J
CHRYSENE		87,000	C		NS		38	J	300	J	120		64	J	140	
DIBENZ[A,H]ANTHRACENE		87	C		NS		91	UJ		R	80	U	160	U		R
DIBENZOFURAN		16,000	N		NS		91	U	93	U	80	U	160	U	14	J
DIETHYLPHTHALATE		6,300,000	N		NS		19	J	16	J	13	J	160	U	85	U
DI-N-BUTYLPHTHALATE		780,000 ‡	N		NS		32	JB	37	JB	16	JB	39	JB	22	JB
DI-N-OCTYLPHTHALATE		160,000 ‡	N		NS		91	UJ		R	80	U	160	U		R
FLUORANTHENE		310,000	N		NS		120		550		280		120	J	260	
FLUORENE		310,000	N		NS		91	U	93	U	80	U	160	U	85	U
INDENO[1,2,3-CD]PYRENE		870	C		NS		91	UJ	96	J	80		160	U	57	J
NAPHTHALENE		160,000	N		NS		91	U	93	U	22	J	160	U	22	J
PHENANTHRENE		NA			NS		67	J	280		160		93	J	210	
PYRENE		230,000	N		NS		160		1200	J	380		270		610	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
SVOC Tentatively Identified Compounds (UG/KG)																
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)		NA			NS		360	NJ		*		*	700	NJ	230	NJ
.ALPHA.-PINENE (CAS # 80-56-8)		NA			NS			*		*		*	2500	NJ	840	NJ
.BETA.-PINENE (CAS# 127-91-3)		NA			NS			*		*		*	5100	NJ	2100	NJ
.GAMMA.-SITOSTEROL (CAS# 83-47-6)		NA			NS			*		*		*		*		*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)		NA			NS			*		*		*		*	280	NJ
11H-BENZO[B]FLUORENE (CAS# 243-17-4)		NA			NS			*		*		*		*		*
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)		NA			NS		130	NJ		*		*		*		*
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)		NA			NS			*		*		*		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)		39,000	N		NS			*		*		*		*		*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)		NA			NS			*		*		*		*		*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)		NA			NS			*		*		*		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)		NA			NS			*		*		*		*		*
9-HEXADECENOIC ACID (CAS# 002091-29-4)		NA			NS			*		*		*	320	NJ		*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)		NA			NS			*		*		*		*		*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)		NA			NS			*		*		*		*		*
BENZO(E)PYRENE (CAS# 192-97-2)		NA			NS			*		*		*		*		*
BORNYL ACETATE (CAS# 76-49-3)		NA			NS			*		*		*		*		*
CARYOPHYLLENE (CAS# 87-44-5)		NA			NS		280	NJ		*		*	1800	NJ	520	NJ
CHOLESTEROL (CAS # 57-88-5)		NA			NS			*		*		*		*		*
COPAENE (CAS# 3856-25-5)		NA			NS		200	NJ		*		*		*		*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)		NA			NS			*		*		*		*		*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)		NA			NS		3100	NJ		*		*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)		16,000,000	N		NS			*		*		*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)		NA			NS		1100	NJ		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4-METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)		NA			NS		500	NJ		*		*		*		*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)		NA			NS		270	NJ		*		*		*		*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)		NA			NS		190	NJ		*		*		*		*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)		NA			NS		450	NJ		*		*		*		*
NONACOSANE (CAS# 630-03-5)		NA			NS			*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			NS		18000	NJ		*		*		*		*
PENTADECANOIC ACID (CAS# 1002-84-2)		NA			NS			*		*		*		*		*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)		NA			NS			*		*		*		*		*
PYRENE, 2-METHYL- (CAS# 3442-78-2)		NA			NS			*		*		*		*		*
SEPTUM BLEED		NA			NS			*		*	710	NJ		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)																
ALUMINUM		7,800	N	**25,798**	5640		6730		5710		6580		5370		9360	
ANTIMONY		**3.1**	N	0.92	1.3	UL	1.2	L	1.3	UL	1	UL	1.1	UL	1.2	UL
ARSENIC		0.43	C	**12.64**	147	J	240	J	159	J	5	J	55.2	J	7.3	J
BARIUM		**550**	N	298.28	54		62.5		50.9		38.8	J	112	J	44.8	J
BERYLLIUM		**16**	N	2.35	0.63	U	0.55	U	0.64	U	0.5	UJ	0.57	UJ	0.6	UJ
CALCIUM		NA		**4,207**	2610		3650		2140		805		6980		1510	
CHROMIUM		**12,000** ‡	N	97.20	18.9	K	28.5	K	19.1	K	19.3		29.8		31.6	
COBALT		**160**	N	22.26	6		7		5.9		4.1	K	7.4	L	5.2	L
COPPER		**310**	N	47.76	17.5		24.7		18.7		28.5		17.1		15.1	
IRON		2,300	N	**31,951**	19100		27300		18600		28600	J	14500	J	23400	J
LEAD		**400** ‡		329.76	30.7	K	31.2	K	36.7	K	41.6	K	46.7	J	47.2	J
MAGNESIUM		NA		**7,093**	1390		1540		1480		665		3290		1120	
MANGANESE		160	N	**1,251**	266	J	246	J	202	J	136	J	482	J	204	J
MERCURY (by CVAA)		NA		**0.29**	0.21		0.17		0.22		0.12		0.14		0.19	
NICKEL		**160**	N	40.12	9.7		11.4		10.2		8.1		47.9		10.5	
PHOSPHORUS		NA		NA	320		380		323		260		414		434	
POTASSIUM		NA		**4,945**	814		886		897		371		809		785	
SELENIUM		**39**	N	0.88	0.63	U	0.55	U	0.64	U	0.98		1.4		1.2	
SILICON		NA		NA	1650		1790		1700		1700		1630		2290	
SODIUM		NA		**55.80**	63	U	55.3	U	63.6	U	49.9	U	57.2	U	59.7	U
STRONTIUM		**4,700**	N	NA	12.4		15.5		10.1		5.9		31.9		7.6	
SULFUR		NA		NA	197		217		179		214	L	420	L	345	L
THALLIUM		0.55	N	**1.36**	1.3	UJ	1.1	UJ	1.3	UJ	1	U	1.1	U	1.2	U
TIN		**4,700**	N	NA	2.8		2.9		3.6		4.2		3.2		4.1	
TITANIUM		**31,000**	N	NA	190		193		203		173		136		244	
VANADIUM		55	N	**66.76**	25.8		30.3		28.5		34.5		28.8		52.9	
ZINC		**2,300**	N	308.8	59.8		60.6		71.1		41		76.6		48	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid
SAMPLE DEPTH:	RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"
SAMPLING DATE:	(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001
Analyses performed by Southwest Research Institute	downward)\1													
IC Scan - EPA 300M (MG/KG)														
CHLORIDE	NA			NS		8.64		5.48		2.59		30.6		NS
FLUORIDE	NA			NS		6.95	L	7.13	L	1.94	L	7.74	L	NS
NITRATE-N	13,000	N		NS		1.37	U	1.44	U	18.9		4.82		NS
PHOSPHATE-P	NA			NS			R		R		R	5.34	L	NS
SULFATE	NA			NS		6.96	K	7.68	K	14.4	K	36.8	K	NS
Mustard Breakdown Products (UG/KG)														
THIODIGLYCOL	39,100	\3,N		NS		313	J	445	J	235	J	463	J	NS
Other Parameters (MG/KG)														
AMMONIA-N	NA			NS		1.33	U	1.37	U	1.23	U	1.17	U	NS
CYANIDE	160 ‡	N		NS		0.66	U	0.72	U	0.58	U	0.58	U	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. This value was calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[11]												
Volatile Organic Compounds - SW8260B (UG/KG)														
1,4-DICHLOROBENZENE		27,000	C			R		R		R		R		R
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		21		15		9		12		6	
2-HEXANONE		310,000	N			R		R		R		R	1.2	UJ
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)		630,000	N		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
ACETONE		780,000	N		110	J	64	J	56	J	62	J	38	J
ACETONITRILE		NA			8		5.9	U	4.1	U	5.1	U	6	U
ACROLEIN		160,000	N		6	U	7		4.1	U	5.1	U	6	U
BENZENE		12,000	C		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
CARBON DISULFIDE		780,000	N		22		11		11		17		9	
CHLOROFORM		78,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
CHLOROMETHANE		NA			9		7		6		6		4	
ISOPROPYLBENZENE (CUMENE)		780,000	N			R		R		R		R		R
METHYL ACETATE		7,800,000	N		30		27		16		7		7	
METHYLCYCLOHEXANE		470,000 ‡	N		1.2	U	1.2	UJ	0.82	UJ	1	U	1.2	U
METHYLENE CHLORIDE		85,000	C		1.2	U	1.2	U	0.82	U	1	U	1.2	U
TETRACHLOROETHENE		32,000	C		1.2	U		R		R		R	1.2	UJ
TOLUENE		1,600,000	N		11		2	J	9	J	3	J	10	J
VOC Tentatively Identified Compounds (UG/KG)														
1,6-OCTADIENE, 7-METHYL-3-ME (CAS# 123-35-3)		NA				*		*		*		*		*
2,4-HEXANEDIONE (CAS# 3002-24-2)		NA				*		*		*		*		*
2-BUTANONE, 3-METHYL- (CAS# 563-80-4)		NA			30	NJ	10	NJ	9	NJ	7	NJ		*
2-DECENE, 4-METHYL-,(Z)-		NA				*		*		*		*		*
2-HEPTANONE, 6-METHYL- (CAS# 928-68-7)		NA				*		*		*		*	10	NJ
2-OCTENE, (E)- ISOMER		NA			20	NJ		*	10	NJ		*		*
2-OCTENE, (E)- ISOMER		NA				*		*	20	NJ		*		*
2-OCTENE, (Z)- ISOMER		NA				*		*		*		*		*
2-PROPANAMINE, 2-METHYL- (CAS# 75-64-9)		NA				*		*		*		*		*
2-PROPANOL (CAS# 67-63-0)		NA				*		*		*		*		*
3-OCTENE, (E)-		NA				*		*		*	7	NJ		*
ACETALDEHYDE (CAS# 75-07-0)		NA			10	NJ	9	NJ	6	NJ		*		*
ACETIC ACID, ETHYL ESTER (CAS# 141-78-6)		7,000,000	N			*		*		*		*		*
BENZALDEHYDE (CAS# 100-52-7)		780,000	N			*		*		*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)		550,000	N			*		*		*		*		*
BENZENE, 1-METHYL-3-(1-METHYLETHYL)-		NA				*		*		*		*		*
BICYCLO 2.2.1 HEPT-2-ENE, 1,7,7-TRIMETHYL		NA				*		*		*		*		*
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-		NA				*		*		*		*	100	NJ
BICYCLO 2.2.1 HEPTANE, 2,2-DIMETHYL-3-METHYLENE-,(1R)-		NA				*		*		*		*		*
BICYCLO 3.1.0 HEX-2-ENE, 2-METHYL		NA				*		*		*		*	20	NJ
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL-		NA				*		*		*		*		*
BICYCLO 3.1.1 HEPT-2-ENE,2,		NA				*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-D		NA				*		*		*		*		*
BICYCLO 3.1.1 HEPTANE, 6,6-DIMETHYL-2-METHYLENE-		NA				*		*		*		*		*
BUTANAL (CAS# 123-72-8)		NA				*	10	NJ		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[12]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[11]												
BUTANAL, 3-METHYL-	NA				*		*		*		*		*
CARBON OXIDE SULFIDE (CARBONYL SULFIDE) (CAS# 463-58-1)	NA				*		*		*		*		*
CYCLOBUTANOL (CAS# 2919-23-5)	NA				*		*		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA			20	NJ	10	NJ		*		*	60	NJ
DECANAL (CAS# 112-31-2)	NA				*		*		*		*	10	NJ
ETHANONE, 1-(3-ETHYLOXIRANYL) (CAS# 17257-81-7)	NA				*		*		*		*		*
HEPTANAL (CAS# 111-71-7)	NA				*		*	7	NJ		*		*
HEPTANE, 3-METHYLENE- (CAS# 1632-16-2)	NA				*		*		*		*		*
HEXANAL (CAS# 66-25-1)	NA			400	NJ	500	NJ	200	NJ	200	NJ	100	NJ
HEXANAL, 2-ETHYL- (CAS# 123-05-7)	NA				*		*		*		*		*
HEXANAL, 5-METHYL- (CAS# 1860-39-5)	NA			20	NJ	20	NJ		*	9	NJ		*
OCTANAL (CAS# 124-13-0)	NA				*	10	NJ		*		*		*
OCTANE (CAS# 111-65-9)	NA				*		*		*		*		*
PENTANAL ISOMER	NA			60	NJ	70	NJ	6	NJ	8	NJ		*
PENTANAL ISOMER	NA			10	NJ	10	NJ	20	NJ	20	NJ	20	NJ
PENTANAL, 2-METHYL- (CAS# 123-15-9)	NA			10	NJ		*		*		*		*
PENTANE (CAS# 109-66-0)	NA			60	NJ	40	NJ	20	NJ	60	NJ	10	NJ
PROPANE, 2-METHYL- (CAS# 72-28-5)	NA				*		*		*	30	NJ		*
UNDECANE (CAS# 1120-21-4)	NA				*		*		*		*		*
Semivolatile Organic Compounds - SW8270C (UG/KG)													
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		17	J	86	U	68	U	80	U	79	U
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		84	U	86	U	68	U	80	U	79	U
4-METHYLPHENOL	39,000	N		84	U	86	U	190		80	U	79	U
4-NITROPHENOL	63,000	N		15	J	86	U	68	U	80	U	79	U
ACENAPHTHENE	470,000	N		21	J	86	U	68	U	80	U	79	U
ACENAPHTHYLENE	470,000 ‡	N		84	U	86	U	68	U	80	U	79	U
ANTHRACENE	2,300,000	N		39	J	86	U	14	J	80	U	79	U
BENZO[A]ANTHRACENE	870	C		220		15	J	74		80	U	41	J
BENZO[A]PYRENE	87	C		140	J		R	39	J		R	31	J
BENZO[B]FLUORANTHENE	870	C		250	J	12	J	82	J		R	32	J
BENZO[G,H,I]PERYLENE	NA				R		R		R		R		R
BENZO[K]FLUORANTHENE	8,700	C		140	J	14	J	65	J		R	47	J
BENZOIC ACID	31,000,000	N		64	J	32	J	39	J	25	J	38	J
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		210	B	60	JB	100	B	190	B	130	B
BUTYLBENZYLPHTHALATE	1,600,000	N		30	J	86	U	20	J	80	U	22	J
CARBAZOLE	32,000	C		84	U	86	U	12	J	80	U	79	U
CHRYSENE	87,000	C		130		16	J	48	J	80	U	46	J
DIBENZ[A,H]ANTHRACENE	87	C			R		R		R		R		R
DIBENZOFURAN	16,000	N		12	J	86	U	68	U	80	U	79	U
DIETHYLPHTHALATE	6,300,000	N		84	U	86	U	11	J	80	U	14	J
DI-N-BUTYLPHTHALATE	780,000 ‡	N		26	JB	57	JB	35	JB	22	JB	25	JB
DI-N-OCTYLPHTHALATE	160,000 ‡	N		23	J		R		R	80	U		R
FLUORANTHENE	310,000	N		270		29	J	110		80	U	55	J
FLUORENE	310,000	N		12	J	86	U	68	U	80	U	79	U
INDENO[1,2,3-CD]PYRENE	870	C			R		R		R		R		R
NAPHTHALENE	160,000	N		11	J	86	U	68	U	80	U	79	U
PHENANTHRENE	NA			220		18	J	110		80	U	34	J
PYRENE	230,000	N		630		59	J	220		20	J	120	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
SVOC Tentatively Identified Compounds (UG/KG)													
.ALPHA.-CARYOPHYLLENE (CAS# 6753-98-6)	NA			360	NJ		*		*	810	NJ		*
.ALPHA.-PINENE (CAS # 80-56-8)	NA				*		*		*		*		*
.BETA.-PINENE (CAS# 127-91-3)	NA				*		*		*		*		*
.GAMMA.-SITOSTEROL (CAS# 83-47-6)	NA				*		*		*		*		*
1,5,9-CYCLOTETRADECATRIENE, 1,5,9-TRIMETHYL-12-(1-METHYLENENYL)- (CAS# 38748-84-4)	NA				*		*		*		*		*
11H-BENZO[B]FLUORENE (CAS# 243-17-4)	NA				*		*		*		*		*
1H-CYCLOPROP(E)AZULENE, DECAHYDRO-1,1,7-TRIMETHYL-H-METHYLENE, [1AR-(1A.ALPHA., 4A.BETA., 7.ALPHA., 7A.BETA., 7B.ALPHA.)]- (CAS# 25246-27-9)	NA			430	NJ		*		*		*		*
1-PROPENE, 1,1,2-TRICHLORO- OR SIMILAR (CAS# 21400-25-9)	NA				*		*		*		*		*
1-PROPENE, 1,2,3-TRICHLORO- OR SIMILAR (CAS# 96-19-5)	39,000	N			*		*		*		*		*
1-PROPENE, 3,3,3-TRICHLORO- OR SIMILAR (CAS# 2233-00-3)	NA				*		*		*		*		*
2(3H)-BENZOFURANONE, 6-ETHENYLHEXAHYDRO-6-METHYL-3-METHYLENE-7-(1-METHYLETHENYL)-, [3AS-(3A.ALPHA., 6.ALPHA., 7.BETA., 7A.BETA.)]- (CAS# 28290-35-9)	NA				*		*	300	NJ		*		*
9,12-OCTADECADIENOIC ACID (Z,Z)- (CAS# 60-33-3)	NA				*		*		*		*		*
9-HEXADECENOIC ACID (CAS# 002091-29-4)	NA			250	NJ	140	NJ		*	190	NJ		*
AZULENE, 1,2,3,4,5,6,7,8-OCTAHYDRO-1,4-DIMETHYL-7- (1-METHYLETHENYL)- [1S- (1.ALPHA., 4.ALPHA., 7.ALPHA)]- (CAS# 3691-12-1)	NA			230	NJ		*		*		*		*
BENZENE, 1-BROMO-4-CHLORO- (CAS# 106-39-8)	NA				*		*		*		*		*
BENZO(E)PYRENE (CAS# 192-97-2)	NA				*		*		*		*		*
BORNYL ACETATE (CAS# 76-49-3)	NA				*		*		*		*		*
CARYOPHYLLENE (CAS# 87-44-5)	NA			270	NJ		*		*	310	NJ		*
CHOLESTEROL (CAS # 57-88-5)	NA				*		*		*		*		*
COPAENE (CAS# 3856-25-5)	NA				*		*		*		*		*
CYCLOHEXANE, 1-ETHENYL-1-METHYL-2,4-BIS(1-METHYLETHENYL)-, [1S- (1.ALPHA., 2.BETA., 4.BETA.)]- (CAS# 515-13-9)	NA				*		*	830	NJ		*		*
ESTRA-1,3,5,7,9-PENTAEN-17-ONE,3-METHOXY- (CAS# 3907-67-3)	NA				*		*		*		*		*
ETHANOL, 2-(2-ETHOXYETHOXY)- (CAS# 111-90-0)	16,000,000	N			*		*		*		*		*
HEXADECANOIC ACID (CAS# 57-10-3)	NA				*	420	NJ		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[11]												
NAPHTHALENE, 1,2,3,4,4A,5,6,8A-OCTAHYDRO-7-METHYL-4 METHYLENE-1- (1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 30021-74-0)		NA				*		*		*		*		*
NAPHTHALENE, 1,2,3,4-TETRAHYDRO-1,6-DIMETHYL-4- (1-METHYLETHYL)-, (1S-CIS)- (CAS# 483-77-2)		NA				*		*		*		*		*
NAPHTHALENE, 1,2,3,5,6,8A-HEXAHYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)- (1S-CIS)- (CAS# 483-76-1)		NA				*		*		*		*		*
NAPHTHALENE,1,2,4A,5,6,8A-HEXADYDRO-4,7-DIMETHYL-1-(1-METHYLETHYL)-, (1.ALPHA., 4A.ALPHA., 8A.ALPHA.)- (CAS# 31983-22-9)		NA			890	NJ		*		*		*		*
NONACOSANE (CAS# 630-03-5)		NA				*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA				*		*		*		*		*
PENTADECANOIC ACID (CAS# 1002-84-2)		NA			160	NJ		*		*		*		*
PHENANTHRENE, 3-METHYL- (CAS# 832-71-3)		NA				*		*		*		*		*
PYRENE, 2-METHYL- (CAS# 3442-78-2)		NA				*		*		*		*		*
SEPTUM BLEED		NA				*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	4870		12600		6070		2980		6110	
ANTIMONY		**3.1**	N	0.92	1.1	UL	1	UL	1	UL	1.1	UL	0.86	UL
ARSENIC		0.43	C	**12.64**	104	J	35.6	J	4.8	J	3.3	J	6.1	J
BARIUM		**550**	N	298.28	65.9	J	77.8	J	47.8	J	20.5	J	19.5	J
BERYLLIUM		**16**	N	2.35	0.56	UJ	0.68	J	0.5	UJ	0.57	UJ	0.9	J
CALCIUM		NA		**4,207**	4230		1700		715		8060		1030	
CHROMIUM		**12,000** ‡	N	97.20	37.6		32.4		27		91.4		52.8	
COBALT		**160**	N	22.26	8.5	L	7.6	L	4.3	L	18.5	L	2.5	L
COPPER		**310**	N	47.76	15		34.8		14.2		14		7.1	
IRON		2,300	N	**31,951**	15000	J	34000	J	26100	J	7530	J	23800	J
LEAD		**400** ‡		329.76	25.8	J	31.7	J	64.3	J	5.1	J	13.3	J
MAGNESIUM		NA		**7,093**	5910		2590		868		20500		1520	
MANGANESE		160	N	**1,251**	323	J	247	J	287	J	298	J	98.4	J
MERCURY (by CVAA)		NA		**0.29**	0.2		0.06		0.15		0.06	U	0.08	
NICKEL		**160**	N	40.12	75.4		11.7		6.7		345		7.3	
PHOSPHORUS		NA		NA	392		527		374		194		678	
POTASSIUM		NA		**4,945**	585		1990		450		172		3260	
SELENIUM		**39**	N	0.88	0.62		1.3		1.2		0.69		0.92	
SILICON		NA		NA	1880		2970		1430		1370		1660	
SODIUM		NA		**55.80**	55.7	U	52.1	U	50.1	U	56.6	U	43	U
STRONTIUM		**4,700**	N	NA	16.7		8.1		3.7		8.4		6.6	
SULFUR		NA		NA	327	L	410	L	273	L	256	L	149	L
THALLIUM		0.55	N	**1.36**	1.1	U	1	U	1	U	1.1	U	0.86	U
TIN		**4,700**	N	NA	3.2		2.9		3.6		2.3	U	1.9	
TITANIUM		**31,000**	N	NA	116		340		139		50.4		110	
VANADIUM		55	N	**66.76**	18.8		69.1		30.1		8		46.1	
ZINC		**2,300**	N	308.8	72.8		65		38.7		18.3		46.6	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground\2	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)\1												
IC Scan - EPA 300M (MG/KG)													
CHLORIDE	NA			NS		NS		4.18		NS		5.78	
FLUORIDE	NA			NS		NS		2.07	L	NS		2.7	L
NITRATE-N	13,000	N		NS		NS		18.3		NS		13.5	
PHOSPHATE-P	NA			NS		NS			R	NS		3.78	L
SULFATE	NA			NS		NS		48	K	NS		73.4	K
Mustard Breakdown Products (UG/KG)													
THIODIGLYCOL	39,100	\3,N		NS		NS		352	J	NS		300	J
Other Parameters (MG/KG)													
AMMONIA-N	NA			NS		NS		1.22	U	NS		1.16	U
CYANIDE	160 ‡	N		NS		NS		0.6		NS		0.57	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. This value was calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

Table 2

AUES List of Compounds for AU 12/CDC Samples (Includes Indicator and Agent Breakdown Compounds)

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:		Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[11]														
Volatile Organic Compounds - SW8260B (UG/KG)																
ACETONITRILE		NA			NS		5.8	U	NS		5.6	UJ	6	U	9	
ACROLEIN		160,000	N		NS		5.8	U	NS		5.6	UJ	7		6	U
BENZYL BROMIDE		NA			NS		5.8	UJ	NS			R	6	UJ	6	UJ
BENZYL CHLORIDE		3,800	C		NS		5.8	UJ	NS			R	6	UJ	6	UJ
CARBON DISULFIDE		780,000	N		NS		12		NS		11	J	9		9	
CARBON TETRACHLORIDE		4,900	C		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CHLOROBENZENE		160,000	N		NS		1.2	UJ	NS			R	1	U	1	U
CHLOROFORM		78,000	N		NS		1.2	U	NS		1.1	UJ	1	U	1	U
CHLOROPICRIN		NA			NS		29	U	NS		28	UJ	30	U	29	U
VOC Tentatively Identified Compounds (UG/KG)																
ALCOHOL		NA			NS			*	NS			*		*		*
ALLYL ALCOHOL		NA			NS			*	NS			*		*		*
BENZYL IODIDE		NA			NS			*	NS			*		*		*
BROMOACETONE		780,000 ‡	N		NS			*	NS			*		*		*
BROMOBENZENE		NA			NS			*	NS			*		*		*
BROMOMETHYL ETHER		NA			NS			*	NS			*		*		*
BUTYL MERCAPTAN		NA			NS				NS			*		*		*
CHLORINATED ACETONE		NA			NS			*	NS			*		*		*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N		NS			*	NS			*		*		*
CHLOROACETONE		780,000 ‡	N		NS			*	NS			*		*		*
CHLOROACETONITRILE		NA			NS			*	NS			*		*		*
CHLOROMETHYL ETHER		NA			NS			*	NS			*		*		*
CHLOROMETHYL ETHYL ETHER		NA			NS			*	NS			*		*		*
CROTONALDEHYDE		340	C		NS			*	NS			*		*		*
ETHYL BROMOACETATE		7,000,000 ‡	N		NS			*	NS			*		*		*
ETHYL CHLOROFORMATE		NA			NS			*	NS			*		*		*
ETHYL DIBROMOACETATE		7,000,000 ‡	N		NS			*	NS			*		*		*
ETHYL MERCAPTAN		NA			NS			*	NS			*		*		*
METHYL BROMOACETATE		NA			NS			*	NS			*		*		*
METHYL CHLOROACETATE		NA			NS			*	NS			*		*		*
METHYL CHLOROFORMATE		NA			NS			*	NS			*		*		*
METHYL CHLOROSULFONATE		NA			NS			*	NS			*		*		*
PERCHLOROMETHYLMERCAPTAN		NA			NS			*	NS			*		*		*
THIOPHENE		NA			NS			*	NS			*		*		*
TRICHLOROACETONITRILE		NA			NS			*	NS			*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:		Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]														
Semivolatile Organic Compounds - SW8270C (UG/KG)																
HEXACHLOROETHANE		46,000	C		NS		89	U	NS		79	U	80	U	86	U
O-CHLORONITROBENZENE		26,000	C		NS		89	U	NS		79	U	80	U	86	U
PHENYL HYDRAZINE		NA			NS		89	U	NS		79	U	80	U	86	U
PHENYL ISOCYANATE		NA			NS		89	U	NS		79	U	80	U	86	U
PHENYL ISOTHIOCYANATE		NA			NS		89	U	NS		79	U	80	U	86	U
SVOC Tentatively Identified Compounds (UG/KG)																
BENZYL FLUORIDE		NA			NS			*	NS			*		*		*
BENZOTRICHLORIDE		NA			NS			*	NS			*		*		*
DIPHENYLCHLOROARSINE		NA			NS			*	NS			*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			NS			*	NS			*		*		*
o-TOLYL ISOCYANIDE		NA			NS			*	NS			*		*		*
PHENYLDICHLOROARSINE		NA			NS			*	NS			*		*		*
PHENYL ISOCYANIDE		NA			NS			*	NS			*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)																
ALUMINUM		7,800	N	**25,798**	7440		9060		10400		8380		7040		9160	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	262	J	11.4	J	5.7	J	3.1	J	198	J	27.1	J
BARIUM *(Indicator only)*		**550**	N	298.28	47.4	J	6.6	J	31.1	J	13.3	J	36.1		78.4	
CADMIUM *(Indicator only)*		**7.8**	N	0.32	0.52	U	0.59	U	0.52	U	0.58	U	0.61	U	0.59	U
CALCIUM *(Indicator only)*		NA		**4,207**	1230		421		715		855		1060		1920	
IRON		2,300	N	**31,951**	30300	J	26700	J	25800	J	27300	J	41700		20200	
LEAD *(Indicator only)*		**400** [‡]		329.76	28.4	J	6.6	J	19.5	J	10.4	J	29.4	K	25.6	K
MAGNESIUM		NA		**7,093**	687		389		412		253		922		3940	
MANGANESE *(Indicator only)*		160	N	**1,251**	321	J	26.1	J	79	J	33.2	J	311	J	274	J
NICKEL *(Indicator only)*		**160**	N	40.12	5.6		1.3		4.3		3.8		8.6		16.6	
PHOSPHORUS		NA		NA	273		145		200		157		488		358	
POTASSIUM *(Indicator only)*		NA		**4,945**	591		363		301		259		1180		2690	
SELENIUM *(Indicator only)*		**39**	N	0.88	1.7		1.2		0.89		0.58	U	0.81		0.59	U
SILICON		NA		NA	2010		2670		2520		1940		2130		2560	
SODIUM		NA		**55.80**	51.9	U	58.9	U	51.6	U	57.7	U	60.6	U	58.5	U
SULFUR		NA		NA	78.2	L	284	L	90.7	L	60.2	L	228		195	
TIN *(Indicator only)*		**4,700**	N	NA	2.5		2.4		3.3		2.7		5.5		2.3	U
TITANIUM *(Indicator only)*		**31,000**	N	NA	135		72		170		119		150		483	
ZINC		**2,300**	N	308.8	31.7		7		17.7		10.7		57.4		61.9	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-SB-A (1')		CDC-SB-A(4')		CDC-SB-B (1')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:	Residential		Metals	(130,190)		(130,190)		(140,120)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-1'		3-4'		0-1'		3-4'		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)\1														
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)															
BROMIDE	NA			NS		1.21	U	NS		1.15	U	1.2	U	1.33	U
CHLORIDE	NA			NS		24.8		NS		1.15	U	10.1		3.56	
FLUORIDE	NA			NS			R	NS			R	2.04	L	3.68	L
NITRATE-N	13,000	N		NS		1.21	U	NS		1.15	U	6.16		4.05	
SULFATE	NA			NS		141	K	NS		15.3	K	19.3	K	7.39	K
Mustard Breakdown Products (UG/KG)															
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		NS		111	U	NS		99	U	97	U	106	U
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		NS		113	U	NS		102	U	99	U	108	U
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		NS		1147	U	NS		1018	U	280	J	300	J
Lewisite Breakdown Products (UG/KG)															
TOTAL CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		NS		11	U	NS		10	U	10	U	10	U
Other Parameters (MG/KG, unless otherwise indicated)															
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		180	U	NS		180	U	180	U	180	U
ADAMSITE **	NA			NS			**	NS			**	7.7	U		**
AMMONIA-N	NA			NS		1.18	U	NS		1.17	U	1.18	U	1.36	U
CYANIDE *(Indicator only)*	160 ‡	N		NS		0.61	U	NS		0.57	U	0.61	U	0.66	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
Volatile Organic Compounds - SW8260B (UG/KG)														
ACETONITRILE		NA			5	U	6	U	6	U	NS		6	U
ACROLEIN		160,000	N		5	U	6	U	6	U	NS		6	U
BENZYL BROMIDE		NA			5	UJ	6	UJ		R	NS		6	UJ
BENZYL CHLORIDE		3,800	C		5	UJ	6	UJ		R	NS		6	UJ
CARBON DISULFIDE		780,000	N		7		8		11		NS		6	
CARBON TETRACHLORIDE		4,900	C		1	U	1	U	1	U	NS		1	U
CHLOROBENZENE		160,000	N		1	U	1	U	1	UJ	NS		1	U
CHLOROFORM		78,000	N		1	U	1	U	1	UJ	NS		1	UJ
CHLOROPICRIN		NA			27	U	27	U	32	U	NS		29	U
VOC Tentatively Identified Compounds (UG/KG)														
ALCOHOL		NA				*		*		*	NS			*
ALLYL ALCOHOL		NA				*		*		*	NS			*
BENZYL IODIDE		NA				*		*		*	NS			*
BROMOACETONE		780,000 ‡	N			*		*		*	NS			*
BROMOBENZENE		NA				*		*		*	NS			*
BROMOMETHYL ETHER		NA				*		*		*	NS			*
BUTYL MERCAPTAN		NA				*		*		*	NS			*
CHLORINATED ACETONE		NA				*		*		*	NS			*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*		*		*	NS			*
CHLOROACETONE		780,000 ‡	N			*		*		*	NS			*
CHLOROACETONITRILE		NA				*		*		*	NS			*
CHLOROMETHYL ETHER		NA				*		*		*	NS			*
CHLOROMETHYL ETHYL ETHER		NA				*		*		*	NS			*
CROTONALDEHYDE		340	C			*		*		*	NS			*
ETHYL BROMOACETATE		7,000,000 ‡	N			*		*		*	NS			*
ETHYL CHLOROFORMATE		NA				*		*		*	NS			*
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*		*		*	NS			*
ETHYL MERCAPTAN		NA				*		*		*	NS			*
METHYL BROMOACETATE		NA				*		*		*	NS			*
METHYL CHLOROACETATE		NA				*		*		*	NS			*
METHYL CHLOROFORMATE		NA				*		*		*	NS			*
METHYL CHLOROSULFONATE		NA				*		*		*	NS			*
PERCHLOROMETHYLMERCAPTAN		NA				*		*		*	NS			*
THIOPHENE		NA				*		*		*	NS			*
TRICHLOROACETONITRILE		NA				*		*		*	NS			*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]												
Semivolatile Organic Compounds - SW8270C (UG/KG)														
HEXACHLOROETHANE		46,000	C		81	U	86	U	92	U	NS		86	U
O-CHLORONITROBENZENE		26,000	C		81	U	86	U	92	U	NS		86	U
PHENYL HYDRAZINE		NA			81	U	86	U	92	U	NS		86	U
PHENYL ISOCYANATE		NA			81	U	86	U	92	U	NS		86	U
PHENYL ISOTHIOCYANATE		NA			81	U	86	U	92	U	NS		86	U
SVOC Tentatively Identified Compounds (UG/KG)														
BENZYL FLUORIDE		NA				*		*		*	NS			*
BENZOTRICHLORIDE		NA				*		*		*	NS			*
DIPHENYLCHLOROARSINE		NA				*		*		*	NS			*
OLEIC ACID (CAS# 112-80-1)		NA				*	1800	NJ		*	NS			*
o-TOLYL ISOCYANIDE		NA				*		*		*	NS			*
PHENYLDICHLOROARSINE		NA				*		*		*	NS			*
PHENYL ISOCYANIDE		NA				*		*		*	NS			*
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	9480		7140		13000		9040		7430	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	81.8	J	210	J	31.3	J	12.9	J	8.9	J
BARIUM *(Indicator only)*		**550**	N	298.28	67.6		37.7		76.3		47.5		38.5	
CADMIUM *(Indicator only)*		**7.8**	N	0.32	0.5	U	0.57	U	0.52	U	0.63	U	0.55	U
CALCIUM *(Indicator only)*		NA		**4,207**	1230		667		4620		2190		4790	
IRON		2,300	N	**31,951**	29500		33300		32700		27800		23600	
LEAD *(Indicator only)*		**400** [‡]		329.76	14.7	K	17.6	K	26.5	K	44	K	34	K
MAGNESIUM		NA		**7,093**	2770		908		5700		1320		2770	
MANGANESE *(Indicator only)*		160	N	**1,251**	288	J	303	J	392	J	158	J	104	J
NICKEL *(Indicator only)*		**160**	N	40.12	12.3		7.6		24.8		15.4		15.5	
PHOSPHORUS		NA		NA	417		353		514		294		218	
POTASSIUM *(Indicator only)*		NA		**4,945**	2520		743		2560		629		514	
SELENIUM *(Indicator only)*		**39**	N	0.88	0.5	U	0.7		0.72		0.63	U	0.55	U
SILICON		NA		NA	2400		1610		2360		1820		1890	
SODIUM		NA		**55.80**	49.8	U	57.1	U	52	U	63	U	55.3	U
SULFUR		NA		NA	154		150		236		162		113	
TIN *(Indicator only)*		**4,700**	N	NA	2	U	2.3	U	2.3		5.5		5.7	
TITANIUM *(Indicator only)*		**31,000**	N	NA	296		176		423		235		187	
ZINC		**2,300**	N	308.8	43.2		31.3		69.4		53.9		36.3	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-1")		CDC-(130,140)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-1"		0-6"	
SAMPLING DATE:	(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[\1]												
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)													
BROMIDE	NA			1.21	U	1.18	U	1.34	U	NS		1.26	U
CHLORIDE	NA			6.13		7.74		6.93		NS		4.64	
FLUORIDE	NA			2.46	L	2.4	L	4.43	L	NS		6.7	L
NITRATE-N	13,000	N		3.12		1.18	U	9.73		NS		1.26	U
SULFATE	NA			14	K	30	K	8.22	L	NS		4.94	K
Mustard Breakdown Products (UG/KG)													
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		101	U	103	U	113	U	NS		102	U
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		104	U	106	U	116	U	NS		105	U
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		1039	U	1095	U	1187	U	NS		257	J
Lewisite Breakdown Products (UG/KG)													
TOTAL CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		10	U	10	U	11	U	NS		10	U
Other Parameters (MG/KG, unless otherwise indicated)													
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	180	U	180	U	NS		180	U
ADAMSITE **	NA			7.7	U	7.7	U		**	NS			**
AMMONIA-N	NA			1.19	U	2.47		1.36	U	NS		1.21	U
CYANIDE *(Indicator only)*	160 ‡	N		0.58	U	0.51	U	0.62	U	NS		0.58	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:		Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:		RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:		(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute		downward)[\1]											
Volatile Organic Compounds - SW8260B (UG/KG)													
ACETONITRILE		NA			5	U	NS		NS		8		NS
ACROLEIN		160,000	N		5	U	NS		NS		7		NS
BENZYL BROMIDE		NA				R	NS		NS			R	NS
BENZYL CHLORIDE		3,800	C			R	NS		NS			R	NS
CARBON DISULFIDE		780,000	N		6		NS		NS		11		NS
CARBON TETRACHLORIDE		4,900	C		1	U	NS		NS		1	U	NS
CHLOROBENZENE		160,000	N		1	U	NS		NS		1	U	NS
CHLOROFORM		78,000	N		1	U	NS		NS		3		NS
CHLOROPICRIN		NA			26	UJ	NS		NS		31	U	NS
VOC Tentatively Identified Compounds (UG/KG)													
ALCOHOL		NA				*	NS		NS			*	NS
ALLYL ALCOHOL		NA				*	NS		NS			*	NS
BENZYL IODIDE		NA				*	NS		NS			*	NS
BROMOACETONE		780,000 ‡	N			*	NS		NS			*	NS
BROMOBENZENE		NA				*	NS		NS			*	NS
BROMOMETHYL ETHER		NA				*	NS		NS			*	NS
BUTYL MERCAPTAN		NA				*	NS		NS			*	NS
CHLORINATED ACETONE		NA				*	NS		NS			*	NS
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*	NS		NS			*	NS
CHLOROACETONE		780,000 ‡	N			*	NS		NS			*	NS
CHLOROACETONITRILE		NA				*	NS		NS			*	NS
CHLOROMETHYL ETHER		NA				*	NS		NS			*	NS
CHLOROMETHYL ETHYL ETHER		NA				*	NS		NS			*	NS
CROTONALDEHYDE		340	C			*	NS		NS			*	NS
ETHYL BROMOACETATE		7,000,000 ‡	N			*	NS		NS			*	NS
ETHYL CHLOROFORMATE		NA				*	NS		NS			*	NS
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*	NS		NS			*	NS
ETHYL MERCAPTAN		NA				*	NS		NS			*	NS
METHYL BROMOACETATE		NA				*	NS		NS			*	NS
METHYL CHLOROACETATE		NA				*	NS		NS			*	NS
METHYL CHLOROFORMATE		NA				*	NS		NS			*	NS
METHYL CHLOROSULFONATE		NA				*	NS		NS			*	NS
PERCHLOROMETHYLMERCAPTAN		NA				*	NS		NS			*	NS
THIOPHENE		NA				*	NS		NS			*	NS
TRICHLOROACETONITRILE		NA				*	NS		NS			*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")	
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"	
SAMPLING DATE:	(adjusted		ground[\2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)[\1]												
Semivolatile Organic Compounds - SW8270C (UG/KG)													
HEXACHLOROETHANE	46,000	C		78	U	NS		NS		83	U	NS	
O-CHLORONITROBENZENE	26,000	C		78	U	NS		NS		83	U	NS	
PHENYL HYDRAZINE	NA			78	UJ	NS		NS		83	U	NS	
PHENYL ISOCYANATE	NA			78	U	NS		NS		83	U	NS	
PHENYL ISOTHIOCYANATE	NA			78	U	NS		NS		83	U	NS	
SVOC Tentatively Identified Compounds (UG/KG)													
BENZYL FLUORIDE	NA				*	NS		NS			*	NS	
BENZOTRICHLORIDE	NA				*	NS		NS			*	NS	
DIPHENYLCHLOROARSINE	NA				*	NS		NS			*	NS	
OLEIC ACID (CAS# 112-80-1)	NA				*	NS		NS		350	NJ	NS	
o-TOLYL ISOCYANIDE	NA				*	NS		NS			*	NS	
PHENYLDICHLOROARSINE	NA				*	NS		NS			*	NS	
PHENYL ISOCYANIDE	NA				*	NS		NS			*	NS	
ICP Inorganic Analyses - SW6010B (MG/KG)													
ALUMINUM	7,800	N	**25,798**	5970		1890		7670		7450		1850	
ARSENIC *(Indicator only)*	0.43	C	**12.64**	122	J	1.3	UJ	161	J	109	J	50.3	J
BARIUM *(Indicator only)*	**550**	N	298.28	61.5		88.2		45.6		60.5		19.1	
CADMIUM *(Indicator only)*	**7.8**	N	0.32	0.57	U	1.3	U	0.53	U	0.5	U	0.53	U
CALCIUM *(Indicator only)*	NA		**4,207**	1830		8660		1470		6050		3070	
IRON	2,300	N	**31,951**	23500		4180		33600		23300		7380	
LEAD *(Indicator only)*	**400** [‡]		329.76	35.2	K	4.6	K	21.2	K	24	K	7.8	K
MAGNESIUM	NA		**7,093**	1350		998		1020		1850		3590	
MANGANESE *(Indicator only)*	160	N	**1,251**	263	J	312	J	180	J	456	J	161	J
NICKEL *(Indicator only)*	**160**	N	40.12	16.7		4.5		9		9.9		66	
PHOSPHORUS	NA		NA	311		214		319		240		112	
POTASSIUM *(Indicator only)*	NA		**4,945**	631		687		709		766		224	
SELENIUM *(Indicator only)*	**39**	N	0.88	0.57	U	1.3	U	0.87		0.5	U	0.53	U
SILICON	NA		NA	1700		1040		1130		2440		665	
SODIUM	NA		**55.80**	56.5	U	138		52.7	U	68.7		146	
SULFUR	NA		NA	139		286		114		157		84	
TIN *(Indicator only)*	**4,700**	N	NA	2.5		5.2	U	2.4		2		2.1	U
TITANIUM *(Indicator only)*	**31,000**	N	NA	144		74.9		149		200		43.5	
ZINC	**2,300**	N	308.8	50.2		18.2		80.2		60.1		40.9	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(130,190)(0-6")		CDC-(140,160)		CDC-(140,160)(0-1")		CDC-(140,160)(0-6")		CDC-(150,140)(0-1")
TYPE or LOCATION:	Residential		Metals	High As Grid		Mulch		High As Grid		High As Grid		High As Grid
SAMPLE DEPTH:	RBC		Back-	0-6"		0-1"		0-1"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)\1											
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)												
BROMIDE	NA			NS		NS		NS		1.16	U	NS
CHLORIDE	NA			NS		NS		NS		7.37		NS
FLUORIDE	NA			NS		NS		NS		6.47	L	NS
NITRATE-N	13,000	N		NS		NS		NS		1.16	U	NS
SULFATE	NA			NS		NS		NS		16	K	NS
Mustard Breakdown Products (UG/KG)												
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		NS		NS		NS		99	U	NS
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		NS		NS		NS		102	U	NS
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		NS		NS		NS		1069	U	NS
Lewisite Breakdown Products (UG/KG)												
TOTAL CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		NS		NS		NS		10	U	NS
Other Parameters (MG/KG, unless otherwise indicated)												
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		NS		NS		180	U	NS
ADAMSITE **	NA			NS		NS		NS		7.7	U	NS
AMMONIA-N	NA			NS		NS		NS		1.19	U	NS
CYANIDE *(Indicator only)*	160 ‡	N		NS		NS		NS		0.57	U	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.

C = Carcinogen as listed on the USEPA RBC table.

NA = NOT AVAILABLE

NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)[1]											
Volatile Organic Compounds - SW8260B (UG/KG)												
ACETONITRILE	NA			9		6	U	8	U	7	J	NS
ACROLEIN	160,000	N		13		6	U	12		7	UJ	NS
BENZYL BROMIDE	NA				R	6	UJ		R		R	NS
BENZYL CHLORIDE	3,800	C			R	6	UJ		R		R	NS
CARBON DISULFIDE	780,000	N		14		7		31		15	J	NS
CARBON TETRACHLORIDE	4,900	C		2	U	1	U	2	U	1	UJ	NS
CHLOROBENZENE	160,000	N		2	UJ	1	U	2	UJ		R	NS
CHLOROFORM	78,000	N		2	U	1	U	2	U	1	UJ	NS
CHLOROPICRIN	NA			45	UJ	30	U	38	U	33	UJ	NS
VOC Tentatively Identified Compounds (UG/KG)												
ALCOHOL	NA				*		*		*		*	NS
ALLYL ALCOHOL	NA				*		*		*		*	NS
BENZYL IODIDE	NA				*		*		*		*	NS
BROMOACETONE	780,000 ‡	N			*		*		*		*	NS
BROMOBENZENE	NA				*		*		*		*	NS
BROMOMETHYL ETHER	NA				*		*		*		*	NS
BUTYL MERCAPTAN	NA				*		*		*		*	NS
CHLORINATED ACETONE	NA				*		*		*		*	NS
CHLORINATED CARBON DISULFIDE	780,000 ‡	N			*		*		*		*	NS
CHLOROACETONE	780,000 ‡	N			*		*		*		*	NS
CHLOROACETONITRILE	NA				*		*		*		*	NS
CHLOROMETHYL ETHER	NA				*		*		*		*	NS
CHLOROMETHYL ETHYL ETHER	NA				*		*		*		*	NS
CROTONALDEHYDE	340	C			*		*		*		*	NS
ETHYL BROMOACETATE	7,000,000 ‡	N			*		*		*		*	NS
ETHYL CHLOROFORMATE	NA				*		*		*		*	NS
ETHYL DIBROMOACETATE	7,000,000 ‡	N			*		*		*		*	NS
ETHYL MERCAPTAN	NA				*		*		*		*	NS
METHYL BROMOACETATE	NA				*		*		*		*	NS
METHYL CHLOROACETATE	NA				*		*		*		*	NS
METHYL CHLOROFORMATE	NA				*		*		*		*	NS
METHYL CHLOROSULFONATE	NA				*		*		*		*	NS
PERCHLOROMETHYLMERCAPTAN	NA				*		*		*		*	NS
THIOPHENE	NA				*		*		*		*	NS
TRICHLOROACETONITRILE	NA				*		*		*		*	NS

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)	
TYPE or LOCATION:		**Residential**		**Metals**	**High As Grid**		**High As Grid**		**High As Grid**		**High As Grid**		**Mulch**	
SAMPLE DEPTH:		**RBC**		**Back-**	**0-6"**		**0-6"**		**0-6"**		**0-6"**		**0-1"**	
SAMPLING DATE:		**(adjusted**		**ground**[2]	**2/21/2001**		**2/21/2001**		**2/21/2001**		**2/21/2001**		**2/21/2001**	
Analyses performed by Southwest Research Institute		**downward)**[1]												
Semivolatile Organic Compounds - SW8270C (UG/KG)														
HEXACHLOROETHANE		46,000	C		120	U	86	U	93	U	95	U	NS	
O-CHLORONITROBENZENE		26,000	C		120	U	86	U	93	U	95	U	NS	
PHENYL HYDRAZINE		NA			120	UJ	86	UJ	93	UJ	95	UJ	NS	
PHENYL ISOCYANATE		NA			120	U	86	U	93	U	95	U	NS	
PHENYL ISOTHIOCYANATE		NA			120	U	86	U	93	U	95	U	NS	
SVOC Tentatively Identified Compounds (UG/KG)														
BENZYL FLUORIDE		NA				*		*		*		*	NS	
BENZOTRICHLORIDE		NA				*		*		*		*	NS	
DIPHENYLCHLOROARSINE		NA				*		*		*		*	NS	
OLEIC ACID (CAS# 112-80-1)		NA			1500	NJ		*	110	NJ		*	NS	
o-TOLYL ISOCYANIDE		NA				*		*		*		*	NS	
PHENYLDICHLOROARSINE		NA				*		*		*		*	NS	
PHENYL ISOCYANIDE		NA				*				*		*	NS	
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	2970		7420		7740		5560		2220	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	91.1	J	173	J	145	J	399	J	5.6	J
BARIUM *(Indicator only)*		**550**	N	298.28	49.6		58.9		76.9		64.9		97	
CADMIUM *(Indicator only)*		**7.8**	N	0.32	0.73	U	0.49	U	0.65	U	0.62	U	1	U
CALCIUM *(Indicator only)*		NA		**4,207**	2930		2450		3170		3390		8440	
IRON		2,300	N	**31,951**	11300		27400		22200		20200		4920	
LEAD *(Indicator only)*		**400** ‡		329.76	16.4	K	28.2	K	43.4	K	37.4	K	6.1	K
MAGNESIUM		NA		**7,093**	2750		1630		1520		1600		1050	
MANGANESE *(Indicator only)*		160	N	**1,251**	205	J	271	J	435	J	270	J	338	J
NICKEL *(Indicator only)*		**160**	N	40.12	61.2		14.8		14.9		12.1		9.6	
PHOSPHORUS		NA		NA	273		391		466		384		252	
POTASSIUM *(Indicator only)*		NA		**4,945**	418		1180		647		942		944	
SELENIUM *(Indicator only)*		**39**	N	0.88	0.73	U	0.58		0.65	U	0.62	U	1	U
SILICON		NA		NA	967		1930		1820		1600		1060	
SODIUM		NA		**55.80**	73.5	U	49.1	U	64.7	U	61.8	U	190	
SULFUR		NA		NA	235		163		332		257		310	
TIN *(Indicator only)*		**4,700**	N	NA	2.9	U	2.6		4.1		2.9		4.2	U
TITANIUM *(Indicator only)*		**31,000**	N	NA	95.9		169		185		204		84.1	
ZINC		**2,300**	N	308.8	49.6		85.7		70.5		73.3		23	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(150,140)(0-6")		CDC-(150,150)(0-6")		CDC-(160,130)(0-6")		CDC-(160,140)(0-6")		CDC-(160,150)
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		High As Grid		Mulch
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-1"
SAMPLING DATE:	(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/21/2001
Analyses performed by Southwest Research Institute	downward)\1											
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)												
BROMIDE	NA			1.59	U	NS		NS		NS		NS
CHLORIDE	NA			4.48		NS		NS		NS		NS
FLUORIDE	NA			2.81	L	NS		NS		NS		NS
NITRATE-N	13,000	N		1.59	U	NS		NS		NS		NS
SULFATE	NA			6.9	K	NS		NS		NS		NS
Mustard Breakdown Products (UG/KG)												
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		137	U	NS		NS		NS		NS
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		140	U	NS		NS		NS		NS
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		732	J	NS		NS		NS		NS
Lewisite Breakdown Products (UG/KG)												
TOTAL CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		14	U	NS		NS		NS		NS
Other Parameters (MG/KG, unless otherwise indicated)												
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	NS		NS		NS		NS
ADAMSITE **	NA			7.7	U	NS		NS		NS		NS
AMMONIA-N	NA			1.54	U	NS		NS		NS		NS
CYANIDE *(Indicator only)*	160 ‡	N		0.5	U	NS		NS		NS		NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[11]														
Volatile Organic Compounds - SW8260B (UG/KG)																
ACETONITRILE		NA			NS		10	J	7	U	5.4	U	33	J	6.1	U
ACROLEIN		160,000	N		NS		12		7	U	5.4	U	8.7	UJ	6.1	UJ
BENZYL BROMIDE		NA			NS			R		R		R		R		R
BENZYL CHLORIDE		3,800	C		NS			R		R		R		R		R
CARBON DISULFIDE		780,000	N		NS		12	J	10		9		32	J	10	
CARBON TETRACHLORIDE		4,900	C		NS		1	UJ	1	U	1.1	UJ	1.7	UJ	1.2	UJ
CHLOROBENZENE		160,000	N		NS			R		R		R		R		R
CHLOROFORM		78,000	N		NS		1	UJ	1	UJ	1.1	U	2	J	1.2	U
CHLOROPICRIN		NA			NS		35	UJ	33	U	27	U	44	UJ	30	U
VOC Tentatively Identified Compounds (UG/KG)																
ALCOHOL		NA			NS			*		*		*		*		*
ALLYL ALCOHOL		NA			NS			*		*		*		*		*
BENZYL IODIDE		NA			NS			*		*		*		*		*
BROMOACETONE		780,000 ‡	N		NS			*		*		*		*		*
BROMOBENZENE		NA			NS			*		*		*		*		*
BROMOMETHYL ETHER		NA			NS			*		*		*		*		*
BUTYL MERCAPTAN		NA			NS			*		*		*		*		*
CHLORINATED ACETONE		NA			NS			*		*		*		*		*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N		NS			*		*		*		*		*
CHLOROACETONE		780,000 ‡	N		NS			*		*		*		*		*
CHLOROACETONITRILE		NA			NS			*		*		*		*		*
CHLOROMETHYL ETHER		NA			NS			*		*		*		*		*
CHLOROMETHYL ETHYL ETHER		NA			NS			*		*		*		*		*
CROTONALDEHYDE		340	C		NS			*		*		*		*		*
ETHYL BROMOACETATE		7,000,000 ‡	N		NS			*		*		*		*		*
ETHYL CHLOROFORMATE		NA			NS			*		*		*		*		*
ETHYL DIBROMOACETATE		7,000,000 ‡	N		NS			*		*		*		*		*
ETHYL MERCAPTAN		NA			NS			*		*		*		*		*
METHYL BROMOACETATE		NA			NS			*		*		*		*		*
METHYL CHLOROACETATE		NA			NS			*		*		*		*		*
METHYL CHLOROFORMATE		NA			NS			*		*		*		*		*
METHYL CHLOROSULFONATE		NA			NS			*		*		*		*		*
PERCHLOROMETHYLMERCAPTAN		NA			NS			*		*		*		*		*
THIOPHENE		NA			NS			*		*		*		*		*
TRICHLOROACETONITRILE		NA			NS			*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:		REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[12]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[11]														
Semivolatile Organic Compounds - SW8270C (UG/KG)																
HEXACHLOROETHANE		46,000	C		NS		91	U	93	U	80	U	160	U	85	U
O-CHLORONITROBENZENE		26,000	C		NS		91	U	93	U	80	U	160	U	85	U
PHENYL HYDRAZINE		NA			NS		91	U	93	UJ	80	U	160	U	85	U
PHENYL ISOCYANATE		NA			NS		91	U	93	U	80	U	160	U	85	U
PHENYL ISOTHIOCYANATE		NA			NS		91	U	93	U	80	U	160	U	85	U
SVOC Tentatively Identified Compounds (UG/KG)																
BENZYL FLUORIDE		NA			NS			*		*		*		*		*
BENZOTRICHLORIDE		NA			NS			*		*		*		*		*
DIPHENYLCHLOROARSINE		NA			NS			*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA			NS		18000	NJ		*		*		*		*
o-TOLYL ISOCYANIDE		NA			NS			*		*		*		*		*
PHENYLDICHLOROARSINE		NA			NS			*		*		*		*		*
PHENYL ISOCYANIDE		NA			NS			*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)																
ALUMINUM		7,800	N	**25,798**	5640		6730		5710		6580		5370		9360	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	147	J	240	J	159	J	5	J	55.2	J	7.3	J
BARIUM *(Indicator only)*		**550**	N	298.28	54		62.5		50.9		38.8	J	112	J	44.8	J
CADMIUM *(Indicator only)*		**7.8**	N	0.32	0.63	U	0.55	U	0.64	U	0.5	U	0.57	U	0.6	U
CALCIUM *(Indicator only)*		NA		**4,207**	2610		3650		2140		805		6980		1510	
IRON		2,300	N	**31,951**	19100		27300		18600		28600	J	14500	J	23400	J
LEAD *(Indicator only)*		**400** ‡		329.76	30.7	K	31.2	K	36.7	K	41.6	K	46.7	J	47.2	J
MAGNESIUM		NA		**7,093**	1390		1540		1480		665		3290		1120	
MANGANESE *(Indicator only)*		160	N	**1,251**	266	J	246	J	202	J	136	J	482	J	204	J
NICKEL *(Indicator only)*		**160**	N	40.12	9.7		11.4		10.2		8.1		47.9		10.5	
PHOSPHORUS		NA		NA	320		380		323		260		414		434	
POTASSIUM *(Indicator only)*		NA		**4,945**	814		886		897		371		809		785	
SELENIUM *(Indicator only)*		**39**	N	0.88	0.63	U	0.55	U	0.64	U	0.98		1.4		1.2	
SILICON		NA		NA	1650		1790		1700		1700		1630		2290	
SODIUM		NA		**55.80**	63	U	55.3	U	63.6	U	49.9	U	57.2	U	59.7	U
SULFUR		NA		NA	197		217		179		214	L	420	L	345	L
TIN *(Indicator only)*		**4,700**	N	NA	2.8		2.9		3.6		4.2		3.2		4.1	
TITANIUM *(Indicator only)*		**31,000**	N	NA	190		193		203		173		136		244	
ZINC		**2,300**	N	308.8	59.8		60.6		71.1		41		76.6		48	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(160,150)(0-1")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")		AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(130,120)(0-6")
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid
SAMPLE DEPTH:	RBC		Back-	0-1"		0-6"		0-6"		0-6"		0-6"		0-6"
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001		2/22/2001		2/22/2001
Analyses performed by Southwest Research Institute	downward)[1]													
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)														
BROMIDE	NA			NS		1.37	U	1.44	U	1.23	U	1.22	U	NS
CHLORIDE	NA			NS		8.64		5.48		2.59		30.6		NS
FLUORIDE	NA			NS		6.95	L	7.13	L	1.94	L	7.74	L	NS
NITRATE-N	13,000	N		NS		1.37	U	1.44	U	18.9		4.82		NS
SULFATE	NA			NS		6.96	K	7.68	K	14.4	K	36.8	K	NS
Mustard Breakdown Products (UG/KG)														
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		NS		110	U	111	U	98	U	94	U	NS
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		NS		113	U	114	U	100	U	96	U	NS
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		NS		313	J	445	J	235	J	463	J	NS
Lewisite Breakdown Products (UG/KG)														
TOTAL CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		NS		11	U	11	U	10	U	10	U	NS
Other Parameters (MG/KG, unless otherwise indicated)														
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		180	U	180	U	180	U	180	U	NS
ADAMSITE **	NA			NS		7.7	U	7.7	U		**	7.7	U	NS
AMMONIA-N	NA			NS		1.33	U	1.37	U	1.23	U	1.17	U	NS
CYANIDE *(Indicator only)*	160 ‡	N		NS		0.66	U	0.72	U	0.58	U	0.58	U	NS

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
Volatile Organic Compounds - SW8260B (UG/KG)													
ACETONITRILE	NA			8		5.9	U	4.1	U	5.1	U	6	U
ACROLEIN	160,000	N		6	U	7		4.1	U	5.1	U	6	U
BENZYL BROMIDE	NA				R		R		R		R		R
BENZYL CHLORIDE	3,800	C			R		R		R		R		R
CARBON DISULFIDE	780,000	N		22		11		11		17		9	
CARBON TETRACHLORIDE	4,900	C		1.2	UJ	1.2	UJ	0.82	UJ	1	U	1.2	U
CHLOROBENZENE	160,000	N			R		R		R		R	1.2	UJ
CHLOROFORM	78,000	N		1.2	U	1.2	U	0.82	U	1	U	1.2	U
CHLOROPICRIN	NA			30	U	30	U	21	U	25	U	30	U
VOC Tentatively Identified Compounds (UG/KG)													
ALCOHOL	NA				*		*		*		*		*
ALLYL ALCOHOL	NA				*		*		*		*		*
BENZYL IODIDE	NA				*		*		*		*		*
BROMOACETONE	780,000 ‡	N			*		*		*		*		*
BROMOBENZENE	NA				*		*		*		*		*
BROMOMETHYL ETHER	NA				*		*		*		*		*
BUTYL MERCAPTAN	NA				*		*		*		*		*
CHLORINATED ACETONE	NA				*		*		*		*		*
CHLORINATED CARBON DISULFIDE	780,000 ‡	N			*		*		*		*		*
CHLOROACETONE	780,000 ‡	N			*		*		*		*		*
CHLOROACETONITRILE	NA				*		*		*		*		*
CHLOROMETHYL ETHER	NA				*		*		*		*		*
CHLOROMETHYL ETHYL ETHER	NA				*		*		*		*		*
CROTONALDEHYDE	340	C			*		*		*		*		*
ETHYL BROMOACETATE	7,000,000 ‡	N			*		*		*		*		*
ETHYL CHLOROFORMATE	NA				*		*		*		*		*
ETHYL DIBROMOACETATE	7,000,000 ‡	N			*		*		*		*		*
ETHYL MERCAPTAN	NA				*		*		*		*		*
METHYL BROMOACETATE	NA				*		*		*		*		*
METHYL CHLOROACETATE	NA				*		*		*		*		*
METHYL CHLOROFORMATE	NA				*		*		*		*		*
METHYL CHLOROSULFONATE	NA				*		*		*		*		*
PERCHLOROMETHYLMERCAPTAN	NA				*		*		*		*		*
THIOPHENE	NA				*		*		*		*		*
TRICHLOROACETONITRILE	NA				*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]												
Semivolatile Organic Compounds - SW8270C (UG/KG)													
HEXACHLOROETHANE	46,000	C		84	U	86	U	68	U	80	U	79	U
O-CHLORONITROBENZENE	26,000	C		84	U	86	U	68	U	80	U	79	U
PHENYL HYDRAZINE	NA			84	U	86	U	68	U	80	U	79	U
PHENYL ISOCYANATE	NA			84	U	86	U	68	U	80	U	79	U
PHENYL ISOTHIOCYANATE	NA			84	U	86	U	68	U	80	U	79	U
SVOC Tentatively Identified Compounds (UG/KG)													
BENZYL FLUORIDE	NA				*		*		*		*		*
BENZOTRICHLORIDE	NA				*		*		*		*		*
DIPHENYLCHLOROARSINE	NA				*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)	NA				*		*		*		*		*
o-TOLYL ISOCYANIDE	NA				*		*		*		*		*
PHENYLDICHLOROARSINE	NA				*		*		*		*		*
PHENYL ISOCYANIDE	NA				*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)													
ALUMINUM	7,800	N	**25,798**	4870		12600		6070		2980		6110	
ARSENIC *(Indicator only)*	0.43	C	**12.64**	104	J	35.6	J	4.8	J	3.3	J	6.1	J
BARIUM *(Indicator only)*	**550**	N	298.28	65.9	J	77.8	J	47.8	J	20.5	J	19.5	J
CADMIUM *(Indicator only)*	**7.8**	N	0.32	0.56	U	0.52	U	0.5	U	0.57	U	0.43	U
CALCIUM *(Indicator only)*	NA		**4,207**	4230		1700		715		8060		1030	
IRON	2,300	N	**31,951**	15000	J	34000	J	26100	J	7530	J	23800	J
LEAD *(Indicator only)*	**400** ‡		329.76	25.8	J	31.7	J	64.3	J	5.1	J	13.3	J
MAGNESIUM	NA		**7,093**	5910		2590		868		20500		1520	
MANGANESE *(Indicator only)*	160	N	**1,251**	323	J	247	J	287	J	298	J	98.4	J
NICKEL *(Indicator only)*	**160**	N	40.12	75.4		11.7		6.7		345		7.3	
PHOSPHORUS	NA		NA	392		527		374		194		678	
POTASSIUM *(Indicator only)*	NA		**4,945**	585		1990		450		172		3260	
SELENIUM *(Indicator only)*	**39**	N	0.88	0.62		1.3		1.2		0.69		0.92	
SILICON	NA		NA	1880		2970		1430		1370		1660	
SODIUM	NA		**55.80**	55.7	U	52.1	U	50.1	U	56.6	U	43	U
SULFUR	NA		NA	327	L	410	L	273	L	256	L	149	L
TIN *(Indicator only)*	**4,700**	N	NA	3.2		2.9		3.6		2.3	U	1.9	
TITANIUM *(Indicator only)*	**31,000**	N	NA	116		340		139		50.4		110	
ZINC	**2,300**	N	308.8	72.8		65		38.7		18.3		46.6	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

SAMPLE ID:	REGION III			CDC-(170,140)(0-6")		CDC-(220,150)(0-6")		CDC-(70,190)(0-6")		CDC-(80,170)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground\2	2/22/2001		2/22/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)\1												
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)													
BROMIDE	NA			NS		NS		1.15	U	NS		1.17	U
CHLORIDE	NA			NS		NS		4.18		NS		5.78	
FLUORIDE	NA			NS		NS		2.07	L	NS		2.7	L
NITRATE-N	13,000	N		NS		NS		18.3		NS		13.5	
SULFATE	NA			NS		NS		48	K	NS		73.4	K
Mustard Breakdown Products (UG/KG)													
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		NS		NS		81	U	NS		99	U
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		NS		NS		83	U	NS		102	U
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		NS		NS		352	J	NS		300	J
Lewisite Breakdown Products (UG/KG)													
TOTAL CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		NS		NS		8.3	U	NS		10	U
Other Parameters (MG/KG, unless otherwise indicated)													
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		NS		NS		180	U	NS		180	U
ADAMSITE **	NA			NS		NS			**	NS			**
AMMONIA-N	NA			NS		NS		1.22	U	NS		1.16	U
CYANIDE *(Indicator only)*	160 ‡	N		NS		NS		0.6		NS		0.57	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

Table 2A

AUES List Detections for AU 12/CDC Samples (Includes Indicator and Agent Breakdown Compounds)

Of the 32 total samples, only the 16 samples that were analyzed for the full AUES List are shown on this table

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:		REGION III			CDC-SB-A(4')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:		Residential		Metals	(130,190)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	3-4'		3-4'		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]										
Volatile Organic Compounds - SW8260B (UG/KG)												
ACETONITRILE		NA			5.8	U	5.6	UJ	6	U	9	
ACROLEIN		160,000	N		5.8	U	5.6	UJ	7		6	U
CARBON DISULFIDE		780,000	N		12		11	J	9		9	
CHLOROFORM		78,000	N		1.2	U	1.1	UJ	1	U	1	U
SVOC Tentatively Identified Compounds (UG/KG)												
OLEIC ACID (CAS# 112-80-1)		NA				*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)												
ALUMINUM		7,800	N	**25,798**	9060		8380		7040		9160	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	11.4	J	3.1	J	198	J	27.1	J
BARIUM *(Indicator only)*		**550**	N	298.28	6.6	J	13.3	J	36.1		78.4	
CALCIUM *(Indicator only)*		NA		**4,207**	421		855		1060		1920	
IRON		2,300	N	**31,951**	26700	J	27300	J	41700		20200	
LEAD *(Indicator only)*		**400** [‡]		329.76	6.6	J	10.4	J	29.4	K	25.6	K
MAGNESIUM		NA		**7,093**	389		253		922		3940	
MANGANESE *(Indicator only)*		160	N	**1,251**	26.1	J	33.2	J	311	J	274	J
NICKEL *(Indicator only)*		**160**	N	40.12	1.3		3.8		8.6		16.6	
PHOSPHORUS		NA		NA	145		157		488		358	
POTASSIUM *(Indicator only)*		NA		**4,945**	363		259		1180		2690	
SELENIUM *(Indicator only)*		**39**	N	0.88	1.2		0.58	U	0.81		0.59	U
SILICON		NA		NA	2670		1940		2130		2560	
SODIUM		NA		**55.80**	58.9	U	57.7	U	60.6	U	58.5	U
SULFUR		NA		NA	284	L	60.2	L	228		195	
TIN *(Indicator only)*		**4,700**	N	NA	2.4		2.7		5.5		2.3	U
TITANIUM *(Indicator only)*		**31,000**	N	NA	72		119		150		483	
ZINC		**2,300**	N	308.8	7		10.7		57.4		61.9	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:		REGION III			CDC-SB-A(4')		CDC-SB-B(4')		AU12-(180,200)(0-6")		AU12-(180,220)(0-6")	
TYPE or LOCATION:		Residential		Metals	(130,190)		(140,120)		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	3-4'		3-4'		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)\1										
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)												
CHLORIDE		NA			24.8		1.15	U	10.1		3.56	
FLUORIDE		NA				R		R	2.04	L	3.68	L
NITRATE-N		13,000	N		1.21	U	1.15	U	6.16		4.05	
SULFATE		NA			141	K	15.3	K	19.3	K	7.39	K
Mustard Breakdown Products (UG/KG)												
THIODIGLYCOL *(Agent Breakdown Product only)*		39,100	\3,N		1147	U	1018	U	280	J	300	J
Other Parameters (MG/KG, unless otherwise indicated)												
AMMONIA-N		NA			1.18	U	1.17	U	1.18	U	1.36	U
CYANIDE *(Indicator only)*		160 ‡	N		0.61	U	0.57	U	0.61	U	0.66	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]										
Volatile Organic Compounds - SW8260B (UG/KG)												
ACETONITRILE		NA			5	U	6	U	6	U	6	U
ACROLEIN		160,000	N		5	U	6	U	6	U	6	U
CARBON DISULFIDE		780,000	N		7		8		11		6	
CHLOROFORM		78,000	N		1	U	1	U	1	UJ	1	UJ
SVOC Tentatively Identified Compounds (UG/KG)												
OLEIC ACID (CAS# 112-80-1)		NA				*	1800	NJ		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)												
ALUMINUM		7,800	N	**25,798**	9480		7140		13000		7430	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	81.8	J	210	J	31.3	J	8.9	J
BARIUM *(Indicator only)*		**550**	N	298.28	67.6		37.7		76.3		38.5	
CALCIUM *(Indicator only)*		NA		**4,207**	1230		667		4620		4790	
IRON		2,300	N	**31,951**	29500		33300		32700		23600	
LEAD *(Indicator only)*		**400** ‡		329.76	14.7	K	17.6	K	26.5	K	34	K
MAGNESIUM		NA		**7,093**	2770		908		5700		2770	
MANGANESE *(Indicator only)*		160	N	**1,251**	288	J	303	J	392	J	104	J
NICKEL *(Indicator only)*		**160**	N	40.12	12.3		7.6		24.8		15.5	
PHOSPHORUS		NA		NA	417		353		514		218	
POTASSIUM *(Indicator only)*		NA		**4,945**	2520		743		2560		514	
SELENIUM *(Indicator only)*		**39**	N	0.88	0.5	U	0.7		0.72		0.55	U
SILICON		NA		NA	2400		1610		2360		1890	
SODIUM		NA		**55.80**	49.8	U	57.1	U	52	U	55.3	U
SULFUR		NA		NA	154		150		236		113	
TIN *(Indicator only)*		**4,700**	N	NA	2	U	2.3	U	2.3		5.7	
TITANIUM *(Indicator only)*		**31,000**	N	NA	296		176		423		187	
ZINC		**2,300**	N	308.8	43.2		31.3		69.4		36.3	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:		REGION III			AU12-(200,180)(0-6")		AU12-(200,200)(0-6")		AU12-(240,180)(0-6")		CDC-(130,140)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		Random As Grid		High As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)\1										
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)												
CHLORIDE		NA			6.13		7.74		6.93		4.64	
FLUORIDE		NA			2.46	L	2.4	L	4.43	L	6.7	L
NITRATE-N		13,000	N		3.12		1.18	U	9.73		1.26	U
SULFATE		NA			14	K	30	K	8.22	L	4.94	K
Mustard Breakdown Products (UG/KG)												
THIODIGLYCOL *(Agent Breakdown Product only)*		39,100	\3,N		1039	U	1095	U	1187	U	257	J
Other Parameters (MG/KG, unless otherwise indicated)												
AMMONIA-N		NA			1.19	U	2.47		1.36	U	1.21	U
CYANIDE *(Indicator only)*		160 ‡	N		0.58	U	0.51	U	0.62	U	0.58	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:		REGION III			CDC-(140,160)(0-6")		CDC-(150,140)(0-6")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")	
TYPE or LOCATION:		Residential		Metals	High As Grid		High As Grid		High As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[2]	2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute		downward)[1]										
Volatile Organic Compounds - SW8260B (UG/KG)												
ACETONITRILE		NA			8		9		10	J	7	U
ACROLEIN		160,000	N		7		13		12		7	U
CARBON DISULFIDE		780,000	N		11		14		12	J	10	
CHLOROFORM		78,000	N		3		2	U	1	UJ	1	UJ
SVOC Tentatively Identified Compounds (UG/KG)												
OLEIC ACID (CAS# 112-80-1)		NA			350	NJ	1500	NJ	18000	NJ		*
ICP Inorganic Analyses - SW6010B (MG/KG)												
ALUMINUM		7,800	N	**25,798**	7450		2970		6730		5710	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	109	J	91.1	J	240	J	159	J
BARIUM *(Indicator only)*		**550**	N	298.28	60.5		49.6		62.5		50.9	
CALCIUM *(Indicator only)*		NA		**4,207**	6050		2930		3650		2140	
IRON		2,300	N	**31,951**	23300		11300		27300		18600	
LEAD *(Indicator only)*		**400** [‡]		329.76	24	K	16.4	K	31.2	K	36.7	K
MAGNESIUM		NA		**7,093**	1850		2750		1540		1480	
MANGANESE *(Indicator only)*		160	N	**1,251**	456	J	205	J	246	J	202	J
NICKEL *(Indicator only)*		**160**	N	40.12	9.9		61.2		11.4		10.2	
PHOSPHORUS		NA		NA	240		273		380		323	
POTASSIUM *(Indicator only)*		NA		**4,945**	766		418		886		897	
SELENIUM *(Indicator only)*		**39**	N	0.88	0.5	U	0.73	U	0.55	U	0.64	U
SILICON		NA		NA	2440		967		1790		1700	
SODIUM		NA		**55.80**	68.7		73.5	U	55.3	U	63.6	U
SULFUR		NA		NA	157		235		217		179	
TIN *(Indicator only)*		**4,700**	N	NA	2		2.9	U	2.9		3.6	
TITANIUM *(Indicator only)*		**31,000**	N	NA	200		95.9		193		203	
ZINC		**2,300**	N	308.8	60.1		49.6		60.6		71.1	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:	REGION III			CDC-(140,160)(0-6")		CDC-(150,140)(0-6")		CDC-(160,150)(0-6")		CDC-(170,150)(0-6")	
TYPE or LOCATION:	Residential		Metals	High As Grid		High As Grid		High As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground\2	2/21/2001		2/21/2001		2/21/2001		2/21/2001	
Analyses performed by Southwest Research Institute	downward)\1										
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)											
CHLORIDE	NA			7.37		4.48		8.64		5.48	
FLUORIDE	NA			6.47	L	2.81	L	6.95	L	7.13	L
NITRATE-N	13,000	N		1.16	U	1.59	U	1.37	U	1.44	U
SULFATE	NA			16	K	6.9	K	6.96	K	7.68	K
Mustard Breakdown Products (UG/KG)											
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		1069	U	732	J	313	J	445	J
Other Parameters (MG/KG, unless otherwise indicated)											
AMMONIA-N	NA			1.19	U	1.54	U	1.33	U	1.37	U
CYANIDE *(Indicator only)*	160 ‡	N		0.57	U	0.5	U	0.66	U	0.72	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table.

(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.

C = Carcinogen as listed on the USEPA RBC table.

NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:	REGION III			AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(70,190)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:	Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:	RBC		Back-	0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:	(adjusted		ground[2]	2/21/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute	downward)[1]										
Volatile Organic Compounds - SW8260B (UG/KG)											
ACETONITRILE	NA			5.4	U	33	J	4.1	U	6	U
ACROLEIN	160,000	N		5.4	U	8.7	UJ	4.1	U	6	U
CARBON DISULFIDE	780,000	N		9		32	J	11		9	
CHLOROFORM	78,000	N		1.1	U	2	J	0.82	U	1.2	U
SVOC Tentatively Identified Compounds (UG/KG)											
OLEIC ACID (CAS# 112-80-1)	NA				*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)											
ALUMINUM	7,800	N	**25,798**	6580		5370		6070		6110	
ARSENIC *(Indicator only)*	0.43	C	**12.64**	5	J	55.2	J	4.8	J	6.1	J
BARIUM *(Indicator only)*	**550**	N	298.28	38.8	J	112	J	47.8	J	19.5	J
CALCIUM *(Indicator only)*	NA		**4,207**	805		6980		715		1030	
IRON	2,300	N	**31,951**	28600	J	14500	J	26100	J	23800	J
LEAD *(Indicator only)*	**400** ‡		329.76	41.6	K	46.7	J	64.3	J	13.3	J
MAGNESIUM	NA		**7,093**	665		3290		868		1520	
MANGANESE *(Indicator only)*	160	N	**1,251**	136	J	482	J	287	J	98.4	J
NICKEL *(Indicator only)*	**160**	N	40.12	8.1		47.9		6.7		7.3	
PHOSPHORUS	NA		NA	260		414		374		678	
POTASSIUM *(Indicator only)*	NA		**4,945**	371		809		450		3260	
SELENIUM *(Indicator only)*	**39**	N	0.88	0.98		1.4		1.2		0.92	
SILICON	NA		NA	1700		1630		1430		1660	
SODIUM	NA		**55.80**	49.9	U	57.2	U	50.1	U	43	U
SULFUR	NA		NA	214	L	420	L	273	L	149	L
TIN *(Indicator only)*	**4,700**	N	NA	4.2		3.2		3.6		1.9	
TITANIUM *(Indicator only)*	**31,000**	N	NA	173		136		139		110	
ZINC	**2,300**	N	308.8	41		76.6		38.7		46.6	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

SAMPLE ID:		REGION III			AU12-(160,100)(0-6")		CDC-(120,170)(0-6")		CDC-(70,190)(0-6")		CDC-(80,210)(0-6")	
TYPE or LOCATION:		Residential		Metals	Random As Grid		Random As Grid		Random As Grid		Random As Grid	
SAMPLE DEPTH:		RBC		Back-	0-6"		0-6"		0-6"		0-6"	
SAMPLING DATE:		(adjusted		ground[\2]	2/21/2001		2/22/2001		2/22/2001		2/22/2001	
Analyses performed by Southwest Research Institute		downward)[\1]										
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)												
CHLORIDE		NA			2.59		30.6		4.18		5.78	
FLUORIDE		NA			1.94	L	7.74	L	2.07	L	2.7	L
NITRATE-N		13,000	N		18.9		4.82		18.3		13.5	
SULFATE		NA			14.4	K	36.8	K	48	K	73.4	K
Mustard Breakdown Products (UG/KG)												
THIODIGLYCOL *(Agent Breakdown Product only)*		39,100	\3,N		235	J	463	J	352	J	300	J
Other Parameters (MG/KG, unless otherwise indicated)												
AMMONIA-N		NA			1.23	U	1.17	U	1.22	U	1.16	U
CYANIDE *(Indicator only)*		160 ‡	N		0.58	U	0.58	U	0.6		0.57	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. These values were calculated for that investigation.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

Table 3

AUES List Scan Results for AU 12/CDC Samples

Of the 32 total samples, only the 16 samples that were analyzed for the full AUES List are shown on this table

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**CDC-SB-A(4') (130, 190)**	**CDC-SB-B(4') (140, 120)**	**AU12-(180,200)(0-6")**	**AU12-(180,220)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Acetyl Fluoride	557-99-3	*fluoride*	NO	NO	YES	YES
Allyl Isocyanide		*cyanide*	NO	NO	NO	NO
Allyl Isothiocyanate	57-06-7	*cyanide*	NO	NO	NO	NO
Aluminium Selenide	1302-82-5	*aluminium, selenium*	YES	NO	YES	NO
Ammonium Chloride	12125-02-09	*chloride, ammonia*	NO	NO	NO	NO
Ammonium Cyanide		*ammonia, cyanide*	NO	NO	NO	NO
Ammonium Nitrate	6484-52-2	*nitrate, ammonia*	NO	NO	NO	NO
Ammonium Picrate	131-74-8	*ammonia*	NO	NO	NO	NO
Arsenic Trichloride	7784-34-1	*chloride, arsenic**	YES	NO	YES	YES
Arsenic Trifluoride	7784-35-2	*fluoride, arsenic**	NO	NO	YES	YES
Arsenic Trioxide	1327-53-3	*arsenic**	YES	YES	YES	YES
Arsine	7784-42-1	*arsenic**	YES	YES	YES	YES
Barium Peroxide	1304-29-6	*barium*	YES	YES	YES	YES
Bromine	7726-95-6	*bromide*	NO	NO	NO	NO
Bromoketone	593-95-3	*bromide*	NO	NO	NO	NO
Bromoacetyl Bromide	598-21-0	*bromide*	NO	NO	NO	NO
Bromobenzyl Cyanide	5798-79-8	*bromide, cyanide*	NO	NO	NO	NO
Bromoxylyl Cyanide		*bromide, cyanide*	NO	NO	NO	NO
Cacodyl	144-21-8	*sodium*, arsenic**	NO	NO	NO	NO
Cacodyl Bromide		*bromide*	NO	NO	NO	NO
Cacodyl Chloride		*chloride*	YES	NO	YES	YES
Cacodyl Cyanide		*cyanide*	NO	NO	NO	NO
Cadmium Methyl		*cadmium*	NO	NO	NO	NO
Calcium Carbonate	471-34-1	*calcium**	YES	YES	YES	YES
Calcium Sulfate	7778-18-9	*sulfate, calcium**	YES	YES	YES	YES
Chlorine	7782-50-5	*chloride*	YES	NO	YES	YES
Cyanogen	460-19-5	*cyanide*	NO	NO	NO	NO
Cyanogen Bromide	506-68-3	*bromide, cyanide*	NO	NO	NO	NO
Cyanogen Chloride	506-77-4	*chloride, cyanide*	NO	NO	NO	NO
Dichloromethyl Ether	542-88-1	*chloride*	YES	NO	YES	YES
Dichloromethyl Sulfide		*chloride, sulfur*	YES	NO	YES	YES
Dichloropropyl Sulfide		*chloride, sulfur*	YES	NO	YES	YES
Dimethylarsine	593-57-7	*arsenic**	YES	YES	YES	YES
Ethyl Sulfide	352-93-2	*sulfur*	YES	YES	YES	YES
Hydrochloric Acid	7647-01-0	*chloride*	YES	NO	YES	YES
Hydrocyanic Acid	74-90-8	*cyanide*	NO	NO	NO	NO
Hydrofluoric Acid	7664-39-3	*fluoride*	NO	NO	YES	YES
Hydrogen Selenide	7/5/7783	*selenium*	YES	NO	YES	NO
Lead Ferrocyanide		*lead, iron, cyanide*	NO	NO	NO	NO
Lead Peroxide	1309-60-0	*lead*	YES	YES	YES	YES
Lead Thiocyanate	592-87-0	*lead, cyanide*	NO	NO	NO	NO
Magnesium Arsenide		*magnesium, arsenic**	YES	YES	YES	YES
Magnesium Carbonate	546-93-0	*magnesium*	YES	YES	YES	YES

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**CDC-SB-A(4') (130, 190)**	**CDC-SB-B(4') (140, 120)**	**AU12-(180,200)(0-6")**	**AU12-(180,220)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Magnesium Oxide	1309-48-4	*magnesium*	YES	YES	YES	YES
Methyl Chloroarsine		*chloride, arsenic**	YES	NO	YES	YES
Methyl Isocyanide	593-75-9	*cyanide*	NO	NO	NO	NO
Methyl Selenide	593-79-3	*selenium*	YES	NO	YES	NO
Nickel Carbonyl	13463-39-3	*nickel*	YES	YES	YES	YES
Oxalyl Chloride	79-37-8	*chloride*	YES	NO	YES	YES
Phenylcarbylamine Chloride	622-44-6	*chloride*	YES	NO	YES	YES
Phosgene	75-44-5	*chloride*	YES	NO	YES	YES
Potassium Chlorate	3811-04-9	*chloride, potassium*	YES	NO	YES	YES
Potassium Nitrate	7757-79-1	*nitrate, potassium*	NO	NO	YES	YES
Potassium Perchlorate	7778-74-7	*potassium*	YES	YES	YES	YES
Potassium Permanganate	7722-64-7	*manganese, potassium*	YES	YES	YES	YES
Silicon	7440-21-3	*silicon*	YES	YES	YES	YES
Silicon Tetrachloride	409-21-2	*chloride, silicon*	YES	NO	YES	YES
Sodium Bicarbonate	144-55-8	*sodium**	NO	NO	NO	NO
Sodium Chlorate	7775-09-9	*chloride, sodium**	NO	NO	NO	NO
Sodium Cyanide	143-33-9	*sodium, cyanide*	NO	NO	NO	NO
Sodium Hydroxide	1310-73-2	*sodium**	NO	NO	NO	NO
Sodium Nitrate	7631-99-4	*nitrate, sodium*	NO	NO	NO	NO
Sodium Oleate	143-19-1	*sodium**	NO	NO	NO	NO
Sodium Silicate	6834-92-0	*sodium*, silicon*	NO	NO	NO	NO
Sodium Stearate	822-16-2	*sodium**	NO	NO	NO	NO
Stannic Chloride (Tin Tetrachloride)	7646-78-8	*chloride, tin*	YES	NO	YES	NO
Sulfur Chloride	10025-67-9	*chloride, sulfur*	YES	NO	YES	YES
Sulfur Trioxide	7446-11-9	*sulfur*	YES	YES	YES	YES
Sulfuryl Chloride	7791-25-5	*chloride, sulfur*	YES	NO	YES	YES
Tetrachloromethyl Sulfide		*chloride, sulfur*	YES	NO	YES	YES
Thermite		*aluminum, iron**	YES	YES	YES	YES
Thiophosgene	463-71-8	*chloride, sulfur*	YES	NO	YES	YES
Titanium Tetrachloride	7550-45-0	*chloride, titanium*	YES	NO	YES	YES
Trichloroacetyl Chloride	76-02-8	*chloride*	YES	NO	YES	YES
Trichloroacetyl Cyanide		*chloride, cyanide*	NO	NO	NO	NO
Trichlorohydrin	96-18-4	*chloride*	YES	NO	YES	YES
Xylyl Bromide	35884-77-6	*bromide*	NO	NO	NO	NO
Zinc Chloride mixture	7646-85-7	*chloride, zinc*	YES	NO	YES	YES
Zinc Oxide	1314-13-2	*zinc*	YES	YES	YES	YES

YES — **Presence of this compound cannot be ruled out.**

NO — **Presence of this compound not indicated.**

Shading indicates an exceedance of the RBC or the background of at least one of the indicator compounds if all were detected. The asterisk shows which indicator compound exceeded.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**AU12-(200,180)(0-6")**	**AU12-(200,200)(0-6")**	**AU12-(240,180)(0-6")**	**CDC-(130,140)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Acetyl Fluoride	557-99-3	*fluoride*	YES	YES	YES	YES
Allyl Isocyanide		*cyanide*	NO	NO	NO	NO
Allyl Isothiocyanate	57-06-7	*cyanide*	NO	NO	NO	NO
Aluminium Selenide	1302-82-5	*aluminium, selenium*	NO	YES	YES	NO
Ammonium Chloride	12125-02-09	*chloride, ammonia*	NO	YES	NO	NO
Ammonium Cyanide		*ammonia, cyanide*	NO	NO	NO	NO
Ammonium Nitrate	6484-52-2	*nitrate, ammonia*	NO	NO	NO	NO
Ammonium Picrate	131-74-8	*ammonia*	NO	YES	NO	NO
Arsenic Trichloride	7784-34-1	*chloride, arsenic**	YES	YES	YES	YES
Arsenic Trifluoride	7784-35-2	*fluoride, arsenic**	YES	YES	YES	YES
Arsenic Trioxide	1327-53-3	*arsenic**	YES	YES	YES	YES
Arsine	7784-42-1	*arsenic**	YES	YES	YES	YES
Barium Peroxide	1304-29-6	*barium*	YES	YES	YES	YES
Bromine	7726-95-6	*bromide*	NO	NO	NO	NO
Bromoketone	593-95-3	*bromide*	NO	NO	NO	NO
Bromoacetyl Bromide	598-21-0	*bromide*	NO	NO	NO	NO
Bromobenzyl Cyanide	5798-79-8	*bromide, cyanide*	NO	NO	NO	NO
Bromoxylyl Cyanide		*bromide, cyanide*	NO	NO	NO	NO
Cacodyl	144-21-8	*sodium*, arsenic**	NO	NO	NO	NO
Cacodyl Bromide		*bromide*	NO	NO	NO	NO
Cacodyl Chloride		*chloride*	YES	YES	YES	YES
Cacodyl Cyanide		*cyanide*	NO	NO	NO	NO
Cadmium Methyl		*cadmium*	NO	NO	NO	NO
Calcium Carbonate	471-34-1	*calcium**	YES	YES	YES	YES
Calcium Sulfate	7778-18-9	*sulfate, calcium**	YES	YES	YES	YES
Chlorine	7782-50-5	*chloride*	YES	YES	YES	YES
Cyanogen	460-19-5	*cyanide*	NO	NO	NO	NO
Cyanogen Bromide	506-68-3	*bromide, cyanide*	NO	NO	NO	NO
Cyanogen Chloride	506-77-4	*chloride, cyanide*	NO	NO	NO	NO
Dichloromethyl Ether	542-88-1	*chloride*	YES	YES	YES	YES
Dichloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Dichloropropyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Dimethylarsine	593-57-7	*arsenic**	YES	YES	YES	YES
Ethyl Sulfide	352-93-2	*sulfur*	YES	YES	YES	YES
Hydrochloric Acid	7647-01-0	*chloride*	YES	YES	YES	YES
Hydrocyanic Acid	74-90-8	*cyanide*	NO	NO	NO	NO
Hydrofluoric Acid	7664-39-3	*fluoride*	YES	YES	YES	YES
Hydrogen Selenide	7/5/7783	*selenium*	NO	YES	YES	NO
Lead Ferrocyanide		*lead, iron, cyanide*	NO	NO	NO	NO
Lead Peroxide	1309-60-0	*lead*	YES	YES	YES	YES
Lead Thiocyanate	592-87-0	*lead, cyanide*	NO	NO	NO	NO
Magnesium Arsenide		*magnesium, arsenic**	YES	YES	YES	YES
Magnesium Carbonate	546-93-0	*magnesium*	YES	YES	YES	YES

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**AU12-(200,180)(0-6")**	**AU12-(200,200)(0-6")**	**AU12-(240,180)(0-6")**	**CDC-(130,140)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Magnesium Oxide	1309-48-4	*magnesium*	YES	YES	YES	YES
Methyl Chloroarsine		*chloride, arsenic**	YES	YES	YES	YES
Methyl Isocyanide	593-75-9	*cyanide*	NO	NO	NO	NO
Methyl Selenide	593-79-3	*selenium*	NO	YES	YES	NO
Nickel Carbonyl	13463-39-3	*nickel*	YES	YES	YES	YES
Oxalyl Chloride	79-37-8	*chloride*	YES	YES	YES	YES
Phenylcarbylamine Chloride	622-44-6	*chloride*	YES	YES	YES	YES
Phosgene	75-44-5	*chloride*	YES	YES	YES	YES
Potassium Chlorate	3811-04-9	*chloride, potassium*	YES	YES	YES	YES
Potassium Nitrate	7757-79-1	*nitrate, potassium*	YES	NO	YES	NO
Potassium Perchlorate	7778-74-7	*potassium*	YES	YES	YES	YES
Potassium Permanganate	7722-64-7	*manganese, potassium*	YES	YES	YES	YES
Silicon	7440-21-3	*silicon*	YES	YES	YES	YES
Silicon Tetrachloride	409-21-2	*chloride, silicon*	YES	YES	YES	YES
Sodium Bicarbonate	144-55-8	*sodium**	NO	NO	NO	NO
Sodium Chlorate	7775-09-9	*chloride, sodium**	NO	NO	NO	NO
Sodium Cyanide	143-33-9	*sodium, cyanide*	NO	NO	NO	NO
Sodium Hydroxide	1310-73-2	*sodium**	NO	NO	NO	NO
Sodium Nitrate	7631-99-4	*nitrate, sodium*	NO	NO	NO	NO
Sodium Oleate	143-19-1	*sodium**	NO	NO	NO	NO
Sodium Silicate	6834-92-0	*sodium*, silicon*	NO	NO	NO	NO
Sodium Stearate	822-16-2	*sodium**	NO	NO	NO	NO
Stannic Chloride (Tin Tetrachloride)	7646-78-8	*chloride, tin*	NO	NO	YES	YES
Sulfur Chloride	10025-67-9	*chloride, sulfur*	YES	YES	YES	YES
Sulfur Trioxide	7446-11-9	*sulfur*	YES	YES	YES	YES
Sulfuryl Chloride	7791-25-5	*chloride, sulfur*	YES	YES	YES	YES
Tetrachloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Thermite		*aluminum, iron**	YES	YES	YES	YES
Thiophosgene	463-71-8	*chloride, sulfur*	YES	YES	YES	YES
Titanium Tetrachloride	7550-45-0	*chloride, titanium*	YES	YES	YES	YES
Trichloroacetyl Chloride	76-02-8	*chloride*	YES	YES	YES	YES
Trichloroacetyl Cyanide		*chloride, cyanide*	NO	NO	NO	NO
Trichlorohydrin	96-18-4	*chloride*	YES	YES	YES	YES
Xylyl Bromide	35884-77-6	*bromide*	NO	NO	NO	NO
Zinc Chloride mixture	7646-85-7	*chloride, zinc*	YES	YES	YES	YES
Zinc Oxide	1314-13-2	*zinc*	YES	YES	YES	YES

YES — **Presence of this compound cannot be ruled out.**

NO — **Presence of this compound not indicated.**

Shading indicates an exceedance of the RBC or the background of at least one of the indicator compounds if all were detected. The asterisk shows which indicator compound exceeded.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**CDC-(140,160)(0-6")**	**CDC-(150,140)(0-6")**	**CDC-(160,150)(0-6")**	**CDC-(170,150)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Acetyl Fluoride	557-99-3	*fluoride*	YES	YES	YES	YES
Allyl Isocyanide		*cyanide*	NO	NO	NO	NO
Allyl Isothiocyanate	57-06-7	*cyanide*	NO	NO	NO	NO
Aluminium Selenide	1302-82-5	*aluminium, selenium*	NO	NO	NO	NO
Ammonium Chloride	12125-02-09	*chloride, ammonia*	NO	NO	NO	NO
Ammonium Cyanide		*ammonia, cyanide*	NO	NO	NO	NO
Ammonium Nitrate	6484-52-2	*nitrate, ammonia*	NO	NO	NO	NO
Ammonium Picrate	131-74-8	*ammonia*	NO	NO	NO	NO
Arsenic Trichloride	7784-34-1	*chloride, arsenic**	YES	YES	YES	YES
Arsenic Trifluoride	7784-35-2	*fluoride, arsenic**	YES	YES	YES	YES
Arsenic Trioxide	1327-53-3	*arsenic**	YES	YES	YES	YES
Arsine	7784-42-1	*arsenic**	YES	YES	YES	YES
Barium Peroxide	1304-29-6	*barium*	YES	YES	YES	YES
Bromine	7726-95-6	*bromide*	NO	NO	NO	NO
Bromoketone	593-95-3	*bromide*	NO	NO	NO	NO
Bromoacetyl Bromide	598-21-0	*bromide*	NO	NO	NO	NO
Bromobenzyl Cyanide	5798-79-8	*bromide, cyanide*	NO	NO	NO	NO
Bromoxylyl Cyanide		*bromide, cyanide*	NO	NO	NO	NO
Cacodyl	144-21-8	*sodium*, arsenic**	YES	NO	NO	NO
Cacodyl Bromide		*bromide*	NO	NO	NO	NO
Cacodyl Chloride		*chloride*	YES	YES	YES	YES
Cacodyl Cyanide		*cyanide*	NO	NO	NO	NO
Cadmium Methyl		*cadmium*	NO	NO	NO	NO
Calcium Carbonate	471-34-1	*calcium**	YES	YES	YES	YES
Calcium Sulfate	7778-18-9	*sulfate, calcium**	YES	YES	YES	YES
Chlorine	7782-50-5	*chloride*	YES	YES	YES	YES
Cyanogen	460-19-5	*cyanide*	NO	NO	NO	NO
Cyanogen Bromide	506-68-3	*bromide, cyanide*	NO	NO	NO	NO
Cyanogen Chloride	506-77-4	*chloride, cyanide*	NO	NO	NO	NO
Dichloromethyl Ether	542-88-1	*chloride*	YES	YES	YES	YES
Dichloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Dichloropropyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Dimethylarsine	593-57-7	*arsenic**	YES	YES	YES	YES
Ethyl Sulfide	352-93-2	*sulfur*	YES	YES	YES	YES
Hydrochloric Acid	7647-01-0	*chloride*	YES	YES	YES	YES
Hydrocyanic Acid	74-90-8	*cyanide*	NO	NO	NO	NO
Hydrofluoric Acid	7664-39-3	*fluoride*	YES	YES	YES	YES
Hydrogen Selenide	7/5/7783	*selenium*	NO	NO	NO	NO
Lead Ferrocyanide		*lead, iron, cyanide*	NO	NO	NO	NO
Lead Peroxide	1309-60-0	*lead*	YES	YES	YES	YES
Lead Thiocyanate	592-87-0	*lead, cyanide*	NO	NO	NO	NO
Magnesium Arsenide		*magnesium, arsenic**	YES	YES	YES	YES
Magnesium Carbonate	546-93-0	*magnesium*	YES	YES	YES	YES

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**CDC-(140,160)(0-6")**	**CDC-(150,140)(0-6")**	**CDC-(160,150)(0-6")**	**CDC-(170,150)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Magnesium Oxide	1309-48-4	*magnesium*	YES	YES	YES	YES
Methyl Chloroarsine		*chloride, arsenic**	YES	YES	YES	YES
Methyl Isocyanide	593-75-9	*cyanide*	NO	NO	NO	NO
Methyl Selenide	593-79-3	*selenium*	NO	NO	NO	NO
Nickel Carbonyl	13463-39-3	*nickel*	YES	YES	YES	YES
Oxalyl Chloride	79-37-8	*chloride*	YES	YES	YES	YES
Phenylcarbylamine Chloride	622-44-6	*chloride*	YES	YES	YES	YES
Phosgene	75-44-5	*chloride*	YES	YES	YES	YES
Potassium Chlorate	3811-04-9	*chloride, potassium*	YES	YES	YES	YES
Potassium Nitrate	7757-79-1	*nitrate, potassium*	NO	NO	NO	NO
Potassium Perchlorate	7778-74-7	*potassium*	YES	YES	YES	YES
Potassium Permanganate	7722-64-7	*manganese, potassium*	YES	YES	YES	YES
Silicon	7440-21-3	*silicon*	YES	YES	YES	YES
Silicon Tetrachloride	409-21-2	*chloride, silicon*	YES	YES	YES	YES
Sodium Bicarbonate	144-55-8	*sodium**	YES	NO	NO	NO
Sodium Chlorate	7775-09-9	*chloride, sodium**	YES	NO	NO	NO
Sodium Cyanide	143-33-9	*sodium, cyanide*	NO	NO	NO	NO
Sodium Hydroxide	1310-73-2	*sodium**	YES	NO	NO	NO
Sodium Nitrate	7631-99-4	*nitrate, sodium*	NO	NO	NO	NO
Sodium Oleate	143-19-1	*sodium**	YES	NO	NO	NO
Sodium Silicate	6834-92-0	*sodium*, silicon*	YES	NO	NO	NO
Sodium Stearate	822-16-2	*sodium**	YES	NO	NO	NO
Stannic Chloride (Tin Tetrachloride)	7646-78-8	*chloride, tin*	YES	NO	YES	YES
Sulfur Chloride	10025-67-9	*chloride, sulfur*	YES	YES	YES	YES
Sulfur Trioxide	7446-11-9	*sulfur*	YES	YES	YES	YES
Sulfuryl Chloride	7791-25-5	*chloride, sulfur*	YES	YES	YES	YES
Tetrachloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Thermite		*aluminum, iron**	YES	YES	YES	YES
Thiophosgene	463-71-8	*chloride, sulfur*	YES	YES	YES	YES
Titanium Tetrachloride	7550-45-0	*chloride, titanium*	YES	YES	YES	YES
Trichloroacetyl Chloride	76-02-8	*chloride*	YES	YES	YES	YES
Trichloroacetyl Cyanide		*chloride, cyanide*	NO	NO	NO	NO
Trichlorohydrin	96-18-4	*chloride*	YES	YES	YES	YES
Xylyl Bromide	35884-77-6	*bromide*	NO	NO	NO	NO
Zinc Chloride mixture	7646-85-7	*chloride, zinc*	YES	YES	YES	YES
Zinc Oxide	1314-13-2	*zinc*	YES	YES	YES	YES

YES — **Presence of this compound cannot be ruled out.**

NO — **Presence of this compound not indicated.**

Shading indicates an exceedance of the RBC or the background of at least one of the indicator compounds if all were detected. The asterisk shows which indicator compound exceeded.

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**AU12-(160,100)(0-6")**	**CDC-(120,170)(0-6")**	**CDC-(70,190)(0-6")**	**CDC-(80,210)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Acetyl Fluoride	557-99-3	*fluoride*	YES	YES	YES	YES
Allyl Isocyanide		*cyanide*	NO	NO	YES	NO
Allyl Isothiocyanate	57-06-7	*cyanide*	NO	NO	YES	NO
Aluminium Selenide	1302-82-5	*aluminium, selenium*	YES	YES	YES	YES
Ammonium Chloride	12125-02-09	*chloride, ammonia*	NO	NO	NO	NO
Ammonium Cyanide		*ammonia, cyanide*	NO	NO	NO	NO
Ammonium Nitrate	6484-52-2	*nitrate, ammonia*	NO	NO	NO	NO
Ammonium Picrate	131-74-8	*ammonia*	NO	NO	NO	NO
Arsenic Trichloride	7784-34-1	*chloride, arsenic**	YES	YES	YES	YES
Arsenic Trifluoride	7784-35-2	*fluoride, arsenic**	YES	YES	YES	YES
Arsenic Trioxide	1327-53-3	*arsenic**	YES	YES	YES	YES
Arsine	7784-42-1	*arsenic**	YES	YES	YES	YES
Barium Peroxide	1304-29-6	*barium*	YES	YES	YES	YES
Bromine	7726-95-6	*bromide*	NO	NO	NO	NO
Bromoketone	593-95-3	*bromide*	NO	NO	NO	NO
Bromoacetyl Bromide	598-21-0	*bromide*	NO	NO	NO	NO
Bromobenzyl Cyanide	5798-79-8	*bromide, cyanide*	NO	NO	NO	NO
Bromoxylyl Cyanide		*bromide, cyanide*	NO	NO	NO	NO
Cacodyl	144-21-8	*sodium*, arsenic**	NO	NO	NO	NO
Cacodyl Bromide		*bromide*	NO	NO	NO	NO
Cacodyl Chloride		*chloride*	YES	YES	YES	YES
Cacodyl Cyanide		*cyanide*	NO	NO	YES	NO
Cadmium Methyl		*cadmium*	NO	NO	NO	NO
Calcium Carbonate	471-34-1	*calcium**	YES	YES	YES	YES
Calcium Sulfate	7778-18-9	*sulfate, calcium**	YES	YES	YES	YES
Chlorine	7782-50-5	*chloride*	YES	YES	YES	YES
Cyanogen	460-19-5	*cyanide*	NO	NO	YES	NO
Cyanogen Bromide	506-68-3	*bromide, cyanide*	NO	NO	NO	NO
Cyanogen Chloride	506-77-4	*chloride, cyanide*	NO	NO	YES	NO
Dichloromethyl Ether	542-88-1	*chloride*	YES	YES	YES	YES
Dichloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Dichloropropyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Dimethylarsine	593-57-7	*arsenic**	YES	YES	YES	YES
Ethyl Sulfide	352-93-2	*sulfur*	YES	YES	YES	YES
Hydrochloric Acid	7647-01-0	*chloride*	YES	YES	YES	YES
Hydrocyanic Acid	74-90-8	*cyanide*	NO	NO	YES	NO
Hydrofluoric Acid	7664-39-3	*fluoride*	YES	YES	YES	YES
Hydrogen Selenide	7/5/7783	*selenium*	YES	YES	YES	YES
Lead Ferrocyanide		*lead, iron, cyanide*	NO	NO	YES	NO
Lead Peroxide	1309-60-0	*lead*	YES	YES	YES	YES
Lead Thiocyanate	592-87-0	*lead, cyanide*	NO	NO	YES	NO
Magnesium Arsenide		*magnesium, arsenic**	YES	YES	YES	YES
Magnesium Carbonate	546-93-0	*magnesium*	YES	YES	YES	YES

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

AU Lot 12 and CDC Locations

(Only 16 of the 32 samples were run for the full AUES List)

Analyses performed by Southwest Research Institute			**AU12-(160,100)(0-6")**	**CDC-(120,170)(0-6")**	**CDC-(70,190)(0-6")**	**CDC-(80,210)(0-6")**
COMPOUND	CAS No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
	Chemical Abstract Service No.					
Magnesium Oxide	1309-48-4	*magnesium*	YES	YES	YES	YES
Methyl Chloroarsine		*chloride, arsenic**	YES	YES	YES	YES
Methyl Isocyanide	593-75-9	*cyanide*	NO	NO	YES	NO
Methyl Selenide	593-79-3	*selenium*	YES	YES	YES	YES
Nickel Carbonyl	13463-39-3	*nickel*	YES	YES	YES	YES
Oxalyl Chloride	79-37-8	*chloride*	YES	YES	YES	YES
Phenylcarbylamine Chloride	622-44-6	*chloride*	YES	YES	YES	YES
Phosgene	75-44-5	*chloride*	YES	YES	YES	YES
Potassium Chlorate	3811-04-9	*chloride, potassium*	YES	YES	YES	YES
Potassium Nitrate	7757-79-1	*nitrate, potassium*	YES	YES	YES	YES
Potassium Perchlorate	7778-74-7	*potassium*	YES	YES	YES	YES
Potassium Permanganate	7722-64-7	*manganese, potassium*	YES	YES	YES	YES
Silicon	7440-21-3	*silicon*	YES	YES	YES	YES
Silicon Tetrachloride	409-21-2	*chloride, silicon*	YES	YES	YES	YES
Sodium Bicarbonate	144-55-8	*sodium**	NO	NO	NO	NO
Sodium Chlorate	7775-09-9	*chloride, sodium**	NO	NO	NO	NO
Sodium Cyanide	143-33-9	*sodium, cyanide*	NO	NO	NO	NO
Sodium Hydroxide	1310-73-2	*sodium**	NO	NO	NO	NO
Sodium Nitrate	7631-99-4	*nitrate, sodium*	NO	NO	NO	NO
Sodium Oleate	143-19-1	*sodium**	NO	NO	NO	NO
Sodium Silicate	6834-92-0	*sodium*, silicon*	NO	NO	NO	NO
Sodium Stearate	822-16-2	*sodium**	NO	NO	NO	NO
Stannic Chloride (Tin Tetrachloride)	7646-78-8	*chloride, tin*	YES	YES	YES	YES
Sulfur Chloride	10025-67-9	*chloride, sulfur*	YES	YES	YES	YES
Sulfur Trioxide	7446-11-9	*sulfur*	YES	YES	YES	YES
Sulfuryl Chloride	7791-25-5	*chloride, sulfur*	YES	YES	YES	YES
Tetrachloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES
Thermite		*aluminum, iron**	YES	YES	YES	YES
Thiophosgene	463-71-8	*chloride, sulfur*	YES	YES	YES	YES
Titanium Tetrachloride	7550-45-0	*chloride, titanium*	YES	YES	YES	YES
Trichloroacetyl Chloride	76-02-8	*chloride*	YES	YES	YES	YES
Trichloroacetyl Cyanide		*chloride, cyanide*	NO	NO	YES	NO
Trichlorohydrin	96-18-4	*chloride*	YES	YES	YES	YES
Xylyl Bromide	35884-77-6	*bromide*	NO	NO	NO	NO
Zinc Chloride mixture	7646-85-7	*chloride, zinc*	YES	YES	YES	YES
Zinc Oxide	1314-13-2	*zinc*	YES	YES	YES	YES

YES — **Presence of this compound cannot be ruled out.**

NO — **Presence of this compound not indicated.**

Shading indicates an exceedance of the RBC or the background of at least one of the indicator compounds if all were detected. The asterisk shows which indicator compound exceeded.

RBC KEY

Note: In accordance with standard Risk Assessment practice, Risk-Based Concentrations (RBCs) for structurally, chemically, or toxicologically similar chemicals were used for those chemicals that did not have RBCs. For this investigation, these included the following:

RBC for 1,3-Dichloropropene was used for CIS and TRANS-1,3-Dichloropropene
RBC for Hexane was used for Cyclohexane and Methylcyclohexane
RBC for Acetone was used for Bromoacetone and Chloroacetone
RBC for Carbon Disulfide was used for Chlorinated Carbon Disulfide
RBC for Ethyl Acetate was used for Ethyl Bromoacetate and Ethyl Dibromoacetate
RBC for Beta-Chloronaphthalene was used for 2-Chloronaphthalene (same chemical)
RBC for 4-Nitrophenol was used for 2-Nitrophenol
RBC for Acenapthene was used for Acenaphthylene
RBC for Dibutylphthalate was used for Di-N-Butylphthalate (same chemical)
RBC for Dioctylphthalate was used for Di-N-Octylphthalate (same chemical)
RBC for Alpha-HCH was used for Alpha-Lindane (same chemical)
RBC for Chromium III was used for Chromium
RBC for Cyanide (Free) was used for Cyanide
For Lead, the USEPA recommended residential land use screening level of 400 ppm was used.

Attachment A

Quality Assurance Report

QUALITY ASSURANCE SUMMARY REPORT FOR

SOIL SAMPLES ASSOCIATED WITH SPRING VALLEY OU-4, AU 12/CDC, AUES LIST SAMPLING (WMP AMENDMENT 1)

INTRODUCTION

This data validation summary report covers environmental soil samples collected from Spring Valley OU-4 American University (AU) Lot 12 and Child Development Center (CDC) locations in Washington, DC. These samples were included in laboratory Sample Delivery Groups 157595 and 157615. The samples were analyzed for Full Scan Parameters including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), adamsite, mustard degradation or breakdown products, lewisite degradation products, trinitrotoluene, metals, ions (bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate) and selected wet chemistry parameters (ammonia and total cyanide). VOC and SVOC analyses included tentatively identified compounds (TICs).

All work was performed in accordance with the OU-4 Work Management Plan (WMP) prepared by Parsons and amended *(Revised Final Amendment 1, February 19, 2001)*. The WMP included a Quality Assurance Project Plan (QAPjP) that was prepared and approved for use to ensure generation of legally defensible data. Southwest Research Institute of San Antonio, Texas, following procedures outlined in the QAPjP and the WMP, performed all analyses with the exception of adamsite, which was analyzed by the Army's Edgewood Chemical and Biological Command (ECBC) laboratory.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and validated following the guidelines described in the QAPjP and consistent with Region III modifications to the USEPA Functional Guidelines for Evaluating Organic and Inorganic Data. All information included in the data packages have been reviewed and validated including sample results, laboratory quality control results, chain-of-custody forms and all supporting raw data.

This report addresses only those problems affecting the usability of the data. A discussion of data validation qualifiers (flags) applied to the data and reasons for the qualifiers is also presented.

Deviations from the QAPjP or the analytical methods and a discussion of the overall usability of the data are also presented in the summary section of this report. QC problems leading to qualifying of data as unusable or rejected are presented in the Major Problems section. QA/QC problems leading to qualifying of data as estimated or not detected are presented in the Minor Problems section. Details concerning samples and target analytes affected are also presented.

SUMMARY

This section of this report discusses deviations from the QAPjP, other laboratory problems, QC problems leading to qualifying of data as rejected, estimated or not detected and the overall usability of the data.

Except as indicated in this report, the samples were collected, prepared and analyzed following the procedures described in the WMP and the QAPjP. Except as indicated in this report, all samples were prepared and analyzed within the specified holding times using the EPA-approved analytical procedures. The types and number of field and laboratory QC samples collected and analyzed met the QA objectives specified in the QAPjP.

Major QA/QC problems leading to rejection of data were found during validation of the data for some samples for VOC, SVOC and wet chemistry parameters. Details regarding the samples and analytes affected and the magnitude of the problems are presented in the Major Problems section.

Minor QA/QC problems leading to qualifying of data as estimated or not detected included: laboratory blank contamination; accuracy (% recovery) outliers, precision outliers, surrogate outliers, internal standard outliers and reported detections less than the project reporting limit (PRL). Details concerning these QC problems are presented in the Minor Problems section.

MAJOR PROBLEMS

As indicated above major problems were found during validation of the data for this SDG. The parameters affected are VOC, SVOC and wet chemistry (phosphate and fluoride). The major problem affecting the VOC and SVOC analyses involved extremely poor internal standard outliers. The major problem affecting the wet chemistry parameter involved extremely poor percent recoveries associated with the MS/MSD samples. Details regarding these problems are presented below by parameter.

Volatile Organic Compounds (VOCs)

The following samples for VOC analysis reported extremely poor internal standard area counts for at least one of the four required internal standards: OU4-CDC-SB-B (4'), OU4-AU12 (140,160)(0-6), OU4-CDC (130,190)(0-6), OU4-CDC (140,160)(0-6), OU4-CDC (150,140)(0-6), OU4-CDC (160,140)(0-6), OU4-CDC (160,130)(0-6), OU4-CDC (160,150)(0-6), OU4-CDC (170,150)(0-6), OU4-AU12 (160,100)(0-6), OU4-CDC (120,170)(0-6), OU4-CDC (130,120)(0-6), OU4-CDC (170,140)(0-6), OU4-CDC (220,150)(0-6), OU4-CDC (70,190)(0-6), OU4-CDC (80,170)(0-6) and OU4-CDC (80,210)(0-6).

The two internal standards affected are chlorobenzene-d5 and 1,4-dichlorobenzene. The reported internal standard area count for the affected internal standard was less than 50% of the required lower control limit. The laboratory attributed the problem to matrix interferences in the sample. Some of the affected samples were reanalyzed, outside of holding time, with similar results. Results for the reanalyses are not reported in the data summary tables. All reported nondetects (laboratory qualified 'U') for target VOCs assigned to the affected internal standard (for quantitation) have been requalified as unusable (rejected) and flagged 'R'. Reported detections for target analytes assigned to the affected internal standards have been qualified as estimated and flagged 'J'.

Semivolatile Organic Compounds (SVOCs)

The following samples for SVOC analysis reported extremely poor internal standard area counts for one of the six required internal standards: OU4-CDC (130,120)(0-6), OU4-CDC (160,130)(0-6), OU4-CDC (160,140)(0-6), OU4-CDC

(170,150(0-6), OU4-CDC (170,140)(0-6), OU4-CDC (220,150)(0-6), OU4-CDC (70,190)(0-6), OU4-CDC (80,170)(0-6) and OU4-CDC (80,210)(0-6).

The only internal standard affected is perylene-d12. The reported internal standard area count for the affected internal standard was less than 50% of the required lower control limit. The laboratory attributed the problem to matrix interferences in the sample. All reported nondetects (laboratory qualified 'U') for target SVOCs assigned to the affected internal standard (for quantitation) have been requalified as unusable (rejected) and flagged 'R'. Reported detections for target analytes assigned (for purposes of quantitation) to the affected internal standards have been qualified as estimated and flagged 'J'.

Wet Chemistry

The laboratory reported no (0%) percent recovery for target analytes phosphate and fluoride for the MS/MSD samples associated with some of the samples. All reported nondetects for these analytes in the associated samples have been qualified as unusable (rejected) and flagged 'R'. Reported detections for these analytes have been qualified as estimated and flagged 'J'.

MINOR PROBLEMS

This section of the QA summary report discusses QC problems leading to qualifying of data as estimated. The "J" qualifier is used to indicate estimated results. The flag indicates that the analyte was positively identified but the associated value may be imprecise due to at least one minor QA/QC problem. When the bias could be determined the 'L' (low bias) or 'K' (high bias) qualifiers have been added to the data.

As indicated above, QC problems leading to qualifying of data as estimated included laboratory blank contamination, accuracy outliers, internal standard outliers and reported detections less than the PRL. Details concerning these problems are presented below by analytical parameter.

Volatile Organic Compounds (VOCs)

- The reported detections for the following VOC target analytes were less than the PRL and should be considered estimated (flagged 'J'): methyl acetate and benzene.

- The laboratory reported internal standard area outliers for the following soil samples: OU4-CDC-SB-A (4'), OU4-AU12 (180,200)(0-6), OU4-AU12 (180,220)(0-6), OU4-AU12 (200,180)(0-6), OU4-AU12 (200,200)(0-6), OU4-CDC (130,140)(0-6), OU4-CDC (140,160)(0-6), OU4-CDC (140,160)(0-6), OU4-CDC (150,140)(0-6), OU4-CDC (150,150)(0-6), OU4-CDC (160,130)(0-6) and OU4-CDC (160,150)(0-6). All reported results for the samples have been qualified as estimated (flagged 'UJ/J').

- The laboratory reported that several samples contained target VOCs at concentrations above the calibration range for the method. The affected results have been qualified as estimated and flagged 'J'. Target VOCs affected are dichlorodifluoromethane, acetone and carbon disulfide.

- Target VOC acetone was detected in at least one blank associated with some of the samples. Some reported results for acetone in associated samples have been requalified as estimated and may be biased high and flagged 'B/JB' due to the blank contamination.

- Surrogate percent recovery outliers were reported for sample OU4-CDC-SB-B (4'). Outliers were reported for all three of the VOC surrogates. Two of the reported recoveries were above the control limit and the other was below the control limit for the respective surrogate. All reported results for this sample have been qualified as estimated and flagged 'J/UJ'.

- Calibration outliers were reported for target VOCs 1,1-dichloroethene and chloroform. The percent difference for the continuing calibration check associated with some of the samples exceeded the control limit. All reported results for these analytes in the affected samples have been qualified as estimated and flagged 'J/UJ'.

- Some of the TICs reported in the samples were also detected in the associated laboratory blanks. The affected results have been requalified as estimated and may be biased high and flagged 'B/JB' due to the blank contamination.

Semivolatile Organic Compounds (SVOCs)

- Reported detections less than the PRL have been requalified as estimated and flagged "J". Target analytes affected include 2-methylnaphthalene, acenaphthylene, benzyl alcohol, naphthalene, benzoic acid, diethylphthalate, phenanthrene, fluoranthene, pyrene, benzo (a) anthracene, chrysene, bis (2-ethylhexyl) phthalate, di-n-octylphthalate, benzo (b) fluoranthene, benzo (k) fluoranthene, indeno (1,2,3-cd) pyrene and benzo (a) pyrene.

- The laboratory reported internal standard outliers for the following samples OU4-AU12 (180,200)(0-6), OU4-AU12 (180,220)(0-6), OU4-CDC (130,140)(0-6), OU4-CDC (130,190)(0-6), OU4-CDC (140,160)(0-6), OU4-CDC (150,140)(0-6), OU4-CDC (150,150)(0-6), OU4-CDC (160,130)(0-6), OU4-CDC (160,140)(0-6), OU4-CDC (160,150)(0-6), OU4-CDC (170,150)(0-6), OU4-CDC (130,120)(0-6), OU4-CDC (170,140)(0-6), OU4-CDC (220,150)(0-6), OU4-CDC (70,190)(0-6) and OU4-CDC (80,210)(0-6). The reported results for the affected sample have been qualified as estimated and flagged 'UJ/J' due to the internal standard outliers. Only the target SVOCs quantitated using the affected internal standard have been qualified. The SVOC internal standards affected are chrysene-d12 and perylene-d12.

- Several target SVOCs were detected in the laboratory blanks associated with some of the soil samples. The affected SVOCs are di-n-butylphthalate and bis (2-ethylhexyl) phthalate. Reported results for these analytes in the associated samples have been requalified as estimated, may be biased high, and flagged 'B/JB' due to the blank contamination. Some SVOC TICs were also detected in the associated laboratory blanks and have been requalified as estimated and may be biased high and flagged 'JNB' due to the blank contamination.

Mustard Degradation Products

- Some reported Thiodiglycol detections were less than the PRL and have been qualified as estimated and flagged 'J'.

Metals

- Accuracy (matrix spike percent recovery) outliers were reported for target metals antimony, cobalt and sulfur for some of the MS/MSD samples. The reported recoveries were below the control limit for the metals (75-125%). The reported results for these metals in the affected samples are considered estimated and may be biased low; the true concentration may be higher than the value reported. The 'L/UL' qualifiers have been assigned to the affected results. Results with the 'L/UL' qualifiers are estimated and considered usable for most decision-making purposes, including risk assessment.

- Accuracy (matrix spike percent recovery) outliers were reported for target metals chromium and lead for some of the MS/MSD samples. The reported recoveries were above the control limit for the metals (75-125%). The reported results for these metals in the affected samples are considered estimated and may be biased high; the true concentration may be lower than the value reported. The 'K' qualifier has been assigned to the affected results. Results with the 'K' qualifier are estimated and considered usable for most decision-making purposes, including risk assessment.

- Precision (relative percent difference) outliers were reported for the following target metals: arsenic, beryllium, thallium, cobalt, lead, barium, iron and manganese. The reported results for these metals in the affected samples have been qualified as estimated and flagged 'J/UJ'.

Wet Chemistry Parameters

- Accuracy (matrix spike percent recovery) outliers were reported for target fluoride and phosphate for some of the MS/MSD samples. The reported recoveries were below the control limit for the target analytes (75-125%). The reported detections of these analytes in the affected samples are considered estimated and may be biased low; the true concentration may be

higher than the value reported. The 'L' qualifiers have been assigned to the affected results. Results with the 'L' qualifiers are estimated and considered usable for most decision-making purposes, including risk assessment.

- Accuracy (matrix spike percent recovery) outliers were reported for sulfate for some of the MS/MSD samples. The reported recoveries were above the control limit (75-125%). Reported detections of sulfate in the affected samples are considered estimated and may be biased high; the true concentration may be lower than the value reported. The 'K' qualifier has been assigned to the affected results. Results with the 'K' qualifier are estimated and considered usable for most decision-making purposes, including risk assessment.

DATA VALIDATION QUALIFIERS

U = The compound was analyzed for and is not present. The associated numerical value (Practical Quantitation Limit - PQL) indicates the approximate concentration necessary to quantify the compound in the sample.

UJ = A combination of the "U" and "J" flags. The compound was analyzed for and is not present. The associated numerical value (Practical Quantitation Limit - PQL) has been qualified as estimated due to a QC anomaly.

J = The compound was detected in the sample, but the reported result is “estimated” (could not be accurately quantified) either because the reported value is less than the PQL or at least one minor Quality Control (QC) problem was found during validation. Data with a “J” qualifier is considered usable for most decision-making purposes, including risk assessment.

K = The analyte was detected in the sample. The reported result is considered estimated and may be biased high due to a minor QA/QC problem. The true concentration present in the sample may be lower than the reported result. The data is considered estimated and usable for most decision-making purposes, including risk assessment.

L = The analyte was detected in the sample. The reported result is considered estimated and may be biased low due to a minor QA/QC problem. The true concentration present in the sample may be higher than the reported result. The data is considered estimated and usable for most decision-making purposes, including risk assessment.

NJ = This flag indicates presumptive evidence of a compound. It is only used for Tentatively Identified Compounds (TICs), where identification is based on a mass spectral library search. The 'N' is not applied to generic descriptions of a TIC, such as 'Unknown Hydrocarbon'. The 'J' flag indicates the reported numerical result is estimated.

JNB = This is a combination of the 'NJ' and 'B' flags. The 'B' indicates the compound was detected in a laboratory or field blank associated with the sample. The reported result should be considered estimated and biased high due to blank contamination.

R = The reported result is considered unusable and unreliable due to a major problem associated with the analysis of the sample or analyte. This qualifier implies no confidence in the reported result due to the problem found during validation. Resampling is recommended if the compound affected is critical to the decision-making process.

B = The analyte was also detected in a laboratory or field blank associated with the sample. The reported result is considered estimated and biased high due to the blank contamination.

Attachment B

AUES Chemicals List
(Presented at the end of the Sedgwick Trench Section)

REPORT OF ANALYTICAL RESULTS -

American University Experiment Station (AUES)
List Of Chemicals

SEDGWICK TRENCH AREA

SPRING VALLEY OPERABLE UNIT 5,
WASHINGTON, D.C.

TASK ORDER TO NATIONAL GUARD BUREAU
CONTRACT NO. DAHA90-94-D-0010, TASK ORDER DA01
DERP-FUDS HTRW PROJECT NUMBER C03DC091802

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared By:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

This document was originally published on APRIL 16, 2002
but has since been updated with revised RBC data

REPORT OF ANALYTICAL RESULTS

American University Experiment Station (AUES)
List Of Chemicals

SEDGWICK TRENCH AREA

SPRING VALLEY OPERABLE UNIT 5,
WASHINGTON, D.C.

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT

Prepared By:

PARSONS
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

This document was originally published on APRIL 16, 2002
but has since been updated with revised RBC data

Overview

In accordance with the *Final Work Plan for Sedgwick Trench Area Investigation (Parsons, March 2001),* Parsons collected five soil samples (four samples plus one duplicate sample) from the Sedgwick Trench bottom to assess for the presence of the American University Experiment Station (AUES) list of chemicals. All samples were analyzed by the Southwest Research Institute (SwRI), with the exception of mustard and adamsite, which were analyzed by the US Army's Edgewood Chemical and Biological Command (ECBC) Laboratory. This submittal is organized as follows:

Figure 1 shows the sample locations.

The results are compiled on five tables.

Table 1 is the comprehensive list of compounds analyzed. These include the routine Target Compound List and Target Analyte List constituents and the Chemical Warfare Materiel (CWM) compounds and CWM breakdown products that were analyzed to make determinations of whether the AUES List chemicals were present. Therefore, the table contains all compounds analyzed, whether they were actually on the AUES list or not.

Table 1A is the comprehensive list detections. It is a subset of Table 1. These are the compounds shown on Table 1 that were present in concentrations above the detection limit.

Table 2 is the AUES list of compounds. It is also a subset of Table 1, showing the results for those AUES chemicals that could be directly analyzed. Additionally, CWM breakdown products and the indicator compounds used in Table 3, although not actually AUES list compounds, are included. They are indicated on the table as either a 'breakdown product' or 'indicator' compound.

Table 2A is the AUES list detections. It is a subset of Table 2. These are the compounds shown on Table 2 that were present in concentrations above the detection limit. Additionally, CWM breakdown products and the indicator compounds, although not actually AUES list compounds, are included.

Table 3 is the AUES list scan results. These are the AUES chemicals that did not have routine analytical methodologies. The possible presence or absence of these chemicals was inferred by the presence or absence of indicator compounds for each AUES chemical.

RBC Key contains the rationale for the RBCs shown for those chemicals that did not have RBCs.

Attachment A contains the Quality Assurance or Data Validation Report of the sampling effort.

Attachment B contains the full AUES Chemicals list and the organization of the analytical effort, i.e., which compounds could be analyzed and by what methods.

Figure 1
AUES List of Chemicals
Sedgwick Trench
Sampling Locations

Spring Valley Operable Unit 5
Washington D.C.

Legend

- Trench Boring Locations
- 1928 Ground Scars
- 1927 Ground Scars
- 1922 Ground Scars
- 1918 Ground Scars
- POIs

Cut & Fill
- Cut
- Level
- Fill

- Buildings
- Roads
- Parcels
- Quadrant Sampling

N
W E
S

50 0 50 100 Feet

Scale:	1 : 1000
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.apr
Date:	02/12/2002
Figure Number:	1
Page Number:	X-X

PARSONS

Spring Valley OU-5
Sedgwick Trench Area
AUES List Analytical Plan

	Location	Depth (feet)	No. of Sx Collected	TAL Metals	TCL VOCs	TCL SVOCs	CWM/ ABPs	AUES List
Property								
5040 Sedgwick Street	\a	4.5-5.5	2[\c]	X	X	X	X	X
5054 Sedgwick Street	\b	3-5	1	X	X	X	X	X
5059 Sedgwick Street	\b	9-10	1	X	X	X	X	X
5065 Sedgwick Street	\a	2.5-4	1	X	X	X	X	X
Totals			5	5	5	5	5	5

\a outer trench location-see Figure 1
\b inner trench location-see Figure 1
\c includes a field duplicate

Notes:

CWM/ABPs = Includes Adamsite, and Mustard and Lewisite Agent Breakdown Products

Table 1

Comprehensive Sample Results for Sedgwick Trench

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Sedgwick Trench Area

SAMPLE ID:		**REGION III**			**5040TR-SB**		**5065TR-SBDUP01**		**5054TR-SB**		**5059TR-SB**		**5065TR-SB**	
TYPE or LOCATION:		**Residential**		**Metals**	**Trench Bottom**		**Dup of 5040**		**Trench Bottom**		**Trench Bottom**		**Trench Bottom**	
SAMPLE DEPTH:		**RBC**		**Back-**	**4.5'-5.5'**		**4.5'-5.5'**		**3'-5'**		**9'-10'**		**2.5'-4'**	
SAMPLING DATE:		*(adjusted*		**ground**[12]	**4/5/2001**		**4/5/2001**		**4/5/2001**		**4/5/2001**		**4/5/2001**	
Analyses performed by Southwest Research Institute		*downward)* [11]												
Volatile Organic Compounds - SW8260B (UG/KG)														
1,1,1-TRICHLOROETHANE		2,200,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
1,1,2,2,-TETRACHLOROETHANE		3,200	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		230,000,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
1,1,2-TRICHLOROETHANE		11,000	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,1-DICHLOROETHANE		780,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
1,1-DICHLOROETHENE		390,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
1,2,4-TRICHLOROBENZENE		78,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,2-DIBROMO-3-CHLOROPROPANE		460	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,2-DIBROMOETHANE		7.5	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,2-DICHLOROBENZENE		700,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,2-DICHLOROETHANE		7,000	C		1	U	1.1	U	1.3	U	1.1	U	1.1	U
1,2-DICHLOROPROPANE		9,400	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,3-DICHLOROBENZENE		230,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
1,4-DICHLOROBENZENE		27,000	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
2-BUTANONE (Methyl Ethyl Ketone, CAS# 78933)		4,700,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
2-HEXANONE		310,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)		630,000	N		1	UJ	1.1	UJ	2	J	1.1	UJ	1.1	UJ
ACETONE		780,000	N		1	B	2	B	3	B	2	B	2	B
ACETONITRILE		NA			5.2	U	5.3	U	6.3	U	5.4	U	5.3	U
ACROLEIN		160,000	N		5.2	U	5.3	U	6.3	U	5.4	U	5.3	U
BENZENE		12,000	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
BENZYL BROMIDE		NA			5.2	UJ	5.3	UJ	6.3	UJ	5.4	UJ	5.3	UJ
BENZYL CHLORIDE		3,800	C		5.2	UJ	5.3	UJ	6.3	UJ	5.4	UJ	5.3	UJ
BROMODICHLOROMETHANE		10,000	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
BROMOFORM		81,000	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
BROMOMETHANE		11,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
CARBON DISULFIDE		780,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
CARBON TETRACHLORIDE		4,900	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
CHLOROBENZENE		160,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
CHLOROETHANE		220,000	C		1	U	1.1	U	1.3	U	1.1	U	1.1	U
CHLOROFORM		78,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
CHLOROMETHANE		NA			1	U	1.1	U	1.3	U	1.1	U	1.1	U
CHLOROPICRIN		NA			26	UJ	27	UJ	32	UJ	27	UJ	27	UJ
CIS-1,2-DICHLOROETHENE		78,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
CIS-1,3-DICHLOROPROPENE		6,400 ‡	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
CYCLOHEXANE		470,000 ‡	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
DIBROMOCHLOROMETHANE		7,600	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
DICHLORODIFLUOROMETHANE		1,600,000	N		1	B	1.1	U	1.3	U	1	B	1	B
ETHYLBENZENE		780,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
ISOPROPYLBENZENE (CUMENE)		780,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
M&P-XYLENE		1,600,000	N		1	UJ	2	J	1.3	UJ	1.1	UJ	1.1	UJ
METHYL ACETATE		7,800,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
METHYL TERT-BUTYL ETHER		160,000	C		1	U	1.1	U	1.3	U	1.1	U	1.1	U
METHYLCYCLOHEXANE		470,000 ‡	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Sedgwick Trench Area

SAMPLE ID:	REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:	Residential		Metals	Trench Bottom		Dup of 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:	RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:	(adjusted		ground[12]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute	*downward)* [12]												
METHYLENE CHLORIDE	85,000	C		1	U	1.1	U	1.3	U	1.1	U	1.1	U
O-XYLENE	1,600,000	N		1	UJ	2	J	1.3	UJ	1.1	UJ	1.1	UJ
STYRENE	1,600,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
TETRACHLOROETHENE	32,000	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
TOLUENE	1,600,000	N		1	UJ	4	J	1.3	UJ	1.1	UJ	1.1	UJ
TRANS-1,2-DICHLOROETHENE	160,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
TRANS-1,3-DICHLOROPROPENE	6,400 ‡	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
TRICHLOROETHENE	1,600	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
TRICHLOROFLUOROMETHANE	2,300,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
VINYL CHLORIDE	90	C		1	U	1.1	U	1.3	U	1.1	U	1.1	U
VOC Tentatively Identified Compounds (UG/KG)													
1-NONENE, 4,6,8-TRIMETHYL-	NA				*		*		*	3	NJ		*
ALCOHOL	NA				*		*		*		*		*
ALLYL ALCOHOL	NA				*		*		*		*		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N		1	NJ	0.8	NJ	1	NJ		*		*
BENZYL IODIDE	NA				*		*		*		*		*
BROMOACETONE	780,000 ‡	N			*		*		*		*		*
BROMOBENZENE	NA				*		*		*		*		*
BROMOMETHYL ETHER	NA				*		*		*		*		*
BUTANE, 1,1-OXYBIS-	NA			1	NJ		*	0.9	NJ		*		*
BUTYL MERCAPTAN	NA				*		*		*		*		*
CHLORINATED ACETONE	NA				*		*		*		*		*
CHLORINATED CARBON DISULFIDE	780,000 ‡	N			*		*		*		*		*
CHLOROACETONE	780,000 ‡	N			*		*		*		*		*
CHLOROACETONITRILE	NA				*		*		*		*		*
CHLOROMETHYL ETHER	NA				*		*		*		*		*
CHLOROMETHYL ETHYL ETHER	NA				*		*		*		*		*
CROTONALDEHYDE	340	C			*		*		*		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA				*	1	NJ	3	NJ	7	NJ		*
ETHYL BROMOACETATE	7,000,000 ‡	N			*		*		*		*		*
ETHYL CHLOROFORMATE	NA				*		*		*		*		*
ETHYL DIBROMOACETATE	7,000,000 ‡	N			*		*		*		*		*
ETHYL MERCAPTAN	NA				*		*		*		*		*
FURAN, TETRAHYDRO-	84,000	C			*	1	NJ		*		*	1	NJ
METHYL BROMOACETATE	NA				*		*		*		*		*
METHYL CHLOROACETATE	NA				*		*		*		*		*
METHYL CHLOROFORMATE	NA				*		*		*		*		*
METHYL CHLOROSULFONATE	NA				*		*		*		*		*
PERCHLOROMETHYLMERCAPTAN	NA				*		*		*		*		*
PROPANE, OCTAFLUORO-	NA				*	2	NJ		*		*	2	NJ
THIOPHENE	NA				*		*		*		*		*
TRICHLOROACETONITRILE	NA				*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Sedgwick Trench Area

SAMPLE ID:	REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:	Residential		Metals	Trench Bottom		Dup of 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:	RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:	(adjusted		ground[12]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute	downward) [12]												
Semivolatile Organic Compounds - SW8270C (UG/KG)													
1,2,4-TRICHLOROBENZENE	78,000	N		82	U	73	U	76	U	81	U	74	U
1,2-DICHLOROBENZENE	700,000	N		82	U	73	U	76	U	81	U	74	U
1,3-DICHLOROBENZENE	230,000	N		82	U	73	U	76	U	81	U	74	U
1,4-DICHLOROBENZENE	27,000	C		82	U	73	U	76	U	81	U	74	U
2,4,5-TRICHLOROPHENOL	780,000	N		82	U	73	U	76	U	81	U	74	U
2,4,6-TRICHLOROPHENOL	58,000	C		82	U	73	U	76	U	81	U	74	U
2,4-DICHLOROPHENOL	23,000	N		82	U	73	U	76	U	81	U	74	U
2,4-DIMETHYLPHENOL	160,000	N		82	U	73	U	76	U	81	U	74	U
2,4-DINITROPHENOL	16,000	N		250	U	220	U	230	U	240	U	220	U
2,4-DINITROTOLUENE	16,000	N		82	U	73	U	76	U	81	U	74	U
2,6-DINITROTOLUENE	7,800	N		82	U	73	U	76	U	81	U	74	U
2-CHLORONAPHTHALENE (CAS# 91587)	630,000 ‡	N		82	U	73	U	76	U	81	U	74	U
2-CHLOROPHENOL	39,000	N		82	U	73	U	76	U	81	U	74	U
2-METHYLNAPHTHALENE (CAS# 91576)	160,000	N		82	U	73	U	76	U	81	U	74	U
2-METHYLPHENOL	390,000	N		82	U	73	U	76	U	81	U	74	U
2-NITROANILINE	NA			82	U	73	U	76	U	81	U	74	U
2-NITROPHENOL	63,000 ‡	N		82	U	73	U	76	U	81	U	74	U
3,3-DICHLOROBENZIDINE'	1,400	C		82	U	73	U	76	U	81	U	74	U
3-NITROANILINE (CAS# 99092)	2,300	N		82	U	73	U	76	U	81	U	74	U
4,6-DINITRO-2-METHYLPHENOL	780	N		82	U	73	U	76	U	81	U	74	U
4-BROMOPHENYL-PHENYLETHER	NA			82	U	73	U	76	U	81	U	74	U
4-CHLORO-3-METHYLPHENOL	NA			82	U	73	U	76	U	81	U	74	U
4-CHLOROANILINE	31,000	N		82	U	73	U	76	U	81	U	74	U
4-CHLOROPHENYL-PHENYLETHER	NA			82	U	73	U	76	U	81	U	74	U
4-METHYLPHENOL	39,000	N		82	U	73	U	76	U	81	U	74	U
4-NITROANILINE	32,000	C		82	U	73	U	76	U	81	U	74	U
4-NITROPHENOL	63,000	N		82	U	73	U	76	U	81	U	74	U
ACENAPHTHENE	470,000	N		82	U	73	U	76	U	81	U	74	U
ACENAPHTHYLENE	470,000 ‡	N		82	U	73	U	76	U	81	U	74	U
ANTHRACENE	2,300,000	N		82	U	73	U	75	J	81	U	74	U
BENZO[A]ANTHRACENE	870	C		82	U	73	U	340		81	U	74	U
BENZO[A]PYRENE	87	C		82	U	73	U	140		81	U	74	U
BENZO[B]FLUORANTHENE	870	C		82	U	73	U	300		81	U	74	U
BENZO[G,H,I]PERYLENE	NA			82	U	73	U	97		81	U	74	U
BENZO[K]FLUORANTHENE	8,700	C		82	U	73	U	130		81	U	74	U
BENZOIC ACID	31,000,000	N		250	U	220	U	230	U	240	U	220	U
BENZYL ALCOHOL	2,300,000	N		82	U	73	U	76	U	81	U	74	U
BIS(2-CHLOROETHOXY)METHANE	NA			82	U	73	U	76	U	81	U	74	U
BIS(2-CHLOROISOPROPYL)ETHER	9,100	C		82	U	73	U	76	U	81	U	74	U
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		82	U	73	U	51	J	81	U	74	U
BUTYLBENZYLPHTHALATE	1,600,000	N		82	U	73	U	76	U	81	U	74	U
CARBAZOLE	32,000	C		82	U	73	U	76	U	81	U	74	U
CHRYSENE	87,000	C		82	U	73	U	160		81	U	74	U
DIBENZ[A,H]ANTHRACENE	87	C		82	U	73	U	34	J	81	U	74	U
DIBENZOFURAN	16,000	N		82	U	73	U	76	U	81	U	74	U

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Sedgwick Trench Area

SAMPLE ID:		REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:		Residential		Metals	Trench Bottom		Dup of 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:		RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:		(adjusted		ground[12]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute		downward) [12]												
DIETHYLPHTHALATE		6,300,000	N		82	U	73	U	76	U	81	U	74	U
DIMETHYLPHTHALATE		78,000,000	N		82	U	73	U	76	U	81	U	74	U
DI-N-BUTYLPHTHALATE		780,000 ‡	N		10	B	73	U	76	U	81	U	74	U
DI-N-OCTYLPHTHALATE		160,000 ‡	N		82	U	73	U	76	U	81	U	74	U
FLUORANTHENE		310,000	N		82	U	73	U	650		81	U	74	U
FLUORENE		310,000	N		82	U	73	U	76	U	81	U	74	U
HEXACHLOROBENZENE		400	C		82	U	73	U	76	U	81	U	74	U
HEXACHLOROBUTADIENE		8,200	C		82	U	73	U	76	U	81	U	74	U
HEXACHLOROCYCLOPENTADIENE		47,000	N		82	U	73	U	76	U	81	U	74	U
HEXACHLOROETHANE		46,000	C		82	U	73	U	76	U	81	U	74	U
INDENO[1,2,3-CD]PYRENE		870	C		82	U	73	U	120		81	U	74	U
ISOPHORONE		670,000	C		82	U	73	U	76	U	81	U	74	U
NAPHTHALENE		160,000	N		82	U	73	U	76	U	81	U	74	U
NITROBENZENE		3,900	N		82	U	73	U	76	U	81	U	74	U
N-NITROSO-DI-N-PROPYLAMINE		NA			82	U	73	U	76	U	81	U	74	U
N-NITROSODIPHENYLAMINE		130,000	C		82	U	73	U	76	U	81	U	74	U
O-CHLORONITROBENZENE		26,000	C		82	U	73	U	76	U	81	U	74	U
PENTACHLOROPHENOL		5,300	C		82	U	73	U	76	U	81	U	74	U
PHENANTHRENE		NA			82	U	73	U	270		81	U	74	U
PHENOL		2,300,000	N		82	U	73	U	76	U	81	U	74	U
PHENYL HYDRAZINE		NA			82	U	73	U	76	U	81	U	74	U
PHENYL ISOCYANATE		NA			82	U	73	U	76	U	81	U	74	U
PHENYL ISOTHIOCYANATE		NA			82	U	73	U	76	U	81	U	74	U
PYRENE		230,000	N		82	U	73	U	450		81	U	74	U
SVOC Tentatively Identified Compounds (UG/KG)														
1-EICOSANOL		NA				*		*		*	160	NJ		*
1-NONADECANOL		NA				*	110	NJ		*		*	110	NJ
1-OCTADECENE		NA				*		*	480	NJ		*		*
BENZO(E)PYRENE (CAS# 192-97-2)		NA				*		*	46	NJ		*		*
BENZOTRICHLORIDE		NA				*		*		*		*		*
BENZYL FLUORIDE		NA				*		*		*		*		*
DIPHENYLCHLOROARSINE		NA				*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA				*		*		*		*		*
o-TOLYL ISOCYANIDE		NA				*		*		*		*		*
PHENYL ISOCYANIDE		NA				*		*		*		*		*
PHENYLDICHLOROARSINE		NA				*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Sedgwick Trench Area

SAMPLE ID:		REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:		Residential		Metals	Trench Bottom		Dup of 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:		RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:		(adjusted		ground[12]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute		downward) [12]												
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	13100		16100		18800		12600		14800	
ANTIMONY		**3.1**	N	0.92	1.2	UJ	1.1	UJ	1	UJ	1.1	UJ	0.97	UJ
ARSENIC		0.43	C	**12.64**	2.2		0.62		1.1		1.3		0.7	
BARIUM		**550**	N	298.28	62.4		75.4		85.4		66.5		74.6	
BERYLLIUM		**16**	N	2.35	1.1		1.6		2.1		1.6		1.5	
CADMIUM		**7.8**	N	0.32	0.59	U	0.55	U	0.52	U	0.57	U	0.49	U
CALCIUM		NA		**4,207**	171		296		448		265		306	
CHROMIUM		**12,000** [‡]	N	97.20	26.5		20.6		20.3		26.4		21.4	
HEXAVALENT CHROMIUM		**23**	N	NA	0.488	U	0.436	U	0.449	U	0.466	U	0.432	U
COBALT		**160**	N	22.26	10.9		18		15.5		21.1		14.4	
COPPER		**310**	N	47.76	31.4		29.2		38.2		34.1		27.9	
IRON		2,300	N	**31,951**	26800		19600		18000		24200		19400	
LEAD		**400** [‡]		329.76	11.1		10.1		5		12.8		7.4	
MAGNESIUM		NA		**7,093**	5010		7490		7440		6170		7410	
MANGANESE		160	N	**1,251**	177	K	602	K	438	K	460	K	384	K
MERCURY (by CVAA)		NA		**0.29**	0.06	U	0.05	U	0.05	U	0.05		0.04	U
NICKEL		**160**	N	40.12	22.5		32.4		32.1		29.3		29.4	
PHOSPHORUS		NA		NA	213		220		502		234		217	
POTASSIUM		NA		**4,945**	3820		6010		5700		4750		6020	
SELENIUM		**39**	N	0.88	0.59	U	0.55	U	0.52	U	0.57	U	0.49	U
SILICON		NA		NA	2340		2280		2320		2410		2110	
SILVER		**39**	N	0.74	0.59	U	0.55	U	0.52	U	0.57	U	0.49	U
SODIUM		NA		**55.80**	58.6	U	57.5		55.9		57.3	U	53.7	
STRONTIUM		**4,700**	N	NA	2.5		4.2		7.9		2.3		3.9	
SULFUR		NA		NA	116		18.9		51		98.8		21	
THALLIUM		0.55	N	**1.36**	1.2	U	1.1	U	1	U	1.1	U	0.97	U
TIN		**4,700**	N	NA	2.3	U	2.2	U	2.1	U	2.3	U	1.9	U
TITANIUM		**31,000**	N	NA	835		922		930		899		923	
VANADIUM		55	N	**66.76**	39.8		24		23.1		32.8		23.4	
ZINC		**2,300**	N	308.8	67.9		92.7		96.7		80.4		91.9	

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1 - COMPREHENSIVE SAMPLE RESULTS FOR SPRING VALLEY

Sedgwick Trench Area

SAMPLE ID:	REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:	Residential		Metals	Trench Bottom		Dup of 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:	RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:	(adjusted		ground[\2]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute	downward) [\1]												
IC Scan - EPA 300M (MG/KG)													
BROMIDE	NA			1.22	U	1.07	U	1.1	U	1.17	U	1.08	U
CHLORIDE	NA			20.2		7.51		9		8.34		8.17	
FLUORIDE	NA				R		R		R		R		R
NITRATE-N	13,000	N		1.22	U	1.69		1.1	U	1.17	U	1.68	
NITRITE-N	780	N		1.22	UL	1.07	UL	1.1	UL	1.17	UL	1.08	UL
PHOSPHATE-P	NA				R		R		R		R		R
SULFATE	NA			52.8	K	12.5	K	69.1	K	67.7	K	13.5	K
Mustard and Mustard Breakdown Products (UG/KG)													
MUSTARD	10	\3,C		200	U	NS		200	U	200	U	200	U
1,4-OXATHIANE	78,000	\3,N		102	U	87	U	90	U	101	U	87	U
1,4-DITHIANE	78,000	N		99	U	84	U	87	U	97	U	84	U
THIODIGLYCOL	39,100	\3,N		1061	U	940	U	971	U	1043	U	940	U
Lewisite Breakdown Products (UG/KG)													
TOTAL CVAA & CVAO	890	\3,C		10	U	9	U	9	U	10	U	9	U
Other Parameters (MG/KG, unless otherwise indicated)													
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	180	U	180	U	180	U	180	U
ADAMSITE **	NA				**		**		**		**		**
AMMONIA-N	NA			1.21	UL	1.09	UL	1.12	UL	1.16	UL	1.06	UL
CYANIDE	160 [‡]	N		0.61	U	0.54	U	0.56	U	0.58	U	0.53	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table. (‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation. For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE
NS = NOT SAMPLED

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

Table 1A

Comprehensive List Detections for Sedgwick Trench

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Sedgwick Trench Area

SAMPLE ID:	REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:	Residential		Metals	Trench Bottom		Dup of 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:	RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:	(adjusted		ground[12]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute	downward)[11]												
Volatile Organic Compounds - SW8260B (UG/KG)													
4-METHYL-2-PENTANONE(Methyl Isobutyl Ketone, CAS#108101)	630,000	N		1	UJ	1.1	UJ	2	J	1.1	UJ	1.1	UJ
ACETONE	780,000	N		1	B	2	B	3	B	2	B	2	B
DICHLORODIFLUOROMETHANE	1,600,000	N		1	B	1.1	U	1.3	U	1	B	1	B
M&P-XYLENE	1,600,000	N		1	UJ	2	J	1.3	UJ	1.1	UJ	1.1	UJ
O-XYLENE	1,600,000	N		1	UJ	2	J	1.3	UJ	1.1	UJ	1.1	UJ
TOLUENE	1,600,000	N		1	UJ	4	J	1.3	UJ	1.1	UJ	1.1	UJ
VOC Tentatively Identified Compounds (UG/KG)													
1-NONENE, 4,6,8-TRIMETHYL-	NA				*		*		*	3	NJ		*
BENZENE, (1-METHYLETHENYL)- (CAS# 98-83-9)	550,000	N		1	NJ	0.8	NJ	1	NJ		*		*
BUTANE, 1,1-OXYBIS-	NA			1	NJ		*	0.9	NJ		*		*
CYCLOTETRASILOXANE, OCTAMETHYL (CAS# 556-67-2)	NA				*	1	NJ	3	NJ	7	NJ		*
FURAN, TETRAHYDRO-	84,000	C			*	1	NJ		*		*	1	NJ
PROPANE, OCTAFLUORO-	NA				*	2	NJ		*		*	2	NJ
Semivolatile Organic Compounds - SW8270C (UG/KG)													
ANTHRACENE	2,300,000	N		82	U	73	U	75	J	81	U	74	U
BENZO[A]ANTHRACENE	870	C		82	U	73	U	340		81	U	74	U
BENZO[A]PYRENE	87	C		82	U	73	U	140		81	U	74	U
BENZO[B]FLUORANTHENE	870	C		82	U	73	U	300		81	U	74	U
BENZO[G,H,I]PERYLENE	NA			82	U	73	U	97		81	U	74	U
BENZO[K]FLUORANTHENE	8,700	C		82	U	73	U	130		81	U	74	U
BIS(2-ETHYLHEXYL)PHTHALATE	46,000	C		82	U	73	U	51	J	81	U	74	U
CHRYSENE	87,000	C		82	U	73	U	160		81	U	74	U
DIBENZ[A,H]ANTHRACENE	87	C		82	U	73	U	34	J	81	U	74	U
DI-N-BUTYLPHTHALATE	780,000 ‡	N		10	B	73	U	76	U	81	U	74	U
FLUORANTHENE	310,000	N		82	U	73	U	650		81	U	74	U
INDENO[1,2,3-CD]PYRENE	870	C		82	U	73	U	120		81	U	74	U
PHENANTHRENE	NA			82	U	73	U	270		81	U	74	U
PYRENE	230,000	N		82	U	73	U	450		81	U	74	U
SVOC Tentatively Identified Compounds (UG/KG)													
1-EICOSANOL	NA				*		*		*	160	NJ		*
1-NONADECANOL	NA				*	110	NJ		*		*	110	NJ
1-OCTADECENE	NA				*		*	480	NJ		*		*
BENZO(E)PYRENE (CAS# 192-97-2)	NA				*		*	46	NJ		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 1A - COMPREHENSIVE LIST DETECTIONS

Sedgwick Trench Area

SAMPLE ID:	REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:	Residential		Metals	Trench Bottom		Dup of 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:	RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:	*(adjusted*		ground[\2]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute	*downward)*[\1]												
ICP Inorganic Analyses - SW6010B (MG/KG)													
ALUMINUM	7,800	N	**25,798**	13100		16100		18800		12600		14800	
ARSENIC	0.43	C	**12.64**	2.2		0.62		1.1		1.3		0.7	
BARIUM	**550**	N	298.28	62.4		75.4		85.4		66.5		74.6	
BERYLLIUM	**16**	N	2.35	1.1		1.6		2.1		1.6		1.5	
CALCIUM	NA		**4,207**	171		296		448		265		306	
CHROMIUM	**12,000** ‡	N	97.20	26.5		20.6		20.3		26.4		21.4	
COBALT	**160**	N	22.26	10.9		18		15.5		21.1		14.4	
COPPER	**310**	N	47.76	31.4		29.2		38.2		34.1		27.9	
IRON	2,300	N	**31,951**	26800		19600		18000		24200		19400	
LEAD	**400** ‡		329.76	11.1		10.1		5		12.8		7.4	
MAGNESIUM	NA		**7,093**	5010		7490		7440		6170		7410	
MANGANESE	160	N	**1,251**	177	K	602	K	438	K	460	K	384	K
MERCURY (by CVAA)	NA		**0.29**	0.06	U	0.05	U	0.05	U	0.05		0.04	U
NICKEL	**160**	N	40.12	22.5		32.4		32.1		29.3		29.4	
PHOSPHORUS	NA		NA	213		220		502		234		217	
POTASSIUM	NA		**4,945**	3820		6010		5700		4750		6020	
SILICON	NA		NA	2340		2280		2320		2410		2110	
SODIUM	NA		**55.80**	58.6	U	57.5		55.9		57.3	U	53.7	
STRONTIUM	**4,700**	N	NA	2.5		4.2		7.9		2.3		3.9	
SULFUR	NA		NA	116		18.9		51		98.8		21	
TITANIUM	**31,000**	N	NA	835		922		930		899		923	
VANADIUM	55	N	**66.76**	39.8		24		23.1		32.8		23.4	
ZINC	**2,300**	N	308.8	67.9		92.7		96.7		80.4		91.9	
IC Scan - EPA 300M (MG/KG)													
CHLORIDE	NA			20.2		7.51		9		8.34		8.17	
NITRATE-N	13,000	N		1.22	U	1.69		1.1	U	1.17	U	1.68	
SULFATE	NA			52.8	K	12.5	K	69.1	K	67.7	K	13.5	K

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds.
Source is the April 25, 2003 USEPA RBC Table.
(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.
C = Carcinogen as listed on the USEPA RBC table.
NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

Table 2

AUES List of Compounds for Sedgwick Trench Samples (Includes Indicator and Agent Breakdown Compounds)

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Sedgwick Trench Area

SAMPLE ID:		**REGION III**			**5040TR-SB**		**5065TR-SBDUP01**		**5054TR-SB**		**5059TR-SB**		**5065TR-SB**	
TYPE or LOCATION:		**Residential**		**Metals**	**Trench Bottom**		**Dup OF 5040**		**Trench Bottom**		**Trench Bottom**		**Trench Bottom**	
SAMPLE DEPTH:		**RBC**		**Back-**	**4.5'-5.5'**		**4.5'-5.5'**		**3'-5'**		**9'-10'**		**2.5'-4'**	
SAMPLING DATE:		*(adjusted*		**ground**[12]	**4/5/2001**		**4/5/2001**		**4/5/2001**		**4/5/2001**		**4/5/2001**	
Analyses performed by Southwest Research Institute		*downward)* [12]												
Volatile Organic Compounds - SW8260B (UG/KG)														
ACETONITRILE		NA			5.2	U	5.3	U	6.3	U	5.4	U	5.3	U
ACROLEIN		160,000	N		5.2	U	5.3	U	6.3	U	5.4	U	5.3	U
BENZYL BROMIDE		NA			5.2	UJ	5.3	UJ	6.3	UJ	5.4	UJ	5.3	UJ
BENZYL CHLORIDE		3,800	C		5.2	UJ	5.3	UJ	6.3	UJ	5.4	UJ	5.3	UJ
CARBON DISULFIDE		780,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
CARBON TETRACHLORIDE		4,900	C		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
CHLOROBENZENE		160,000	N		1	UJ	1.1	UJ	1.3	UJ	1.1	UJ	1.1	UJ
CHLOROFORM		78,000	N		1	U	1.1	U	1.3	U	1.1	U	1.1	U
CHLOROPICRIN		NA			26	UJ	27	UJ	32	UJ	27	UJ	27	UJ
VOC Tentatively Identified Compounds (UG/KG)														
ALCOHOL		NA				*		*		*		*		*
ALLYL ALCOHOL		NA				*		*		*		*		*
BENZYL IODIDE		NA				*		*		*		*		*
BROMOACETONE		780,000 ‡	N			*		*		*		*		*
BROMOBENZENE		NA				*		*		*		*		*
BROMOMETHYL ETHER		NA				*		*		*		*		*
BUTYL MERCAPTAN		NA				*		*		*		*		*
CHLORINATED ACETONE		NA				*		*		*		*		*
CHLORINATED CARBON DISULFIDE		780,000 ‡	N			*		*		*		*		*
CHLOROACETONE		780,000 ‡	N			*		*		*		*		*
CHLOROACETONITRILE		NA				*		*		*		*		*
CHLOROMETHYL ETHER		NA				*		*		*		*		*
CHLOROMETHYL ETHYL ETHER		NA				*		*		*		*		*
CROTONALDEHYDE		340	C			*		*		*		*		*
ETHYL BROMOACETATE		7,000,000 ‡	N			*		*		*		*		*
ETHYL CHLOROFORMATE		NA				*		*		*		*		*
ETHYL DIBROMOACETATE		7,000,000 ‡	N			*		*		*		*		*
ETHYL MERCAPTAN		NA				*		*		*		*		*
METHYL BROMOACETATE		NA				*		*		*		*		*
METHYL CHLOROACETATE		NA				*		*		*		*		*
METHYL CHLOROFORMATE		NA				*		*		*		*		*
METHYL CHLOROSULFONATE		NA				*		*		*		*		*
PERCHLOROMETHYLMERCAPTAN		NA				*		*		*		*		*
THIOPHENE		NA				*		*		*		*		*
TRICHLOROACETONITRILE		NA				*		*		*		*		*

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Sedgwick Trench Area

SAMPLE ID:		REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:		Residential		Metals	Trench Bottom		Dup OF 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:		RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:		*(adjusted*		ground[2]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute		*downward)* [1]												
Semivolatile Organic Compounds - SW8270C (UG/KG)														
HEXACHLOROETHANE		46,000	C		82	U	73	U	76	U	81	U	74	U
O-CHLORONITROBENZENE		26,000	C		82	U	73	U	76	U	81	U	74	U
PHENYL HYDRAZINE		NA			82	U	73	U	76	U	81	U	74	U
PHENYL ISOCYANATE		NA			82	U	73	U	76	U	81	U	74	U
PHENYL ISOTHIOCYANATE		NA			82	U	73	U	76	U	81	U	74	U
SVOC Tentatively Identified Compounds (UG/KG)														
BENZOTRICHLORIDE		NA				*		*		*		*		*
BENZYL FLUORIDE		NA				*		*		*		*		*
DIPHENYLCHLOROARSINE		NA				*		*		*		*		*
OLEIC ACID (CAS# 112-80-1)		NA				*		*		*		*		*
o-TOLYL ISOCYANIDE		NA				*		*		*		*		*
PHENYL ISOCYANIDE		NA				*		*		*		*		*
PHENYLDICHLOROARSINE		NA				*		*		*		*		*
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	13100		16100		18800		12600		14800	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	2.2		0.62		1.1		1.3		0.7	
BARIUM *(Indicator only)*		**550**	N	298.28	62.4		75.4		85.4		66.5		74.6	
CADMIUM *(Indicator only)*		**7.8**	N	0.32	0.59	U	0.55	U	0.52	U	0.57	U	0.49	U
CALCIUM *(Indicator only)*		NA		**4,207**	171		296		448		265		306	
IRON		2,300	N	**31,951**	26800		19600		18000		24200		19400	
LEAD *(Indicator only)*		**400** [‡]		329.76	11.1		10.1		5		12.8		7.4	
MAGNESIUM		NA		**7,093**	5010		7490		7440		6170		7410	
MANGANESE *(Indicator only)*		160	N	**1,251**	177	K	602	K	438	K	460	K	384	K
NICKEL *(Indicator only)*		**160**	N	40.12	22.5		32.4		32.1		29.3		29.4	
PHOSPHORUS		NA		NA	213		220		502		234		217	
POTASSIUM *(Indicator only)*		NA		**4,945**	3820		6010		5700		4750		6020	
SELENIUM *(Indicator only)*		**39**	N	0.88	0.59	U	0.55	U	0.52	U	0.57	U	0.49	U
SILICON		NA		NA	2340		2280		2320		2410		2110	
SODIUM		NA		**55.80**	58.6	U	57.5		55.9		57.3	U	53.7	
SULFUR		NA		NA	116		18.9		51		98.8		21	
TIN *(Indicator only)*		**4,700**	N	NA	2.3	U	2.2	U	2.1	U	2.3	U	1.9	U
TITANIUM *(Indicator only)*		**31,000**	N	NA	835		922		930		899		923	
ZINC		**2,300**	N	308.8	67.9		92.7		96.7		80.4		91.9	
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)														
BROMIDE		NA			1.22	U	1.07	U	1.1	U	1.17	U	1.08	U
CHLORIDE		NA			20.2		7.51		9		8.34		8.17	
FLUORIDE		NA				R		R		R		R		R
NITRATE-N		13,000	N		1.22	U	1.69		1.1	U	1.17	U	1.68	
SULFATE		NA			52.8	K	12.5	K	69.1	K	67.7	K	13.5	K

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2 - AUES LIST OF COMPOUNDS (Includes Indicator Compounds and Agent Breakdown Products)

Sedgwick Trench Area

SAMPLE ID:	REGION III			5040TR-SB		5065TR-SBDUP01		5054TR-SB		5059TR-SB		5065TR-SB	
TYPE or LOCATION:	Residential		Metals	Trench Bottom		Dup OF 5040		Trench Bottom		Trench Bottom		Trench Bottom	
SAMPLE DEPTH:	RBC		Back-	4.5'-5.5'		4.5'-5.5'		3'-5'		9'-10'		2.5'-4'	
SAMPLING DATE:	*(adjusted*		ground[\2]	4/5/2001		4/5/2001		4/5/2001		4/5/2001		4/5/2001	
Analyses performed by Southwest Research Institute	*downward)* [\1]												
Mustard and Mustard Breakdown Products (UG/KG)													
MUSTARD	10	\3,C		200	U	NS		200	U	200	U	200	U
1,4-OXATHIANE *(Agent Breakdown Product only)*	78,000	\3,N		102	U	87	U	90	U	101	U	87	U
1,4-DITHIANE *(Agent Breakdown Product only)*	78,000	N		99	U	84	U	87	U	97	U	84	U
THIODIGLYCOL *(Agent Breakdown Product only)*	39,100	\3,N		1061	U	940	U	971	U	1043	U	940	U
Lewisite Breakdown Products (UG/KG)													
TOTAL CVAA & CVAO *(Agent Breakdown Product only)*	890	\3,C		10	U	9	U	9	U	10	U	9	U
Other Parameters (MG/KG, unless otherwise indicated)													
2,4,6-TRINITROTOLUENE (UG/KG)	21,000	C		180	U	180	U	180	U	180	U	180	U
ADAMSITE **	NA				**		**		**		**		**
AMMONIA-N	NA			1.21	UL	1.09	UL	1.12	UL	1.16	UL	1.06	UL
CYANIDE *(Indicator only)*	160 [‡]	N		0.61	U	0.54	U	0.56	U	0.58	U	0.53	U

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table.

(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

\3 RBC source is 1995 OSR FUDS Remedial Investigation Report. Except for mustard, these values were calculated for that investigation. For mustard, the source is the USACHPPM residential HBESL.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.

C = Carcinogen as listed on the USEPA RBC table.

NA = NOT AVAILABLE

*** Sample was scanned using GC/MS unit and the analyte was not identified using the mass spectral library search.**

Shading indicates result exceeds higher (bolded) of RBC or background.

**** The Edgewood Chemical Biological Center performed the Adamsite analyses. ECBC's procedure was to run samples based on the initial arsenic content. These samples were not analyzed for Adamsite as the arsenic concentration was determined to be too low.**

Table 2A

AUES List Detections for Sedgwick Trench Samples (Includes Indicator and Agent Breakdown Compounds)

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 2A - AUES LIST DETECTIONS (Includes Indicator Compounds and Agent Breakdown Products)

Sedgwick Trench Area

SAMPLE ID:		**REGION III**			**5040TR-SB**		**5065TR-SBDUP01**		**5054TR-SB**		**5059TR-SB**		**5065TR-SB**	
TYPE or LOCATION:		**Residential**		**Metals**	**Trench Bottom**		**Dup OF 5040**		**Trench Bottom**		**Trench Bottom**		**Trench Bottom**	
SAMPLE DEPTH:		**RBC**		**Back-**	**4.5'-5.5'**		**4.5'-5.5'**		**3'-5'**		**9'-10'**		**2.5'-4'**	
SAMPLING DATE:		*(adjusted*		**ground**[\2]	**4/5/2001**		**4/5/2001**		**4/5/2001**		**4/5/2001**		**4/5/2001**	
Analyses performed by Southwest Research Institute		*downward)* [\1]												
ICP Inorganic Analyses - SW6010B (MG/KG)														
ALUMINUM		7,800	N	**25,798**	13100		16100		18800		12600		14800	
ARSENIC *(Indicator only)*		0.43	C	**12.64**	2.2		0.62		1.1		1.3		0.7	
BARIUM *(Indicator only)*		**550**	N	298.28	62.4		75.4		85.4		66.5		74.6	
CALCIUM *(Indicator only)*		NA		**4,207**	171		296		448		265		306	
IRON		2,300	N	**31,951**	26800		19600		18000		24200		19400	
LEAD *(Indicator only)*		**400** ‡		329.76	11.1		10.1		5		12.8		7.4	
MAGNESIUM		NA		**7,093**	5010		7490		7440		6170		7410	
MANGANESE *(Indicator only)*		160	N	**1,251**	177	K	602	K	438	K	460	K	384	K
NICKEL *(Indicator only)*		**160**	N	40.12	22.5		32.4		32.1		29.3		29.4	
PHOSPHORUS		NA		NA	213		220		502		234		217	
POTASSIUM *(Indicator only)*		NA		**4,945**	3820		6010		5700		4750		6020	
SILICON		NA		NA	2340		2280		2320		2410		2110	
SODIUM		NA		**55.80**	58.6	U	57.5		55.9		57.3	U	53.7	
SULFUR		NA		NA	116		18.9		51		98.8		21	
TITANIUM *(Indicator only)*		**31,000**	N	NA	835		922		930		899		923	
ZINC		**2,300**	N	308.8	67.9		92.7		96.7		80.4		91.9	
IC Scan - EPA 300M *(Indicator Compounds Only)* (MG/KG)														
CHLORIDE		NA			20.2		7.51		9		8.34		8.17	
NITRATE-N		13,000	N		1.22	U	1.69		1.1	U	1.17	U	1.68	
SULFATE		NA			52.8	K	12.5	K	69.1	K	67.7	K	13.5	K

\1 RBC for non-carcinogenic compounds (N) adjusted downward by a factor of 10 to account for cumulative effect of all such compounds. Source is the April 25, 2003 USEPA RBC Table.

(‡) See RBC Key table for chemicals not on USEPA table.

\2 95th percentile of the background concentration. This value was used for the comparison when it was higher than the RBC.

N = Non-carcinogen. This RBC was adjusted down by a factor of 10.

C = Carcinogen as listed on the USEPA RBC table.

NA = NOT AVAILABLE

Shading indicates result exceeds higher (bolded) of RBC or background.

Table 3

AUES List Scan Results for Sedgwick Trench Samples

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

Sedgwick Trench Area

Analyses performed by Southwest Research Institute			5040TR-SB	5065TR-SBDUP01 (of 5040TR)	5054TR-SB	5059TR-SB	5065TR-SB
COMPOUND	Chemical Abstract Service (CAS) No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
Acetyl Fluoride	557-99-3	*fluoride*	NO	NO	NO	NO	NO
Allyl Isocyanide		*cyanide*	NO	NO	NO	NO	NO
Allyl Isothiocyanate	57-06-7	*cyanide*	NO	NO	NO	NO	NO
Aluminium Selenide	1302-82-5	*aluminium, selenium*	NO	NO	NO	NO	NO
Ammonium Chloride	12125-02-09	*chloride, ammonia*	NO	NO	NO	NO	NO
Ammonium Cyanide		*ammonia, cyanide*	NO	NO	NO	NO	NO
Ammonium Nitrate	6484-52-2	*nitrate, ammonia*	NO	NO	NO	NO	NO
Ammonium Picrate	131-74-8	*ammonia*	NO	NO	NO	NO	NO
Arsenic Trichloride	7784-34-1	*chloride, arsenic*	YES	YES	YES	YES	YES
Arsenic Trifluoride	7784-35-2	*fluoride, arsenic*	NO	NO	NO	NO	NO
Arsenic Trioxide	1327-53-3	*arsenic*	YES	YES	YES	YES	YES
Arsine	7784-42-1	*arsenic*	YES	YES	YES	YES	YES
Barium Peroxide	1304-29-6	*barium*	YES	YES	YES	YES	YES
Bromine	7726-95-6	*bromide*	NO	NO	NO	NO	NO
Bromoketone	593-95-3	*bromide*	NO	NO	NO	NO	NO
Bromoacetyl Bromide	598-21-0	*bromide*	NO	NO	NO	NO	NO
Bromobenzyl Cyanide	5798-79-8	*bromide, cyanide*	NO	NO	NO	NO	NO
Bromoxylyl Cyanide		*bromide, cyanide*	NO	NO	NO	NO	NO
Cacodyl	144-21-8	*sodium*, arsenic*	NO	YES	YES	NO	YES
Cacodyl Bromide		*bromide*	NO	NO	NO	NO	NO
Cacodyl Chloride		*chloride*	YES	YES	YES	YES	YES
Cacodyl Cyanide		*cyanide*	NO	NO	NO	NO	NO
Cadmium Methyl		*cadmium*	NO	NO	NO	NO	NO
Calcium Carbonate	471-34-1	*calcium*	YES	YES	YES	YES	YES
Calcium Sulfate	7778-18-9	*sulfate, calcium*	YES	YES	YES	YES	YES
Chlorine	7782-50-5	*chloride*	YES	YES	YES	YES	YES
Cyanogen	460-19-5	*cyanide*	NO	NO	NO	NO	NO
Cyanogen Bromide	506-68-3	*bromide, cyanide*	NO	NO	NO	NO	NO
Cyanogen Chloride	506-77-4	*chloride, cyanide*	NO	NO	NO	NO	NO
Dichloromethyl Ether	542-88-1	*chloride*	YES	YES	YES	YES	YES
Dichloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES
Dichloropropyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES
Dimethylarsine	593-57-7	*arsenic*	YES	YES	YES	YES	YES
Ethyl Sulfide	352-93-2	*sulfur*	YES	YES	YES	YES	YES
Hydrochloric Acid	7647-01-0	*chloride*	YES	YES	YES	YES	YES
Hydrocyanic Acid	74-90-8	*cyanide*	NO	NO	NO	NO	NO
Hydrofluoric Acid	7664-39-3	*fluoride*	NO	NO	NO	NO	NO
Hydrogen Selenide	7/5/7783	*selenium*	NO	NO	NO	NO	NO
Lead Ferrocyanide		*lead, iron, cyanide*	NO	NO	NO	NO	NO
Lead Peroxide	1309-60-0	*lead*	YES	YES	YES	YES	YES
Lead Thiocyanate	592-87-0	*lead, cyanide*	NO	NO	NO	NO	NO

SUMMARY OF VALIDATED SAMPLE RESULTS

TABLE 3 - AUES LIST SCAN RESULTS

Sedgwick Trench Area

Analyses performed by Southwest Research Institute			5040TR-SB	5065TR-SBDUP01 (of 5040TR)	5054TR-SB	5059TR-SB	5065TR-SB
COMPOUND	Chemical Abstract Service (CAS) No.	*INDICATOR COMPOUNDS*	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?	All Indicators Detected?
Magnesium Arsenide		*magnesium*, arsenic*	YES	YES	YES	YES	YES
Magnesium Carbonate	546-93-0	*magnesium**	YES	YES	YES	YES	YES
Magnesium Oxide	1309-48-4	*magnesium**	YES	YES	YES	YES	YES
Methyl Chloroarsine		*chloride, arsenic*	YES	YES	YES	YES	YES
Methyl Isocyanide	593-75-9	*cyanide*	NO	NO	NO	NO	NO
Methyl Selenide	593-79-3	*selenium*	NO	NO	NO	NO	NO
Nickel Carbonyl	13463-39-3	*nickel*	YES	YES	YES	YES	YES
Oxalyl Chloride	79-37-8	*chloride*	YES	YES	YES	YES	YES
Phenylcarbylamine Chloride	622-44-6	*chloride*	YES	YES	YES	YES	YES
Phosgene	75-44-5	*chloride*	YES	YES	YES	YES	YES
Potassium Chlorate	3811-04-9	*chloride, potassium**	YES	YES	YES	YES	YES
Potassium Nitrate	7757-79-1	*nitrate, potassium**	NO	YES	NO	NO	YES
Potassium Perchlorate	7778-74-7	*potassium**	YES	YES	YES	YES	YES
Potassium Permanganate	7722-64-7	*potassium*, manganese*	YES	YES	YES	YES	YES
Silicon	7440-21-3	*silicon*	YES	YES	YES	YES	YES
Silicon Tetrachloride	409-21-2	*chloride, silicon*	YES	YES	YES	YES	YES
Sodium Bicarbonate	144-55-8	*sodium**	NO	YES	YES	NO	YES
Sodium Chlorate	7775-09-9	*chloride, sodium**	NO	YES	YES	NO	YES
Sodium Cyanide	143-33-9	*sodium, cyanide*	NO	NO	NO	NO	NO
Sodium Hydroxide	1310-73-2	*sodium**	NO	YES	YES	NO	YES
Sodium Nitrate	7631-99-4	*nitrate, sodium**	NO	YES	NO	NO	YES
Sodium Oleate	143-19-1	*sodium**	NO	YES	YES	NO	YES
Sodium Silicate	6834-92-0	*sodium*, silicon*	NO	YES	YES	NO	YES
Sodium Stearate	822-16-2	*sodium**	NO	YES	YES	NO	YES
Stannic Chloride (Tin Tetrachloride)	7646-78-8	*chloride, tin*	NO	NO	NO	NO	NO
Sulfur Chloride	10025-67-9	*chloride, sulfur*	YES	YES	YES	YES	YES
Sulfur Trioxide	7446-11-9	*sulfur*	YES	YES	YES	YES	YES
Sulfuryl Chloride	7791-25-5	*chloride, sulfur*	YES	YES	YES	YES	YES
Tetrachloromethyl Sulfide		*chloride, sulfur*	YES	YES	YES	YES	YES
Thermite		*aluminum, iron*	YES	YES	YES	YES	YES
Thiophosgene	463-71-8	*chloride, sulfur*	YES	YES	YES	YES	YES
Titanium Tetrachloride	7550-45-0	*chloride, titanium*	YES	YES	YES	YES	YES
Trichloroacetyl Chloride	76-02-8	*chloride*	YES	YES	YES	YES	YES
Trichloroacetyl Cyanide		*chloride, cyanide*	NO	NO	NO	NO	NO
Trichlorohydrin	96-18-4	*chloride*	YES	YES	YES	YES	YES
Xylyl Bromide	35884-77-6	*bromide*	NO	NO	NO	NO	NO
Zinc Chloride mixture	7646-85-7	*chloride, zinc*	YES	YES	YES	YES	YES
Zinc Oxide	1314-13-2	*zinc*	YES	YES	YES	YES	YES

YES — **Presence of this compound cannot be ruled out.**

NO — **Presence of this compound not indicated.**

Shading indicates an exceedance of the RBC or background of at least one of the indicator compounds if all were detected. The asterisk shows which indicator compound exceeded.

RBC KEY

Note: In accordance with standard Risk Assessment practice, Risk-Based Concentrations (RBCs) for structurally, chemically, or toxicologically similar chemicals were used for those chemicals that did not have RBCs. For this investigation, these included the following:

RBC for 1,3-Dichloropropene was used for CIS and TRANS-1,3-Dichloropropene
RBC for Hexane was used for Cyclohexane and Methylcyclohexane
RBC for Acetone was used for Bromoacetone and Chloroacetone
RBC for Carbon Disulfide was used for Chlorinated Carbon Disulfide
RBC for Ethyl Acetate was used for Ethyl Bromoacetate and Ethyl Dibromoacetate
RBC for Beta-Chloronaphthalene was used for 2-Chloronaphthalene (same chemical)
RBC for 4-Nitrophenol was used for 2-Nitrophenol
RBC for Acenapthene was used for Acenaphthylene
RBC for Dibutylphthalate was used for Di-N-Butylphthalate (same chemical)
RBC for Dioctylphthalate was used for Di-N-Octylphthalate (same chemical)
RBC for Alpha-HCH was used for Alpha-Lindane (same chemical)
RBC for Chromium III was used for Chromium
RBC for Cyanide (Free) was used for Cyanide
For Lead, the USEPA recommended residential land use screening level of 400 ppm was used.

Attachment A

Quality Assurance Report

QUALITY ASSURANCE SUMMARY REPORT FOR

SOIL SAMPLES ASSOCIATED WITH SPRING VALLEY OU-5 SEDGWICK AUES LIST SAMPLING

INTRODUCTION

This data validation summary report covers environmental soil samples collected from the Sedgwick Trench Area of the Spring Valley OU-5 project, Washington, DC. These samples were included in laboratory Sample Delivery Group 159223. The samples were analyzed for Full Scan Parameters including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), mustard degradation products, lewisite degradation products, trinitrotoluene, metals, ions (bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate) and selected wet chemistry parameters (ammonia and total cyanide). VOC and SVOC analyses included tentatively identified compounds (TICs).

All work was performed in accordance with the Revised Final Workplan for Sedgwick Trench Area Investigation *(Parsons, June 2001).* The Workplan included a Quality Assurance Project Plan (QAPjP) which was prepared and approved for use to ensure generation of legally defensible data. Southwest Research Institute of San Antonio, Texas, following procedures outlined in the QAPjP and the WMP, performed all analyses with the exception of Mustard and Adamsite, which were analyzed by the Army's Edgewood Chemical and Biological Command (ECBC) laboratory.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and validated following the guidelines described in the QAPjP and consistent with Region III modifications to the USEPA Functional Guidelines for Evaluating Organic and Inorganic Data. All information included in the data packages have been reviewed and validated including sample results, laboratory quality control results, chain-of-custody forms and all supporting raw data.

This report addresses only those problems affecting the usability of the data. A discussion of data validation qualifiers (flags) applied to the data and reasons for the qualifiers is also presented.

Deviations from the QAPjP or the analytical methods and a discussion of the overall usability of the data are also presented in the summary section of this report. QC problems leading to qualifying of data as unusable or rejected are presented in the Major Problems section. QA/QC problems leading to qualifying of data as estimated or not detected are presented in the Minor Problems section. Details concerning samples and target analytes affected are also presented.

SUMMARY

This section of this report discusses deviations from the QAPjP, other laboratory problems, QC problems leading to qualifying of data as rejected, estimated or not detected and the overall usability of the data.

Except as indicated in this report, the samples were collected, prepared and analyzed following the procedures described in the Workplan and the QAPjP. Except as indicated in this report, all samples were prepared and analyzed within the specified holding times using the EPA-approved analytical procedures. The types and number of field and laboratory QC samples collected and analyzed met the QA objectives specified in the QAPjP.

Major QA/QC problems leading to rejection of data were found during validation of the data for some samples for some wet chemistry parameters. Details regarding the samples and analytes affected and the magnitude of the problems are presented in the Major Problems section.

Minor QA/QC problems leading to qualifying of data as estimated or not detected included: laboratory blank contamination; accuracy (% recovery) outliers, precision outliers, surrogate outliers, internal standard outliers and reported detections less than the project reporting limit (PRL). Details concerning these QC problems are presented in the Minor Problems section.

MAJOR PROBLEMS

As indicated above major problems were found during validation of the data for this SDG. The parameters affected are fluoride and phosphate. The major problem affecting the wet chemistry parameter involved extremely poor (0%) percent recoveries associated with the MS/MSD samples. Details regarding these problems are presented below by parameter. Accordingly, the completeness goal for the analyses was not met.

Wet Chemistry

The laboratory reported no (0%) percent recovery for target analytes phosphate and fluoride for the MS/MSD samples associated with the Sedgwick samples. All reported nondetects for these analytes in the associated Sedgwick samples have been qualified as unusable (rejected) and flagged 'R'. The laboratory indicated that these anions may form insoluble salts with certain cations present in the samples and therefore will precipitate out of solution.

MINOR PROBLEMS

This section of the QA summary report discusses QC problems leading to qualifying of data as estimated. The "J" qualifier is used to indicate estimated results. The flag indicates that the analyte was detected in the sample and the result is either less than the PRL or affected by at least one minor QA/QC problem found during validation. The 'B' qualifier indicates the associated analyte was also detected in the field or laboratory associated with the sample. The reported result should be considered estimated and may be biased high. The 'D' qualifier indicates the reported result was obtained from a diluted sample. The dilution was necessary either because the calibration was exceeded or matrix interferences in the sample. Generally, all reported results affected by a minor problem are usable for most decision-making purposes.

As indicated above, QC problems leading to qualifying of data as estimated included laboratory blank contamination; accuracy outliers, internal standard outliers and reported detections less than the PRL. Details concerning these problems are presented below.

Volatile Organic Compounds (VOCs)

- The laboratory reported internal standard area outliers for each of the samples in this SDG. Three of the four required internal standards reported outliers. All reported results for the target analytes assigned to the affected internal standards, for quantitation, have been qualified as estimated (flagged 'UJ/J'). Data with the 'J' qualifier are considered usable for most decision-making purposes, including risk assessment.

- Target VOC acetone was detected in at least one blank associated with some of the samples. Some reported results for acetone in associated samples have been requalified as estimated and flagged 'B'. Data with the 'B' qualifier are considered usable for most decision-making purposes, including risk assessment.

- Accuracy outliers were reported for target VOCs toluene and chlorobenzene. The percent recoveries for the MS/MSD associated with this SDG were below the lower control limit. All reported results for these analytes in the affected samples have been qualified as estimated and flagged 'UJ'. Although the affected analytes were not detected in the samples, the reported PRLs should be considered estimated.

Semivolatile Organic Compounds (SVOCs)

- Reported results less than the PRL have been qualified as estimated and flagged "J". Target analytes affected include anthracene and dibenz(a,h)anthracene.

- Target SVOC di-n-butylphthalate was detected in the laboratory blanks associated with the samples. Reported results for this analyte in the associated samples have been qualified as estimated and flagged 'B' due to the blank contamination. Data with the 'B' qualifier should be considered estimated and usable for most decision-making purposes, including risk assessment.

Metals

- Accuracy (matrix spike percent recovery) outliers were reported for target metal antimony. The reported recoveries for antimony in the associated MS/MSD were below the required control limits (75-125%). The reported results for these metals in the affected soil samples have been qualified as estimated and flagged 'L/UL'. The 'L' qualifier indicates a low bias meaning the actual result or PRL may be higher than reported. The reported result is usable for most decision-making purposes, including risk assessment.

- Accuracy (matrix spike percent recovery) outliers were reported for target metal manganese. The reported recoveries for manganese in the associated MS/MSD were above the required control limits (75-125%). The reported results for these metals in the affected soil samples have been qualified as estimated and flagged 'K'. The 'K' qualifier indicates a high bias meaning the actual result may be lower than reported. The reported result is usable for most decision-making purposes, including risk assessment.

Wet Chemistry Parameters

- Accuracy outliers were reported for ammonia, nitrite and sulfate for the MS/MSDs associated with some of the samples. The reported results for these analytes in the associated samples have been qualified as estimated and flagged 'L/UL' (low bias – nitrite and ammonia) or 'K' (high bias - sulfate). All reported results are usable as reported for most decision-making purposes, including risk assessment.

DATA VALIDATION QUALIFIERS

U = The compound was analyzed for and is not present. The associated numerical value (Practical Quantitation Limit - PQL) indicates the approximate concentration necessary to quantify the compound in the sample.

UJ = A combination of the "U" and "J" flags. The compound was analyzed for and is not present. The associated numerical value (Practical Quantitation Limit - PQL) has been qualified as estimated due to a QC anomaly.

J = The compound was detected in the sample, but the reported result is “estimated” (could not be accurately quantified) either because the reported value is less than the PQL or at least one minor Quality Control (QC) problem was found during validation. Data with a “J” qualifier is considered usable for most decision-making purposes, including risk assessment.

K = The analyte was detected in the sample. The reported result is considered estimated and may be biased high due to a minor QA/QC problem. The true concentration of present in the sample may be lower than the reported result. The data is considered estimated and usable for most decision-making purposes, including risk assessment.

L = The analyte was detected in the sample. The reported result is considered estimated and may be biased low due to a minor QA/QC problem. The true concentration present in the sample may be higher than the reported result. The data is considered estimated and usable for most decision-making purposes, including risk assessment.

NJ = This flag indicates presumptive evidence of a compound. It is only used for Tentatively Identified Compounds (TICs), where identification is based on a mass spectral library search. The 'N' is not applied to generic descriptions of a TIC, such as 'Unknown Hydrocarbon'. The 'J' flag indicates the reported numerical result is estimated.

JNB = This is a combination of the 'NJ' and 'B' flags. The 'B' indicates the compound was detected in a laboratory or field blank associated with the sample. The reported result should be considered estimated and biased high due to blank contamination.

R = The reported result is considered unusable and unreliable due to a major problem associated with the analysis of the sample or analyte. This qualifier implies no confidence in the reported result due to the problem found during validation. Resampling is recommended if the compound affected is critical to the decision-making process.

B = The analyte was also detected in a laboratory or field blank associated with the sample. The reported result is considered estimated and biased high due to the blank contamination.

Attachment B

AUES Chemicals List

SPRING VALLEY
AUES CHEMICALS

				WILL BE ANALYZED FOR THIS PROJECT			*WILL **NOT** BE ANALYZED FOR THIS PROJECT*	
COMPOUND	**CAS No.**	**Primary Name/Notes**	**ROUTINE**	**NON-ROUTINE**	**SPECIALTY LAB**	**NON-SPECIFIC**	**RESEARCH PROJ**	
	Chemical Abstract Service No.	(I.e., compound name in column 1 is listed as a synonym of this primary name in resources)	(TCL or TAL) + TICs	(But readily available methodology)	Chemical Warfare Materiels			
Acetonitrile	75-05-8		VOC					
Acetyl Cyanide	631-57-2	propanenitrile, 2-oxo						
Acetyl Fluoride	557-99-3			IC/ICP SCAN				
Acetyl Thiocyanate								
Acrolein	107-02-8		VOC					
Adamsite	578-94-9	phenarsazine chloride			CWM			
Alcohol			VOC TIC					
Allyl Alcohol	107-18-6		VOC TIC					
Allyl Isocyanide				IC/ICP SCAN				
Allyl Isothiocyanate	57-06-7	AKA mustard oil		IC/ICP SCAN				
Allylamine	107-11-9							
Aluminium	7429-90-5		METAL					
Aluminium –CC14-NaC103								
Aluminium Selenide	1302-82-5			IC/ICP SCAN				
Ammonia	7664-41-7		DIRECT					
Ammonia Gas	7664-41-7	DELETE-SAME AS ABOVE						
Ammonium Chloride	12125-02-09			IC/ICP SCAN				
Ammonium Cyanide	No			IC/ICP SCAN				
Ammonium Nitrate	6484-52-2			IC/ICP SCAN				
Ammonium Picrate	131-74-8			IC/ICP SCAN				
Arsenic Trichloride	7784-34-1	arsenic chloride		IC/ICP SCAN				
Arsenic Trifluoride	7784-35-2			IC/ICP SCAN				
Arsenic Trioxide	1327-53-3			IC/ICP SCAN				
Arsine	7784-42-1			IC/ICP SCAN				
Barium Peroxide	1304-29-6			IC/ICP SCAN				
Benzotrichloride	98-07-7		SVOC TIC					
Benzyl Bromide	100-39-0	bromotoluene	VOC					
Benzyl Chloride	100-44-7	chlorotoluene	VOC					
Benzyl Fluoride	350-50-5		SVOC TIC					
Benzyl Iodide	620-05-3	iodomethyl benzene	VOC TIC					
Black Powder								
Bromine	7726-95-6			IC/ICP SCAN				
Bromoacetone	598-31-2	bromo-2-propanone	VOC TIC					
Bromoketone	593-95-3	carbonic dibromide		IC/ICP SCAN				
Bromoacetyl Bromide	598-21-0			IC/ICP SCAN				
Bromobenzene	108-86-1	phenyl bromide	VOC TIC					
Bromobenzyl Cyanide	5798-79-8	bromobenzylnitrile		IC/ICP SCAN				
Bromomethyl Ether			VOC TIC					
Bromoxylyl Cyanide				IC/ICP SCAN				
Butyl Mercaptan	109-79-5		VOC TIC					

SPRING VALLEY
AUES CHEMICALS

				WILL BE ANALYZED FOR THIS PROJECT			*WILL **NOT** BE ANALYZED FOR THIS PROJECT*	
COMPOUND	**CAS No.**	**Primary Name/Notes**	**ROUTINE**	**NON-ROUTINE**	**SPECIALTY LAB**	**NON-SPECIFIC**	**RESEARCH PROJ**	
	Chemical Abstract Service No.	(I.e., compound name in column 1 is listed as a synonym of this primary name in resources)	(TCL or TAL) + TICs	(But readily available methodology)	Chemical Warfare Materiels			
Cacodyl	144-21-8	cacodyl new/disodium methanearsenate		IC/ICP SCAN				
Cacodyl Bromide				IC/ICP SCAN				
Cacodyl Chloride				IC/ICP SCAN				
Cacodyl Cyanide				IC/ICP SCAN				
Cadmium Methyl				IC/ICP SCAN				
Calcium Carbonate	471-34-1	limestone		IC/ICP SCAN				
Calcium Sulfate	7778-18-9	AKA plaster of paris		IC/ICP SCAN				
Carbon Bisulphide	75-15-0	DELETE-SAME AS BELOW						
Carbon Disulfide	75-15-0		VOC					
Carbon Monoxide	630-08-0					Not analyzed, too volatile to be present		
Carbon Tetrachloride	56-23-5		VOC					
Carborundum	409-21-2	silicon carbide						
Celluloid								
Chlorinated Acetone, Turpentine			VOC TIC					
Chlorinated Carbon Disulfide			VOC TIC					
Chlorine	7782-50-5			IC/ICP SCAN				
Chloroacetic Anhydride	541-88-8							
Chloroacetone	78-95-5		VOC TIC					
Chloroacetonitrile	107-14-2		VOC TIC					
Chloroacetyl Fluoride								
Chlorobenzene	108-90-7		VOC					
Chlorobenzol	108-90-7	DELETE-SAME AS ABOVE						
Chlorodiethyl Sulfide								
Chloroform	67-66-3		VOC					
Chloroformate	503-38-8	trichloromethyl chloroformate (diphosgene)						
Chloromethyl Chloroformate	22128-62-7							
Chloromethyl Ether	542-88-1		VOC TIC					
Chloromethyl Ethyl Ether	107-30-2		VOC TIC					
Chloropicrin	76-06-2		VOC					
Chromyl Chloride	14977-61-8							
Crotonaldehyde	4170-30-3		VOC TIC					
Cyanogen	460-19-5			IC/ICP SCAN				
Cyanogen Bromide	506-68-3			IC/ICP SCAN				
Cyanogen Chloride	506-77-4			IC/ICP SCAN				
Diazomethane	334-88-3							
Dichloroethyl Disulfide								

SPRING VALLEY
AUES CHEMICALS

			WILL BE ANALYZED FOR THIS PROJECT			*WILL **NOT** BE ANALYZED FOR THIS PROJECT*	
COMPOUND	**CAS No.**	**Primary Name/Notes**	**ROUTINE**	**NON-ROUTINE**	**SPECIALTY LAB**	**NON-SPECIFIC**	**RESEARCH PROJ**
	Chemical Abstract Service No.	(I.e., compound name in column 1 is listed as a synonym of this primary name in resources)	(TCL or TAL) + TICs	(But readily available methodology)	Chemical Warfare Materiels		
Dichloromethyl Ether	542-88-1	bis-chloromethyl ether		IC/ICP SCAN			
Dichloromethyl Sulfide	no	bis(chloromethyl)sulfide		IC/ICP SCAN			
Dichloropropyl Sulfide				IC/ICP SCAN			
Diiodoacetylene	624-74-8						
Dimethylarsine	593-57-7			IC/ICP SCAN			
Diphenylchloroarsine	712-48-1	chlorodiphenyl arsine	SVOC TIC				
Ethyl Bromoacetate	105-36-2		VOC TIC				
Ethyl Chloroformate	541-41-3		VOC TIC				
Ethyl Dibromoacetate	617-33-4	dibromoacetic acid ethyl ether	VOC TIC				
Ethyl Iodoacetate	623-48-3						
Ethyl Isocyanide	624-79-3						
Ethyl Isothiocyanate	542-85-8						
Ethyl Mercaptan	75-08-1		VOC TIC				
Ethyl Sulfide	352-93-2			IC/ICP SCAN			
Ethyl Trichloroacetate	515-84-4						
Ethyldichloroarsine	598-14-1						
Flash mixture							
Halo Wax	1321-65-9	trichloronaphthalene					
Hexachloroethane	67-72-1		SVOC				
Hydrochloric Acid	7647-01-0	hydrogen chloride, aqueous		IC/ICP SCAN			
Hydrocyanic Acid	74-90-8	hydrogen cyanide		IC/ICP SCAN			
Hydrofluoric Acid	7664-39-3	hydrogen fluoride, aqueous		IC/ICP SCAN			
Hydrogen Selenide	7/5/7783			IC/ICP SCAN			
Iron	15438-31-0		METAL				
Isoallylamine							
Kendallite							
Kieselguhr	61790-53-2	Diatomaceous earth/amorphous silica					
Lead Ferrocyanide				IC/ICP SCAN			
Lead Peroxide	1309-60-0	Lead dioxide		IC/ICP SCAN			
Lead Thiocyanate	592-87-0			IC/ICP SCAN			
Magnesium	7439-95-4		METAL				
Magnesium Arsenide				IC/ICP SCAN			
Magnesium Carbonate	546-93-0	magnesite		IC/ICP SCAN			
Magnesium Oxide	1309-48-4			IC/ICP SCAN			
Methyl	7/4/2229	methyl radical					
Methyl Bromoacetate	96-32-2		VOC TIC				
Methyl Chloroacetate	96-34-4		VOC TIC				
Methyl Chloroarsine				IC/ICP SCAN			
Methyl Chloroformate	79-22-1	methylchlorocarbonate	VOC TIC				

SPRING VALLEY
AUES CHEMICALS

				WILL BE ANALYZED FOR THIS PROJECT			WILL **NOT** BE ANALYZED FOR THIS PROJECT	
COMPOUND	**CAS No.**	**Primary Name/Notes**	**ROUTINE**	**NON-ROUTINE**	**SPECIALTY LAB**	**NON-SPECIFIC**	**RESEARCH PROJ**	
	Chemical Abstract Service No.	(I.e., compound name in column 1 is listed as a synonym of this primary name in resources)	(TCL or TAL) + TICs	(But readily available methodology)	Chemical Warfare Materiels			
Methyl Chlorosulfonate			VOC TIC					
Methyl Isocyanide	593-75-9			IC/ICP SCAN				
Methyl Selenide	593-79-3	dimethyl selenide		IC/ICP SCAN				
Methyl Sulfate	77-78-1	dimethylsulfate						
Methyldichloroarsine	593-89-5	dichloromethylarsine						
Methylnitrosourethan	615-53-2							
Mustard (crude, pure, distilled, gas forms)	505-60-2				CWM			
Nickel Carbonyl	13463-39-3			IC/ICP SCAN				
o-Chloronitrobenzene	88-73-3		SVOC					
Oil Smoke								
Oleic Acid	112-80-1		SVOC TIC					
o-Tolyl Isocyanide			SVOC TIC					
Oxalyl Chloride	79-37-8			IC/ICP SCAN				
Paraffin	8002-74-2							
Parazol		dinitrodichlorobenzene						
Perchloromethylmercaptan	594-42-3		VOC TIC					
Phenyl Isocyanate	103-71-9		SVOC					
Phenyl Isocyanide	931-54-5	isocyano benzene	SVOC TIC					
Phenyl Isothiocyanate	103-72-0	isothiocyanic acid, phenyl ester	SVOC					
Phenylcarbylamine Chloride	622-44-6	phenylimidocarbonyl chloride		IC/ICP SCAN				
Phenyldichloroarsine	696-28-6	dichlorophenylarsine	SVOC TIC					
Phenylhydrazine	100-63-0		SVOC					
Phosgene	75-44-5			IC/ICP SCAN				
Phosphorus			METAL					
Phosphorus, Red		DELETE-SAME AS BELOW						
Phosphorus, White	7723-14-0		SVOC TIC					
Potassium Chlorate	3811-04-9			IC/ICP SCAN				
Potassium Chlorate and Aluminum		DELETE-SAME AS ABOVE						
Potassium Nitrate	7757-79-1			IC/ICP SCAN				
Potassium Perchlorate	7778-74-7			IC/ICP SCAN				
Potassium Permanganate	7722-64-7			IC/ICP SCAN				
Ricin	9009-86-3							
Rosin	8050-09-7							
Silicon	7440-21-3			IC/ICP SCAN				
Silicon Tetrachloride	409-21-2	silicon carbide		IC/ICP SCAN				
Sodium	7440-23-5		METAL					
Sodium (metallic)	7440-23-5	DELETE-SAME AS ABOVE						
Sodium Bicarbonate	144-55-8			IC/ICP SCAN				

SPRING VALLEY
AUES CHEMICALS

				WILL BE ANALYZED FOR THIS PROJECT			*WILL **NOT** BE ANALYZED FOR THIS PROJECT*	
COMPOUND	**CAS No.**	**Primary Name/Notes**	**ROUTINE**	**NON-ROUTINE**	**SPECIALTY LAB**	**NON-SPECIFIC**	**RESEARCH PROJ**	
	Chemical Abstract Service No.	(I.e., compound name in column 1 is listed as a synonym of this primary name in resources)	(TCL or TAL) + TICs	(But readily available methodology)	Chemical Warfare Materiels			
Sodium Chlorate	7775-09-9			IC/ICP SCAN				
Sodium Cyanide	143-33-9			IC/ICP SCAN				
Sodium Hydroxide	1310-73-2			IC/ICP SCAN				
Sodium Nitrate	7631-99-4			IC/ICP SCAN				
Sodium Oleate	143-19-1	oleic acid, sodium salt		IC/ICP SCAN				
Sodium Silicate	6834-92-0			IC/ICP SCAN				
Sodium Stearate	822-16-2			IC/ICP SCAN				
Stannic Chloride (Tin Tetrachloride)	7646-78-8	Tin(IV) chloride		IC/ICP SCAN				
Stannic Chloride, Anhydrous	7646-78-8	DELETE-SAME AS ABOVE						
Stearic Acid	57-11-4							
Sulfur	7704-34-9		METAL					
Sulfur Chloride	10025-67-9			IC/ICP SCAN				
Sulfur Trioxide	7446-11-9			IC/ICP SCAN				
Sulfuryl Chloride	7791-25-5			IC/ICP SCAN				
Superpalite	503-38-8	DELETE-same as chloroformate						
Tetrachloromethyl Sulfide				IC/ICP SCAN				
Thermite		Thermite is iron and aluminum		IC/ICP SCAN				
Thermite Igniter								
Thiophene	110-02-1		VOC TIC					
Thiophosgene	463-71-8			IC/ICP SCAN				
Titanium Tetrachloride	7550-45-0			IC/ICP SCAN				
Tolyl Isocyanides	DELETE-same as o-Tolyl Isocyanide							
Trichloroacetonitrile	545-06-2		VOC TIC					
Trichloroacetyl Chloride	76-02-8			IC/ICP SCAN				
Trichloroacetyl Cyanide				IC/ICP SCAN				
Trichlorohydrin	96-18-4	1,2,3 trichloroproane		IC/ICP SCAN				
Trichloromethyl Chloroformate	503-38-8	DELETE-same as chloroformate						
Trinitrotoluene	118-96-7		8330					
Turpentine	8006-64-2							

SPRING VALLEY
AUES CHEMICALS

				WILL BE ANALYZED FOR THIS PROJECT			WILL ***NOT*** BE ANALYZED FOR THIS PROJECT	
COMPOUND	**CAS No.**	**Primary Name/Notes**	**ROUTINE**	**NON-ROUTINE**	**SPECIALTY LAB**	**NON-SPECIFIC**	**RESEARCH PROJ**	
	Chemical Abstract Service No.	(I.e., compound name in column 1 is listed as a synonym of this primary name in resources)	(TCL or TAL) + TICs	(But readily available methodology)	Chemical Warfare Materiels			
Waste								
Xylyl Bromide	35884-77-6			IC/ICP SCAN				
Zinc	7440-66-6		METAL					
Zinc Chloride mixture	7646-85-7			IC/ICP SCAN				
Zinc Oxide	1314-13-2			IC/ICP SCAN				
Zinc Powder	7440-66-6	DELETE-Same as Zinc						
Total is 188, or 177 (subtracting deleted lines).			56	79	2	12	28	

IC/ICP SCAN	This process uses ion chromatography or induction coupled plasma to scan for prominent atoms in the compound. For example, for bromobenzyl cyanide, the sample would be scanned for bromine and cyanide. If both were present, then the possible presence of this compound could not be eliminated.	**TOTAL TO BE RUN** **137**	*(Blue+Yellow + Orange)*
ROUTINE	Standard services from most labs. Either the compound category (metal, VOC, TIC) or a separate method no., is shown.		
NON-ROUTINE	These are either the scan as described above, or a method not typically used but which has an established method. These are non-routine, but do not present difficulties for most labs to provide. In some cases, where the routine analyses only identify TICs, the non-routine method is shown if an additional level beyond the TIC is needed.		
SPECIALTY LAB	These chemicals are Chemical Warfare Materiels that require a special laboratory to handle. Special shipping requirements are also necessary.		
NON-SPECIFIC	Materials such as "waste" or "flash mixture" that cannot be identified without knowing specific components.		
RESEARCH PROJECT	If none of the labs suggested a way to identify these items, they were categorized as research projects. Some of these may not be familiar because of outdated names, synonyms, or "brand" names.		

DCDOH Comments to AUES List Sampling

The following section contains the DCDOH response to the AUES List sampling (Selected OU-4 Residences) presented in the preceding sections. Following the DCDOH comments, the USACE response to these comments is presented.

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF HEALTH

DRAFT COMMENTS ON THE CORPS OF ENGINEERS' FINAL REPORT OF ANALYTICAL RESULTS DATED MAY 8, 2002 3819 48TH STREET; 4710 QUEBEC STREET; 4625 ROCKWOOD PARKWAY AND 4633 ROCKWOOD PARKWAY

FEBRUARY 2003

Prepared by
Environmental Health Administration
Bureau of Hazardous Material and Toxic Substances
Hazardous Waste Division

Sequence of Events

First, the Corps of Engineers' (Corps') Final Report of Analytical Results (Report) WAS DATED May 8, 2002. Relevant data from this report was transmitted to only one of the property owners, 3819 48th Street, on or about January 14th, 2003. The property owner transmitted his portion of the data to DC Department of Health on January 23rd, 2003. At the partnering meeting on January 29th, 2003, the District of Columbia's Remedial Project Manager expressed concern over the delay and means of obtaining even a portion of the report. Also, concern was expressed over the more important delay in notifying the property owners.

At the partnering meeting, the District of Columbia's Remedial Project Manager noticed that the EPA's Remedial Project Manager had a completed Report dated May 8, 2002, which he also was given on January 14th, 2003. DC requested a copy of this Report, which the Corps transmitted on January 31st, 2003.

The Report indicates that sampling was done on 2/8/01 and 2/13/01. The Report also states on page 2 under SUMMARY, "Except as indicated in this report, all samples were prepared and analyzed within the specified holding times using the EPA-approved analytical procedures." The District will reserve comment on this portion of the Report until it receives copies of all field notes, chain-of-custody forms, laboratory quality control results, and all other information included in the data packages including the original laboratory reports, hereby requested pursuant to the Department of Defense and District Memorandum of Agreement (DDMOA) dated 5-9-94, paragraph 1, page 2-3.

This request is necessary due to the unusual nature of the timeline. A delay of a year and three months from sample collection to validated results is unusual, even for Spring Valley. Another delay of eight more months until the regulators and at least one property owner was notified is another inexplicable circumstance. Finally, the Report states in the first sentence, "In accordance with the revised Final Work Management Plan for Follow-on Sampling for OU-4 Residential Lots, Amendment 2 (Parsons, April 2001), Parsons collected soil samples from four OU-4 residences to assess for the presence of the American University Experiment Station (AUES) list of chemicals." The District needs to know how samples collected in February 2001 could be in accordance with a Plan Amended in April 2001.

Because many of the constituents of concern were volatile substances, this lengthy timeline and the missing date as to when the samples were actually analyzed is even more important. Also, several Trip Blank samples were apparently contaminated with volatile compounds, raising a further question on how well the sample blanks were sealed and whether any loss of volatile constituents occurred before analysis.

Generic Comments

During January and February of 2002, the District had several discussions with the Corps of Engineers "new" members of the partnering team, over the need to include the District in the deliberative process. While the District was and is pleased with the high level of expertise these "new" members possess, the District was under the impression that these "new" members were not used to working with state or local governments that assumed such a prominent role on a military weapons site. The District was under the impression that long before May 2002, these "new" members understood the need to include the District in the deliberations and to supply the District with all information regarding items or contamination found at the site. Therefore after this new member orientation, the District is at a loss to explain why it was not told of the sampling results, at least at a point in time where the results were validated.

The District requests that the Corps of Engineers search its files to ensure that no other relevant data or information is being withheld. The District reminds the Corps that the vast majority of the AUES site is private property and military customs regarding "need to know" are simply inapplicable.

The District has been informed that rights of entry for this expanded sampling were not obtained from two of the residents. The District is not in a position to assess the accuracy of this anecdotal information.

The District is also concerned about the timeline because the Corps has repeatedly stressed that its expertise is in the ordnance and engineering aspects, and has deferred the health related issues to the regulators. In the Work Management Plan for OU-5, August 10, 2001, the Corps states, "CENAB responsibilities include...obtaining rights-of-entry to properties in the investigation areas...and coordinating with regulatory agencies on issues pertaining to protection of human health and the environment." Par. 1.4.2 page 1-5. (See also page 1-5 of the Work Management Plan for OU-4 dated August 14, 2000). Again the Corps states, "Communication with the residents of Spring Valley is considered paramount to the successful completion of this project. The flow chart (Figure 1-4) below indicates the general sequence of events necessary to accomplish the sampling of the residential properties...Submit Right of Entry Letter to Homeowner-Receive signed Right of Entry-...Submit Sample Results Letter to Homeowner." Par. 1.5.9.4 Page 1-11. **(TAB A).** The District suggests that the Corps insure that its new personnel familiarize themselves with these generic work plans.

Since the Corps defers health issues to the regulators, not advising the regulators of the presence of these compounds left the residents without any competent opinion on the impact of the compounds for a period broaching two years. The fact that the residents were not even informed about the existence of the compounds, further exacerbates the problem. This "ostrichesque" approach to environmental remediation is not appropriate.

Specific Constituents

The following constituents are listed in the Report as being detected:
acenaphthalene
acetone
acrolein
acetaldehyde
alpha-lindane
anthracene
benzaldehyde
benzo[A]anthracene
benzo[B]fluoranthene
benzo[G,H,I]perylene
benzo[K]fluoranthene
benzoic acid
benzyl alcohol
benzyl bromide
benzene
benzeneetanol, 4-hydroxy
benzene, (1-methylethenyl)
benzene, 1-methyl-3-(1-methyl)
bicyclo2,2,1 heptane,7,7-d
bicyclo3.1.1 hept-2-ene.2.6.5-trimethyl
bicyclo3.1.1 hept-2-ene.2.6.6-trimethyl
bis(2-ethylhexyl)phthalate
butanal
butane
2-butanone
2-butanone, 3-methyl
2-butene, (z)
butylbenzylphthalate
carbon disulfide
carbonyl sulfide
carboxylic acid ester
chloride
chloroform
chloromethane
chrysene
cyanide
cyclohexene, 1-methyl-4-(1-methylethenyl)
cyclorpropane, 1,2-dimethyl-,trans
cyclotetrasiloxane, octamethyl
dibenz[A,H]anthracene
dibenzofuran
dichlorofluoromethane

diethylphthalate
di-n-butylphthalate
docosane
dodecanal
1-eicosanol
ethanethiol
ethanol,2-(2-ethoxyethoxy)
ethanone, 1-(3-ethyloxiranyl)
fluoranthene
fluorene
fluoride
gama-sitosterol
heptadecane
heptadecane, 9-octyl
heptane.3-methylene
hexadecanoic acid
9- hexadecanoic acid
2,4-hexanedione
2-hexanone
hexanal
hexanal, 2-ethyl
hexanal.5-methyl
hexane
1-hexene,4-methyl
2-hexene, (z)
indeno[1,2,3-CD]pyrene
methyl acetate
methylene chloride
2-methylnaphthalene
naphthalene
nitrate-n
nonacosane
nonadecane
nonanal
octacosane
13-octadecenal
14-octadecenal
9,12-octadecadenoic acid
octanal
octane
1-octanol,2,7-dimethyl
2-octene
2-octene, (e)
oleic acid
pentadecane,8-hexyl
pentanal isomer 1

pentanal isomer 2
pentanal isomer 114-octadecenal
phenanthrene
phenanthrene, 9-methyl
phosphate-P
propanal, 2-methyl
propane, 1,1-oxybis
1-propene,1.2.3-trichloro
pyrene
sulfate
thiodiglycol
toluene
trichlorofluoromethane
tricosane

Comments on Risk

Since many of these are volatile compounds, and many of these were found in surface soils, a presumptive pathway to human exposure exists. However, since many of these compounds are unknown in modern industry and do not have Risk Based Concentrations established, it would be difficult, if not impossible, to do an accurate Risk Assessment.

The District agrees with the Corps that most of these compounds are found in very low levels (i.e. a few parts per billion). However, the District notes that a few of these compounds are experimental chemical warfare agents or precursor compounds listed in the archival documents. Some are listed in standard hazardous materials references. **(TAB B).**

In addition, there are 102 compounds detected on one or more properties. The lowest number on any single property is 24. The two properties with the largest number of compounds lie in close proximity to each other. Because of the number of compounds on any given property, the synergistic and combinative effects would make it difficult, if not impossible, to do a Risk Assessment.

Finally, since EPA has already done a risk assessment on the Spring Valley site, it would be repetitive to do another. While EPA's Risk Assessment was done in 1999, it was primarily based on the limited sampling data from 1993 and 1994. Newer data from the site-wide arsenic sampling and limited sampling for other constituents should be added. If EPA feels that a Risk Assessment could be done on this new data, it should also be included.

Comments on Implications for the Spring Valley Project

Since two of these properties are known to have burial sites adjacent to them and are suspected of having burial sites on them based on geophysical surveys, the remaining two properties should also be examined geophysically for potential burial sites. Indeed one of those properties is already on the list for the first 50 properties to be geophysically surveyed, for other reasons.

The District noted in letter sent to the Corps in 1998 that the general absence of volatile and semi-volatile compounds found in the 1993 and 1994 sampling suggested that where such compounds were found a containerized burial site might exist. The reasoning seems especially apropos in light of the Report.

Other adjacent properties, as well as those in Points of Interest, should have a similar battery of tests done.

The District suggests that the partners discuss, as a priority, the need for more extensive sampling (some of these properties had only 3 samples) and whether a mapping of the soil gas would be useful in pointing to potential burial sites. The Corps should discuss interim measures with the property owners.

TAB A

WORK MANAGEMENT PLAN

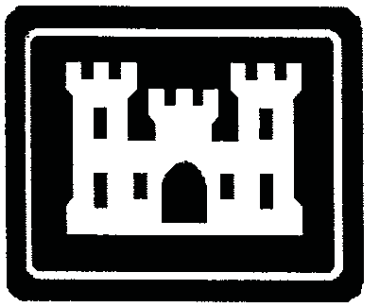
- Field Sampling Plan
- Quality Assurance Project Plan
- OE/CWM Risk Evaluation
- OE/CWM Contingency Plan
- Site Specific Safety & Health Plan
- Work Management Structure

TASK ORDER TO NATIONAL GUARD BUREAU
CONTRACT NO. DAHA90-94-D-0010, TASK ORDER DA01
DERP-FUDS HTRW PROJECT NUMBER C03DC091804

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) SPRING VALLEY OPERABLE UNIT 5, WASHINGTON, D.C.

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT



Prepared By:

PARSONS ENGINEERING SCIENCE, INC.
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

AUGUST 10, 2001

1.3.3 Environmental Setting

1.3.3.1 Four geological formations, three Piedmont and one Coastal Plain formation, are apparent in the vicinity of the site. These formations (from west to east) are the Sykesville Formation, the Dalecarlia Intrusive Suite, the Actinolite Schist, and the Coastal Plain Terrace Formation (USGS 1994). The Sykesville Formation is a sedimentary melange consisting of fragments of metagraywacke, migmatites, amphibolite, and actinolite schist in a quartzofeldspathic matrix. The Dalecarlia Intrusive Suite consists of massive to well-foliated biotite monzogranite and lesser granodiorites. The Actinolite Schist Unit consists of actinolite schist, actinofels, actinolite-chlorite schist and lesser talc bearing rocks. The Coastal Plain Terrace Gravel consists of highly weathered, crudely bedded gravel, sand, silt, and clay (Fleming, A. H., Drake, A. A., Jr., McCartan, Lucy, 1994). The Piedmont Formations are igneous or metamorphic in origin. The Coastal Plain Terrace Formation is fluvial in origin (Fleming, A. H., Drake, A. A., Jr., McCartan, Lucy, 1994). Schistosity is the major structural feature of the Piedmont rocks and saprolite in the OU-4 vicinity.

1.3.3.2 Two soil associations are present at the site, the Urban Land-Sassafras Chillum (ULSC) and the Urban Land-Manor Glenelg (ULMG). The ULMG soil association appears to comprise the majority of the soil at the site. It is a well to moderately well drained soil resulting from the weathering of the basement rocks (schist). The site ULSC soil in the vicinity of the residence results from the weathering of Coastal deposits. However, these soils have been greatly disturbed by construction and landscaping activities. The bedrock at this location consists of a variety of metasedimentary rocks of the Sykesville Formation. Depth to bedrock in the vicinity of the site ranges between 6 and 20 feet.

1.4 PROJECT ORGANIZATION

1.4.1 Project Team

1.4.1.1 Several organizations are directly involved in the Spring Valley OU-5 project. The technical team comprises the USACE, Parsons, and various subcontractors (Figure 1-2). The roles of these team members are described below.

1.4.2 U.S. Army Corps of Engineers, Baltimore District (CENAB)

1.4.2.1 CENAB is the Project Manager for this project. CENAB responsibilities include review of project plans and documents, obtaining rights-of-entry to properties in the investigation areas, working with the news media and the public (in conjunction with the Parsons ES Public Affairs Officer), and coordinating with regulatory agencies on issues pertaining to protection of human health and the environment.

1.4.3 Parsons Engineering Science (Parsons)

1.4.3.1 Parsons will function as the A/E contractor, and provide overall site management and coordination during field operations, including sampling, coordination of analytical samples, coordination of subcontractors, documentation of site activities, and preparation of the final report. Parsons will appoint a Public Affairs Officer (PAO) to assist CENAB in communicating progress and results to the public.

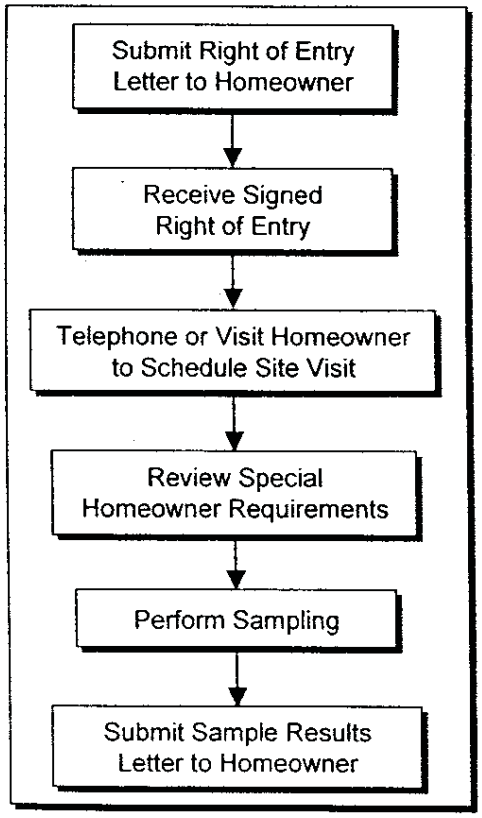
1.5.9.2 During sampling, it is anticipated that Ms. McQuilkin will be on site at the CENAB trailer located at the Federal Property.

1.5.9.3 Ms. McQuilkin, in close coordination with the CENAB Project Manager, will assist with the following:

- Answering phone calls from residents, providing answers to questions or taking messages for more difficult questions. Researching questions and returning phone calls within a reasonable time. Maintaining a log of contact with residents;
- Scheduling of sampling activities on each property with the homeowner and the sampling team;
- Tracking of requirements to conduct sampling at a resident's property. This will include pre and post sampling activities such as notifying the residents, tracking the status of signed rights of entry and preparing post sampling letters to be sent by CENAB to residents. The final list of items to be tracked will be coordinated with the CENAB Project Manager;
- Participating in meetings with residents as appropriate.

1.5.9.4 Communication with the residents of Spring Valley is considered paramount to the successful completion of this project. The flow chart (Figure 1-4) below indicates the general sequence of events necessary to accomplish the sampling of the residential properties.

Figure 1-4
Home Owner Communication Flow Chart



TAB B

Final Report

A Brief History of the *American University Experiment Station* and *U.S. Navy Bomb Disposal School, American University*

Prepared under the
Defense Environmental Restoration Program
for
U.S. Army Engineer District, Baltimore

by
Martin K. Gordon, Ph.D.
Barry R. Sude, Ph.D.
Ruth Ann Overbeck, M.A.
Charles Hendricks, Ph.D.

Office of History
Headquarters, U.S. Army Corps of Engineers
May 1994

Specific Activities and Operations

Operations at the Experiment Station, first under the Bureau of Mines and then under the Chemical Warfare Service, fell into several comprehensive, if sometimes overlapping, categories: gas mask research, offensive and defensive toxic chemical investigations, medical research, pyrotechnic investigations, and mechanical investigations. The Experiment Station's Chemical Research Division (Offense) studied the properties and efficiency of toxic substances—mustard gas, phosgene, superpalite (trichloromethyl chloroformate)—already in use in Europe. It suggested, developed, and submitted for testing literally hundreds of new chemical and solid toxic substances—including new types of mustard gas, cyanogen chloride, and bromobenzyl cyanide—for possible use in gas warfare. The division also investigated and developed smoke mixtures for Navy smoke screens and colored smokes for Army signaling on the battlefield, as well as incendiary materials for use in bombs, shells, projectiles, darts, and hand grenades. In addition, it investigated the problem of obtaining resistant linings suitable for gas shells; devised methods for manufacturing inorganic compounds for use in new explosives and as new toxic and corrosive shell fillers; and invented new methods for analyzing the effectiveness of new materials developed for use in gas warfare. It conducted extensive tests related to the toxicity and symptomology of various classes of mustard gas and similar compounds; developed a method for determining the tear-producing effects of toxic substances on humans; and contributed to various aspects of gas mask research.

The Chemical Research Division (Offense) also devised methods for the preparation, manufacture, and use of such toxic materials as acrolein, martonite, nitrosomethylurethane, chloroacetic anhydride, diphenylchloroarsine, adamsite, phenylbromoacetonitrile, methyldichloroarsine, thionyl fluoride, methyldichloroarsine, lewisite, bromobenzyl cyanide, phenylimidophosgene, thiophosgene, sulfur monochloride, sulfur dichloride, superpalite, cyanogen chloride, cyanogen bromide, diethyl sulfide, diphenyl sulfide, chloropicrin, acetylene-arsenic trichloride, acetyl fluoride, acetyl chloride, chloroacetyl chloride, acetophenone, chloroacetophenone, zinc arsenide, calcium arsenide, magnesium arsenide, arsenic trifluoride, bromine trifluoride, boron trifluoride, sulfur hexafluoride, iodine pentafluoride, aluminum chloride, titanium tetrachloride, and mustard gas.[47]

CHEMICAL	COMMENT
2-butonone	toxic by ingestion and dermal, affects peripheral nervous system[1]
acetone	
carbon disulfide	sulfide exception[2]
chloromethane	organic halogen (aliphatic halide)[3]
dichlorofluoromethane	organic halogen (aliphatic halide)[4]
2-butanone, 3-methyl	
2-octene	octylene [5](acrid smoke)
acetaldehyde	causes respiratory paralysis[6]
bicyclo2,2,1 heptane,7,7-d	
bicyclo3.1.1 hept-2-ene.2.6.5trimethyl	Similar to pinene, causes skin eruption, ataxia, kidney damage[7]
carbonyl sulfide (carbon oxide sulfide	sulfide[8]
cyclotetrasiloxane, octamethyl	siloxanes can spontaneously combust in air[9]
heptane.3-methylene	
hexanal	toxic, ingestion & inhalation, (acrid
smoke)[10]	
hexanal.5-methyl	
octanal	
octane	asphyxiant and blister agent[11]
pentanal isomer 114-octadecenal	Irritating to eyes & respiratory tract[12]
1-eicosanol	
1-propene,1.2.3-trichloro	organic halogen[13]
hexadecanoic acid	decanoic acid is a poison (acrid smoke)[14]
oleic acid	poison and skin irritant[15]

---

[1] Hazardous Chemical Desk Reference by N. Irving Sax and Richard J. Lewis, Sr., Van Nostrand Reinhold NY 1987.

[2] Military Chemistry and Chemical Agents TM 3-215 1942 at page 59 "Chemical agents are, almost without exception, organic compounds of the halogens." The exceptions are the sulfur derivatives (sulfides, mercaptans), nitrogen derivatives (cyanides), and some arsines.

[3] Supra, TM 3-215

[4] Supra, TM 3-215

[5] Chemical and Technical Dictionary H. Bennett editor, Chemical Publishing Co. NY 1962.

[6] The Merck Index Martha Windholz editor, Merck and Company 1976

[7] Supra, Merck

[8] Supra, TM 3-215

[9] Supra, Hazardous Chemicals

[10] Supra, Hazardous Chemicals

[11] Supra, Hazardous Chemicals

[12] Supra, Merck

[13] Supra, TM 3-215

[14] Supra, Hazardous Chemicals

[15] Supra, Hazardous Chemicals

Appendix 8.

192 70 w arsenic

COMPOUNDS PREPARED FOR TOXICOLOGICAL TESTS.

COMPOUND	REPORT NO.
Allyl Dichlorarsine	EACD 179
Allyl Formate	" 129
Allyl Isothiocyanate	*MR 7- '25
p-Amino Chloracetophenone	EACD 158
Ortho Arsanilic Acid	" 323
Para Arsanilic Acid	" 279
Atoxyl	" 279
Benzyl Arsonic Acid	*MR 4- '25
Benzyl Bromacetamide	EACD 307
Benzyl Bromide	*MR 9- '25
Benzyl Dichlorarsine	EACD 171
Bromacetoacetic Ester, Alpha	" 190
Bromacetoacetic Ester, Gamma	" 190
Bromnitromethane	" 275
Brompicrin	" 151
Butyl Arsenious Oxide	" 345
Butyl Arsonic Acid	" 345
Butyl Dichlorarsine	" 345
Butyl Difluorarsine	" 345
Calcium Butyl Arsonate	" 345
Calcium Ethyl Arsonate	" 338
Calcium Methyl Arsonate	" 319
Calcium Meta Nitrophenyl Arsonate	* MR 9- '24
Capsaicin	EACD-186
Chloracetic Acid	" 82
Chloracetoxylone	*MR 9- '25
Chloracetyl Chloride	EACD 87
Beta Chlorethyl Dichlorarsine	" 331
Bis Alpha Chlorethyl Sulfide	" 354
Bis Beta Chlorethylthio Ethane	*MR 3- '25
Bis Beta Chlorethylthiol Carbonate	EACD 280
Beta Chlorethylthiol Chlorformate	" 280
Beta Chlorethylthio Cyanate	" 285
Bis Chlorethylthio Methane	" 311
Bis Chlormethyl Ether	" 126
Chlormethyl Phenyl Sulfone	" 199
Bis Chlormethyl Sulfide	" 267
Chlorpicrin	" 75
Beta Chlorvinyl Arsenious Oxide	" 321
Bis Beta Chlorvinyl Arsenious Oxide	*MR 12 -22
Bis Beta Chlorvinyl Chlorarsine	EACD 239
Beta Chlorvinyl Dichlorarsine	" 239
Beta Chlorvinyl Difluorarsine	" 346
Beta Chlorvinyl Dimethoxyarsine	" 321

COMPOUND	REPORT NO.
Bis Beta Chlorvinyl Fluorarsine	*MR 8- '25
Bis Alpha Chlorvinyl Sulfide	EACD 354
Bis Beta Chlorvinyl Sulfide	" 354
Copper Xanthate	*MR 5- '25
Cyanogen Bromide	EACD 196
Cyanogen Sulfide	" 221
Dibromacetamide	" 307
Dichloracetone	" 312
Dichlorarsanthrene	" 323
Dichlor Nitroso Ethane	" 191
Diethoxy Chlorarsine	" 352
Diethyl Diselenide	" 277
Diethylene Disulfide	" 311
Diethylene Oxide Sulfone	" 337
Diethyl Selenide	" 277
Dimethyl Aniline Arsenious Oxide	" 229
Dimethyl Sulfate	*MR 8- '25
Dimethyl Sulfide	EACD 252
2,4 Dinitrophenol	" 238
2,4 Dinitrophenyl Beta Chlorethyl Sulfide	" 251
2,4 Dinitrophenyl Beta Chlorethyl Sulfone	" 251
2,4 Dinitrophenyl Beta Chlorethyl Sulfoxide	" 251
Dinitrotetrachlorethane	" 157
Di-isothiocyan Dimethyl Ether	*MR 3- '26
Diphenylamine Arsenious Oxide	EACD 324
Diphenylamine Bromarsine	*MR 3- '25
Diphenylamine Cyanarsine	EACD 257
Diphenylamine Fluorarsine	" 318
Diphenyl Arsenious Oxide	" 324
Diphenyl Arsenious Sulfide	*MR 4- '25
Diphenyl Arsinic Acid Ortho Arsonic Acid	EACD 323
Diphenyl Chlorarsine Ortho Chlorarsine	" 323
Diphenyl Cyanarsine	" 220
Diphenyl Fluorarsine	" 183
Diphenyl Trichlorarsine	*MR 3- '25
Diphenyl Antimonous Oxide	*MR 2- '25
Diphenyl Chlorstibine	*MR 2- '25
Diphenyl Phenoxyarsine	EACD 156
Divinyl Sulfide	" 354
Bis Beta Ethoxy Ethyl Sulfone	" 354
Ethyl Arsenious Oxide	" 324
Ethyl Arsenious Sulfide	*MR 6- '25
Ethyl Beta Chlorethyl Sulfide	EACD 254
Ethyl Beta Chlorethyl Sulfone	" 254
Ethyl Beta Chlorethyl Sulfoxide	" 254
Ethyl Beta Hydroxyethyl Sulfide	" 254
Ethyl Dichlorarsine	" 313
Ethyl Dichlor Phosphine	" 283
Ethyl Difluorarsine	" 338

COMPOUND	REPORT NO.
Ethylene Dithiocyanate	EACD 285
Ethyl Iodoacetate	*MR 12- '23
Ferric Xanthate	*MR 5- '25
Fluorbenzene	EACD 262
Guaiacyl Dichlorarsine	" 189
Heptoyl Amide	" 307
Hexachlorbenzene	" 253
Hexachlorethane	" 253
Ortho Hydroxy Chloracetophenone	" 158
Beta Hydroxy Ethyl Arsenious Oxide	" 331
Beta Hydroxy Ethyl Arsonic Acid	" 331
Para Hydroxy Ethyl Phenyl Arsenious Oxide	" 189
Bis Beta Hydroxy Ethylthiol Carbonate	" 280
Beta Hydroxy Ethylthiol Chlorformate	" 280
Iodoacetophenone	*MR 1- '24
Lead Xanthate	*MR 5- '25
Magnesium Methyl Arsonate	*MR 9- '24
Magnesium Phenyl Arsonate	EACD 259
Magnesium p Phenylene Diarsinate	" 279
Mercaptol	" 217
Mercury Diethyl	" 283
Mercury Dimethyl	" 192
Mercury Dinaphthyl	" 274
Mercury Diphenyl	*MR 10- '24
Methyl Arsenious Oxide	EACD 324
Methyl Arsenious Sulfide	*MR 5- '25
Methyl Arsonic Acid	*MR 10- '24
Methyl Beta Chlorethyl Sulfide	EACD 231
Methyl Beta Chlorethyl Sulfone	" 231
Methyl Beta Chlorethyl Sulfoxide	" 231
Methyl Chlormethyl Sulfate	" 198
Methyl Cyanformate	" 102
Methyl Dibromarsine	*MR 8- '25
Methyl Dichlorarsine	EACD 211
Methyl Difluorarsine	" 344
Methylene Methylol Undecenoylamide	" 307
Methyl Heptoyl Amide	" 307
Methyl Beta Hydroxyethyl Sulfide	" 231
Methylol Benzamide	" 307
Methylol Heptoate	" 307
Methylol Nonoyl Amide	" 307
Methylol Phthalimide	" 307
Methylol Undecenoylamide	" 307
Methyl Oxamic Ester	" 102
Methyl Phenyl Sulfone	" 199
Methylthiol Chlorformate	" 180
Methyl Vinyl Sulfide	" 354
Monothioethylene Glycol	" 311
Mustard Sulfone	" 177
Alpha Naphthoyl Amide	" 258

COMPOUND	REPORT NO.
Beta Naphthoyl Amide	EACD 258
Naphthyl Dichlorarsine	" 274
Alpha Naphtho Nitrile	" 258
Beta Naphtho Nitrile	" 258
Ortho Nitraniline	" 323
Nitro Cnloracetophenone	" 158
Nitromethane	" 275
Meta Nitrophenyl Arsenious Oxide	*MR 5- '24
Meta Nitrophenyl Arsonic Acid	*MR 10- '24
Ortho Nitrophenyl Arsonic Acid	EACD 323
Meta Nitro Phenyl Dichlorarsine	*MR 10- '24
Meta Nitro Phenyl Difluorarsine	*MR 1- '25
Meta Nitro p Oxy Benzoyl Benzamide	EACD 307
Phenoxarsine Chloride	*MR 5- '25
Phenoxarsine Fluoride	**WR6-22-25
Phenoxarsine Oxide	*MR 6- '25
Phenyl Antimonous Oxide	*MR 11- '24
Phenyl Arsenious Oxide	EACD 324
Phenyl Beta Chlorethyl Sulfide	" 263
Phenyl Beta Chlorethyl Sulfone	" 263
Phenyl Dichlorarsine	*MR 7- '25
Phenyl Dichlorphosphine	EACD 283
Phenyl Difluorarsine	" 273
Para phenylene Diarsonic Acid	" 279
Para Phenylene bis Dichlorarsine	" 279
Phenyl Beta Hydroxyethyl Sulfide	" 263
Phenyl Vinyl Sulfide	" 354
Phosphorus Pentaselenide	" 277
Picric Acid	" 238
Potassium Xanthate	*MR 5- '25
Pyromucic Acid	EACD 159
Pyromucyl Chloride	" 159
Resorcyl Aldehyde	" 307
Sodium Methyl Arsonate	" 211
Tetrachlordiethyl Sulfide	" 254
Tetrachlordiethyl Sulfoxide	" 232
Thiobenzamide	*MR 5- '23
Toluyl Acetamide	EACD 307
Toluyl Bromacetamide	" 307
Toluyl Chloracetamide	" 307
Toluyl Dibromacetamide	" 307
Para Toluyl Heptoyl Amide	" 307
Trimethoxyarsine	" 310
Triphenylarsine	*MR 5- '25
Triphenyl Dichlorarsine	*MR 5- '25
Tris Chlorvinyl Arsine	EACD 239
Trithioacetaldehyde	" 354
Trithioformaldehyde	" 267
Vanillyl Alpha Benzoyl Amide	" 307

U.S. Army Corps of Engineers' Response to Regulator and Community Stakeholder Concerns regarding 2001 Soil Sampling for Possible Contaminants remaining from World War I-Era Chemical Warfare Research Activities at American University Experiment Station

U.S. Army Corps of Engineers' Response to Regulator and Community Stakeholder Concerns regarding 2001 Soil Sampling for Possible Contaminants remaining from World War I-Era Chemical Warfare Research Activities at American University Experiment Station

1 Purpose

In recent months, several regulator and community stakeholder concerns have been expressed regarding soil sampling conducted by the U.S. Army Corps of Engineers (USACE) in early 2001 as part of the Spring Valley Formerly Used Defense Site (FUDS) investigation. This specific effort, referred to as the American University Experiment Station (AUES) List sampling, involved the analysis of soil for a variety of chemicals suspected of being used at AUES as part of the US Army's chemical warfare research from 1917 to 1920. This document addresses the identified concerns by describing the circumstances surrounding the planning and execution of the AUES List sampling and how the results were shared with various stakeholders.

2 Stakeholder Concerns

On January 14, 2003 USACE representatives and the US Environmental Protection Agency (USEPA) Region 3 remedial project manager met with the property owner of 3819 48th Street to discuss his individual concerns regarding the Spring Valley investigation and characterization of his property. During this meeting, the AUES List soil sampling results for this property were shared with the owner, unbeknownst to the USACE representatives that the owner had not seen these results previously. Though surprised, the owner appeared relieved to receive the data and to learn from USACE that the results did not contain any significant findings or reason for additional investigation.

In the days following this meeting, the property owner forwarded the data results to Washington DC's Department of Health (DC DOH). Data results for 3819 48th Street and the other three properties included in this sampling, referred to as the Operable Unit 4 (OU4) AUES residential properties, were discussed at the January 2003 Spring Valley Partnership meeting between USACE, USEPA and DC Health. During this meeting, the DC DOH representative expressed several concerns regarding USACE actions, alleging that DC DOH was not aware of the sampling and that DC DOH had not been furnished with the final report of the sampling effort dated May 2002. The following month, DC DOH released its *Draft Comments on the Corps of Engineers' Final Report of Analytical Results dated May 8, 2002 for 3819 48th Street; 4710 Quebec Street; 4625 Rockwood Parkway, and 4633 Rockwood Parkway* **(Appendix 1)**. Subsequently, in the Spring of 2003, the 2001 AUES List sampling event and management of the data results became the focus of several Spring Valley Restoration Advisory Board (RAB) discussions and local press articles.

The DC DOH comments and related concerns expressed by the property owners/residents can be grouped into the following major issues:

- *USACE did not inform the regulators or the property owners about the sampling event*
- *USACE did not have permission to conduct the AUES sampling on at least two of the residential properties investigated*
- *The process for validating the data was unusually long and inadequate*

- *Sampling results were not shared with the regulatory agencies or property owners*
- *The compounds detected may present a significant risk to those living on the properties*
- *Uncertainties associated with compounds that could not be analyzed for may present a significant risk to those living on the properties.*
- *Additional investigations, including resampling, should be conducted on the four OU4 AUES residential properties.*

USACE believes that the AUES List sampling was an appropriate effort to determine if a broader AUES List investigation was necessary. Records indicate USACE had permission from the property owners to conduct this sampling. Additionally, USACE records indicate that both DC DOH and USEPA were involved in the planning of the AUES List sampling and were provided results in a timely manner. Most importantly, USACE, USEPA and DC DOH all agree that the AUES List sampling results currently do not indicate the presence of any chemicals posing significant risks to those living on the OU4 AUES residential properties, a conclusion shared publicly during a recent Spring Valley RAB meeting.

USACE does acknowledge that the data results and the absence of significant risk for these four properties should have been shared with the property owners in a more timely manner and apologized for this community outreach oversight during meetings with the OU4 AUES residential property owners and the RAB. Actions are underway to ensure that such oversights do not occur in the future. Additionally, USACE also recognizes the present of uncertainties within the data results from the AUES List sampling and is working with the regulator and community stakeholders to evaluate and address these uncertainties to the greatest extent practicable.

Support for these conclusions and the ongoing efforts to move the AUES List sampling issue forward collectively are provided in the remainder of this document and the attached appendices.

3 Investigation Background

USACE conducted the AUES List sampling at ten locations within the Spring Valley project, including: the Child Development Center and Lot 12 on the campus of American University (the AU properties); four residential properties associated with the Sedgwick Trench on the 5000 block of Sedgwick Street, NW (the Sedgwick AUES residential properties); and four residential properties located in OU4 to the south and east of the AU campus (the OU4 AUES residential properties). The purpose of the sampling was to determine whether contaminants other than arsenic were present at levels whereby additional investigation on more properties would be warranted.

To fully understand the AUES List sampling, it is important to view it in the larger context of the Spring Valley soil investigation. Specifically, the AUES List sampling was part of a tiered approach involving a focused, small scale evaluation of a large suite of potential contaminants, a medium scale investigation targeting a more refined list of potential AUES contaminants, and a large scale characterization of the identified contaminant of concern (arsenic). These three tiers of soil investigation conducted in Spring Valley to date are delineated as follows:

> *Tier 1* – The AUES List sampling and analysis was conducted for a **broad suite of compounds and analytes on approximately 10 properties/locations**.

Tier 2 – Within the Operable Unit 5 (OU5) investigation initiated in 2001, **approximately 301 properties received soil boring analysis for explosives and/or chemical warfare agents and their degradation products.** The purpose of this investigation was to determine if AUES-specific contaminants were present in areas classified as points of interest (POI), where historical records suggested past activity most likely took place. Since historical records are rarely complete, 15% of the Spring Valley project area properties not associated with a POI was also sampled for these specific AUES-related constituents.

Tier 3 – Also within the OU5 investigation, **all residential properties and business lots (approximately 1500) for which rights of entry (ROEs) were obtain were sampled and analyzed for soil arsenic contamination**. Arsenic was initially identified as a contaminant of concern during OU3 work at the Korean Ambassador's residence located at 4801 Glenbrook Road, NW. Approximately 10 % or 150 properties have since been identified as needing soil removal.

This approach was a logical and cost-effective effort to evaluate comprehensively the nature and extent of soil contamination resulting from AUES activities throughout Spring Valley. These sampling efforts were well-coordinated with DC Health and EPA Region 3, and identified arsenic as the only soil contaminant of concern to date.

With the investigative approach delineated, it is now possible to address the timeline by which these efforts unfolded, resulting in the most recent DC DOH draft comments.

4 Sequence of Events

DC DOH draft comments refer to significant time delays between sample collection, data validation and notification of regulators and affected residents/owners. However, DC DOH and EPA Region 3 were fully aware of AUES List sampling at AU, at the four Sedgwick AUES residential properties, and the four OU4 AUES residential properties. As outlined in **Appendix 2** of this response document, clear efforts were made by USACE to provide the regulatory agencies opportunities for input into the planning, and to incorporate regulator requests into the final work plans. Additionally, records indicate that USACE shared the data results with its regulatory partners in a timely manner.

Specific regulator and resident concerns revolve around the 2-year length of time that has transpired between sample collection and final data publication. Table 1 provides a timeline of the sequence of events, which is supported by USACE records.

Table 1 reveals USACE efforts to conduct an open and responsive investigation. As discussed with the Spring Valley Restoration Advisory Board in March 2003 **(Appendix 2, Attachment A)**, there are several ongoing facets of the Spring Valley project that require attention during any given time frame, with priorities and project plans shifting as new discoveries are made and additional requests from regulators and community members are received. In the case of the AUES Sampling results, project efforts to resolve uncertainties and to release the data for public comment were given a lower priority and pushed back as USACE implemented area-wide arsenic sampling, executed the TCRA, and initiated the second round of TCRA based on regulator comments. Such delay was only acceptable to the USACE because no significant risks to community members were identified by USACE or its regulatory partners during initial review.

Throughout the project, USACE has made a committed effort to keep property owners informed of upcoming sampling and subsequent data results with regard to arsenic contamination, the only contaminant of concern identified to date in Spring Valley. For instance, as shown in **Appendix 2 (Attachments M and N)**, preliminary arsenic results were sent to the OU4 residents to keep them informed in a timely manner, noting that final results were then sent a few months later. As the project expanded significantly into OU5 in the summer of 2001, preliminary arsenic data could no longer be mailed to residents. However, validated results were provided over the phone if requested, in order to meet immediate resident needs or concerns until the formal letter with the final results could be produced. Additionally, validated data were placed in the Information Repository at the Palisade Library for broader public use.

Table 1: 2001 AUES List Sampling Timeline

Nov – Feb 2001	Partnership planning of AUES List sampling
Feb – Apr 2001	Soil samples collected
May – July 2001	Validated data shared with regulators
Aug 2001 – Jan 2002	Work on acceptable data reporting approach using AU results as a test case
Feb – April 2002	Finalize reports for OU4 AUES List sampling for all AUES List sampling
May – July 2002	Plan and initiate Time Critical Removal Action (TCRA); Simultaneously discuss reporting and uncertainty issues with DC DOH and USEPA in preparation for Fall 2002 Public Comment release of Engineering Evaluation and Cost Analysis (EE/CA) in support of Non-Time Critical Removal Action
Aug – Oct 2002	Address DC DOH request for second tier of TCRA removals; EE/CA and Non-Time Critical Removal Action delayed until TCRA is completed
Nov 2002 – June 2003	Conduct and complete second round of TCRA; Release of EE/CA and AUES List sampling results scheduled for July 2003

Unlike the arsenic results, data for the wide-array of compounds investigated through the AUES List sampling are quite complicated and could not be easily put in layman's terms and distributed by simple letter. Also, during the AUES List data evaluation process, soil arsenic delineation and removal was the highest priority, receiving a significant portion of the available funding and personnel. In turn, the project management team decided to develop an adequate reporting process for the AUES List data results as time allowed, instead of releasing the data for full public consumption without the necessary supporting materials and conclusions. While other ongoing work facilitated the private exchange of the AUES List sampling results with AU and the

Sedgwick AUES owners/residents until the official reports could be released, the four OU4 residents did not receive this same courtesy.

In early 2001, USACE did vastly expand its community outreach efforts to manage the many owner/residents concerns that would naturally arise during the broad, OU5 arsenic sampling investigation. However, the small-scale AUES list sampling unfortunately fell outside the focused community outreach efforts at that time. Realizing this oversight with regard to the four OU4 AUES residential properties, USACE has acknowledged openly to the OU4 property owners and Spring Valley RAB that it would have been appropriate to share the data sooner. Even if the reports would not be released for some time, USACE could have sent brief letters explaining that a) the sampling results had been reviewed and b) they did not indicate any other contaminants of concern. Efforts to remedy the resulting misunderstandings and questions are ongoing and discussed in more detail in Section 8 of this document.

5 Property Access

Some stakeholders have questioned whether ROEs for the AUES List sampling effort were obtained for two of the four OU4 properties. It is USACE's regular process to obtain the necessary ROE prior to accessing any property in support of the Spring Valley investigation, and the process for the AUES List sampling in 2001 was no different**. Attachments O, P, Q and R in Appendix 3** contain the ROEs for the four properties that received the AUES List sampling. Other included attachments reveal USACE's proactive efforts to communicate verbally and/or in writing with the property owners prior to executing the AUES List sampling.

Related to the issue of access, some question has been raised by one or two property owners regarding whether they provided permission to analyze for the AUES list of compounds. In response, it is important to note that the ROE is a legal mechanism to provide access to a property, and is not utilized to gain property owner permission for specific laboratory analysis. While efforts were made by USACE to inform residents of sampling plans, the specific type of laboratory analyses executed for a property is an investigative judgment decision to be made by USACE and the participating regulatory agencies. Both DC DOH and EPA participated fully in this decision process, as previously described.

6 Data Quality

In response to data quality concerns, USACE notes that the data were validated in accordance with EPA Region 3 modifications to the National Functional Guidelines for data validation. The validation covered all information contained in the data packages, including sample results, laboratory quality control results, chain-of-custody forms, and all supporting raw data. No major data quality control issues were noted during the review of the data by USACE's remedial contractor, Parsons Engineering Science, Inc.

In response to DC DOH's request for the laboratory reports and data packages for the OU4 AUES sampling, Parsons sent copies of the data packages to DC DOH and EPA on 26 February 2003. As part of the regulatory oversight process, EPA Region 3 conducted an independent validation of the data. Two validation reports were generated by the EPA's lab, identifying only two inorganics (antimony and phosphate) and two organics (acrolein and benzyl bromide) out of all the compounds analyzed for as major problems. At the present time, USACE holds a different perspective regarding the validation findings and does not believe the problems identified are major. The EPA's reports have been distributed to the participating agencies, community RAB

members and the affected property owners for review. Currently, a working meeting to discuss these reports and any necessary next steps is targeted for July.

7 AUES List Data Assessment

Several regulator and community concerns have been expressed regarding the number and variety of compounds detected during the AUES List sampling and the potential health effects associated with these compounds. Concerns expressed by DC DOH or the involved residents revolve around a) potential sources of the compounds detected, b) the toxicity of individual compounds and c) potential synergistic effects from exposure to multiple compounds.

Contaminant Sources - The DC DOH comments provide a detailed list of compounds detected through the AUES List sampling, but make no distinctions between chemicals that are likely present as a result of AUES activities, those chemicals that are natural constituents of soil (e.g., nitrate, phosphate, sulfate), and chemicals that are expected to be present in an urban residential neighborhood (e.g., hydrocarbons, polycyclic aromatic hydrocarbons). Upon closer review, it is clear that virtually all of the compounds detected through the AUES List sampling are either used extensively in industry, are commonly found in the urban environment or are potentially of natural origin. Furthermore, many of the compounds detected on the OU4 residential properties are only tentatively identified, and some of the identified compounds are likely analytical artifacts (false positives).

Additionally, draft DC DOH comments also suggest that some of the detected compounds are experimental chemical warfare agents or precursor compounds and that many of these compounds are unknown in modern industry. However, USACE's review indicates that none of the 23 compounds listed in Tab B of the DC DOH comments are experimental chemical warfare agents and only two are potential precursor compounds.

Toxicity - The draft DC DOH comments circulated to property owners list the compounds detected, but do not describe the concentrations of the chemicals found. By not considering the concentrations of the compounds detected, DC DOH comments, in turn, fail to note that most of the reported concentrations are less than EPA Region 3's Risk-Based Concentrations (RBCs) for screening residential property. Considering the available RBCs, it is clear that the detected concentrations found on the OU4 AUES residential properties correspond to a *de minimis* risk and do not pose any health risks of concern for those individuals residing on the four properties sampled. As discussed with the affected property owners, USACE, EPA Region 3 and DC Health are in agreement on this issue.

In presenting risk concerns, the DC DOH comments (Tab B) note that many of the chemicals on the AUES list are "toxic" and cites various published sources of toxicity information. However, the DC DOH comments mischaracterize and misinterpret the content of the cited references in many places. Furthermore, the comments fail to recognize the first tenet of toxicology—the dose makes the poison. For example, the DC DOH comments state that oleic acid is a "poison and skin irritant"; they fail to note that oleic acid is found in percentage amounts in olive oil. While pure oleic acid applied to the skin is likely to cause irritation, this fact is not relevant to the concentrations detected in soil at any of the OU4 properties. The DC DOH notation of "toxic" and "poison" in Tab B fails to capture the context in which these chemicals are detected. Specific comments on the chemicals listed as "toxic" in the DC DOH report are provided in **Appendix 4**.

USACE does recognize that certain compounds detected do not have RBCs. Such inherent limitations are part of any scientific investigation and must be dealt with to the greatest extent practicable. USACE is working with DC DOH, USEPA and concerned residents in trying to reduce these and other identified uncertainties, which is discussed in more detail in the last section of these responses.

Risk Assessment - DC DOH comments state that the number of compounds on any given property makes it difficult, if not impossible, to assess the risk. USACE acknowledges that potential synergistic, antagonistic, or additive effects of multiple chemicals can complicate risk assessment in locations where large numbers of chemical compounds are found, and continues to work with DC DOH and USEPA in trying to address such risk uncertainties. However, while scientific research is ongoing to develop methodologies for assessing risk from complex mixtures, it is equally important to acknowledge that the potential for future advances does not mean current risk assessment practices are invalid.

USACE does follow currently appropriate regulations and guidance when evaluating risks. For instance when screening the AUES List data, USACE followed EPA Region 3 guidance indicating that the effects of multiple chemicals are accounted for by adjusting the non-carcinogenic RBCs down by an order of magnitude. In other words, if the RBC for a non-carcinogen was 5.2 mg/kg, USACE compared the concentration detected in the soil at the OU4 properties to 0.52 mg/kg. It remains USACE's commitment that any risk assessment evaluating the AUES data will be performed using the best practices available at the time, and that both DC DOH and USEPA will have full opportunity to provide regulatory review and comment to any such risk assessment.

USACE notes that EPA has prepared two risk assessments for the Spring Valley area, one in 1999 and one in 2000. The DC DOH comments suggest that a new risk assessment should be done using newer data from site-wide arsenic sampling and limited sampling for other constituents, if EPA feels that the additional limited data should be included. However, it is important to note that the purpose of OU4 AUES residential properties study was to examine whether certain additional chemicals should be added to the assessment, and the results to date indicate that chemicals other than arsenic appear to pose little, if any, additional risk. While any decision to update or append the earlier two risk assessments is a decision for EPA Region 3, USACE does not see any value in revising these earlier risk assessments because of the low concentrations of the other constituents detected and because a response action to address the arsenic contamination is already underway.

8 Future Project Efforts

Several concerns have been expressed by DC DOH and the affected OU4 residents with regard to the need for additional investigations on the four OU4 properties sampled previously. Specifically, DC DOH recommends that the Partners discuss the need for more extensive sampling and whether soil-gas mapping would be useful to identify potential burial sites. DC DOH recommends examining the remaining two properties geophysically for potential burial sites, and suggests that the detection of volatile organic compounds in a location might indicate a containerized burial site.

USACE does not believe that the types and concentrations of volatile and semivolatile organic compounds found in the soil on the OU4 AUES residential properties are indicative of the presence of a containerized burial site. However, it should be noted that three of the OU4

residential properties are slated to be surveyed geophysically to determine the presence of subsurface anomalies that could possibly be buried munition items, pits, or trenches based on a property prioritization plan developed in collaboration with DC DOH and USEPA and reviewed with the Spring Valley RAB. Progress on these ongoing geophysical investigations will continue to be one of the priorities discussed at monthly partnering meetings between USACE, EPA Region 3 and DC DOH.

In conjunction with the OU4 AUES sampling, USACE has established a work group with regulatory agencies and the affected OU4 AUES property owners/residents to review the AUES sampling results, identify uncertainties and discuss potential next steps. Whether or not additional AUES sampling will be necessary in the future will be evaluated through this multi-stakeholder work group. Minutes from the first meeting of this group are available on the project's web site at http://www.nab.usace.army.mil/projects/WashingtonDC/springvalley.htm. Additionally, it should be noted that 85 questions have been submitted by community RAB members regarding this sampling event, and that responses to these questions have been completed in consultation with USEPA and DC DOH and also will be available through the Spring Valley web site. USACE will continue to post the status and progress of efforts to address AUES List sampling uncertainties, as it becomes available.

These continued efforts regarding the AUES List findings and uncertainties will be integrated with the several other ongoing project priorities. Included in these project priorities is a multi-year removal action for addressing the 150 properties requiring soil arsenic removal, as well as several ongoing or planned investigations into other potential contamination and environmental media (i.e., potential buried ordnance, indoor air and groundwater).

Appendix 1

DC Department of Health's *Draft Comments on the Corps of Engineers' Final Report of Analytical Results dated May 8, 2002 for 3819 48th Street; 4710 Quebec Street; 4625 Rockwood Parkway, and 4633 Rockwood Parkway*

June 10, 2003

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF HEALTH

DRAFT COMMENTS ON THE CORPS OF ENGINEERS' FINAL REPORT OF ANALYTICAL RESULTS DATED MAY 8, 2002 3819 48TH STREET; 4710 QUEBEC STREET; 4625 ROCKWOOD PARKWAY AND 4633 ROCKWOOD PARKWAY

FEBRUARY 2003

Prepared by
Environmental Health Administration
Bureau of Hazardous Material and Toxic Substances
Hazardous Waste Division

Sequence of Events

First, the Corps of Engineers' (Corps') Final Report of Analytical Results (Report) WAS DATED May 8, 2002. Relevant data from this report was transmitted to only one of the property owners, 3819 48th Street, on or about January 14th, 2003. The property owner transmitted his portion of the data to DC Department of Health on January 23rd, 2003. At the partnering meeting on January 29th, 2003, the District of Columbia's Remedial Project Manager expressed concern over the delay and means of obtaining even a portion of the report. Also, concern was expressed over the more important delay in notifying the property owners.

At the partnering meeting, the District of Columbia's Remedial Project Manager noticed that the EPA's Remedial Project Manager had a completed Report dated May 8, 2002, which he also was given on January 14th, 2003. DC requested a copy of this Report, which the Corps transmitted on January 31st, 2003.

The Report indicates that sampling was done on 2/8/01 and 2/13/01. The Report also states on page 2 under SUMMARY, "Except as indicated in this report, all samples were prepared and analyzed within the specified holding times using the EPA-approved analytical procedures." The District will reserve comment on this portion of the Report until it receives copies of all field notes, chain-of-custody forms, laboratory quality control results, and all other information included in the data packages including the original laboratory reports, hereby requested pursuant to the Department of Defense and District Memorandum of Agreement (DDMOA) dated 5-9-94, paragraph 1, page 2-3.

This request is necessary due to the unusual nature of the timeline. A delay of a year and three months from sample collection to validated results is unusual, even for Spring Valley. Another delay of eight more months until the regulators and at least one property owner was notified is another inexplicable circumstance. Finally, the Report states in the first sentence, "In accordance with the revised Final Work Management Plan for Follow-on Sampling for OU-4 Residential Lots, Amendment 2 (Parsons, April 2001), Parsons collected soil samples from four OU-4 residences to assess for the presence of the American University Experiment Station (AUES) list of chemicals." The District needs to know how samples collected in February 2001 could be in accordance with a Plan Amended in April 2001.

Because many of the constituents of concern were volatile substances, this lengthy timeline and the missing date as to when the samples were actually analyzed is even more important. Also, several Trip Blank samples were apparently contaminated with volatile compounds, raising a further question on how well the sample blanks were sealed and whether any loss of volatile constituents occurred before analysis.

Generic Comments

During January and February of 2002, the District had several discussions with the Corps of Engineers "new" members of the partnering team, over the need to include the District in the deliberative process. While the District was and is pleased with the high level of expertise these "new" members possess, the District was under the impression that these "new" members were not used to working with state or local governments that assumed such a prominent role on a military weapons site. The District was under the impression that long before May 2002, these "new" members understood the need to include the District in the deliberations and to supply the District with all information regarding items or contamination found at the site. Therefore after this new member orientation, the District is at a loss to explain why it was not told of the sampling results, at least at a point in time where the results were validated.

The District requests that the Corps of Engineers search its files to ensure that no other relevant data or information is being withheld. The District reminds the Corps that the vast majority of the AUES site is private property and military customs regarding "need to know" are simply inapplicable.

The District has been informed that rights of entry for this expanded sampling were not obtained from two of the residents. The District is not in a position to assess the accuracy of this anecdotal information.

The District is also concerned about the timeline because the Corps has repeatedly stressed that its expertise is in the ordnance and engineering aspects, and has deferred the health related issues to the regulators. In the Work Management Plan for OU-5, August 10, 2001, the Corps states, "CENAB responsibilities include...obtaining rights-of-entry to properties in the investigation areas...and coordinating with regulatory agencies on issues pertaining to protection of human health and the environment." Par. 1.4.2 page 1-5. (See also page 1-5 of the Work Management Plan for OU-4 dated August 14, 2000). Again the Corps states, "Communication with the residents of Spring Valley is considered paramount to the successful completion of this project. The flow chart (Figure 1-4) below indicates the general sequence of events necessary to accomplish the sampling of the residential properties...Submit Right of Entry Letter to Homeowner-Receive signed Right of Entry-...Submit Sample Results Letter to Homeowner." Par. 1.5.9.4 Page 1-11. **(TAB A).** The District suggests that the Corps insure that its new personnel familiarize themselves with these generic work plans.

Since the Corps defers health issues to the regulators, not advising the regulators of the presence of these compounds left the residents without any competent opinion on the impact of the compounds for a period broaching two years. The fact that the residents were not even informed about the existence of the compounds, further exacerbates the problem. This "ostrichesque" approach to environmental remediation is not appropriate.

Specific Constituents

The following constituents are listed in the Report as being detected:
acenaphthalene
acetone
acrolein
acetaldehyde
alpha-lindane
anthracene
benzaldehyde
benzo[A]anthracene
benzo[B]fluoranthene
benzo[G,H,I]perylene
benzo[K]fluoranthene
benzoic acid
benzyl alcohol
benzyl bromide
benzene
benzeneetanol, 4-hydroxy
benzene, (1-methylethenyl)
benzene, 1-methyl-3-(1-methyl)
bicyclo2,2,1 heptane,7,7-d
bicyclo3.1.1 hept-2-ene.2.6.5-trimethyl
bicyclo3.1.1 hept-2-ene.2.6.6-trimethyl
bis(2-ethylhexyl)phthalate
butanal
butane
2-butanone
2-butanone, 3-methyl
2-butene, (z)
butylbenzylphthalate
carbon disulfide
carbonyl sulfide
carboxylic acid ester
chloride
chloroform
chloromethane
chrysene
cyanide
cyclohexene, 1-methyl-4-(1-methylethenyl)
cyclorpropane, 1,2-dimethyl-,trans
cyclotetrasiloxane, octamethyl
dibenz[A,H]anthracene
dibenzofuran
dichlorofluoromethane

diethylphthalate
di-n-butylphthalate
docosane
dodecanal
1-eicosanol
ethanethiol
ethanol,2-(2-ethoxyethoxy)
ethanone, 1-(3-ethyloxiranyl)
fluoranthene
fluorene
fluoride
gama-sitosterol
heptadecane
heptadecane, 9-octyl
heptane.3-methylene
hexadecanoic acid
9- hexadecanoic acid
2,4-hexanedione
2-hexanone
hexanal
hexanal, 2-ethyl
hexanal.5-methyl
hexane
1-hexene,4-methyl
2-hexene, (z)
indeno[1,2,3-CD]pyrene
methyl acetate
methylene chloride
2-methylnaphthalene
naphthalene
nitrate-n
nonacosane
nonadecane
nonanal
octacosane
13-octadecenal
14-octadecenal
9,12-octadecadenoic acid
octanal
octane
1-octanol,2,7-dimethyl
2-octene
2-octene, (e)
oleic acid
pentadecane,8-hexyl
pentanal isomer 1

pentanal isomer 2
pentanal isomer 114-octadecenal
phenanthrene
phenanthrene, 9-methyl
phosphate-P
propanal, 2-methyl
propane, 1,1-oxybis
1-propene,1.2.3-trichloro
pyrene
sulfate
thiodiglycol
toluene
trichlorofluoromethane
tricosane

Comments on Risk

Since many of these are volatile compounds, and many of these were found in surface soils, a presumptive pathway to human exposure exists. However, since many of these compounds are unknown in modern industry and do not have Risk Based Concentrations established, it would be difficult, if not impossible, to do an accurate Risk Assessment.

The District agrees with the Corps that most of these compounds are found in very low levels (i.e. a few parts per billion). However, the District notes that a few of these compounds are experimental chemical warfare agents or precursor compounds listed in the archival documents. Some are listed in standard hazardous materials references. **(TAB B).**

In addition, there are 102 compounds detected on one or more properties. The lowest number on any single property is 24. The two properties with the largest number of compounds lie in close proximity to each other. Because of the number of compounds on any given property, the synergistic and combinative effects would make it difficult, if not impossible, to do a Risk Assessment.

Finally, since EPA has already done a risk assessment on the Spring Valley site, it would be repetitive to do another. While EPA's Risk Assessment was done in 1999, it was primarily based on the limited sampling data from 1993 and 1994. Newer data from the site-wide arsenic sampling and limited sampling for other constituents should be added. If EPA feels that a Risk Assessment could be done on this new data, it should also be included.

Comments on Implications for the Spring Valley Project

Since two of these properties are known to have burial sites adjacent to them and are suspected of having burial sites on them based on geophysical surveys, the remaining two properties should also be examined geophysically for potential burial sites. Indeed one of those properties is already on the list for the first 50 properties to be geophysically surveyed, for other reasons.

The District noted in letter sent to the Corps in 1998 that the general absence of volatile and semi-volatile compounds found in the 1993 and 1994 sampling suggested that where such compounds were found a containerized burial site might exist. The reasoning seems especially apropos in light of the Report.

Other adjacent properties, as well as those in Points of Interest, should have a similar battery of tests done.

The District suggests that the partners discuss, as a priority, the need for more extensive sampling (some of these properties had only 3 samples) and whether a mapping of the soil gas would be useful in pointing to potential burial sites. The Corps should discuss interim measures with the property owners.

TAB A

WORK MANAGEMENT PLAN

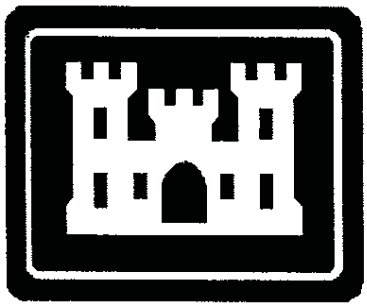
- Field Sampling Plan
- Quality Assurance Project Plan
- OE/CWM Risk Evaluation
- OE/CWM Contingency Plan
- Site Specific Safety & Health Plan
- Work Management Structure

TASK ORDER TO NATIONAL GUARD BUREAU
CONTRACT NO. DAHA90-94-D-0010, TASK ORDER DA01
DERP-FUDS HTRW PROJECT NUMBER C03DC091804

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) SPRING VALLEY OPERABLE UNIT 5, WASHINGTON, D.C.

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT



Prepared By:

PARSONS ENGINEERING SCIENCE, INC.
10521 ROSEHAVEN STREET
FAIRFAX, VA 22030

AUGUST 10, 2001

1.3.3 Environmental Setting

1.3.3.1 Four geological formations, three Piedmont and one Coastal Plain formation, are apparent in the vicinity of the site. These formations (from west to east) are the Sykesville Formation, the Dalecarlia Intrusive Suite, the Actinolite Schist, and the Coastal Plain Terrace Formation (USGS 1994). The Sykesville Formation is a sedimentary melange consisting of fragments of metagraywacke, migmatites, amphibolite, and actinolite schist in a quartzofeldspathic matrix. The Dalecarlia Intrusive Suite consists of massive to well-foliated biotite monzogranite and lesser granodiorites. The Actinolite Schist Unit consists of actinolite schist, actinofels, actinolite-chlorite schist and lesser talc bearing rocks. The Coastal Plain Terrace Gravel consists of highly weathered, crudely bedded gravel, sand, silt, and clay (Fleming, A. H., Drake, A. A., Jr., McCartan, Lucy, 1994). The Piedmont Formations are igneous or metamorphic in origin. The Coastal Plain Terrace Formation is fluvial in origin (Fleming, A. H., Drake, A. A., Jr., McCartan, Lucy, 1994). Schistosity is the major structural feature of the Piedmont rocks and saprolite in the OU-4 vicinity.

1.3.3.2 Two soil associations are present at the site, the Urban Land-Sassafras Chillum (ULSC) and the Urban Land-Manor Glenelg (ULMG). The ULMG soil association appears to comprise the majority of the soil at the site. It is a well to moderately well drained soil resulting from the weathering of the basement rocks (schist). The site ULSC soil in the vicinity of the residence results from the weathering of Coastal deposits. However, these soils have been greatly disturbed by construction and landscaping activities. The bedrock at this location consists of a variety of metasedimentary rocks of the Sykesville Formation. Depth to bedrock in the vicinity of the site ranges between 6 and 20 feet.

1.4 PROJECT ORGANIZATION

1.4.1 Project Team

1.4.1.1 Several organizations are directly involved in the Spring Valley OU-5 project. The technical team comprises the USACE, Parsons, and various subcontractors (Figure 1-2). The roles of these team members are described below.

1.4.2 U.S. Army Corps of Engineers, Baltimore District (CENAB)

1.4.2.1 CENAB is the Project Manager for this project. CENAB responsibilities include review of project plans and documents, obtaining rights-of-entry to properties in the investigation areas, working with the news media and the public (in conjunction with the Parsons ES Public Affairs Officer), and coordinating with regulatory agencies on issues pertaining to protection of human health and the environment.

1.4.3 Parsons Engineering Science (Parsons)

1.4.3.1 Parsons will function as the A/E contractor, and provide overall site management and coordination during field operations, including sampling, coordination of analytical samples, coordination of subcontractors, documentation of site activities, and preparation of the final report. Parsons will appoint a Public Affairs Officer (PAO) to assist CENAB in communicating progress and results to the public.

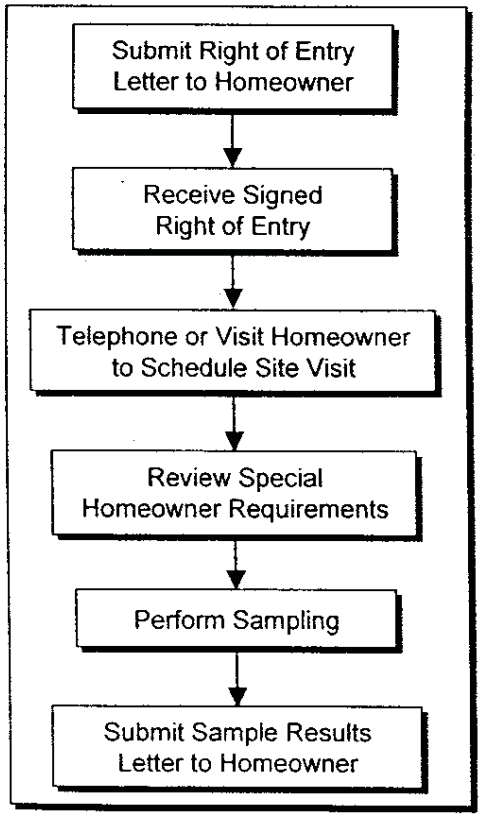
1.5.9.2 During sampling, it is anticipated that Ms. McQuilkin will be on site at the CENAB trailer located at the Federal Property.

1.5.9.3 Ms. McQuilkin, in close coordination with the CENAB Project Manager, will assist with the following:

- Answering phone calls from residents, providing answers to questions or taking messages for more difficult questions. Researching questions and returning phone calls within a reasonable time. Maintaining a log of contact with residents;
- Scheduling of sampling activities on each property with the homeowner and the sampling team;
- Tracking of requirements to conduct sampling at a resident's property. This will include pre and post sampling activities such as notifying the residents, tracking the status of signed rights of entry and preparing post sampling letters to be sent by CENAB to residents. The final list of items to be tracked will be coordinated with the CENAB Project Manager;
- Participating in meetings with residents as appropriate.

1.5.9.4 Communication with the residents of Spring Valley is considered paramount to the successful completion of this project. The flow chart (Figure 1-4) below indicates the general sequence of events necessary to accomplish the sampling of the residential properties.

Figure 1-4
Home Owner Communication Flow Chart



TAB B

Final Report

A Brief History of the *American University Experiment Station* and *U.S. Navy Bomb Disposal School, American University*

Prepared under the
Defense Environmental Restoration Program
for
U.S. Army Engineer District, Baltimore

by
Martin K. Gordon, Ph.D.
Barry R. Sude, Ph.D.
Ruth Ann Overbeck, M.A.
Charles Hendricks, Ph.D.

Office of History
Headquarters, U.S. Army Corps of Engineers
May 1994

Specific Activities and Operations

Operations at the Experiment Station, first under the Bureau of Mines and then under the Chemical Warfare Service, fell into several comprehensive, if sometimes overlapping, categories: gas mask research, offensive and defensive toxic chemical investigations, medical research, pyrotechnic investigations, and mechanical investigations. The Experiment Station's Chemical Research Division (Offense) studied the properties and efficiency of toxic substances—mustard gas, phosgene, superpalite (trichloromethyl chloroformate)—already in use in Europe. It suggested, developed, and submitted for testing literally hundreds of new chemical and solid toxic substances—including new types of mustard gas, cyanogen chloride, and bromobenzyl cyanide—for possible use in gas warfare. The division also investigated and developed smoke mixtures for Navy smoke screens and colored smokes for Army signaling on the battlefield, as well as incendiary materials for use in bombs, shells, projectiles, darts, and hand grenades. In addition, it investigated the problem of obtaining resistant linings suitable for gas shells; devised methods for manufacturing inorganic compounds for use in new explosives and as new toxic and corrosive shell fillers; and invented new methods for analyzing the effectiveness of new materials developed for use in gas warfare. It conducted extensive tests related to the toxicity and symptomology of various classes of mustard gas and similar compounds; developed a method for determining the tear-producing effects of toxic substances on humans; and contributed to various aspects of gas mask research.

The Chemical Research Division (Offense) also devised methods for the preparation, manufacture, and use of such toxic materials as acrolein, martonite, nitrosomethylurethane, chloroacetic anhydride, diphenylchloroarsine, adamsite, phenylbromoacetonitrile, methyldichloroarsine, thionyl fluoride, methyldichloroarsine, lewisite, bromobenzyl cyanide, phenylimidophosgene, thiophosgene, sulfur monochloride, sulfur dichloride, superpalite, cyanogen chloride, cyanogen bromide, diethyl sulfide, diphenyl sulfide, chloropicrin, acetylene-arsenic trichloride, acetyl fluoride, acetyl chloride, chloroacetyl chloride, acetophenone, chloroacetophenone, zinc arsenide, calcium arsenide, magnesium arsenide, arsenic trifluoride, bromine trifluoride, boron trifluoride, sulfur hexafluoride, iodine pentafluoride, aluminum chloride, titanium tetrachloride, and mustard gas.[47]

CHEMICAL	COMMENT
2-butonone	toxic by ingestion and dermal, affects peripheral nervous system[1]
acetone	
carbon disulfide	sulfide exception[2]
chloromethane	organic halogen (aliphatic halide)[3]
dichlorofluoromethane	organic halogen (aliphatic halide)[4]
2-butanone, 3-methyl	
2-octene	octylene [5](acrid smoke)
acetaldehyde	causes respiratory paralysis[6]
bicyclo2,2,1 heptane,7,7-d	
bicyclo3.1.1 hept-2-ene.2.6.5trimethyl	Similar to pinene, causes skin eruption, ataxia, kidney damage[7]
carbonyl sulfide (carbon oxide sulfide	sulfide[8]
cyclotetrasiloxane, octamethyl	siloxanes can spontaneously combust in air[9]
heptane.3-methylene	
hexanal	toxic, ingestion & inhalation, (acrid
smoke)[10]	
hexanal.5-methyl	
octanal	
octane	asphyxiant and blister agent[11]
pentanal isomer 114-octadecenal	Irritating to eyes & respiratory tract[12]
1-eicosanol	
1-propene,1.2.3-trichloro	organic halogen[13]
hexadecanoic acid	decanoic acid is a poison (acrid smoke)[14]
oleic acid	poison and skin irritant[15]

---

[1] Hazardous Chemical Desk Reference by N. Irving Sax and Richard J. Lewis, Sr., Van Nostrand Reinhold NY 1987.

[2] Military Chemistry and Chemical Agents TM 3-215 1942 at page 59 "Chemical agents are, almost without exception, organic compounds of the halogens." The exceptions are the sulfur derivatives (sulfides, mercaptans), nitrogen derivatives (cyanides), and some arsines.

[3] Supra, TM 3-215

[4] Supra, TM 3-215

[5] Chemical and Technical Dictionary H. Bennett editor, Chemical Publishing Co. NY 1962.

[6] The Merck Index Martha Windholz editor, Merck and Company 1976

[7] Supra, Merck

[8] Supra, TM 3-215

[9] Supra, Hazardous Chemicals

[10] Supra, Hazardous Chemicals

[11] Supra, Hazardous Chemicals

[12] Supra, Merck

[13] Supra, TM 3-215

[14] Supra, Hazardous Chemicals

[15] Supra, Hazardous Chemicals

Appendix 8.

192 70 w arsenic

COMPOUNDS PREPARED FOR TOXICOLOGICAL TESTS.

COMPOUND	REPORT NO.
Allyl Dichlorarsine	EACD 179
Allyl Formate	" 129
Allyl Isothiocyanate	*MR 7- '25
p-Amino Chloracetophenone	EACD 158
Ortho Arsanilic Acid	" 323
Para Arsanilic Acid	" 279
Atoxyl	" 279
Benzyl Arsonic Acid	*MR 4- '25
Benzyl Bromacetamide	EACD 307
Benzyl Bromide	*MR 9- '25
Benzyl Dichlorarsine	EACD 171
Bromacetoacetic Ester, Alpha	" 190
Bromacetoacetic Ester, Gamma	" 190
Bromnitromethane	" 275
Brompicrin	" 151
Butyl Arsenious Oxide	" 345
Butyl Arsonic Acid	" 345
Butyl Dichlorarsine	" 345
Butyl Difluorarsine	" 345
Calcium Butyl Arsonate	" 345
Calcium Ethyl Arsonate	" 338
Calcium Methyl Arsonate	" 319
Calcium Meta Nitrophenyl Arsonate	* MR 9- '24
Capsaicin	EACD-186
Chloracetic Acid	" 82
Chloracetoxylone	*MR 9- '25
Chloracetyl Chloride	EACD 87
Beta Chlorethyl Dichlorarsine	" 331
Bis Alpha Chlorethyl Sulfide	" 354
Bis Beta Chlorethylthio Ethane	*MR 3- '25
Bis Beta Chlorethylthiol Carbonate	EACD 280
Beta Chlorethylthiol Chlorformate	" 280
Beta Chlorethylthio Cyanate	" 285
Bis Chlorethylthio Methane	" 311
Bis Chlormethyl Ether	" 126
Chlormethyl Phenyl Sulfone	" 199
Bis Chlormethyl Sulfide	" 267
Chlorpicrin	" 75
Beta Chlorvinyl Arsenious Oxide	" 321
Bis Beta Chlorvinyl Arsenious Oxide	*MR 12 -22
Bis Beta Chlorvinyl Chlorarsine	EACD 239
Beta Chlorvinyl Dichlorarsine	" 239
Beta Chlorvinyl Difluorarsine	" 346
Beta Chlorvinyl Dimethoxyarsine	" 321

COMPOUND	REPORT NO.
Bis Beta Chlorvinyl Fluorarsine	*MR 8- '25
Bis Alpha Chlorvinyl Sulfide	EACD 354
Bis Beta Chlorvinyl Sulfide	" 354
Copper Xanthate	*MR 5- '25
Cyanogen Bromide	EACD 196
Cyanogen Sulfide	" 221
Dibromacetamide	" 307
Dichloracetone	" 312
Dichlorarsanthrene	" 323
Dichlor Nitroso Ethane	" 191
Diethoxy Chlorarsine	" 352
Diethyl Diselenide	" 277
Diethylene Disulfide	" 311
Diethylene Oxide Sulfone	" 337
Diethyl Selenide	" 277
Dimethyl Aniline Arsenious Oxide	" 229
Dimethyl Sulfate	*MR 8- '25
Dimethyl Sulfide	EACD 252
2,4 Dinitrophenol	" 238
2,4 Dinitrophenyl Beta Chlorethyl Sulfide	" 251
2,4 Dinitrophenyl Beta Chlorethyl Sulfone	" 251
2,4 Dinitrophenyl Beta Chlorethyl Sulfoxide	" 251
Dinitrotetrachlorethane	" 157
Di-isothiocyan Dimethyl Ether	*MR 3- '26
Diphenylamine Arsenious Oxide	EACD 324
Diphenylamine Bromarsine	*MR 3- '25
Diphenylamine Cyanarsine	EACD 257
Diphenylamine Fluorarsine	" 318
Diphenyl Arsenious Oxide	" 324
Diphenyl Arsenious Sulfide	*MR 4- '25
Diphenyl Arsinic Acid Ortho Arsonic Acid	EACD 323
Diphenyl Chlorarsine Ortho Chlorarsine	" 323
Diphenyl Cyanarsine	" 220
Diphenyl Fluorarsine	" 183
Diphenyl Trichlorarsine	*MR 3- '25
Diphenyl Antimonous Oxide	*MR 2- '25
Diphenyl Chlorstibine	*MR 2- '25
Diphenyl Phenoxyarsine	EACD 156
Divinyl Sulfide	" 354
Bis Beta Ethoxy Ethyl Sulfone	" 354
Ethyl Arsenious Oxide	" 324
Ethyl Arsenious Sulfide	*MR 6- '25
Ethyl Beta Chlorethyl Sulfide	EACD 254
Ethyl Beta Chlorethyl Sulfone	" 254
Ethyl Beta Chlorethyl Sulfoxide	" 254
Ethyl Beta Hydroxyethyl Sulfide	" 254
Ethyl Dichlorarsine	" 313
Ethyl Dichlor Phosphine	" 283
Ethyl Difluorarsine	" 338

COMPOUND	REPORT NO.
Ethylene Dithiocyanate	EACD 285
Ethyl Iodoacetate	*MR 12- '23
Ferric Xanthate	*MR 5- '25
Fluorbenzene	EACD 262
Guaiacyl Dichlorarsine	" 189
Heptoyl Amide	" 307
Hexachlorbenzene	" 253
Hexachlorethane	" 253
Ortho Hydroxy Chloracetophenone	" 158
Beta Hydroxy Ethyl Arsenious Oxide	" 331
Beta Hydroxy Ethyl Arsonic Acid	" 331
Para Hydroxy Ethyl Phenyl Arsenious Oxide	" 189
Bis Beta Hydroxy Ethylthiol Carbonate	" 280
Beta Hydroxy Ethylthiol Chlorformate	" 280
Iodoacetophenone	*MR 1- '24
Lead Xanthate	*MR 5- '25
Magnesium Methyl Arsonate	*MR 9- '24
Magnesium Phenyl Arsonate	EACD 259
Magnesium p Phenylene Diarsinate	" 279
Mercaptol	" 217
Mercury Diethyl	" 283
Mercury Dimethyl	" 192
Mercury Dinaphthyl	" 274
Mercury Diphenyl	*MR 10- '24
Methyl Arsenious Oxide	EACD 324
Methyl Arsenious Sulfide	*MR 5- '25
Methyl Arsonic Acid	*MR 10- '24
Methyl Beta Chlorethyl Sulfide	EACD 231
Methyl Beta Chlorethyl Sulfone	" 231
Methyl Beta Chlorethyl Sulfoxide	" 231
Methyl Chlormethyl Sulfate	" 198
Methyl Cyanformate	" 102
Methyl Dibromarsine	*MR 8- '25
Methyl Dichlorarsine	EACD 211
Methyl Difluorarsine	" 344
Methylene Methylol Undecenoylamide	" 307
Methyl Heptoyl Amide	" 307
Methyl Beta Hydroxyethyl Sulfide	" 231
Methylol Benzamide	" 307
Methylol Heptoate	" 307
Methylol Nonoyl Amide	" 307
Methylol Phthalimide	" 307
Methylol Undecenoylamide	" 307
Methyl Oxamic Ester	" 102
Methyl Phenyl Sulfone	" 199
Methylthiol Chlorformate	" 180
Methyl Vinyl Sulfide	" 354
Monothioethylene Glycol	" 311
Mustard Sulfone	" 177
Alpha Naphthoyl Amide	" 258

COMPOUND	REPORT NO.
Beta Naphthoyl Amide	EACD 258
Naphthyl Dichlorarsine	" 274
Alpha Naphtho Nitrile	" 258
Beta Naphtho Nitrile	" 258
Ortho Nitraniline	" 323
Nitro Cnloracetophenone	" 158
Nitromethane	" 275
Meta Nitrophenyl Arsenious Oxide	*MR 5- '24
Meta Nitrophenyl Arsonic Acid	*MR 10- '24
Ortho Nitrophenyl Arsonic Acid	EACD 323
Meta Nitro Phenyl Dichlorarsine	*MR 10- '24
Meta Nitro Phenyl Difluorarsine	*MR 1- '25
Meta Nitro p Oxy Benzoyl Benzamide	EACD 307
Phenoxarsine Chloride	*MR 5- '25
Phenoxarsine Fluoride	**WR6-22-25
Phenoxarsine Oxide	*MR 6- '25
Phenyl Antimonous Oxide	*MR 11- '24
Phenyl Arsenious Oxide	EACD 324
Phenyl Beta Chlorethyl Sulfide	" 263
Phenyl Beta Chlorethyl Sulfone	" 263
Phenyl Dichlorarsine	*MR 7- '25
Phenyl Dichlorphosphine	EACD 283
Phenyl Difluorarsine	" 273
Para phenylene Diarsonic Acid	" 279
Para Phenylene bis Dichlorarsine	" 279
Phenyl Beta Hydroxyethyl Sulfide	" 263
Phenyl Vinyl Sulfide	" 354
Phosphorus Pentaselenide	" 277
Picric Acid	" 238
Potassium Xanthate	*MR 5- '25
Pyromucic Acid	EACD 159
Pyromucyl Chloride	" 159
Resorcyl Aldehyde	" 307
Sodium Methyl Arsonate	" 211
Tetrachlordiethyl Sulfide	" 254
Tetrachlordiethyl Sulfoxide	" 232
Thiobenzamide	*MR 5- '23
Toluyl Acetamide	EACD 307
Toluyl Bromacetamide	" 307
Toluyl Chloracetamide	" 307
Toluyl Dibromacetamide	" 307
Para Toluyl Heptoyl Amide	" 307
Trimethoxyarsine	" 310
Triphenylarsine	*MR 5- '25
Triphenyl Dichlorarsine	*MR 5- '25
Tris Chlorvinyl Arsine	EACD 239
Trithioacetaldehyde	" 354
Trithioformaldehyde	" 267
Vanillyl Alpha Benzoyl Amide	" 307

Appendix 2

Appendix 2

Project records support the USACE position that the AUES sampling was conducted with the full knowledge of others. To demonstrate the level of coordination and communication between USACE and its regulatory partners throughout the AUES list sampling event, the following attachments are provided[1]:

- **Attachment A:** Supplemental handout distributed at the March 11, 2003 Spring Valley Restoration Advisory Board meeting, which outlines USACE efforts and project management considerations associated with the 2001 AUES List sampling.
- **Attachment B:** Partnering Meeting minutes dated January 3, 2001, at which Richard Albright, DC DOH, was present. The expanded sampling on three of the four OU4 properties that were the focus of the DC DOH comments was discussed at this meeting. These minutes also demonstrate that the partners participated in other decisions being made at that time.
- **Attachment C:** E-mail dated January 24, 2001 that demonstrates that USACE provided the AUES list to the Partners, including Richard Albright, DC DOH.
- **Attachment D:** E-mail dated January 31, 2001 distributing to the Partners, including Richard Albright, DC DOH, the AUES List sampling plan (amendment 1) for the CDC and Lot 12 on the AU campus. The message also notes upcoming sampling at the OU4 residential properties.
- **Attachment E:** E-mail dated February 22, 2001 providing the agenda for the next Partnering meeting to the regulatory agencies, including Richard Albright, DC DOH. It notes that DC DOH will be represented by Greg Hope at the next meeting because Mr. Albright will be unable to attend. One of the agenda items is the OU4 residential properties sampling.
- **Attachment F:** Excerpt from partnering meeting minutes dated February 27, 2001, at which Gregory Hope, DC DOH, was present. These minutes include discussion of expanding the AUES List sampling to the Sedgwick residential properties.
- **Attachment G:** E-mail dated May 8, 2001 from MAJ Michael Peloquin, USACE, asking the sampling contractor to prepare presentations for the upcoming partnering meeting (May 14) on any "qualified" sampling results received since the March meeting, what the preliminary results are showing and challenges associated with interpretation of the AUES data results (using AUES data as examples).
- **Attachment H:** Partnering Meeting minutes from May 14, 2001 during which USACE believes OU4 AUES List data results were shared with DC DOH and USEPA, as suggested in attachments G and I. USACE notes that these minutes do not specifically document distribution of these data and realize future minutes should be more detailed to ensure adequate capture of discussions and decisions between USACE, USEPA and DC DOH.
- **Attachment I:** E-mail dated June 1, 2001 from the sampling contractor to USACE, transmitting the draft AUES List sampling data tables that had been handed out at the meeting. One table is for the OU4 residential properties and the other for the AU properties

[1] Attachments contain only relevant pages – full copies of these documents are available on the project's web site at http://www.nab.usace.army.mil/projects/WashingtonDC/springvalley.htm.

(Lot 12 and the CDC). It also notes some problems were encountered in getting analyses back from the lab in a timely manner.

- **Attachment J:** E-mail dated July 25 and 27, 2001 among the partners, including Richard Albright, DC DOH, referencing a Sedgwick AUES List data discussion at the previous week's partnering meeting and a follow-up discussion between MAJ Michael Peloquin, USACE, and Mr. Richard Albright. The e-mails indicate that the partners discussed the format of the results to be furnished to the Sedgwick AUES residential property owners, and notes that DC DOH "did not see any results posing any serious health risks" in its preliminary review of the results.
- **Attachment K:** E-mail dated May 8, 2002 from the sampling contractor to USACE, suggesting that the AUES List sampling results for all ten properties be presented and discussed at the May 22 partnering meeting. The message notes that the final reports on the OU4 residential properties were expected to be completed May 8 or 9.
- **Attachment L:** Excerpts from Partnering Meeting minutes dated May 22, 2002, at which Richard Albright, DC DOH, was present. The minutes describes the partners' discussion of how to report the results of the AUES List sampling results to the property owners, as well as USACE's ongoing efforts to share data with DC DOH and work with Mr. Albright on prioritizing next steps based on the data available. The minutes also note USACE efforts to track and address sampling concerns expressed by the owner of 3819 48th Street.
- **Attachment M:** Letter dated March 15, 2001 sent to the property owners of 4710 Quebec Street, providing the preliminary grid sampling arsenic results from sampling conducted on February 2, 2001.
- **Attachment N:** Letter dated May 15, 2001 sent to the property owner of 3819 48th Street, conveying the preliminary results of the arsenic sampling on their property from sampling conducted on February 7 and 8, 2001.

Spring Valley Restoration Advisory Board
Supplemental Handout regarding 2001 AUES List Sampling
March 11, 2003

Corps Efforts to Meet Stakeholder Needs through Sampling

Between February and April 2001, soil samples were collected in three separate focus areas, including A) American University's Child Development Center and Lot 12, B) four properties on the 5000 block of Sedgwick Street, and C) four residential properties associated with, or in the vicinity of, Operable Unit 4. Soil samples collected from these properties were analyzed for the full list of chemicals used at American University Experiment Station (AUES), noting the AUES list had been agreed upon by the Corps, EPA and DC Health (subsequently referred to as the "partnership").

These properties with elevated arsenic, except for 3819 48th, were selected for additional sampling in an effort to determine if arsenic is the only chemical of concern for the Spring Valley project, and whether or not sampling for other contaminants on a broader scale was necessary. The Corps efforts to work with DC Health and specific property owners are outlined in the following examples.

Work Management Plan - Addendum 1 - AU Lot 12/Child Development Center

Section 1.1 indicates, *"This follow-on sampling scope of work reflects the discussions of the USEPA and DC Health regulators, the Baltimore District Corps of Engineers, and AU personnel at the January 25, 2001, Spring Valley Partnering Meeting."*

Table 4.1, Sampling Objectives, from this same addendum indicates that 48 inch subsurface boring sampling for the AUES list was conducted *"to accommodate the DC Health regulator's request to further define extent of metals and compounds from former AUES activities in subsurface soils inside the CDC in areas near former AUES buildings or disturbed earth features."*

Work Management Plan - Addendum 2 - Follow-on Sampling for OU-4 Residential Lots

With regard to quadrant surface sampling for arsenic, Table 4.1 indicates this sampling was conducted to *"further define extent of arsenic in surface soils at properties adjacent to properties containing notable concentrations of arsenic as determined by the Aug-Nov (2000) residential sampling. 4900 Quebec (arsenic only) and 3819 48th Streets were included to accommodate individual property owner requests based on special circumstances."*

In this same table, while it does not specifically confirm the property owner's knowledge that additional chemical analyses would be conducted, it does indicate the Corps' efforts to meet the needs of DC Health and the property owner. Specifically, it states that *"non-grid, non-quadrant surface samples for the TCL VOCs, TCL SVOCs, ABPs, TICs and the AUES List were conducted to accommodate the DC Health regulator's request to sample for compounds that may have been used at the AUES, four locations were selected for full scan sampling. The properties were geographically spread with the objective of investigating different potential depositional environments. In general, the locations were in areas of high surface arsenic concentrations, or for 3819 48th Street, which had not been previously sampled, random locations in each quadrant (these were collected at the 12" - 18" depth based on the information from the property owner)."*

Project Management

To better understand the length of time the process has taken, it is important to consider the other ongoing events within the Spring Valley project during this time. First, when the specialty sampling was conducted within the 3 focus areas, the Corps was responding to community requests to initiate area-wide sampling for arsenic, to conduct a time-critical removal action at the AU Child Development Center and to establish the Restoration Advisory Board. By June, the area-wide arsenic sampling had commenced, requiring significant project coordination over the next 12 months to obtain rights-of-entry, collect the data, return data results letters and coordinate follow-on sampling. This short list does not convey the time and detail required to:

- Reach consensus with the RAB representatives on ROE and results letter content
- Delineate the remediation goal of 20 ppm for the arsenic removals
- Plan and execute the time-critical removal action process
- Finish remediation on the Korean Ambassador's residence
- Investigate the pit on 4825 Glenbrook
- Respond to congressional inquiries
- Coordinate community meetings and educational materials,
- Address real estate and data results requests from individual residents
- Develop a long-term plan to resolve ordnance concerns
- Discuss other potential areas of investigation
- Address Administrative Record/Information Repository issues
- Explore concerns regarding missing historical records
- Etc.

In short, initial review of the data from the Child Development Center, Sedgwick Trench and OU-4 in 2001 caused the finalization of these data to be placed on a slower track. It was never a question of whether these data would be released,

noting that it would be included in the Engineering Evaluation and Cost Analysis (EE/CA). This document is required to be released for public comment.

The Corps must execute this project with a finite amount of funding and manpower. Given that the specialty sampling data from the three focus areas did not reveal any apparent risks, the identified arsenic risks and resulting community needs took priority out of necessity to keep the project moving as fast as possible.

The Corps' Relationship with Spring Valley Residents

Corps personnel and our contractors make every effort possible to meet special requests regardless of whether it is from a RAB member with substantial project understanding, or a resident interacting with the Corps for the first time. Unfortunately, the environmental cleanup process is not perfect and neither are those trying to execute the project nor those overseeing it or otherwise participating in the cleanup. The Corps acknowledges that it should have provided data results sooner in order to help address any lingering questions or concerns a given resident might have had. Although we do our best to work closely with Spring Valley residents and meet their needs, occasionally we are unable to meet a specific request and sometimes we do make mistakes.

In this case, from a community relationship perspective, the Corps should have provided each property owner with a timely set of data, even if we did not have the support materials ready to explain all the data. Clearly, we fell short of meeting the needs of the four property owners/residents. On this point I have already apologized and do so again; the entire team feels bad about this delay and the subsequent repercussions on our relationship with the RAB and those specific property owners. Nevertheless, the Corps remains hopeful that this informational issue can be resolved and that the Corps and the community RAB members can continue to work together to address community needs.

SPRING VALLEY OU-4
Child Development Center
Washington, DC

MEETING MINUTES

PURPOSE OF MEETING: Child Development Center

LOCATION: Federal Property Trailer

DATE: January 3, 2001

TIME: 1:30 p.m. – 5:00 pm

---

1. INTRODUCTIONS

Everyone was introduced. Attendees attached.

Maj Plaisted began with a discussion plan for the CDC sampling

He provided an update of current projects on SV. Doing the excavation at 4801 and 4825. Getting the permit to place the roll-offs on Glenbrook.

SDA – People arrive back on site today to finish the set-up. Have the approvals to start working and will start the actual operation on Monday.

OU-4 sampling. Completed at 42 properties and on AU. Results on the 42 properties sent to the owners, USEPA and DC Health.

CDC.

Rich Albright stated the DC Health Department is ordering an immediate removal of the soil in the playground of the SDA. There was discussion on the need for an immediate removal. The discussion focused on sampling. The workplan was discussed. Sampling on 20' grids to determine the extent of the contamination. Willi Suter stated he did not feel the 20' grid was sufficiently fine. Discussion focused around using 10' grid. It was agreed sampling within the CDC will be performed on a 10' grid. Willi Suter stated AU wants split samples as does EPA. Parsons will be able to sample approximately 30 samples (two duplicates) per day with a three person team.

Ed Bishop discussed the analysis of the samples for volatiles and semi-volatile compounds for the target contaminant list (TCL) (EPA standard list) and tentatively identified compounds (TICs). TICs

are peaks that are not on the TCL but do give a peak that can be compared against a national mass spectrometry database. These peaks can be identified but not quantified.

Rich Albright suggested two samples at 4-5 feet within the CDC area.

Need to make sure we analyze for semi-vols (BNAs) to pick up the compounds identified in sample Baker 03

Surface sampling will be done on 10' grids. Two borings will be advanced to a depth of 4'. For each of the two borings, at 1' a discrete sample for TAL metals will be taken. At 4', a discrete sample will be taken and analyzed for agent breakdown products (mustard and lewisite), and volatiles, semi-volatiles TCLs and TICS. For the highest 5% arsenic results within the CDC, samples will be taken and analyzed for agent breakdown products (mustard and lewisite), and volatiles, semi-volatiles TCLs, TICS, and TAL metals. As results will be compared to background and the areas removed. It will take approximately 15 days to excavate, load out, receive results, and backfill. Assume an extra week for weather and other contingencies. AU will select a date after mid February when they can vacate for a month. The excavation will then progress at that date.

No need to do a geophysical survey within the CDC fence unless sampling indicates otherwise. Additional geophysical sampling will be based upon results of the AU sampling. The validated samples for AU should be available in 2 weeks.

OU-4 Sample Results

MAJ Plaisted presented the results of the 42 properties. Lan Reeser explained the approach for those properties with elevated arsenic (4641, 4637, 4633, 4625, 4621 Rockwood Parkway, 4710 Quebec, 4710 Woodway, and 4861 Indian Lane). These lots (including 4629 Rockwood) will be gridded on 20' centers and samples taken and analyzed for arsenic.

On 4625 and 4633 Rockwood Parkway, three surface samples will be taken in the highest quadrant(s) [4625 2 in Q3, 1 in Q4] [4633 take the sample at the borehole and two randomly in the backyard] (based up the initial arsenic results) and analyzed for agent breakdown products (mustard and lewisite), and volatiles and semi-volatiles TCLs and TICS. For these properties, each of the three quadrants not already containing a subsurface boring will be further sampled by compositing three 1' borings from each quadrant and analyzing for arsenic. 4604 and 4608 will be sampled with the quadrant sampling approach.

The same approach will be used for 4710 Quebec [1 ea in front quadrants and 1 in the high backyard quadrant]. Samples will be analyzed for agent breakdown products (mustard and lewisite), and volatiles and semi-volatiles TCLs and TICS. OU-4 will be expanded to include the three houses across the street from 4710 Quebec. These properties will be sampled with the quadrant sampling approach.

The 4710 Woodway front yard, specifically quadrant 4 and the northern portion of quadrant 3 will be gridded on 20' centers and sampled for arsenic. A composite of three 1' borings will be taken in each of these two quadrants in the front yard and analyzed for arsenic.

The lot at 4861 Indian Lane will gridded on 20' centers and sampled for arsenic. The property directly across the street will be sampled with the quadrant sampling approach.

A CENAB representative will accompany the sampling team.

Name	Organization/Address
Mike Rogers	CENAB
Lan Reeser	CENAB
Brian Plaisted	CENAB
Terry Schlonecker	EPA
Ken Shuster	EPA
Willi Suter	AU
Verna Green	AU CDC
Richard Albright	DC DOH EHA
Chuck Twing	CEHNC
Mike Winningham	Parsons ES
Kevin Brennan	CENAB
Ray Livermore	CENAB
Eryn Lussier	Parsons ES
James Taylor	Parsons ES

Hughes, Edward T NAB02

From: Rogers, Michael J NAB02
Sent: Thursday, February 08, 2001 12:10 PM
To: Peloquin, Michael CPT NAB02
Subject: FW: Chem list

-----Original Message-----
From: Plaisted, Brian D MAJ NAB02
Sent: Wednesday, January 24, 2001 10:28 AM
To: 'Albright, Rich'; 'Harbold, Harry'; 'Shuster, Ken'; 'EPIC - Slonecker, Terry'; Anderson-Hudgins, Sherri HNC; 'AU-Bridgham, Bethany'
Cc: Rogers, Michael J NAB02; Reeser, Leland H NAB02
Subject: Chem list

To all,
Attached is the list of contaminants that we had discussed at our last meeting and Parsons ability to have a lab for check for these compounds. This will be part of our discussion for tomorrow.

Brian Plaisted

chemic~1.xls

(Later called the AUES - list of contaminants)

SPRING VALLEY
AUES CHEMICALS

COMPOUND	ROUTINE	NON-ROUTINE	SPECIALTY LAB	NON-SPECIFIC	RESEARCH PROJ
	(TCL or TAL) + TICs	(But readily available methodology)			
Acetonitrile	VOC				
Acetyl Cyanide					
Acetyl Fluoride		IC/ICP SCAN			
Acetyl Thiocyanate					
Acrolein	VOC				
Adamsite			CWM		
Alcohol	VOC				
Allyl Alcohol	VOC				
Allyl Isocyanide		IC/ICP SCAN			
Allyl Isothiocyanate		IC/ICP SCAN			
Allylamine					
Aluminium	METAL				
Aluminium –CC14-NaC103					
Aluminium Selenide		IC/ICP SCAN			
Ammonia	E-350				
Ammonia Gas		IC/ICP SCAN			
Ammonium Chloride		IC/ICP SCAN			
Ammonium Cyanide		IC/ICP SCAN			
Ammonium Nitrate		IC/ICP SCAN			
Ammonium Picrate		IC/ICP SCAN			
Arsenic Trichloride		IC/ICP SCAN			
Arsenic Trifluoride		IC/ICP SCAN			
Arsenic Trioxide		AOAC 920			
Arsine		D 4490			
Barium Peroxide		IC/ICP SCAN			
Benzotrichloride	SVOC TIC	8121			
Benzyl Bromide	VOC				
Benzyl Chloride	VOC				
Benzyl Fluoride	SVOC TIC				
Benzyl Iodide	VOC				
Black Powder					
Bromine	SM-4500BR				
Bromoacetone	VOC				
Bromoketone		IC/ICP SCAN			
Bromoacetone, Chloroacetone	VOC TIC				
Bromoacetyl Bromide		IC/ICP SCAN			
Bromobenzene	VOC				
Bromobenzyl Cyanide		IC/ICP SCAN			
Bromomethyl Ether	VOC TIC				
Bromoxylyl Cyanide		IC/ICP SCAN			
Butyl Mercaptan	SVOC TIC	D 4490			
Cacodyl		IC/ICP SCAN			
Cacodyl Bromide		IC/ICP SCAN			
Cacodyl Chloride		IC/ICP SCAN			
Cacodyl Cyanide		IC/ICP SCAN			
Cadmium Methyl		IC/ICP SCAN			
Calcium Carbonate		7020			
Calcium Sulfate		IC/ICP SCAN			
Carbon Bisulphide	VOC				
Carbon Disulfide	VOC				
Carbon Monoxide		D 3416			
Carbon Tetrachloride	VOC				
Carborundum					
Celluloid					
Chlorinated Acetone, Turpentine	VOC TIC				
Chlorinated Carbon Disulfide	VOC TIC				
Chlorine		IC/ICP SCAN			
Chloroacetic Anhydride					

SPRING VALLEY
AUES CHEMICALS

COMPOUND	ROUTINE	NON-ROUTINE	SPECIALTY LAB	NON-SPECIFIC	RESEARCH PROJ
	(TCL or TAL) + TICs	(But readily available methodology)			
Chloroacetonitrile	VOC TIC				
Chloroacetyl Fluoride					
Chlorobenzene	VOC				
Chlorobenzol					
Chlorodiethyl Sulfide					
Chloroform	VOC				
Chloroformate					
Chloromethyl Chloroformate					
Chloromethyl Ether	VOC				
Chloromethyl Ethyl Ether	VOC				
Chloropicrin	SVOC-MODIF.				
Chloroacetone	VOC TIC				
Chromyl Chloride					
Crotonaldehyde	VOC TIC	D 3695			
Cyanogen		D 4490			
Cyanogen Bromide		IC/ICP SCAN			
Cyanogen Chloride		IC/ICP SCAN			
Diazomethane					
Dichloroethyl Disulfide					
Dichloromethyl Ether	VOC				
Dichloromethyl Sulfide		IC/ICP SCAN			
Dichloropropyl Sulfide		IC/ICP SCAN			
Diiodoacetylene					
Dimethylarsine		IC/ICP SCAN			
Diphenylchloroarsine	SVOC				
Ethyl Bromoacetate	VOC TIC				
Ethyl Chloroformate	VOC TIC				
Ethyl Dibromoacetate	VOC TIC				
Ethyl Iodoacetate					
Ethyl Isocyanide					
Ethyl Isothiocyanate					
Ethyl Mercaptan	SVOC				
Ethyl Sulfide		GC FPD			
Ethyl Trichloroacetate					
Ethyldichloroarsine					
Flash mixture					
Halo Wax					
Hexachloroethane	SVOC				
Hydrochloric Acid		IC/ICP SCAN			
Hydrocyanic Acid		IC/ICP SCAN			
Hydrofluoric Acid		IC/ICP SCAN			
Hydrogen Selenide		IC/ICP SCAN			
Iron	METAL				
Isoallylamine					
Kendallite					
Kieselguhr					
Lead Ferrocyanide		IC/ICP SCAN			
Lead Peroxide		IC/ICP SCAN			
Lead Thiocyanate		IC/ICP SCAN			
Magnesium	METAL				
Magnesium Arsenide		IC/ICP SCAN			
Magnesium Carbonate		IC/ICP SCAN			
Magnesium Oxide and Limestone		IC/ICP SCAN			
Methyl					
Methyl Bromoacetate	VOC TIC				
Methyl Chloroacetate	VOC TIC				
Methyl Chloroarsine		IC/ICP SCAN			
Methyl Chloroformate	VOC TIC				
Methyl Chlorosulfonate	VOC TIC				
Methyl Isocyanide		IC/ICP SCAN			

SPRING VALLEY
AUES CHEMICALS

COMPOUND	ROUTINE (TCL or TAL) + TICs	NON-ROUTINE (But readily available methodology)	SPECIALTY LAB	NON-SPECIFIC	RESEARCH PROJ
Methyl Selenide		IC/ICP SCAN			
Methyl Sulfate					
Methyldichloroarsine					
Methylnitrosourethan					
Mustard (crude, pure, distilled, gas forms)			CWM		
Nickel Carbonyl		IC/ICP SCAN			
o-Chloronitrobenzene	SVOC TIC				
Oil Smoke					
Oleic Acid					
o-Tolyl Isocyanide	SVOC				
Oxalyl Chloride		IC/ICP SCAN			
Paraffin					
Parazol					
Perchloromethylmercaptan	SVOC TIC				
Phenyl Isocyanate	SVOC				
Phenyl Isocyanide	SVOC				
Phenyl Isothiocyanate	SVOC				
Phenylcarbylamine Chloride		IC/ICP SCAN			
Phenyldichloroarsine	SVOC				
Phenylhydrazine	SVOC				
Phosgene		IC/ICP SCAN			
Phosphorus	E-365.2				
Phosphorus, Red	SVOC TIC				
Phosphorus, White	SVOC TIC				
Potassium Chlorate		IC/ICP SCAN			
Potassium Chlorate and Aluminum		IC/ICP SCAN			
Potassium Nitrate		IC/ICP SCAN			
Potassium Perchlorate		IC/ICP SCAN			
Potassium Permanganate		IC/ICP SCAN			
Ricin					
Rosin, Turpentine					
Silicon		IC/ICP SCAN			
Silicon Tetrachloride		IC/ICP SCAN			
Sodium	METAL				
Sodium (metallic)	METAL				
Sodium Bicarbonate		IC/ICP SCAN			
Sodium Chlorate		IC/ICP SCAN			
Sodium Cyanide		IC/ICP SCAN			
Sodium Hydroxide		IC/ICP SCAN			
Sodium Nitrate		IC/ICP SCAN			
Sodium Oleate		IC/ICP SCAN			
Sodium Silicate		IC/ICP SCAN			
Sodium Stearate		IC/ICP SCAN			
Stannic Chloride (Tin Tetrachloride)		IC/ICP SCAN			
Stannic Chloride, Anhydrous		IC/ICP SCAN			
Stearic Acid					
Sulfur	GPL's SOP				
Sulfur Chloride		IC/ICP SCAN			
Sulfur Trioxide		IC/ICP SCAN			
Sulfuryl Chloride		IC/ICP SCAN			
Superpalite					
Tetrachloromethyl Sulfide		IC/ICP SCAN			
Thermite					
Thermite Igniter					
Thiophene	SVOC TIC				
Thiophosgene		IC/ICP SCAN			
Titanium Tetrachloride:					
Cyanogen Chloride		IC/ICP SCAN			
Tolyl Isocyanides		IC/ICP SCAN			

SPRING VALLEY
AUES CHEMICALS

COMPOUND	ROUTINE (TCL or TAL) + TICs	NON-ROUTINE (But readily available methodology)	SPECIALTY LAB	NON-SPECIFIC	RESEARCH PROJ
Trichloroacetonitrile	VOC TIC				
Trichloroacetyl Chloride		IC/ICP SCAN			
Trichloroacetyl Cyanide		IC/ICP SCAN			
Trichlorohydrin		IC/ICP SCAN			
Trichloromethyl Chloroformate		IC/ICP SCAN			
Trinitrotoluene	8330				
Turpentine					
Waste					
Xylyl Bromide	VOC TIC				
Zinc	METAL				
Zinc Chloride mixture		IC/ICP SCAN			
Zinc Oxide		IC/ICP SCAN			
Zinc Powder		IC/ICP SCAN			
Totals	62	82	2	12	32

IC/ICP SCAN — This process uses ion chromatography or induction coupled plasma to scan for prominent atoms in the compound. For example, for bromobenzyl cyanide, the sample would be scanned for bromine and cyanide. If both were present, then this compound could be "tentatively" identified. The idea is similar to the TICs.

ROUTINE — Standard services from most labs. Either the compound category, whether it can be identified as a TIC, or a separate method no., is shown.

NON-ROUTINE — These are either the scan as described above, or a method not typically used but which has an established method. These are non-routine, but do not present difficulties for most labs to provide. In some cases, where the routine analyses only identify TICs, the non-routine method is shown if an additional level beyond the TIC is needed.

RESEARCH PROJECT — If none of the labs suggested a way to identify these items, they were categorized as research projects. Some of these may not be familiar because of outdated names, synonyms, or "brand" names.

Henry, Theodore J NAB02 Contractor

From: Hughes, Edward T NAB02
Sent: Monday, May 19, 2003 9:00 AM
To: Henry, Theodore J NAB02 Contractor
Subject: FW: Sampling at CDC

-----Original Message-----
From: Plaisted, Brian D MAJ NAB02
Sent: Wednesday, January 31, 2001 9:00 AM
To: 'Albright, Rich'; 'Harbold, Harry'; 'Shuster, Ken'
Subject: Sampling at CDC

To all,

Attached is the sampling plan for the additional sampling that we agreed to at the meeting on Thursday for your review. This covers only the CDC. A second plan will be coming out to address the other AU lots. We will be ready to sample a couple days after AU give us the go ahead. On Thursday we start on the private residences in OU-4 so that will likely have some impact on the scheduling. If you have questions give me a call.

Brian Plaisted

final-WP CDC.pdf

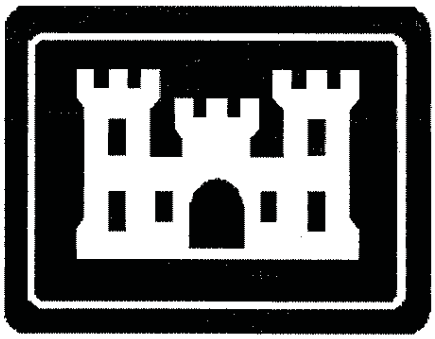
FINAL

WORK MANAGEMENT PLAN – AMENDMENT 1
AU LOT 12 / CHILD DEVELOPMENT CENTER
GRID SAMPLING

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
SPRING VALLEY OPERABLE UNIT 4
WASHINGTON, D.C.

Prepared For:

U.S. ARMY CORPS OF ENGINEERS,
BALTIMORE DISTRICT



Prepared By:

PARSONS ENGINEERING SCIENCE, INC.
10521 ROSEHAVEN STREET
FAIRFAX, VIRGINIA 22030

JANUARY 30, 2001

Hughes, Edward T NAB02

From: Plaisted, Brian D MAJ NAB02
Sent: Thursday, February 22, 2001 3:42 PM
To: 'Albright, Richard'; 'Thomas Bachovchin'; 'bjbesq@american.edu'; Whisenant, Bruce K HNC; 'HARBOLD.HARRY@epamail.epa.gov'; Durham, Jon HNC; Reeser, Leland H NAB02; Rogers, Michael J NAB02; Peloquin, Michael CPT NAB02; Hill, Robert F NAB02; Anderson-Hudgins, Sherri HNC; 'Slonecker.T@epa.gov'; 'jorge@american.edu'; 'shuster.kenneth@epa.gov'; 'Hope, Gregory (DC Health)'; 'Bishop, Ed'; Walters, Wilson C HNC
Subject: Next Partnering Meeting

AGENDA 27
Feb 01.doc

To all,

Although Richard Albright will be vacationing at Mardi Gras next week :-), there was a consensus that the Spring Valley team needed to meet as scheduled on 27 Feb. Greg Hope (Rich's partner) will be there to represent DC Health. I have attached the agenda. I have also included below some ideas that Harry Harbold from EPA had about expanding and expediting sampling. We will discuss these as part of our review and discussion of the sampling options. If you have additions for the agenda or questions about it let me know. I can be reached at 410-962-6784 or 202-686-03359.

Greg, I will send you a separate e-mail with directions to the EPA Science Building at Ft. Meade. The meeting will start at 1000 and we should be finished around 4:00 P.M.

Brian Plaisted

Harry Habold's ideas for expanding/expediting sampling:

-Increase number of sampling teams and use existing composite sampling protocol at several high priority POI geographic areas

-Increase sampling at special interest areas(young children, known health problems,real estate transfer

-Increase number of sampling teams and focus more on grab sampling

-Use geostatistical sampling method to grid out entire 660 acre parcel and sample randomly assigned grid sectors concurrent with sampling at high priority POIs

-Use of EPA laboratory support to accelerate sampling

Spring Valley Meeting Agenda
February 27, 2001

EPA Science Center at Ft. Meade, Maryland
Ruckelhaus Room

Introductions/Review Agenda	**10:00-10:15**
Update on **OU-3 (arsenic removal, test pits, risk assessment for 4835, restoration)** **OU-4 (sample status and results)** **SDA (confirmation results and stream sediment removal)** **Geophysical surveys at 4835 Glenbrook & 4710 Woodway** **Anomaly Review Board for 5 Sedgwick area properties** **-Major Plaisted and others**	**10:15-11:00**
Review and discussion of sampling options **This will include a review of EPA input** **-Spring Valley team**	**11:00-1:00**
Break-lunch sandwiches delivered	**12:15-12:30**
Geophysical survey in OU-4 area **-Spring Valley team**	**1:00-1:45**
Review of 52nd Court Trench data **-Terry Slonecker & SV team**	**1:45- 2:45**
Break	**2:45-3:00**
Other issues of concern	**3:00-3:30**
Action Items/Timelines	**3:30-3:45**

FINAL

SPRING VALLEY
Partnering Meeting
Fort Meade, EPA Science Building

MEETING MINUTES

PURPOSE OF MEETING:	Partnering Meeting
LOCATION:	Fort Meade, EPA Science Building
DATE:	February 27, 2001
TIME:	10:00 a.m. – 4:30 p.m.

Action items are *underlined and italicized.*

OU3 Non-Time Critical Removal Action, Risk Assessment, Test Pits

Major Plaisted summarized the status of this work.

4825 Glenbrook: Front yard done. Waiting for confirmation sample results. The Right of Entry expires February 28, 2001.

Test Pit Investigation at 4825 Glenbrook is tentatively set to start the week of 3/19/01.

The property owner will do the restoration of 4825 Glenbrook with funding from CENAB. The restoration of 4801 will be done by CENAB. The landscape architect for the Korean residents is completing the design.

The draft Risk Assessment (RA) for 4835 Glenbrook was distributed. Within EPA's acceptable risk range of 10^{-4} to 10^{-6}. The RA concludes that hot spot removal will not need to be done. American University (AU) wanted to know more about this process. Major Plaisted explained how the removal levels have previously been determined. *The draft-final report will be submitted to DC Health, American University, and EPA by March 9, 2001*. Once draft-final RA is delivered, will wait on feedback from EPA and AU on how to proceed. *Comments are due back to Parsons by March 16, 2001.*

There was a brief discussion of phytoremediation (planting a special type of fern that 'absorbs' high levels of arsenic).

Terry Slonecker (EPIC): Review of 52nd Court and POI 16 Areas

This presentation focused on the 52nd Court and POI 16 Areas and concluded that there were many more ground scars or disturbed earth areas than previously indicated. Should these be considered new POIs? Mr. Slonecker indicated there were no obvious ones. *CENAB will review the issue further.* Mr. Slonecker thought he could differentiate between stressed vegetation and ground scars. *Parsons will assist Mr. Slonecker's deliverable by providing information from the 2000 aerial photography.*

Major Plaisted suggested EPA, DC Health, and CENAB should take a look at the latest EPIC information to see if there is a need for additional geophysical surveys in the areas identified by Mr. Slonecker along Massachusetts Avenue. It was suggested that geophysics be done where there are ground scars, but no POIs (since these have been tested).

Mr. Harbold (EPA) presented the list of things residents have asked for. CENAB questioned whether this was a formal list from all residents or one person's idea of what is needed.

Mr. Harbold suggested that the residents be informed of the new ground scar information presented by Mr. Slonecker, but others questioned whether this will cause more problems if done as a half-measure, i.e., the residents could get the wrong idea about the ground scars if they had no other information to put this in context. Mr. Harbold also suggested that when sampling properties, residents should be given maps with info (scars, cut/fill {finalized}) because residents want to know what was put on their property (sprayed, fired, dumped). Mike Rogers (CENAB) pointed out that when a resident requests information, they are directed to the many previous reports (zone reports, lot reports) that generally contain all the old historical information for their area.

Mr. Slonecker volunteered to add the property lines into the ArcView database. Major Plaisted mentioned that with 1200 properties, this was a considerable effort. Mr. Slonecker added that his report was a draft and that these scars might not mean chemical agents impacts. *Mr. Slonecker will produce a report by the end of the month that includes whether these scars could be stressed vegetation.* Mr. Slonecker's overall report will be done by the end of March.

The review of ground scars at POI 16 brought up the issue of how to provide this information to the residents. It was suggested that an historical POI report be compiled by CENAB. Mark Baker, CENAB historian will need to get involved. Major Plaisted and Mr. Harbold agreed that it was necessary to show all information to residents to let them know whether there is a problem or not.

DC Health suggested that maybe they should just get a general idea of historic testing. Major Plaisted mentioned that Zone reports were distributed to every resident, but many people have left, so new people don't know the site history. These reports detailed what POIs are on their property, what was tested (geophysical and environmental sampling). A question was raised on the structure of the report: divide by POI or zone? It was decided that zone boundaries are arbitrary, so should probably do it by POI. *CENAB will review the level of effort (cost) for this type of report.*

DC Health and EPA would like to categorize all ground scars and/or stressed vegetation to determine whether or not any action (e.g., geophysical survey, sampling, intrusive investigation, etc.) has been accomplished at these areas as identified by the photo interpretation. If no action has been taken what should be taken if anything for each area identified? *The EPA will take the lead on the photo interpretation.*

Brian mentioned the next public meeting was March 14, 2001.

Principals need to get together to review 52nd court area and historic documentation (Schedule for early April). Brian said CENAB will need at least 4-5 weeks (also to give time to Mark Baker to do research), and that DC Health, EPA, and one person from Parsons should attend.

The question was asked if a Community Representative needs to attend the Partnering Meetings? It was decided in the future that the Chair or Co-Chair of the RAB might attended the Partnering Meetings.

OU-4 Follow-on Sampling and Sampling Options

Major Plaisted/Parsons reviewed the results of the OU-4 residential follow-on sampling action (not all the results had been received as of the meeting date). Based on arsenic levels, EPA requested three additional borings at the 4900 Quebec property at the 1-2 foot depth (CENAB agreed). 20 foot grid sampling was recommended by Major Plaisted for 4871 Glenbrook Road, based on the quadrant sampling results. In response to a question, Major Plaisted explained the basic procedure following grid sampling for a given property: once the sampling is completed a Risk Assessment will be completed for each property, followed by a Feasibility Study, and then a ROD.

Major Plaisted reviewed the sampling options for addressing the rest of the 661 acre Spring Valley boundary. Plans 1 and 2 were variations on the current sampling work being performed. Plan 3 included quadrant-type sampling of a 200 ft buffer zone around the POIs with documented CWM testing. Plan 4 included quadrant sampling the entire 661 acres (approximately 1600 homes/half-acre lots).

Mr. Harbold said Plan 3 was a good start but felt all 1600 should be addressed. He suggested a lesser level of sampling to cover these areas, involving only two surface samples (front and back yards) and no subsurface samples. Mike Rogers questioned whether EPA will commit to supporting this since CENAB was following EPA guidance with the quadrant approach. Tom Bachovchin questioned whether this approach was defensible or produced enough data to make risk assessment conclusions. It was also questioned whether "sooner" was a better rationale than "more complete" for follow on sampling. DC Health stated they would prefer that all of the 1600 properties be sampled using the standard quadrant method (Plan 4).

The Plan 4 discussion focused on obtaining all of the Rights-Of-Entry (ROEs). Mr. Harbold suggested that an easy way might be to simply have the residents sign up for sampling at the community meeting, but CENAB suggested that only a relatively small percentage of people

might be at these meetings and many will be missed. Mr Stephens suggested that an Area Neighborhood Commission (ANC) get involved to get the word to all residents involved.

AU personnel asked if additional samples will be taken outside the AUES boundary lines. CENAB stated that only if the contamination was indicating a pattern where the contamination might cross the property boundaries. AU personnel expressed an interest in ensuring that the northern parts of the campus be tested so that AU has assurances that the entire campus has been tested.

Major Plaisted will present these options at the upcoming community meeting. *Parsons was tasked with costing the option with the decreased sampling scope (two surface samples, no subsurface samples for 1600 homes/lots).*

Parsons strongly recommended that one lab will be used for all the additional follow-on sampling.

CDC Time Critical Removal Action

Soil samples have been taken with a 4 –6 week turn around time due to the constituents being analyzed. Once the soil results have been received and evaluated by the USACE, DC Health, EPA, and AU, the soil will be excavated (tentatively schedule for the end of May after the students have left for the summer).

SDA

Mike Winningham presented the data on the SDA characterization samples. Based on the arsenic and lead levels, over-excavation was recommended. *Based on a question from EPA, Parsons will review the comparison standards and derive a construction worker standard for lead and mercury.*

AU was asked to provide the timing for placing the large Baker Tank back on the parking area overlooking the SDA for the purposes of containing the stream water per the previous excavation procedures.

Need to obtain the last three ROEs prior to starting the culvert cleaning.

Geophysics

Bob Selfridge, Huntsville COE lead geophysicist joined the meeting by phone and summarized the proposed additional geophysical investigations for Spring Valley. *Mr. Selfridge said the contract action draft statement of work will be finalized by Friday March 2.* The new prove out area had not been selected yet but could be in the area of the AU soccer fields and possibly near the radio tower. Mr. Selfridge said he will be using the EM 31 and 61, the GEM-3, and the man-portable MTADS. The commercial MTADS will be used at the prove out and if certain problems were resolved, it could be used for the investigation. The radio tower will not be

turned off, therefore instruments will need to be tested near the radio tower. The objective is pits/trenches.

Mr. Selfridge explained that the EM 61 can locate a drum at 3 meters, but this depth decreases to ~ 4 feet for a 105 mm or 2.5 feet for a 75 mm item. The EM 31 can see a drum at 6 meters. For smaller, shallower objects, Mr. Selfridge recommended the EM 61. Mr. Selfridge indicated that GPR is ineffective in high clay soils. Mr. Shuster indicated that the USGS could conduct a GPR survey at the prove-out.

CENAB and EPA need to send Bob Selfridge the four AU areas needing to be geophysically surveyed.

ARB is scheduled for March 2, 2001 in Huntsville.

Sedgwick Trench Area

Major Plaisted briefly described the scope of the Sedgwick Trench investigation. It was decided to add the full scan parameters (including the AUES List) to the bottom of the trench samples. It was decided that making the leap over quadrant sampling to grid sampling set a bad precedent for sampling actions, and that quadrant sampling will be done on the Sedgwick properties. *Parsons will have the draft Work Plan for that investigation submitted by March 2, 2001.* Cases of multiple myeloma and aplastic anemia were discussed, but it was not clear exactly which house was reported to have which case.

Ken Shuster of EPA suggested using the Gore Sorber soil gas technology to get a better idea of volatile contamination. Parsons explained that the Encore sampling device was now being used for all volatile sampling and that this was the best method for obtaining good data. *However, Major Plaisted said that CENAB will look into the soil gas suggestion.* Ken suggested that the best way to find the trench bottom was to look at the six feet below the 1918 level depth because the old photos indicate the trench was generally six feet deep.

The meeting concluded at approximately 4:30 pm. The next Partnering meeting will be March 28, 2001, same time and place.

Name	Organization/Address
Tom Bachovchin	Parsons ES
Mike Winningham	Parsons ES
Marianne Cardwell	Parsons ES
Mike Rogers	CENAB
Lan Reeser	CENAB
Brian Plaisted	CENAB
Capt. Peloquin	CENAB
Wilson Walters	USAESCH
Mr. Bob Selfridge (by phone)	USAESCH
Gregory Hope	DCEHA
Mr. Harry Harbold	USEPA
Ken Shuster	USEPA
Terry Slonecker	EPA/EPIC
Jorge Abud	AU
Bethany Bridgham	AU
Patience Nwanna	CENAB
Bill Abadie	CENAB
Mark Stephens	USEPA

From: Peloquin, Michael CPT NAB02
Sent: Tuesday, May 08, 2001 12:40 PM
To: 'Edward Bishop'; 'Michael Winningham'; 'Thomas Bachovchin'
Cc: Reeser, Leland H NAB02
Subject: Support for the next partnering meeting

Ed,
I'm trying to give you a little prep time this month for the meeting.
If you look at the proposed agenda, there are several areas in which I'll need your help. First, in presenting any qualified sampling results we have back in since the March meeting. I'd also like to give an indication of what we are seeing in the preliminary results as well.
Second, I want to raise the issue to the partners that the results we anticipate from the SWRI AUES testing will require a good bit of interpretation prior to releasing them. Please be ready to talk this. I just spoke to Tom and he said we will actually have some of this data to use (as an example).
Third, need help getting to a final POI-specific contaminant list. Tom has some info that I asked him to share at the meeting.
Fourth, need the computer/projector to use in working through the addresses associated with each POI. A handout with the draft list would be a great starting point here as well.
Fifth, as the agenda shows, I'm trying to get (partial?) resolution regarding the soil gas and individual round issues. Your expertise and historical knowledge will be a great help.
Lastly, I'm sure there are some other issues to raise at the end. Tom mentioned at least one on the phone.

Major Michael D. Peloquin
Programs and Project Management Division
US Army Corps of Engineers, Baltimore District
michael.peloquin.cpt@nab02.usace.army.mil
410-962-0157 voice
410-962-9312 fax

Lee email dated June 01, 2001 1:39 PM
from Thomas Bachovchin
to Reeser, Peloquin
Subject – DATA TABLES FOR SPRING VALLEY (DRAFT)

FINAL

SPRING VALLEY

Partnering Meeting
DC Department of Health
51 N St NE, Washington, DC

MEETING MINUTES

PURPOSE OF MEETING: Sampling Strategy Meeting

LOCATION: DC Department of Health

DATE: May 14, 2001

TIME: 10:30 a.m. – 4:00 p.m.

Action items are ***bolded and italicized***.

1. INTRODUCTIONS/REVIEW AGENDA

2. UPDATE:

2.1 OU-5 (Sedgwick Trench sample status and results)

Tom Bachovchin presented the arsenic results for the Sedgwick Trench area. He also addressed the arsenic and pH results for the trench borings. Arsenic was below 13 ppm and pH was 5-7+ su (normal range). In general, the arsenic results were highest in the easterly section of the trenches (5040, 5046, and 5054 of Sedgwick, and Quadrant 1 of 3720 Fordham). The arsenic was below background in the lots in the western section (5059 and 5065 Sedgwick). Grid sampling will be accomplished for all 5040, 5046, and 5054 of Sedgwick, and 3720 Fordham properties in accordance with the grid sampling protocol. Since there were elevated results in these backyards, 3712 and 3706 Fordham will be assigned a high priority for quadrant sampling.

MAJ Peloquin proposed a community meeting for residents within the Sedgwick Trench area within the next month.

2.2 OU-3 (arsenic removal, test pits, risk assessment for 4835, restoration)

No results are yet available for the Horace Mann school quadrant properties.

The 4835 Glenbrook Road risk assessment is under review. Parsons is awaiting comments. ***Comments are due May 29, 2001.***

2.3 OU-4 (sample status and results for AU and private residences)

MAJ Peloquin reported they now have approximately 500 completed rights of entry.

Tom Bachovchin presented the arsenic results for grid samples on properties that had previously had elevated arsenic levels. There were additional elevated levels on properties on the ball field. A risk assessment will be performed combining these properties into a single exposure level commensurate with the use of the area (recreational). Results for the one property between the ball fields and the CDC are pending. Rich Albright raised the issues of skin rashes on teams using the fields. Bethany Bridgham reported these results were anecdotal.

The initial individual risk assessments are being developed, incorporating comments received to date on the 4835 risk assessment.

2.4 SDA (confirmation results and stream sediment removal).

The upper stream has been remediated. The current plan is to replace the railroad ties with new railroad ties. Parsons recommended against using railroad ties due to the creosote treatment. Pressure treated lumber sometimes contains arsenic. Parsons recommended concrete. Rich Albright suggested borax treated landscape timbers. (Update after meeting - The manufacture AWS contacted said wood treated this way should not be used where constantly exposed to water as the chemical used in the treatment process, disodium octaborate tetrahydrate is water soluble. ***Parsons will investigate other pressure treated lumber without toxics. CENAB will discuss the options, including concrete, with the property owners.***

The lower stream has been excavated and is awaiting confirmation sampling results.

2.5 Test Pits

The test pits were started today. Air monitoring indicated 2-3 X TWA for Lewisite. DAAMS have been pulled and are awaiting confirmation. It appears there is an associated 5 gallon drum. Rich Albright requested a copy of the tape. This will be copied from the video system that is a security system and requires special equipment. ***Parsons will make a copy.*** At a later update, Michael Winningham reported they had uncovered additional glassware and some contained liquid. Initial DAAMS tube results were negative for Lewisite.

2.6 Geophysical surveys at 5058 and 5054 Sedgwick

Chris Evans reported there is a large anomaly in the backyard of 5058. Sherri Anderson-Hudgins reported the homeowner is in the process of selling the property and wants the anomaly removed right away. Rich Albright distributed a letter from Mr. Gordon on these properties. Chris Evans reported the two anomalies have been confirmed and no more can be done without intrusive investigation.

Discussion was held on how to address the intrusive investigations from the USACE approval perspective. Previously intrusive investigations were done under operations orders. Since the area is known to have CWM, emergency removals cannot be used. Therefore, it appears it will require an amendment to the Site Safety Submission and associated pre-ops, etc. ***Sherri Anderson-Hudgins will take this as an action item to determine the path forward.***

MAJ Peloquin asked Chris Evans for an evaluation of the geophysics prioritization status. Chris Evans reported he has identified 40 priority one properties within the CTA.

Since an amendment to the Site Safety Submission will be required for any intrusive investigation, it was decided additional geophysics of the area could be accomplished concurrently. The geophysics will commence after the geophysics work plan is approved. The intrusive investigations will be accomplished at 5058 and 5054 Sedgwick first.

Regarding the geophysics of 5058 and 5054, the previously collected data will be evaluated using the newer version of Geosoft. ***Sherri Anderson-Hudgins will work with Scott Millhouse (USAESCH) to re-evaluate this data.***

MAJ Peloquin asked Rich Albright the DC Health response to this approach in light of the letter from Mr. Gordon. Rich Albright responded he felt it would be satisfactory so long as the residents are continually informed.

3. AIR MONITORING – 4825 GLENBROOK AND/OR 5065 SEDGWICK

CENAB made a request to do air monitoring in the basement of 4825 Glenbrook. The owners are requesting a detailed air monitoring plan outlining the objectives of the study. The homeowner at 5065 Sedgwick also requested indoor air monitoring. This is the residence where there was a reported case of multiple myeloma. Rich Albright wants to ensure the monitoring includes arsine.

Ken Shuster discussed his conversations with EPA emergency response team. This evidently is a real-time instrument that has not been tested for the contaminants of concern. The individual Ken Shuster talked to also stated the Gore Sorbers ? are not calibrated for the chemicals of concern. After discussion, it was decided to sample for arsine and mustard agent. These are contaminants that are unlikely to be present from any source other than chemical agents. ***Ken Shuster will follow up with the EPA contact regarding the applicability and availability of this instrument. Someone needs to take the lead with ECBC, CHPPM or others – Parsons or CENAB?***

Rich Albright requested air monitoring at 5054 Sedgwick because of the high arsenic and the anomaly. ***MAJ Peloquin will discuss this with the homeowner.***

4. SAMPLING PLAN ISSUES

4.1 Composite sampling

The issue of the number of composite samples per property for those properties outside of the CTA. Lan Reeser explained to obtain the same confidence level of 6 composite samples in each of 4 quadrants requires 8 composite samples in each of the two halves. This is based upon a low coefficient of variability for the background arsenic. Using 8 composite samples, the screening level for grid sampling should be lowered. ***Parsons will investigate the proper screening level.***

4.2 Final POI-specific contaminant lists

Tom Bachovchin briefed the attached list. Sampling will be performed from the 1918 level to one foot below for those properties with fill. For properties at the 1918 level or with cut, samples will taken from the surface to one foot below. There was no objection to the recommendation that Adamsite analysis be eliminated in favor of using arsenic as an indicator compound. Similarly, hydrocyanic acid and cyanogen chloride will be eliminated from the list in favor of using cyanide as an indicator analyte.

CENAB reviewed the "new" Mark Baker list of compounds filled into shells and determined there were no new compounds to add. Ray Livermore discussed their rationale. This included:

Xylyl Bromide—used as a gas, volatile, not expected to be present.

Oleum—fuming sulfuric acid, soluble in water and not expected to be present at this point.

Magnesium Arsenide—found as magnesium or arsenic. Magnesium is common metal and not a health hazard and arsenic will be analyzed.

Red Lead—Lead tetroxide, would be found as lead. Excluding the Small Disposal Area, only one sample contained lead greater than 400 ppm.

Aluminum Powder—found as aluminum. Abundant and not a health hazard. No samples except Small Disposal Area have been greater than the EPA RBC.

Magnesium Powder-- found as magnesium. Abundant and not a health hazard.

Benzoic Acid—becomes gaseous at 100 degrees F. Anaerobically degrades to CO2 and methane.

Methyl Alcohol—volatile and highly soluble in water. Not expected to be present at this time.

4.3 Soil sample depth

Soil sampling will be performed at the 6" level per USEPA guidance. This predicts the risk to residents from airborne dust or soil tracked into a residence. Harry Harbold recommended taking the boring in a garden area if requested by the resident if there is no ground scar.

4.4 Contaminants outside the CTA

Approximately 15% of the properties outside of the CTA will be subjected to additional boring sampling similar to the POIs within the CTA. These will be developed following receipt and review of EPIC's analysis of additional ground scars.

5. REVIEW LIST OF ADDRESSES IN EACH CTA POI

Discussion centered on what properties are within POIs in the CTA. Parsons presented the properties that had any portion of the lot within the POI. Everyone agreed these are the only properties that initially require sampling. If contamination is found at any POI, the POI bounds may be expanded.

6. SOIL GAS

Rich Albright distributed a paper discussing the formation of arsine from soil bacteriological activity. Ed Bishop recommended capturing a sample using an inverted vessel and sample for arsine. ***Someone needs to take the lead-DCEHA, Parsons or CENAB?***

7. NEXT PARTNERING MEETING

The next meeting will be held the second week of July 10, 2001, at the Spring Valley resident office.

SPRING VALLEY OU-5
POI SPECIFIC SAMPLING PLANS - CTA

Sampling Plan 1 (POI 19)

- ? Arsenic
- ? Mustard
- ? Mustard ABP (oxathiane, dithiane, thiodiglycol)

Sampling Plan 2 (POIs 15R and 16R)

- ? Arsenic
- ? Mustard
- ? Mustard ABP (oxathiane, dithiane, thiodiglycol)
- ? Lewisite ABP (CVAA/CVAO)
- ? Adamsite **(use arsenic as indicator)**
- ? Hydrocyanic acid **(use cyanide as indicator)**
- ? Cyanogen chloride **(use cyanide as indicator)**
- ? Cyanide
- ? Carbon Disulfide

Sampling Plan 3 (POIs 7, 13, 39)

- ? Arsenic
- ? Mustard
- ? Mustard ABP (oxathiane, dithiane, thiodiglycol)
- ? Lewisite ABP (CVAA/CVAO)
- ? Adamsite **(use arsenic as indicator)**
- ? Hydrocyanic acid **(use cyanide as indicator)**
- ? Cyanogen chloride **(use cyanide as indicator)**
- ? Cyanide
- ? Carbon Disulfide
- ? Tetryl
- ? Trinitrotoluene (TNT)
- ? Nitroglycerin
- ? 2,4 dinitrotoluene (2,4-DNT)
- ? 2,6 dinitrotoluene (2,6-DNT)
- ? **Nitrobenzene (part of original explosive suite)**

SPRING VALLEY OU-5
POI SPECIFIC SAMPLING PLANS - CTA

Sampling Plan 4 (POI 38)

- ? Arsenic
- ? Adamsite **(use arsenic as indicator)**
- ? Tetryl
- ? Trinitrotoluene (TNT)
- ? Nitroglycerin
- ? 2,4 dinitrotoluene (2,4-DNT)
- ? 2,6 dinitrotoluene (2,6-DNT)
- ? **Nitrobenzene (part of original explosive suite)**

CTA POIs	Sample Plan	Notes
16 R	Plan 2	Borings will be placed at the center of each patch. This POI area will be extended per the revised EPIC review. Now named POI 16R.
19	Plan 1	
15 R	Plan 2	This POI area will be extended per the revised EPIC review. Now named POI 15R.
7 R (?)	Plan 3	
13	Plan 3	
39	Plan 3	
38	Plan 4	Arsenic as an indicator of Adamsite
17	?	Potential dump area at end of ravine (truck turnaround), outside of the CTA. 2 composite arsenic samples per lot. Possible Geophysical investigation?

Name	Organization/Address
Sherri Anderson-Hudgins	USAESCH-OE-DC
Tom Bachovchin	Parsons ES
Ed Bishop	Parsons ES
Michael Winningham	Parsons ES
Marianne Cardwell	Parsons ES
Ray Livermore	CENAB
Lan Reeser	CENAB
MAJ Mike Peloquin	CENAB
Richard Albright	DCEHA
Chris Evans	CENAB-EH-GG
Mark Baker	CENAB
Mr. Harry Harbold	USEPA
Ken Shuster	USEPA
Jorge Abud	American University
Bethany Bridgham	American University
Mark Stephens	USEPA
Susan Platt	CENAB

Reeser, Leland H NAB02
From: Thomas Bachovchin [Thomas.Bachovchin@parsons.com]
Sent: Friday, June 01, 2001 1:39 PM
To: Reeser, Leland H; Peloquin, Michael CPT
Cc: David Badio
Subject: 'DRAFT' DATA TABLES FOR SPRING VALLEY

Mike,

Here are the versions handed out at the meeting. One is the residence AUES List sampling and the other is the lot 12/CDC. These are preliminary and more subject to change than preliminary arsenic data. For example we are still working out the wet/dry weight TDG issue.

Schedule—we have been having some problems with the lab. We just spoke to them and I think we can get the lot 12/CDC finalized by COB Monday. The others are actually farther along but we've prioritized the CDC.

I can only keep screaming at the lab to get us their stuff—again, it is promised to us by COB today, then David Badio needs to review the final submittal and then send out with the target COB Monday. As an aside, even allowing for the non-routine nature of the analyses, we're not real satisfied with what we're getting from this lab and we will not be using them on the upcoming OU-5 stuff, for what it's worth.

Sorry for these delays, but David has been working non stop on trying to get every issue hammered out.

Thanks.

SVSRI1.XLS

_____ Forward Header

Subject: 'DRAFT' DATA TABLES FOR SPRING VALLEY
Author: David Badio at NetTalk
Date: 6/1/2001 10:36 AM

TABLE 2
SUMMARY OF UNVALIDATED ANALYTICAL RESULTS

SAMPLE ID:		OU4-3819-1	OU4-3819-2	OU4-3819-3	OU4-3819-4	OU4-4710QS-1	OU4-4710QS-3	OU4-4710QS-4	OU4-4625-3A	OU4-4625-3B
SAMPLE TYPE:		NX	NX	NX	NX	NX	NX	NX	NX	NX
LAB SAMPLE ID:		157020	157021	157022	157023	157024	157025	157026	157203	157204
ORDER NO.:		1	1	1	1	1	1	1	1	1
SAMPLING DATE:		2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/13/2001	2/13/2001
Volatile Organic Compounds - SW8260B										
DICHLORODIFLUOROMETHANE	UG/KG	67 J	67 J	160 J	1 U	1 U	130 J	99 J	0.97 U	1.5 U
CHLOROMETHANE	UG/KG	1 J	1 J	1 J	2	2	2	1	0.97 U	3
VINYL CHLORIDE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
BROMOMETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
CHLOROETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
ACETONE	UG/KG	27 J	27 J	28 J	27	56 J	39 J	57 J	47 UB	120 J
TRICHLOROFLUOROMETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	9	1.5 U
ACETONITRILE	UG/KG	5.3 U	5.4 U	5.6 U	5 U	5 U	4.8 U	5.2 U	4.8 U	7.4 U
1,1-DICHLOROETHENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
METHYLENE CHLORIDE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	24	1.5 U
CARBON DISULFIDE	UG/KG	11	11	38 J	11	11	8	26	170 J	8
TRANS-1,2-DICHLOROETHENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
1,1-DICHLOROETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
METHYL TERT-BUTYL ETHER	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
2-BUTANONE	UG/KG	4	4	4	3	8	6	6	16	22
CIS-1,2-DICHLOROETHENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
CHLOROPICRIN	UG/KG	27 U	27 U	28 U	25 U	25 U	24 U	26 U	24 U	37 U
CHLOROFORM	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
1,2-DICHLOROETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
1,1,1-TRICHLOROETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
METHYL ACETATE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	3	0.97 U	2	15	20
BENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	4	1.5 U
CARBON TETRACHLORIDE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
CYCLOHEXANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
1,2-DICHLOROPROPANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
BROMODICHLOROMETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
TRICHLOROETHENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
4-METHYL-2-PENTANONE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
CIS-1,3-DICHLOROPROPENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
1,1,2-TRICHLOROETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
METHYLCYCLOHEXANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
TOLUENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	3	1.5 U
2-HEXANONE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	1	1.5 U
DIBROMOCHLOROMETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
1,2-DIBROMOETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
TETRACHLOROETHENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
CHLOROBENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
ETHYLBENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
M&P-XYLENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
BROMOFORM	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 UJ	1.5 UJ
STYRENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
1,1,2,2,-TETRACHLOROETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
O-XYLENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
BENZYL BROMIDE	UG/KG	5.3 U	5.4 U	5.6 U	5 U	5 U	4.8 U	5.2 U	4.8 U	7.4 U
ISOPROPYLBENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 UJ	1.5 UJ
BENZYL CHLORIDE	UG/KG	5 U	5.4 U	5.6 U	5 U	5 U	4.8 U	5.2 U	4.8 UJ	7.4 UJ
ACROLEIN	UG/KG	5.3 U	5.4 U	5.6 U	5 U	5 U	4.8 U	5.2 U	4.8 U	16
1,3-DICHLOROBENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 UJ	1.5 UJ
1,4-DICHLOROBENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 UJ	1.5 UJ
1,2-DICHLOROBENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 UJ	1.5 UJ
1,2-DIBROMO-3-CHLOROPROPANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 UJ	1.5 UJ
1,2,4-TRICHLOROBENZENE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	UG/KG	1.1 U	1.1 U	1.1 U	1 U	1 U	0.97 U	1 U	0.97 U	1.5 U
VOC Tentatively Identified Compounds										
1-HEXENE, 4-METHYL	UG/KG								10 NJ	
1-OCTANOL, 2,7-DIMETHYL-	UG/KG									10 NJ
2,4-HEXANEDIONE	UG/KG							3 NJ		
2-BUTANONE, 3-METHYL-	UG/KG			6 NJ	2 NJ	10 NJ	10 NJ	6 NJ		40 NJ
2-BUTENE, (Z)-	UG/KG									
2-HEPTANONE, 6-METHYL-	UG/KG									
2-HEXENE, (Z)-	UG/KG								10 J	
2-OCTENE, (E)	UG/KG						10 J			
2-OCTENE, (E)-	UG/KG	50 J	30 J	60 J	20 J	20 J		10 J	50 J	
ACETALDEHYDE	UG/KG	10 NJ	5 NJ	6 NJ	4 NJ	20 NJ	10 NJ	7 NJ	10 NJ	30 NJ
BENZALDEHYDE	UG/KG								10 NJ	
BENZENE, (1-METHYLETHENYL)-	UG/KG									
BENZENE, 1-METHYL-3-(1-METHYL	UG/KG									
BICYCLO 2.2.1 HEPTANE, 7, 7,-D	UG/KG		6 J							
BICYCLO 2.2.1 HEPTANE, 7,7-D	UG/KG									
BICYCLO 3.1.1 HEPT-2-ENE, 2,	UG/KG		10 J							
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL	UG/KG									
BUTANAL	UG/KG									9 NJ
BUTANE	UG/KG									
CARBON OXIDE SULFIDE(COS)	UG/KG	8 NJ		6 NJ		10 NJ	8 NJ			
CYCLOHEXENE, 1-METHYL-4-(1-METHYLTHENYL)-,®	UG/KG									
CYCLOPROPANE, 1,2-DIMETHYL-, TRANS	UG/KG								10 J	
CYCLOTETRASILOXANE, OCTAMETH	UG/KG		10 NJ		4 NJ	10 NJ	10 NJ	3 NJ		
DODECANAL	UG/KG									
ETHANETHIOL	UG/KG									
ETHANONE, 1-(3-ETHYLOXIRANYL	UG/KG								20 NJ	
HEPTANE, 3-METHYLENE-	UG/KG	10 NJ	6 NJ		6 NJ					
HEPTANTE, 3-METHYLENE-	UG/KG			10 NJ						
HEXANAL	UG/KG	40 NJ	10 NJ	10 NJ	10 NJ	100 NJ	40 NJ	60 NJ	30 NJ	100 NJ
HEXANAL, 2-ETHYL-	UG/KG			5 NJ						
HEXANAL, 5-METHYL-	UG/KG	7 NJ			3 NJ	10 NJ	6 NJ	3 NJ		10 NJ
HEXANE	UG/KG									
NONANAL	UG/KG					10 NJ				10 NJ
OCTANAL	UG/KG	8 NJ			4 NJ	20 NJ	6 NJ	4 NJ		20 NJ
OCTANE	UG/KG	20 NJ	9 NJ	20 NJ	8 NJ					
PENTANAL	UG/KG	10 NJ	4 NJ	4 NJ	3 NJ	30 NJ	10 NJ	9 NJ		20 NJ
PENTANE	UG/KG									20 NJ
PROPANAL, 2-METHYL-	UG/KG									
PROPANE, 1,1-OXYBIS-	UG/KG								10 NJ	
Semivolatile Organic Compounds - SW8270C										
PHENYL ISOCYANATE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
PHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2-CHLOROPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
1,3-DICHLOROBENZENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
1,4-DICHLOROBENZENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U

TABLE 2
SUMMARY OF UNVALIDATED ANALYTICAL RESULTS

SAMPLE ID:		OU4-3819-1	OU4-3819-2	OU4-3819-3	OU4-3819-4	OU4-4710QS-1	OU4-4710QS-3	OU4-4710QS-4	OU4-4625-3A	OU4-4625-3B
SAMPLE TYPE:		NX	NX	NX	NX	NX	NX	NX	NX	NX
LAB SAMPLE ID:		157020	157021	157022	157023	157024	157025	157026	157203	157204
ORDER NO.:		1	1	1	1	1	1	1	1	1
SAMPLING DATE:		2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/13/2001	2/13/2001
1,2-DICHLOROBENZENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
BENZYL ALCOHOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
BIS(2-CHLOROISOPROPYL)ETHER	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2-METHYLPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
HEXACHLOROETHANE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
4-METHYLPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
NITROBENZENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
ISOPHORONE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2-NITROPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2,4-DIMETHYLPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2,4-DICHLOROPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
1,2,4-TRICHLOROBENZENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
NAPHTHALENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	12 J	24 J
BENZOIC ACID	UG/KG	240 U	230 U	250 U	240 U	20 J	25 J	22 J	36 J	61 J
4-CHLOROANILINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
PHENYL ISOTHIOCYANATE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
HEXACHLOROBUTADIENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
O-CHLORONITROBENZENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
4-CHLORO-3-METHYLPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2-METHYLNAPHTHALENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	18 J
HEXACHLOROCYCLOPENTADIENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2,4,6-TRICHLOROPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2,4,5-TRICHLOROPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2-CHLORONAPHTHALENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2-NITROANILINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
ACENAPHTHYLENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	18 J	91 J
2,6-DINITROTOLUENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
ACENAPHTHENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
3-NITROANILINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2,4-DINITROPHENOL	UG/KG	240 U	230 U	250 U	240 U	240 U	240 U	250 U	230 U	280 U
DIBENZOFURAN	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
2,4-DINITROTOLUENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
4-NITROPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
FLUORENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	20 J
4-CHLOROPHENYL-PHENYLETHER	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
DIETHYLPHTHALATE	UG/KG	82 U	78 U	250 UB	81 U	18 J	21 J	14 J	42 UB	93 U
4-NITROANILINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
N-NITROSODIPHENYLAMINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
HEXACHLOROBENZENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
PENTACHLOROPHENOL	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
PHENANTHRENE	UG/KG	82 U	78 U	83 U	81 U	81 U	18 J	84 U	170	230
ANTHRACENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	19 J	34 J
CARBAZOLE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	15 J	23 J
DI-N-BUTYLPHTHALATE	UG/KG	25 UB	23 UB	26 UB	29 UB	33 UB	24 UB	32 UB	28 UB	29 UB
FLUORANTHENE	UG/KG	82 U	78 U	83 U	81 U	12 J	67 J	17 J	440	700
PYRENE	UG/KG	82 U	78 U	83 U	81 U	11 J	56 J	14 J	440	1100
BUTYLBENZYLPHTHALATE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	15 J
PHENYL HYDRAZINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
3,3-DICHLOROBENZIDINE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
BENZO(A)ANTHRACENE	UG/KG	82 U	78 U	83 U	81 U	81 U	62 J	12 J	250	620
CHRYSENE	UG/KG	82 U	78 U	83 U	81 U	81 U	30 J	84 U	160	360
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	82 U	21 UB	13 UB	81 U	18 J	12 J	14 J	79 UB	110 UB
DI-N-OCTYLPHTHALATE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
BENZO[B]FLUORANTHENE	UG/KG	82 U	78 U	83 U	81 U	81 U	67 J	15 J	350	900
BENZO[K]FLUORANTHENE	UG/KG	82 U	78 U	83 U	81 U	81 U	20 J	84 U	150	350
BENZO[A]PYRENE	UG/KG	82 U	78 U	83 U	81 U	81 U	28 J	84 U	160	440
INDENO[1,2,3-CD]PYRENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	120	320
DIBENZ[A,H]ANTHRACENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	37 J	76 J
BENZO[G,H,I]PERYLENE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	87	230
DIMETHYLPHTHALATE	UG/KG	82 U	78 U	83 U	81 U	81 U	80 U	84 U	76 U	93 U
SVOC Tentatively Identified Compounds										
.ALPHA.-LINDANE	UG/KG						180 NJ			
.GAMMA.-SITOSTEROL	UG/KG							130 NJ		
1-EICOSANOL	UG/KG		190 NJ						200 NJ	
1-OCTADECANOL	UG/KG									
1-PROPENE, 1,2,3-TRICHLORO-	UG/KG								100 UB	
1-PROPENE,1,1,2-TRICHLORO-	UG/KG									
1-PROPENE,1,2,3-TRICHLORO-	UG/KG	130 UB	280 UB							
13-OCTADECENAL	UG/KG					1700 NJ				
14-OCTADECENAL	UG/KG		180 NJ							
5-EICOSENE, (E)-	UG/KG									
7-HEXADECENE, (Z)-	UG/KG									
9,12-OCTADECADIENOIC ACID (Z,Z)-	UG/KG							97 NJ		
9-HEXADECENOIC ACID	UG/KG					440 NJ		140 NJ		
BENZENEETANOL, 4-HYDROXY-	UG/KG									
CARBOXYLIC ACID ESTER	UG/KG									
DOCOSANE	UG/KG									
ETHANOL, 2-(2-ETHOXYETHOXY)-	UG/KG					240 UB	240 UB	220 UB		
HEPADECANE, 9-OCTYL-	UG/KG									
HEPTADECANE	UG/KG									
HEPTADECANE, 9-OCTYL-	UG/KG									
HEXADECANOIC ACID	UG/KG	110 NJ				670 NJ	140 NJ	160 NJ	120 NJ	440 NJ
NONACOSANE	UG/KG						1000 NJ	1000 NJ	870 NJ	
NONADECANE	UG/KG									
OCTACOSANE	UG/KG								500 NJ	
OLEIC ACID	UG/KG	260 NJ				4200 NJ	260 NJ	250 NJ	140 NJ	
PENTADECANE, 8-HEXYL-	UG/KG						590 NJ			
PHENANTHRENE, 2-METHYL-	UG/KG									
PHENANTHRENE,9-METHYL-	UG/KG								230 NJ	
SEPTUM BLEED	UG/KG									
TRICOSANE	UG/KG									
UNKNOWN	UG/KG	150 UB	330 UB			170 J		130 J	210 J	230 J
UNKNOWN ALKANE	UG/KG					510 J	260 J	420 J	180 J	190 J
UNKNOWN HYDROCARBON	UG/KG	220 J				890 J	670 J	290 J	410 J	160 J
UNKNOWN SILOXANE	UG/KG					400 J	280 J	190 J		
ICP Scan Metals - SW6010B										
ALUMINUM	MG/KG	24800	27300	36300	26000	18400	21400	29700	12400	15500

TABLE 2
SUMMARY OF UNVALIDATED ANALYTICAL RESULTS

	SAMPLE ID:		OU4-3819-1	OU4-3819-2	OU4-3819-3	OU4-3819-4	OU4-4710QS-1	OU4-4710QS-3	OU4-4710QS-4	OU4-4625-3A	OU4-4625-3B
	SAMPLE TYPE:		NX	NX	NX	NX	NX	NX	NX	NX	NX
	LAB SAMPLE ID:		157020	157021	157022	157023	157024	157025	157026	157203	157204
	ORDER NO.:		1	1	1	1	1	1	1	1	1
	SAMPLING DATE:		2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/8/2001	2/13/2001	2/13/2001
ANTIMONY		MG/KG	0.96 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.1 UJ	1.3 UJ
ARSENIC		MG/KG	1.5	1.7	1.4	2.2	36.1	14	12	53.9	133
BARIUM		MG/KG	121	156	168	124	69	98	168	73.3	109
BERYLLIUM		MG/KG	1.8	1.9	2.4	2.1	1.2	1.6	1.9	0.68	0.87
CADMIUM		MG/KG	0.48 U	0.56 U	0.57 U	0.55 U	0.56 U	0.56 U	0.54 U	0.57 U	0.65 U
CALCIUM		MG/KG	707	705	1010	737	868	951	1320	1580	2520
CHROMIUM		MG/KG	45.6	53.7	192	80.4	46.5	53.3	62.5	56.9	54.8
COBALT		MG/KG	19.5	22.1	27.9	27.6	14.2	21.1	25.7	13.1	18.5
COPPER		MG/KG	28.3	48.7	36.9	48.7	35.4	61.9	116	32.9	47.6
IRON		MG/KG	32300	36500	43900	38600	26400	28300	36600	30500	34200
LEAD		MG/KG	13.6	21.5	16.4	15.9	24.6	26.6	24.5	64.3	71.9
MAGNESIUM		MG/KG	11700 J	14000 J	22300 J	11700 J	8180 J	10100 J	13100 J	1360 J	3940 J
MANGANESE		MG/KG	401 J	366 J	840 J	518 J	344 J	726 J	512 J	571 J	800 J
NICKEL		MG/KG	53.3	43.1	87.2	53.6	32.7	41.9	43.9	13.7	19.9
PHOSPHORUS		MG/KG	221 J	239 J	296 J	280 J	333 J	357 J	420 J	792 J	850 J
POTASSIUM		MG/KG	8530 J	12500 J	13900 J	9190 J	5400 J	6650 J	9580 J	514 J	888 J
SELENIUM		MG/KG	0.48 UJ	0.56 UJ	0.72 J	0.55 UJ	0.56 UJ	0.58 J	0.54 UJ	1.2 J	0.71 J
SILICON		MG/KG	1510 J	1380 J	1580 J	1300 J	2080 J	2590 J	2300 J	1290 J	1850 J
SILVER		MG/KG	0.48 U	0.56 U	0.57 U	0.55 U	0.56 U	0.56 U	0.54 U	2	1.3
SODIUM		MG/KG	130	134	157	92.6	68	139	112	57.2 U	65 U
STRONTIUM		MG/KG	7.5	9.7	7.4	6	5.1	6.8	8.2	8.1	11.8
SULFUR		MG/KG	75.8	76.7	103	101	106	81.7	99.4	212	293
THALLIUM		MG/KG	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.6	1.1 U	1.3 U
TIN		MG/KG	1.9 U	2.4	2.3 U	2.2 U	2.3 U	2.2 U	3.1	3.8	3.4
TITANIUM		MG/KG	1420	1900	2320	1730	991	1010	1440	252	445
VANADIUM		MG/KG	62.2	81	108	91.3	47.9	56.9	103	52	85.8
ZINC		MG/KG	135	114	140	109	73.5	89.9	103	73.5	88.8
MERCURY		MG/KG	0.11 U	0.11 U	0.11 U	0.1 U	0.35	0.26	0.29	0.41	0.54
IC Scan - EPA 300M											
BROMIDE		MG/KG	1.22 U	1.17 U	1.25 U	1.22 U	1.2 U	1.18 U	1.26 U	1.23 U	1.39 U
CHLORIDE		MG/KG	17.7	4.07	3.88	2.58	4.24	70.1	23.5	3	7.36
FLUORIDE		MG/KG	1.58	1.17 U	1.25 U	1.22 U	3.55 J	3.91 J	6.66 J	4.86 J	4.85 J
NITRATE-N		MG/KG	1.22 U	1.17 U	1.25 U	1.22 U	2.68	1.18 U	4.06	3.28	5.47
NITRITE-N		MG/KG	1.22 U	1.17 U	1.25 U	1.22 U	1.2 U	1.18 U	1.26 U	1.23 U	1.39 U
PHOSPHATE-P		MG/KG	1.22 U	1.17 U	1.25 U	1.22 U	1.2 UJ	1.18 UJ	1.26 UJ	3.84 J	4 J
SULFATE		MG/KG	63.6	46.7	62	58.9	14.7	27.2	19	9.6	9.3
Mustard Degradation Products											
1,4-Oxathiane		UG/KG	81 U	82 U	80 U	83 U	78 U	80 U	81 U	78 U	78 U
1,4-Dithiane		UG/KG	79 U	79 U	77 U	80 U	76 U	77 U	79 U	76 U	76 U
Thiodiglycol		UG/KG	1056 U	1001 U	1069 U	1039 U	257 J	411 J	1088 U	985 U	813 J
Lewisite Degradation Products											
TOTAL CVAA & CVAO		UG/KG	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U	8 U
Other Parameters											
2,4,6-Trinitrotoluene		UG/KG	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U	180 U
AMMONIA-N		MG/KG	1.2 U	1.15 U	1.23 U	1.22 U	1.2 U	1.19 U	1.27 U	1.25 U	1.38 U
CYANIDE		MG/KG	0.61 U	0.54 U	0.6 U	0.59 U	0.61 U	0.59 U	0.64 U	0.58 U	0.68 U

TABLE 2
SUMMARY OF UNVALIDATED ANALYTICAL RESULTS

SAMPLE ID:		**OU4-4625-4**	**OU4-4633-1**	**OU4-4633-2**	**OU4-4633-SB**
SAMPLE TYPE:		**NX**	**NX**	**NX**	**NX**
LAB SAMPLE ID:		**157205**	**157206**	**157207**	**157208**
ORDER NO.:		**1**	**1**	**1**	**1**
SAMPLING DATE:		**2/13/2001**	**2/13/2001**	**2/13/2001**	**2/13/2001**
1,2-DICHLOROBENZENE	UG/KG	86 U	88 U	90 U	86 U
BENZYL ALCOHOL	UG/KG	86 U	88 U	27 J	86 U
BIS(2-CHLOROISOPROPYL)ETHER	UG/KG	86 U	88 U	90 U	86 U
2-METHYLPHENOL	UG/KG	86 U	88 U	90 U	86 U
HEXACHLOROETHANE	UG/KG	86 U	88 U	90 U	86 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	86 U	88 U	90 U	86 U
4-METHYLPHENOL	UG/KG	13 J	88 U	90 U	86 U
NITROBENZENE	UG/KG	86 U	88 U	90 U	86 U
ISOPHORONE	UG/KG	86 U	88 U	90 U	86 U
2-NITROPHENOL	UG/KG	86 U	88 U	90 U	86 U
2,4-DIMETHYLPHENOL	UG/KG	86 U	88 U	90 U	86 U
BIS(2-CHLOROETHOXY)METHANE	UG/KG	86 U	88 U	90 U	86 U
2,4-DICHLOROPHENOL	UG/KG	86 U	88 U	90 U	86 U
1,2,4-TRICHLOROBENZENE	UG/KG	86 U	88 U	90 U	86 U
NAPHTHALENE	UG/KG	27 J	88 U	90 U	86 U
BENZOIC ACID	UG/KG	41 J	26 J	28 J	260 U
4-CHLOROANILINE	UG/KG	86 U	88 U	90 U	86 U
PHENYL ISOTHIOCYANATE	UG/KG	86 U	88 U	90 U	86 U
HEXACHLOROBUTADIENE	UG/KG	86 U	88 U	90 U	86 U
O-CHLORONITROBENZENE	UG/KG	86 U	88 U	90 U	86 U
4-CHLORO-3-METHYLPHENOL	UG/KG	86 U	88 U	90 U	86 U
2-METHYLNAPHTHALENE	UG/KG	14 J	88 U	90 U	86 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	86 U	88 U	90 U	86 U
2,4,6-TRICHLOROPHENOL	UG/KG	86 U	88 U	90 U	86 U
2,4,5-TRICHLOROPHENOL	UG/KG	86 U	88 U	90 U	86 U
2-CHLORONAPHTHALENE	UG/KG	86 U	88 U	90 U	86 U
2-NITROANILINE	UG/KG	86 U	88 U	90 U	86 U
ACENAPHTHYLENE	UG/KG	230	12 J	13 J	86 U
2,6-DINITROTOLUENE	UG/KG	86 U	88 U	90 U	86 U
ACENAPHTHENE	UG/KG	86 U	88 U	90 U	86 U
3-NITROANILINE	UG/KG	86 U	88 U	90 U	86 U
2,4-DINITROPHENOL	UG/KG	260 U	260 U	270 U	260 U
DIBENZOFURAN	UG/KG	14 J	88 U	90 U	86 U
2,4-DINITROTOLUENE	UG/KG	86 U	88 U	90 U	86 U
4-NITROPHENOL	UG/KG	86 U	88 U	90 U	86 U
FLUORENE	UG/KG	24 J	88 U	90 U	86 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	86 U	88 U	90 U	86 U
DIETHYLPHTHALATE	UG/KG	86 U	14 UB	90 U	86 U
4-NITROANILINE	UG/KG	86 U	88 U	90 U	86 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	86 U	88 U	90 U	86 U
N-NITROSODIPHENYLAMINE	UG/KG	86 U	88 U	90 U	86 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	86 U	88 U	90 U	86 U
HEXACHLOROBENZENE	UG/KG	86 U	88 U	90 U	86 U
PENTACHLOROPHENOL	UG/KG	86 U	88 U	90 U	86 U
PHENANTHRENE	UG/KG	300	33 J	49 J	38 J
ANTHRACENE	UG/KG	62 J	13 J	14 J	86 U
CARBAZOLE	UG/KG	33 J	88 U	90 U	86 U
DI-N-BUTYLPHTHALATE	UG/KG	28 UB	27 UB	22 UB	22 UB
FLUORANTHENE	UG/KG	1200	110	140	87
PYRENE	UG/KG	1800	170	210	130
BUTYLBENZYLPHTHALATE	UG/KG	22 J	12 J	90 U	86 U
PHENYL HYDRAZINE	UG/KG	86 U	88 U	90 U	86 U
3,3-DICHLOROBENZIDINE'	UG/KG	86 U	88 U	90 U	86 U
BENZO[A]ANTHRACENE	UG/KG	1100	88 J	110	48 J
CHRYSENE	UG/KG	620	66 J	78 J	49 J
BIS(2-ETHYLHEXYL)PHTHALATE	UG/KG	120 UB	230 UB	170 B	23 UB
DI-N-OCTYLPHTHALATE	UG/KG	86 UJ	88 UJ	90 UJ	86 UJ
BENZO[B]FLUORANTHENE	UG/KG	1800 J	130 J	180 J	62 J
BENZO[K]FLUORANTHENE	UG/KG	800 J	82 J	83 J	34 J
BENZO[A]PYRENE	UG/KG	720 J	49 J	58 J	41 J
INDENO[1,2,3-CD]PYRENE	UG/KG	660 J	88 UJ	32 J	86 UJ
DIBENZ[A,H]ANTHRACENE	UG/KG	140 J	88 UJ	90 UJ	86 UJ
BENZO[G,H,I]PERYLENE	UG/KG	350 J	88 UJ	23 J	86 UJ
DIMETHYLPHTHALATE	UG/KG	86 UJ	88 UJ	90 UJ	86 UJ
SVOC Tentatively Identified Compounds					
.ALPHA.-LINDANE	UG/KG				
.GAMMA.-SITOSTEROL	UG/KG				
1-EICOSANOL	UG/KG				
1-OCTADECANOL	UG/KG		5000 NJ		
1-PROPENE, 1,2,3-TRICHLORO-	UG/KG				160 UB
1-PROPENE,1,1,2-TRICHLORO-	UG/KG				
1-PROPENE,1,2,3-TRICHLORO-	UG/KG				
13-OCTADECENAL	UG/KG				
14-OCTADECENAL	UG/KG				
5-EICOSENE, (E)-	UG/KG		950 NJ		
7-HEXADECENE, (Z)-	UG/KG				
9,12-OCTADECADIENOIC ACID (Z,Z)-	UG/KG				
9-HEXADECENOIC ACID	UG/KG				
BENZENEETANOL, 4-HYDROXY-	UG/KG			290 NJ	
CARBOXYLIC ACID ESTER	UG/KG		360 J		
DOCOSANE	UG/KG			570 NJ	
ETHANOL, 2-(2-ETHOXYETHOXY)-	UG/KG				
HEPADECANE, 9-OCTYL-	UG/KG		450 NJ		
HEPTADECANE	UG/KG			790 NJ	
HEPTADECANE, 9-OCTYL-	UG/KG			2000 NJ	
HEXADECANOIC ACID	UG/KG	89 NJ			
NONACOSANE	UG/KG			1800 NJ	840 NJ
NONADECANE	UG/KG	160 NJ	430 NJ		
OCTACOSANE	UG/KG				
OLEIC ACID	UG/KG		130 NJ	190 NJ	
PENTADECANE, 8-HEXYL-	UG/KG				
PHENANTHRENE, 2-METHYL-	UG/KG				
PHENANTHRENE,9-METHYL-	UG/KG				
SEPTUM BLEED	UG/KG				
TRICOSANE	UG/KG			570 NJ	
UNKNOWN	UG/KG	140 J	290 J	860 J	180 BJ
UNKNOWN ALKANE	UG/KG	120 J		1700 J	
UNKNOWN HYDROCARBON	UG/KG	160 J	190 NJ	730 J	150 J
UNKNOWN SILOXANE	UG/KG				
ICP Scan Metals - SW6010B					
ALUMINUM	MG/KG	12500	8520	7020	13500

TABLE 2
SUMMARY OF UNVALIDATED ANALYTICAL RESULTS

SAMPLE ID:		**OU4-4625-4**	**OU4-4633-1**	**OU4-4633-2**	**OU4-4633-SB**
SAMPLE TYPE:		**NX**	**NX**	**NX**	**NX**
LAB SAMPLE ID:		**157205**	**157206**	**157207**	**157208**
ORDER NO.:		**1**	**1**	**1**	**1**
SAMPLING DATE:		**2/13/2001**	**2/13/2001**	**2/13/2001**	**2/13/2001**
Volatile Organic Compounds - SW8260B					
DICHLORODIFLUOROMETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
CHLOROMETHANE	UG/KG	3	7	1.4 U	3
VINYL CHLORIDE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
BROMOMETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
CHLOROETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
ACETONE	UG/KG	120 J	70 UB	62 UB	57 J
TRICHLOROFLUOROMETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
ACETONITRILE	UG/KG	6.5 U	5 U	7 U	5.5 U
1,1-DICHLOROETHENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
METHYLENE CHLORIDE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
CARBON DISULFIDE	UG/KG	8	15	8	10
TRANS-1,2-DICHLOROETHENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
1,1-DICHLOROETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
METHYL TERT-BUTYL ETHER	UG/KG	1.3 U	1 U	1.4 U	1.1 U
2-BUTANONE	UG/KG	25	25	30	9
CIS-1,2-DICHLOROETHENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
CHLOROPICRIN	UG/KG	32 U	25 U	25 U	27 U
CHLOROFORM	UG/KG	1 J	1 U	1.4 U	1.1 U
1,2-DICHLOROETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
1,1,1-TRICHLOROETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
METHYL ACETATE	UG/KG	11	11	1.4 U	2
BENZENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
CARBON TETRACHLORIDE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
CYCLOHEXANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
1,2-DICHLOROPROPANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
BROMODICHLOROMETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
TRICHLOROETHENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
4-METHYL-2-PENTANONE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
CIS-1,3-DICHLOROPROPENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
TRANS-1,3-DICHLOROPROPENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
1,1,2-TRICHLOROETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
METHYLCYCLOHEXANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
TOLUENE	UG/KG	1 J	2	1.4 U	8 J
2-HEXANONE	UG/KG	1.3 U	1	1.4 U	1.1 UJ
DIBROMOCHLOROMETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
1,2-DIBROMOETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
TETRACHLOROETHENE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
CHLOROBENZENE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
ETHYLBENZENE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
M&P-XYLENE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
BROMOFORM	UG/KG	1.3 UJ	1 UJ	1.4 UJ	1.1 UJ
STYRENE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
1,1,2,2,-TETRACHLOROETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 UJ
O-XYLENE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
BENZYL BROMIDE	UG/KG	6.5 U	16	7 U	5.5 U
ISOPROPYLBENZENE	UG/KG	1.3 UJ	1 UJ	1.4 UJ	1.1 UJ
BENZYL CHLORIDE	UG/KG	6.5 UJ	5 UJ	7 UJ	5.5 UJ
ACROLEIN	UG/KG	10	5 U	7 U	7
1,3-DICHLOROBENZENE	UG/KG	1.3 UJ	1 UJ	1.4 UJ	1.1 UJ
1,4-DICHLOROBENZENE	UG/KG	1.3 UJ	1 UJ	1.4 UJ	2 J
1,2-DICHLOROBENZENE	UG/KG	1.3 UJ	1 UJ	1.4 UJ	1.1 UJ
1,2-DIBROMO-3-CHLOROPROPANE	UG/KG	1.3 UJ	1 UJ	1.4 UJ	1.1 UJ
1,2,4-TRICHLOROBENZENE	UG/KG	1.3 UJ	1 UJ	1.4 UJ	1.1 UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	UG/KG	1.3 U	1 U	1.4 U	1.1 U
VOC Tentatively Identified Compounds					
1-HEXENE, 4-METHYL	UG/KG				
1-OCTANOL, 2,7-DIMETHYL-	UG/KG				
2,4-HEXANEDIONE	UG/KG				
2-BUTANONE, 3-METHYL-	UG/KG	20 NJ	4 NJ		
2-BUTENE, (Z)-	UG/KG			3 J	
2-HEPTANONE, 6-METHYL-	UG/KG	10 NJ			
2-HEXENE, (Z)-	UG/KG				
2-OCTENE, (E)	UG/KG				
2-OCTENE, (E)-	UG/KG	7 J	10 J	60 J	10 J
ACETALDEHYDE	UG/KG	40 NJ	20 NJ		
BENZALDEHYDE	UG/KG		10 NJ	5 NJ	
BENZENE, (1-METHYLETHENYL)-	UG/KG		5 NJ		
BENZENE, 1-METHYL-3-(1-METHYL	UG/KG				30 NJ
BICYCLO 2.2.1 HEPTANE, 7, 7,-D	UG/KG				
BICYCLO 2.2.1 HEPTANE, 7,7-D	UG/KG				50 J
BICYCLO 3.1.1 HEPT-2-ENE, 2,	UG/KG				
BICYCLO 3.1.1 HEPT-2-ENE, 2,6,6-TRIMETHYL	UG/KG				80 J
BUTANAL	UG/KG		5 NJ		
BUTANE	UG/KG			1 NJ	
CARBON OXIDE SULFIDE(COS)	UG/KG				
CYCLOHEXENE, 1-METHYL-4-(1-METHYLTHENYL)-,®	UG/KG				10 J
CYCLOPROPANE, 1,2-DIMETHYL-, TRANS	UG/KG				
CYCLOTETRASILOXANE, OCTAMETH	UG/KG	3 NJ			
DODECANAL	UG/KG	7 NJ			
ETHANETHIOL	UG/KG			10 NJ	
ETHANONE, 1-(3-ETHYLOXIRANYL	UG/KG				
HEPTANE, 3-METHYLENE-	UG/KG			10 NJ	
HEPTANTE, 3-METHYLENE-	UG/KG				
HEXANAL	UG/KG	40 NJ	60 NJ		100 NJ
HEXANAL, 2-ETHYL-	UG/KG				
HEXANAL, 5-METHYL-	UG/KG				
HEXANE	UG/KG			4 NJ	
NONANAL	UG/KG				
OCTANAL	UG/KG	10 NJ			10 NJ
OCTANE	UG/KG			10 NJ	
PENTANAL	UG/KG		8 NJ		20 NJ
PENTANE	UG/KG	8 NJ	9 NJ	5 NJ	20 NJ
PROPANAL, 2-METHYL-	UG/KG	8 NJ			
PROPANE, 1,1-OXYBIS-'	UG/KG				
Semivolatile Organic Compounds - SW8270C					
PHENYL ISOCYANATE	UG/KG	86 U	88 U	90 U	86 U
PHENOL	UG/KG	86 U	88 U	90 U	86 U
2-CHLOROPHENOL	UG/KG	86 U	88 U	90 U	86 U
1,3-DICHLOROBENZENE	UG/KG	86 U	88 U	90 U	86 U
1,4-DICHLOROBENZENE	UG/KG	86 U	88 U	90 U	86 U

TABLE 2
SUMMARY OF UNVALIDATED ANALYTICAL RESULTS

SAMPLE ID:		**OU4-4625-4**	**OU4-4633-1**	**OU4-4633-2**	**OU4-4633-SB**
SAMPLE TYPE:		**NX**	**NX**	**NX**	**NX**
LAB SAMPLE ID:		**157205**	**157206**	**157207**	**157208**
ORDER NO.:		**1**	**1**	**1**	**1**
SAMPLING DATE:		**2/13/2001**	**2/13/2001**	**2/13/2001**	**2/13/2001**
ANTIMONY	MG/KG	1.2 UJ	1.2 UJ	1.2 UJ	1.1 UJ
ARSENIC	MG/KG	107	4.4	6.3	2
BARIUM	MG/KG	108	53.4	44.9	54.6
BERYLLIUM	MG/KG	0.78	0.6 U	0.59 U	0.67
CADMIUM	MG/KG	0.62 U	0.6 U	0.59 U	0.56 U
CALCIUM	MG/KG	3250	2860	9240	1810
CHROMIUM	MG/KG	40.9	87.6	50.4	68.2
COBALT	MG/KG	15.1	7.1	5.4	14.9
COPPER	MG/KG	34	54.3	27	26.6
IRON	MG/KG	26900	18300	16700	25200
LEAD	MG/KG	72	65.6	62.5	20.6
MAGNESIUM	MG/KG	2520 J	1850 J	5350 J	4830 J
MANGANESE	MG/KG	695 J	216 J	231 J	342 J
NICKEL	MG/KG	13.5	14.4	10.7	31.4
PHOSPHORUS	MG/KG	921 J	1530 J	1320 J	205 J
POTASSIUM	MG/KG	890 J	704 J	625 J	859 J
SELENIUM	MG/KG	0.62 UJ	0.6 UJ	0.59 UJ	0.56 UJ
SILICON	MG/KG	1370 J	1300 J	1400 J	1350 J
SILVER	MG/KG	0.73	0.85	0.59 U	0.56 U
SODIUM	MG/KG	61.6 U	58.9 U	58.7 U	55.5 U
STRONTIUM	MG/KG	13	12.9	11	8.5
SULFUR	MG/KG	313	387	422	73.9
THALLIUM	MG/KG	1.2 U	1.2 U	1.2 U	1.1 U
TIN	MG/KG	2.7	4.5	2.3 U	2.2 U
TITANIUM	MG/KG	378	253	199	272
VANADIUM	MG/KG	55.8	37.6	33.7	47.6
ZINC	MG/KG	76.9	86.1	80.2	33.1
MERCURY	MG/KG	0.15	0.16	0.13	0.1 U
IC Scan - EPA 300M					
BROMIDE	MG/KG	1.3 U	1.32 U	1.4 U	1.2 U
CHLORIDE	MG/KG	4.49	2.2	2.21	3.39
FLUORIDE	MG/KG	3.35	4.83	4.61	4.76
NITRATE-N	MG/KG	6.68	10.3	11.6	1.2 U
NITRITE-N	MG/KG	1.3 U	1.32 U	1.4 U	1.2 U
PHOSPHATE-P	MG/KG	5.07	37.5	34	2.36
SULFATE	MG/KG	8.62	8.38	10.6	11.2
Mustard Degradation Products					
1,4-Oxathiane	UG/KG	83 U	83 U	81 U	84 U
1,4-Dithiane	UG/KG	81 U	81 U	79 U	82 U
Thiodiglycol	UG/KG	1117 U	1130 U	1156 U	1105 U
Lewisite Degradation Products					
TOTAL CVAA & CVAO	UG/KG	8 U	8 U	8 U	8 U
Other Parameters					
2,4,6-Trinitrotoluene	UG/KG	180 U	180 U	180 U	180 U
AMMONIA-N	MG/KG	1.29 U	1.3 U	1.41 U	1.18 U
CYANIDE	MG/KG	0.62 U	1.19	0.68 U	0.54 U

Reeser, Leland H NAB02

From: Peloquin, Michael CPT NAB02
Sent: Friday, July 27, 2001 7:24 AM
To: Brennan, Kevin M NAB02
Cc: Leland Reeser; Michael Rogers
Subject: RE: Sedgwick trench AUES list

Kevin,
I spoke to Rich Albright about the AUES list results.
Here are the items I'd like you to communicate in a letter sent with the results today. Also, please try to call the four residents to let them know the results are going out.
After conferring with EPA and DC Health officials we have decided to provide the results to the residents before we complete our analysis of what the mean in terms of any health risks.
In its preliminary review, DC Health did not see any results posing any serious health risks (i.e., a contaminants of concern). Arsenic remains the primary contaminant of concern for the Sedgwick trench area.
The detailed review of the data will take several more weeks, at which time we will notify the residents by mail (phone if there is any significant change in the preliminary assessment).
Analyzing the results is a difficult process and everyone involved wants to ensure the property owners have information that is useful to them.
-mike p

-----Original Message-----
From: Brennan, Kevin M NAB02
Sent: Wednesday, July 25, 2001 2:11 PM
To: 'Albright, Richard'; 'Harbold, Harry'
Cc: Peloquin, Michael CPT NAB02
Subject: Sedgwick trench AUES list

Rich and Harry,

As discussed during last week's partnership meeting, attached are the validated results from the Sedgwick trench borings. I will be furnishing these results to the property owners in this format with an explanation that we are currently working on formatting the results so that the reader (property owner) will better understand what they mean.

<< File: sedgw_~1.xls >> << File: sedgw.doc >> << File: justti~1.xls >>

Kevin Brennan
Civil Projects Management Branch
410.962.6113

SUMMARY OF VALIDATED ANALYTICAL RESULTS
SEDGWICK TRENCH AREA

SAMPLE ID:		5/8/2001		5040TR-SB	5065TR-SBDUP01	5054TR-SB	5059TR-SB	5065TR-SB
SAMPLE DEPTH:		REGION III	Result	4.5'-5.5'	4.5'-5.5'	3'-5'	9'-10'	2.5'-4'
LAB SAMPLE ID:		Residential	Exceeds	159223	159227	159224	159225	159226
TYPE or LOCATION:		RBC	RBC?	Trench Bottom	Dup 5040 Trench Bottom	Trench Bottom	Trench Bottom	Trench Bottom
SAMPLING DATE:		*(Adjusted Down by factor of 10)*		4/5/2001	4/5/2001	4/5/2001	4/5/2001	4/5/2001
Volatile Organic Compounds - SW8260B								
DICHLORODIFLUOROMETHANE	UG/KG	1.60E+06	NO	1 UB	1.1 U	1.3 U	1 UB	1 UB
CHLOROMETHANE	UG/KG	4.90E+04	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
VINYL CHLORIDE	UG/KG	9.00E+01	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
BROMOMETHANE	UG/KG	1.10E+04	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
CHLOROETHANE	UG/KG	2.20E+05	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
ACETONE	UG/KG	7.80E+05	NO	1 UB	2 UB	3 UB	2 UB	2 UB
TRICHLOROFLUOROMETHANE	UG/KG	2.30E+06	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
ACETONITRILE	UG/KG	NA		5.2 U	5.3 U	6.3 U	5.4 U	5.3 U
1,1-DICHLOROETHENE	UG/KG	NA		1 U	1.1 U	1.3 U	1.1 U	1.1 U
METHYLENE CHLORIDE	UG/KG	8.50E+04	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
CARBON DISULFIDE	UG/KG	7.80E+05	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
TRANS-1,2-DICHLOROETHENE	UG/KG	1.60E+05	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
1,1-DICHLOROETHANE	UG/KG	7.80E+05	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
METHYL TERT-BUTYL ETHER	UG/KG	NA		1 U	1.1 U	1.3 U	1.1 U	1.1 U
2-BUTANONE	UG/KG	4.70E+06	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
CIS-1,2-DICHLOROETHENE	UG/KG	7.80E+04	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
CHLOROPICRIN	UG/KG	NA		26 UJ	27 UJ	32 UJ	27 UJ	27 UJ
CHLOROFORM	UG/KG	7.80E+04	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
1,2-DICHLOROETHANE	UG/KG	7.00E+03	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
1,1,1-TRICHLOROETHANE	UG/KG	2.20E+06	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
METHYL ACETATE	UG/KG	7.80E+06	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
BENZENE	UG/KG	1.20E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
CARBON TETRACHLORIDE	UG/KG	4.90E+03	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
CYCLOHEXANE	UG/KG	4.70E+05	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,2-DICHLOROPROPANE	UG/KG	9.40E+03	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
BROMODICHLOROMETHANE	UG/KG	1.00E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
TRICHLOROETHENE	UG/KG	4.70E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
4-METHYL-2-PENTANONE	UG/KG	6.30E+06	NO	1 UJ	1.1 UJ	2 J	1.1 UJ	1.1 UJ
CIS-1,3-DICHLOROPROPENE	UG/KG	6.40E+03	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
TRANS-1,3-DICHLOROPROPENE	UG/KG	6.40E+03	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,1,2-TRICHLOROETHANE	UG/KG	1.10E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
METHYLCYCLOHEXANE	UG/KG	NA		1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
TOLUENE	UG/KG	1.60E+06	NO	1 UJ	4 J	1.3 UJ	1.1 UJ	1.1 UJ
2-HEXANONE	UG/KG	3.10E+05	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
DIBROMOCHLOROMETHANE	UG/KG	7.60E+03	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,2-DIBROMOETHANE	UG/KG	7.50E+00	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
TETRACHLOROETHENE	UG/KG	1.20E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
CHLOROBENZENE	UG/KG	1.60E+05	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
ETHYLBENZENE	UG/KG	7.80E+05	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
M&P-XYLENE	UG/KG	1.60E+07	NO	1 UJ	2 J	1.3 UJ	1.1 UJ	1.1 UJ
BROMOFORM	UG/KG	8.10E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
STYRENE	UG/KG	1.60E+06	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,1,2,2-TETRACHLOROETHANE	UG/KG	3.20E+03	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
O-XYLENE	UG/KG	1.60E+07	NO	1 UJ	2 J	1.3 UJ	1.1 UJ	1.1 UJ
BENZYL BROMIDE	UG/KG	NA		5.2 UJ	5.3 UJ	6.3 UJ	5.4 UJ	5.3 UJ

SUMMARY OF VALIDATED ANALYTICAL RESULTS
SEDGWICK TRENCH AREA

SAMPLE ID:		5/8/2001		5040TR-SB	5065TR-SBDUP01	5054TR-SB	5059TR-SB	5065TR-SB
SAMPLE DEPTH:		REGION III	Result	4.5'-5.5'	4.5'-5.5'	3'-5'	9'-10'	2.5'-4'
LAB SAMPLE ID:		Residential	Exceeds	159223	159227	159224	159225	159226
TYPE or LOCATION:		RBC	RBC?	Trench Bottom	Dup 5040 Trench Bottom	Trench Bottom	Trench Bottom	Trench Bottom
SAMPLING DATE:		*(Adjusted Down by factor of 10)*		4/5/2001	4/5/2001	4/5/2001	4/5/2001	4/5/2001
ISOPROPYLBENZENE	UG/KG	NA		1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
BENZYL CHLORIDE	UG/KG	3.80E+03	NO	5.2 UJ	5.3 UJ	6.3 UJ	5.4 UJ	5.3 UJ
ACROLEIN	UG/KG	1.60E+05	NO	5.2 U	5.3 U	6.3 U	5.4 U	5.3 U
1,3-DICHLOROBENZENE	UG/KG	2.30E+05	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,4-DICHLOROBENZENE	UG/KG	2.70E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,2-DICHLOROBENZENE	UG/KG	7.00E+05	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,2-DIBROMO-3-CHLOROPROPANE	UG/KG	4.60E+02	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,2,4-TRICHLOROBENZENE	UG/KG	7.80E+04	NO	1 UJ	1.1 UJ	1.3 UJ	1.1 UJ	1.1 UJ
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	UG/KG	2.30E+08	NO	1 U	1.1 U	1.3 U	1.1 U	1.1 U
VOC Tentatively Identified Compounds								
No AUES List VOC TICs Identified								
Semivolatile Organic Compounds - SW8270C								
PHENYL ISOCYANATE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
PHENOL	UG/KG	4.70E+06	NO	82 U	73 U	76 U	81 U	74 U
2-CHLOROPHENOL	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
1,3-DICHLOROBENZENE	UG/KG	2.30E+05	NO	82 U	73 U	76 U	81 U	74 U
1,4-DICHLOROBENZENE	UG/KG	2.70E+04	NO	82 U	73 U	76 U	81 U	74 U
1,2-DICHLOROBENZENE	UG/KG	7.00E+05	NO	82 U	73 U	76 U	81 U	74 U
BENZYL ALCOHOL	UG/KG	2.30E+06	NO	82 U	73 U	76 U	81 U	74 U
BIS (2-CHLOROISOPROPYL)ETHER	UG/KG	9.10E+03	NO	82 U	73 U	76 U	81 U	74 U
2-METHYLPHENOL	UG/KG	3.90E+05	NO	82 U	73 U	76 U	81 U	74 U
HEXACHLOROETHANE	UG/KG	7.80E+02	NO	82 U	73 U	76 U	81 U	74 U
N-NITROSO-DI-N-PROPYLAMINE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
4-METHYLPHENOL	UG/KG	3.90E+04	NO	82 U	73 U	76 U	81 U	74 U
NITROBENZENE	UG/KG	3.90E+03	NO	82 U	73 U	76 U	81 U	74 U
ISOPHORONE	UG/KG	6.70E+05	NO	82 U	73 U	76 U	81 U	74 U
2-NITROPHENOL	UG/KG	6.30E+04	NO	82 U	73 U	76 U	81 U	74 U
2,4-DIMETHYLPHENOL	UG/KG	1.60E+05	NO	82 U	73 U	76 U	81 U	74 U
BIS (2-CHLOROETHOXY) METHANE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
2,4-DICHLOROPHENOL	UG/KG	2.30E+04	NO	82 U	73 U	76 U	81 U	74 U
1,2,4-TRICHLOROBENZENE	UG/KG	7.80E+04	NO	82 U	73 U	76 U	81 U	74 U
NAPHTHALENE	UG/KG	1.60E+05	NO	82 U	73 U	76 U	81 U	74 U
BENZOIC ACID	UG/KG	3.10E+07	NO	250 U	220 U	230 U	240 U	220 U
4-CHLOROANILINE	UG/KG	3.10E+04	NO	82 U	73 U	76 U	81 U	74 U
PHENYL ISOTHIOCYANATE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
HEXACHLOROBUTADIENE	UG/KG	1.60E+00	<PQL	82 U	73 U	76 U	81 U	74 U
O-CHLORONITROBENZENE	UG/KG	2.60E+04	NO	82 U	73 U	76 U	81 U	74 U
4-CHLORO-3-METHYLPHENOL	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
2-METHYLNAPHTHALENE	UG/KG	1.60E+05	NO	82 U	73 U	76 U	81 U	74 U
HEXACHLOROCYCLOPENTADIENE	UG/KG	5.50E+04	NO	82 U	73 U	76 U	81 U	74 U
2,4,6-TRICHLOROPHENOL	UG/KG	5.80E+04	NO	82 U	73 U	76 U	81 U	74 U
2,4,5-TRICHLOROPHENOL	UG/KG	7.80E+05	NO	82 U	73 U	76 U	81 U	74 U
2-CHLORONAPHTHALENE	UG/KG	6.30E+05	NO	82 U	73 U	76 U	81 U	74 U

SUMMARY OF VALIDATED ANALYTICAL RESULTS
SEDGWICK TRENCH AREA

SAMPLE ID:		5/8/2001		5040TR-SB	5065TR-SBDUP01	5054TR-SB	5059TR-SB	5065TR-SB
SAMPLE DEPTH:		REGION III	Result	4.5'-5.5'	4.5'-5.5'	3'-5'	9'-10'	2.5'-4'
LAB SAMPLE ID:		Residential	Exceeds	159223	159227	159224	159225	159226
TYPE or LOCATION:		RBC	RBC?	Trench Bottom	Dup 5040 Trench Bottom	Trench Bottom	Trench Bottom	Trench Bottom
SAMPLING DATE:		*(Adjusted Down by factor of 10)*		4/5/2001	4/5/2001	4/5/2001	4/5/2001	4/5/2001
2-NITROANILINE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
ACENAPHTHYLENE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
DIMETHYLPHTHALATE	UG/KG	7.80E+07	NO	82 U	73 U	76 U	81 U	74 U
2,6-DINITROTOLUENE	UG/KG	7.80E+03	NO	82 U	73 U	76 U	81 U	74 U
ACENAPHTHENE	UG/KG	4.70E+05	NO	82 U	73 U	76 U	81 U	74 U
3-NITROANILINE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
2,4-DINITROPHENOL	UG/KG	1.60E+04	NO	250 U	220 U	230 U	240 U	220 U
DIBENZOFURAN	UG/KG	3.10E+04	NO	82 U	73 U	76 U	81 U	74 U
2,4-DINITROTOLUENE	UG/KG	1.60E+04	NO	82 U	73 U	76 U	81 U	74 U
4-NITROPHENOL	UG/KG	6.30E+04	NO	82 U	73 U	76 U	81 U	74 U
FLUORENE	UG/KG	3.10E+05	NO	82 U	73 U	76 U	81 U	74 U
4-CHLOROPHENYL-PHENYLETHER	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
DIETHYLPHTHALATE	UG/KG	6.30E+06	NO	82 U	73 U	76 U	81 U	74 U
4-NITROANILINE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
4,6-DINITRO-2-METHYLPHENOL	UG/KG	7.80E+02	NO	82 U	73 U	76 U	81 U	74 U
N-NITROSODIPHENYLAMINE	UG/KG	1.30E+05	NO	82 U	73 U	76 U	81 U	74 U
4-BROMOPHENYL-PHENYLETHER	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
HEXACHLOROBENZENE	UG/KG	4.00E+02	NO	82 U	73 U	76 U	81 U	74 U
PENTACHLOROPHENOL	UG/KG	5.30E+03	NO	82 U	73 U	76 U	81 U	74 U
PHENANTHRENE	UG/KG	NA		82 U	73 U	270	81 U	74 U
ANTHRACENE	UG/KG	2.30E+06	NO	82 U	73 U	75 J	81 U	74 U
CARBAZOLE	UG/KG	3.20E+04	NO	82 U	73 U	76 U	81 U	74 U
DI-N-BUTYLPHTHALATE	UG/KG	7.80E+05	NO	10 UB	73 U	76 U	81 U	74 U
FLUORANTHENE	UG/KG	3.10E+05	NO	82 U	73 U	650	81 U	74 U
PYRENE	UG/KG	2.30E+05	NO	82 U	73 U	450	81 U	74 U
BUTYLBENZYLPHTHALATE	UG/KG	1.60E+06	NO	82 U	73 U	76 U	81 U	74 U
PHENYL HYDRAZINE	UG/KG	NA		82 U	73 U	76 U	81 U	74 U
3,3-DICHLOROBENZIDINE'	UG/KG	1.40E+03	NO	82 U	73 U	76 U	81 U	74 U
BENZO [A] ANTHRACENE	UG/KG	8.70E+02	NO	82 U	73 U	340	81 U	74 U
CHRYSENE	UG/KG	8.70E+04	NO	82 U	73 U	160	81 U	74 U
BIS (2-ETHYLHEXYL) PHTHALATE	UG/KG	4.60E+04	NO	82 U	73 U	51 J	81 U	74 U
DI-N-OCTYLPHTHALATE	UG/KG	1.60E+05	NO	82 U	73 U	76 U	81 U	74 U
BENZO [B] FLUORANTHENE	UG/KG	8.70E+02	NO	82 U	73 U	300	81 U	74 U
BENZO [K] FLUORANTHENE	UG/KG	8.70E+03	NO	82 U	73 U	130	81 U	74 U
BENZO [A] PYRENE	UG/KG	8.70E+01	YES	82 U	73 U	140	81 U	74 U
INDENO [1,2,3-CD] PYRENE	UG/KG	8.70E+02	NO	82 U	73 U	120	81 U	74 U
DIBENZ [A,H] ANTHRACENE	UG/KG	8.70E+01	NO	82 U	73 U	34 J	81 U	74 U
BENZO [G,H,I] PERYLENE	UG/KG	NA		82 U	73 U	97	81 U	74 U

SVOC Tentatively Identified Compounds

No AUES List SVOC TICs Identified

SUMMARY OF VALIDATED ANALYTICAL RESULTS
SEDGWICK TRENCH AREA

SAMPLE ID:		5/8/2001		5040TR-SB	5065TR-SBDUP01	5054TR-SB	5059TR-SB	5065TR-SB
SAMPLE DEPTH:		REGION III	Result	4.5'-5.5'	4.5'-5.5'	3'-5'	9'-10'	2.5'-4'
LAB SAMPLE ID:		Residential	Exceeds	159223	159227	159224	159225	159226
TYPE or LOCATION:		RBC	RBC?	Trench Bottom	Dup 5040 Trench Bottom	Trench Bottom	Trench Bottom	Trench Bottom
SAMPLING DATE:		*(Adjusted Down by factor of 10)*		4/5/2001	4/5/2001	4/5/2001	4/5/2001	4/5/2001
ICP Scan Metals - SW6010B								
ALUMINUM	MG/KG	7.80E+03	YES	13100	16100	18800	12600	14800
ANTIMONY	MG/KG	3.10E+00	NO	1.2 UJ	1.1 UJ	1 UJ	1.1 UJ	0.97 UJ
ARSENIC	MG/KG	4.30E-01	YES	2.2	0.62	1.1	1.3	0.7
BARIUM	MG/KG	5.50E+02	NO	62.4	75.4	85.4	66.5	74.6
BERYLLIUM	MG/KG	1.60E+01	NO	1.1	1.6	2.1	1.6	1.5
CADMIUM	MG/KG	7.80E+00	NO	0.59 U	0.55 U	0.52 U	0.57 U	0.49 U
CALCIUM	MG/KG	NA		171	296	448	265	306
CHROMIUM	MG/KG	2.30E+01	YES	26.5	20.6	20.3	26.4	21.4
COBALT	MG/KG	1.60E+02	NO	10.9	18	15.5	21.1	14.4
COPPER	MG/KG	3.10E+02	NO	31.4	29.2	38.2	34.1	27.9
IRON	MG/KG	2.30E+03	YES	26800	19600	18000	24200	19400
LEAD	MG/KG	4.00E+02	NO	11.1	10.1	5	12.8	7.4
MAGNESIUM	MG/KG	NA		5010	7490	7440	6170	7410
MANGANESE	MG/KG	1.10E+03	NO	177 J	602 J	438 J	460 J	384 J
NICKEL	MG/KG	1.60E+02	NO	22.5	32.4	32.1	29.3	29.4
PHOSPHORUS	MG/KG	1.60E-01	YES	213	220	502	234	217
POTASSIUM	MG/KG	NA		3820	6010	5700	4750	6020
SELENIUM	MG/KG	3.90E+01	NO	0.59 U	0.55 U	0.52 U	0.57 U	0.49 U
SILICON	MG/KG	NA		2340	2280	2320	2410	2110
SILVER	MG/KG	3.90E+01	NO	0.59 U	0.55 U	0.52 U	0.57 U	0.49 U
SODIUM	MG/KG	NA		58.6 U	57.5	55.9	57.3 U	53.7
STRONTIUM	MG/KG	4.70E+03	NO	2.5	4.2	7.9	2.3	3.9
SULFUR	MG/KG	NA		116	18.9	51	98.8	21
THALLIUM	MG/KG	5.50E-01	<PQL	1.2 U	1.1 U	1 U	1.1 U	0.97 U
TIN	MG/KG	4.70E+03	NO	2.3 U	2.2 U	2.1 U	2.3 U	1.9 U
TITANIUM	MG/KG	3.10E+04	NO	835	922	930	899	923
VANADIUM	MG/KG	5.50E+01	NO	39.8	24	23.1	32.8	23.4
ZINC	MG/KG	2.30E+03	NO	67.9	92.7	96.7	80.4	91.9
GFAA/CVAA Metals								
MERCURY	MG/KG	NA		0.06 U	0.05 U	0.05 U	0.05	0.04 U
Hexavalent Chromium	MG/KG	2.30E+01	NO	0.488 U	0.436 U	0.449 U	0.466 U	0.432 U

SUMMARY OF VALIDATED ANALYTICAL RESULTS
SEDGWICK TRENCH AREA

SAMPLE ID:		5/8/2001		5040TR-SB	5065TR-SBDUP01	5054TR-SB	5059TR-SB	5065TR-SB
SAMPLE DEPTH:		REGION III	Result	4.5'-5.5'	4.5'-5.5'	3'-5'	9'-10'	2.5'-4'
LAB SAMPLE ID:		Residential	Exceeds	159223	159227	159224	159225	159226
TYPE or LOCATION:		RBC	RBC?	Trench Bottom	Dup 5040 Trench Bottom	Trench Bottom	Trench Bottom	Trench Bottom
SAMPLING DATE:		*(Adjusted Down by factor of 10)*		4/5/2001	4/5/2001	4/5/2001	4/5/2001	4/5/2001
IC Scan - EPA 300M								
BROMIDE	MG/KG	NA		1.22 U	1.07 U	1.1 U	1.17 U	1.08 U
CHLORIDE	MG/KG	NA		20.2	7.51	9	8.34	8.17
FLUORIDE	MG/KG	NA		1.22 R	1.07 R	1.1 R	1.17 R	1.08 R
NITRATE-N	MG/KG	1.30E+04	NO	1.22 U	1.69	1.1 U	1.17 U	1.68
NITRITE-N	MG/KG	7.80E+02	NO	1.22 UJ	1.07 UJ	1.1 UJ	1.17 UJ	1.08 UJ
PHOSPHATE-P	MG/KG	NA		1.22 R	1.07 R	1.1 R	1.17 R	1.08 R
SULFATE	MG/KG	NA		52.8 J	12.5 J	69.1 J	67.7 J	13.5 J
Mustard and Mustard Degradation Products								
MUSTARD	UG/KG			200 U	Not Analyzed	200 U	200 U	200 U
1,4-OXATHIANE	UG/KG	NA		102 U	87 U	90 U	101 U	87 U
1,4-DITHIANE	UG/KG	7.80E+01	<PQL	99 U	84 U	87 U	97 U	84 U
THIODIGLYCOL	UG/KG	NA		1061 U	940 U	971 U	1043 U	940 U
Lewisite Degradation Products								
TOTAL CVAA & CVAO	UG/KG	NA		10 U	9 U	9 U	10 U	9 U
ADAMSITE*								
Other Parameters								
2,4,6-TRINITROTOLUENE	UG/KG	3.90E+00	<PQL	180 U	180 U	180 U	180 U	180 U
AMMONIA-N	MG/KG	NA		1.21 UJ	1.09 UJ	1.12 UJ	1.16 UJ	1.06 UJ
CYANIDE	MG/KG	1.60E+02	NO	0.61 U	0.54 U	0.56 U	0.58 U	0.53 U

*ECBC's method was to run samples based on the initial arsenic content. ECBC did n these samples for Adamsite since the arsenic concentration was so low.

QUALITY ASSURANCE SUMMARY REPORT FOR

SOIL SAMPLES ASSOCIATED WITH SPRING VALLEY SEDGWICK STREET RESIDENTIAL AND TRENCH SAMPLING (FINAL WORK PLAN, *MARCH 30, 2001*)

INTRODUCTION

This data validation summary report covers environmental soil samples collected from the following Spring Valley Sedgwick Street locations in Washington, DC: 5040, 5054, 5059, and 5065 Sedgwick Street. These are included in laboratory Sample Delivery Group 159223. The samples, collected April 5, 2001, are the interval representing the bottom of the Sedgwick Trench. All samples were analyzed for Full Scan Parameters including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), mustard and mustard degradation products, adamsite, lewisite degradation products, trinitrotoluene, metals, ions (bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate) and selected wet chemistry parameters (ammonia and total cyanide). VOC and SVOC analyses included tentatively identified compounds (TICs).

All work was performed in accordance with the Work Plan (WP) prepared by Parsons ES (Final, March 30, 2001). The WP included a Quality Assurance Project Plan (QAPjP) which was prepared and approved for use to ensure generation of legally defensible data. Southwest Research Institute (SwRI) of San Antonio, Texas, following procedures outlined in the QAPjP and the WMP, performed the majority of the analyses. SwRI did not perform mustard and adamsite analyses. Those were performed by the Edgewood Chemical and Biological Command (ECBC).

A summary of the samples collected is presented in Table 1 (Attachment 1). A glossary of the validation qualifiers is presented in Attachment 2.

SUMMARY OF VALIDATED ANALYTICAL RESULTS
SEDGWICK TRENCH AREA

SAMPLE ID:			5040TR-SB	5065TR-SBDUP01	5054TR-SB	5059TR-SB	5065TR-SB
SAMPLE DEPTH:	REGION III	Result	4.5'-5.5'	4.5'-5.5'	3'-5'	9'-10'	2.5'-4'
LAB SAMPLE ID:	Residential	Exceeds	159223	159227	159224	159225	159226
TYPE or LOCATION:	RBC	RBC?	Trench Bottom	Dup 5040 Trench Bottom	Trench Bottom	Trench Bottom	Trench Bottom
SAMPLING DATE:	5/8/2001		4/5/2001	4/5/2001	4/5/2001	4/5/2001	4/5/2001
VOC Tentatively Identified Compounds							
1-NONENE, 4,6,8-TRIMETHYL-	UG/KG					3 NJ	
BENZENE, (1-METHYLETHENYL)-	UG/KG		1 NJ	0.8 NJ	1 NJ		
BUTANE, 1,1-OXYBIS-'	UG/KG		1 NJ		0.9 NJ		
CYCLOTETRASILOXANE, OCTAMETH	UG/KG			1 NJ	3 NJ	7 NJ	
FURAN, TETRAHYDRO-	UG/KG			1 NJ			1 NJ
PROPANE, OCTAFLUORO-	UG/KG			2 NJ			2 NJ
UNKNOWN	UG/KG			4 J		3 J	0.9 J
SVOC Tentatively Identified Compounds							
1-EICOSANOL	UG/KG					160 NJ	
1-NONADECANOL	UG/KG			110 NJ			110 NJ
1-OCTADECENE	UG/KG				480 NJ		
BENZO[E] PYRENE	UG/KG				46 NJ		
UNKNOWN HYDROCARBON	UG/KG			150 J			150 J

Bochnowicz, Frank NAB02

From: Thomas Bachovchin [Thomas.Bachovchin@parsons.com]
Sent: Wednesday, May 08, 2002 2:21 PM
To: 'Peloquin, Michael MAJ NAB02'
Cc: Frank. Bochnowicz@nab02. usace. army. mil (E-mail); Leland. H. Reeser@nab02. usace. army. mil (E-mail); James.W.Baron@nab02.usace.army.mil (E-mail)
Subject: RE: May partnering meeting

Mike,

One other thing is the Final presentation of the AUES List sampling results. The CDC and Sedgwick reports have been sent Final to Jim and Frank. The 3819 (Telecki) and other OU-4 properties report will go out today or tomorrow. This may be more than you want to get into at the meeting, but it also might be a way to get final buy-off from regulators as to how these have been presented and the conclusions resulting.

I am not certain whether your items 1 and 2 below impact those documents.

Thanks.

-----Original Message-----
From: Peloquin, Michael MAJ NAB02
Sent: Wednesday, May 08, 2002 1:15 PM
To: Bethany Bridgham; Bruce Whisenant; Christopher Evans; Edward Hughes; Frank Vavra; Gary Schilling; Gerald Pollis; Gregory Nielson; Jon Durham; Jorge Abud; Ken Shuster; Laura Frazier; Leland Reeser; Mark Baker; Michael Peloquin; Michael Rogers; Richard Albright; Robert Hill; Sherri Anderson-Hudgins; Stukas.Tom@epamail.epa.gov; Susan Platt; Terry Slonecker; Theodore Henry; Wilson Walters; abjackson@starpower.net; 'Beumel, Greg'; Dorothy Zolandz; Doug Garman; 'dperkins@iiaa.org'; 'drrobins@llgm.com'; Geza Teleki; Jim Girard (Dr.); Jim Sweeney; 'jpb@gdllaw.com'; Karen Egbert; Kent Slowinski; 'Liebenthal, Andres'; Lucy Lather; 'mleone@ANTH.umd.edu'; 'pdenby@bellatlantic.net'; Rich Albright; 'ssshap@starpower.net'; 'whall@winston.com'; 'woodway2@mindspring.com'; Bachovchin, Thomas; Bishop, Edward
Subject: FW: May partnering meeting

All:
Votes are in and the next partnering meeting will be 22 May.
Here is a list of proposed topics for discussion. Please review and add to/comment on it by 14 May so I can get the agenda out shortly thereafter.

Agenda Topics:

1. Thallium Issue - Presentation/discussion on how to address the elevated thallium results from the 1995 RI.
2. Adjusted Background Results - Recalculation using only EPA's data collected in 1999.
3. Test Pit 23 Characterization on 4801 Glenbrook property - status of arsenic overexcavation. Issues with other metals should be resolved by the time of the Partnering Meeting, but if not, they can be discussed also.
4. 4835 Glenbrook Rd. Risk Assessment - No unacceptable risk. Elevated grids will be addressed under current Non-TCRA and concurrent with any follow-up geophys investigation.
5. General status of overall work on 4801 Glenbrook
6. Update on OU4 AU TCRA (resolve any EPA, DC Health and AU comments on the R.A.D. document not finalized during the 8 May "on-board" meeting
7. Update on OU5 Residential TCRA
8. Update on the draft SSS and appendices for the Sedgwick properties
9. Indoor air monitoring status update
10. Presentation by Rich/Ken/Terry on recent research efforts

Michael D. Peloquin
Major, Corps of Engineers
Deputy District Engineer for Spring Valley

410-962-0157 (Baltimore voice)
410-962-9312 (Balt. fax)
202-686-3359 (DC voice)
202-686-3596 (DC fax)

> -----Original Message-----
> From: Peloquin, Michael MAJ NAB02
> Sent: Friday, April 26, 2002 2:36 PM
> To: Bethany Bridgham; Bruce Whisenant; Christopher Evans; Edward Bishop;
> Edward Hughes; Frank Vavra; Gary Schilling; Gerald Pollis; Gregory
> Nielson; Jon Durham; Jorge Abud; Ken Shuster; Laura Frazier; Leland
> Reeser; Mark Baker; Michael Peloquin; Michael Rogers; Richard Albright;
> Robert Hill; Sherri Anderson-Hudgins; Stukas.Tom@epamail.epa.gov; Susan
> Platt; Terry Slonecker; Theodore Henry; 'Thomas Bachovchin'; Wilson
> Walters
> Subject: May partnering meeting
>
> All:
> Despite our on-board review meetings last week and next week, we still
> need to schedule a regular partnering meeting in mid-May to cover all the
> stuff not addressed in the recent meetings. I would like to hold the
> meeting 21, 22 or 23 May and need your input. Please respond, indicating
> your first and second choice.
>
> Also, please identify topics or specific issues you would like to see
> addressed at the meeting.
>
> Thanks,
>
> Michael D. Peloquin
> Major, Corps of Engineers
> Deputy District Engineer for Spring Valley
> 410-962-0157 (Baltimore voice)
> 410-962-9312 (Balt. fax)
> 202-686-3359 (DC voice)
> 202-686-3596 (DC fax)
>
>

SPRING VALLEY

Partner Meeting
Spring Valley Resident Office

PURPOSE OF MEETING: Partnering Meeting

LOCATION: Spring Valley Resident Office

DATE: May 22, 2002

TIME: 10:00 a.m. – 4:00 p.m.

Discussion of New Boundaries and POIs

Rich Albright, Greg Nielson, and Frank Vavra discussed a recent meeting of the regulators and CENAB personnel.

Rich Albright handed out copies of photos of ordnance items he uncovered from research. One of the documents referenced is "History of the Chemical Warfare Service in the United States" by Lt. Col Bancroft.

Rich Albright presented a summary of the report he distributed, "Draft Comments on the Corps of Engineers Selection of Points of Interest and Boundary Delineation for the Spring Valley DERP/FUDS Site", May 2002. His summary included:

- Expansion of FUDS boundary west of Zone 9 and north of Zone 6
- Additional POIs based upon the plan view of 1918 buildings. He also supplied a list of the buildings.
- He feels POI 7 requires additional investigation because he has uncovered information there was significant CWM testing within this POI.
- He stated the 1918 Manual of Gas Shell Storage required a pre-dug 4' deep hole for disposal of leaking shells.
- The area previously identified as an airstrip is actually an area composed of linear trenches.

- The circular testing area was an area for smoke candle testing. It is also his opinion 3-4 million candles were loaded with toxic smoke at AUES.
- He recommends including all shell loading plants.
- He believes there is another large persistency test area to the west of POI 16.
- He believes there a number of additional burial pits.
- He wants the anomalies investigated near the debris field on 4835 Glenbrook.
- The area of Dalecarlia Reservoir requires additional geophysical investigation.
- His summary of the DC report is that there are still many unknowns that require additional investigation.

Greg Nielson explained the next geophysics effort will be focused on areas agreed to by the partners. He will develop the prioritization guidelines and coordinate these with the partners. It will then be distributed to the public. This will be based upon the current prioritization scheme.

MAJ Peloquin would like to develop a Spring Valley Master Plan that would condense available information and integrate DC DOH, EPA, and CENAB prioritizations that would serve as a guide for future investigations and activities on the Spring Valley FUDS.

Glenbrook Road Activities

Update at 4801 Glenbrook Road

MAJ Peloquin reported work is starting on the separation wall and backfilling the pit. The VCS will be removed shortly followed by the removal of the access road and turn over of the property to the landscape contractor.

Right of Entry for 4825

The ROE is currently being addressed at the Dept of the Army level. Work is complete for this fiscal year. When access is again gained, the pit will be excavated, and the other areas of interest investigated (driveway, front yard).

There was discussion on the items found under the concrete retaining wall. Greg Nielson will send copies of photos of the glassware to Rich Albright.

4835 Human Health Risk Assessment

Lan Reeser reported the risk assessment for this property is complete and did not identify an unacceptable risk. However, there are approximately five grids with arsenic above 20 ppm that will be removed. Greg Nielson reported consensus from the partners will be obtained on the geophysical anomalies to be removed prior to initiating intrusive investigations.

OU5 Sampling Plan

Status/Results

MAJ Peloquin provided the results of sampling to date to Rich Albright. He will email the results to Ken Shuster and Frank Vavra. MAJ Peloquin will meet with Rich Albright to discuss prioritization of additional sampling.

MAJ Peloquin discussed the grid sample results for OU-5 and OU-4.

Van Ness Reservoir

MAJ Peloquin pointed out the Van Ness Reservoir and stated composite samples were taken today in each of 9 one-half acre lots. Rich Albright requested a boring sample for arsenic be performed in one of the garden lots. Parsons will review exactly where borings in this area have already been taken.

Sample Result Reporting

MAJ Peloquin stated the group needs to come to a conclusion on how to report the results of the AUES List of compounds. Tom Bachovchin explained these are chemical compounds where one or more indicators are above the RBC and, therefore, the result is reported as the potential compound. Frank Vavra suggested reviewing the fate and transport of the chemicals, stoichiometry, and also reviewing the relative toxicity of the compound compared to the indicators. Rich Albright stated this needs to be put in context to the historical area. Ed Bishop stated Parsons will also discuss other potential sources of the indicator compound.

CTA vs CSA Sampling

Drew Rak provided an explanation of the sampling in the CTA in four quadrants compared to the CSA with half lots compared to the EPA soil screening guidance. The sampling was based upon the criteria that CWM testing occurred within the CTA but not in the CSA.

Parsons and Drew Rak will retrieve the statistical discussion on the CTA and CSA sampling.

Removals

AU lots TCRA

These lots were addressed during the geophysics review meeting. Lots were defined as pink, yellow, or red. The pink are arsenic removal grids without anomalies for intrusive investigation. The red are arsenic removal grids with anomalies for intrusive investigation. The yellow are grids with anomalies (only) for intrusive investigation. The pink grids will be removed under HTRW conditions. The red and yellow grids will be addressed under the site-wide locally approved work plan and AU lot annex. Removal actions on the pink grids are scheduled to begin on or about June 3 with intrusive investigations in yellow and red grids likely beginning in mid-July.

Residential TCRA

Ed Hughes updated the group on the status of the pending TCRA removal action at 7 residential properties. The update included scheduling considerations (preliminary actions in June, removals starting in July/August and the goal for completion in September). Ed H mentioned about the need for cooperation from the Partnering group in support of the aggressive removal schedule, especially for issues such as the adjusted action level (43ppm) near large trees or other sensitive items, crawl space remediation options (if required) and decisions about continuing removal activities onto adjacent properties. The partners indicated concurrence with this request.

Discussion of Sedgwick Trench Investigation

Status of SSS

Ed Bishop reported the SSS will go out final tomorrow. Work will start on the site-wide local approved work plan and associated annexes. Greg Nielson stated we plan to start work mid-July. He is meeting with the property owners this evening to discuss the work plans.

Air monitoring plan revisions

Liza Finley described her concerns with the air monitoring. The methods used had levels of detection that were too low to meet the RBCs. The EPA methods that will meet the RBCs are not suitable for indoor use in residences. Her recommendation is to put the air monitoring on hold until a suitable method is determined. Greg Nielson stated the Corps' recommendation was to finalize the current work effort. However, since that effort was inconclusive, a new effort was needed. Discussion followed.

Recommendation is to use size selection to determine particulates < 10 um or < 2.5 um. It was recommended to sample 6 houses with high, low, or background levels of arsenic in soil. Ed Bishop recommended sampling for PM_{10} arsenic, mustard, and arsine. He

will work with Liza Finley (CENAB) and Pat Flores (EPA). There will be a conference call with the above personnel, DC DOH, and an EPA toxicologist (Frank Vavra will supply a name) to determine the best methods for sampling. We will use 10^{-5} as the RBC.

On the issue of swipe samples, the group recommended collecting dust samples rather than swipe samples. Dust samples were collected by ATSDR. Drew Rak asked about collecting vacuum cleaner bags.

Miscellaneous Issues

Adjusted background results

Drew Rak explained the results of recalculation of the background data. There were some discrepancies with the data from field duplicates, and a transcription error. He presented a summary of the combined 1993/94 and 1999 data to the 1999 data. Some metals were higher and some were lower. However, in general, the results are not vastly different. He recommends continuing to use the corrected combined 1993/94 and 1999 data The group concurred.

Scientific Advisory Panel

The Scientific Advisory Panel meets May 29, 2002. MAJ Peloquin will briefly present on the sampling results. ATSDR will also present.

Evergreen document

This is a document to capture all of the open items from RAB and partnering meetings. These items will be prioritized and addressed. Gary Schilling, CENAB, will be preparing this document.

Open Discussion

Greg Nielson stated the Donovan Chamber will be mobilized to the site within 3 months. He stated he is still awaiting an approval from the DC DOH on the use of the chamber on the Federal Property.

There has been a change in the security service. They are now using the Washington Aqueduct (WAD) security personnel at the Federal Facility with the DC Police at American University. In the future, an intrusion detection system (IDS) will be installed at the Federal Facility with on-site guard presence only during working hours. The IDS will be monitored during non-working hours by WAD security personnel. DC Police Special Operations Division (SOD) will continue to be used at intrusive investigations where OE/CWM are found.

Ed Hughes brought up the re-sampling of the Teleki property. Frank Vavra said the homeowner was not happy with the locations because they were in the homeowner's clean soil. Tom Bachovchin stated we took the samples with anomaly avoidance protocols. Any location change was the result of anomaly avoidance procedures. Parsons will summarize all sampling procedures and provide an analysis of where the surface samples were taken compared to the homeowner's map.

Short Term Taskers:

1. Greg Nielson – provide photos of glassware found within or near the concrete footer of the 4825 Glenbrook wall to Rich Albright

2. Greg Nielson – prepare a narrative describing general methodology for selecting future sites for geophysical investigation

3. Ed Bishop – take lead in setting up conference call with DC DOH, EPA, and CENAB to determine appropriate means for sampling/measuring indoor air quality

4. Frank Vavra – provide EPA POC to Ed Bishop so he can address #3 above

5. Gary Schilling – compile draft Evergreen List

6. Parsons – provide to CENAB, EPA, and DC DOH an analysis of where the Teleki property surface samples were taken compared to the homeowner's map

7. CENAB/Parsons – review boring samples collected near the Van Ness reservoir in the garden lots

8. Major Peloquin - . E-mail OU5 sampling results to Ken Shuster and Frank Vavra and meet with Rich Albright to discuss prioritization of additional sampling

Evergreen List:

1. Major Peloquin – Initiate master plan effort.

2. All partners – review DC DOH report on new POIs for incorporation into future master plan effort

3. CENAB – reevaluation of data collected to date and additional geophysics on the Dalecarlia Reservoir

Attendees

Name	Organization/Address
Major Mike Peloquin	CENAB
Lan Reeser	CENAB
Rich Albright	DCEHA
Frank Vavra	USEPA
Wilson Walters	USAESCH
Ken Shuster	USEPA
Ed Hughes	CENAB
Greg Nielson	CENAB
Jim Baron	CENAB
Ben Rooney	CENAB
Bethany Bridgham	AU
Frank Bochnowicz	CENAB
Drew Rak	CENAB
Mark Baker	CENAB
Liza Finley	CENAB
Tom Stukas	ATSDR
Terry Slonecker	USEPA
RAB Member	Not Otherwise Identified
Tom Bachovchin	Parsons ES
Ed Bishop	Parsons ES
Pete Crowley	Parsons ES

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

March 15, 2001

REPLY TO
ATTENTION OF
Programs and Project
Management Division

Mr. and Mrs. Curtis Bohlen
4710 Quebec Street
Washington, D.C. 20016

Dear Mr. and Mrs. Bohlen:

I have enclosed the preliminary results of the arsenic sampling that we conducted on your property on February 2, 2001. I have also included a map identifying the samples' locations.

If you have any questions on this matter, please feel free to contact me, at 410-962-6782

Sincerely,

Patience N. Nwanna
Spring Valley OU4 Project Manager

Enclosure

Lot Number	Sample Type	Sample ID	Date Collected	Date Reviewed	Data Validated	PARAMETER Arsenic mg/kg	Qualifier
4710 Quebec	soil	OU4-4710QS-150,90	2/2/2001	2/12/2001		5.70	
	soil	OU4-4710QS-130,110	2/2/2001	2/12/2001		20.8	
	soil	OU4-4710QS-130,90	2/2/2001	2/12/2001		3.52	
	soil	OU4-4710QS-130,70	2/2/2001	2/12/2001		17.2	
	soil	OU4-4710QS-110,130	2/2/2001	2/12/2001		12.5	
	soil	OU4-4710QS-110,110	2/2/2001	2/12/2001		25.3	
	soil	OU4-4710QS-110,90	2/2/2001	2/12/2001		27.2	
	soil	OU4-4710QS-110,70	2/2/2001	2/12/2001		49.4	
	soil	OU4-4710QS-110,50	2/2/2001	2/12/2001		42.7	
	soil	OU4-4710QS-90,150	2/2/2001	2/12/2001		17.2	
	soil	OU4-4710QS-90,130	2/2/2001	2/12/2001		5.38	
	soil	OU4-4710QS-90,110	2/2/2001	2/12/2001		35.1	
	soil	OU4-4710QS-90,90	2/2/2001	2/12/2001		10.4	
	soil	OU4-4710QS-90,50	2/2/2001	2/12/2001		5.13	
	soil	OU4-4710QS-90,30	2/2/2001	2/12/2001		10.6	
	soil	OU4-4710QS-70,150	2/2/2001	2/12/2001		3.52	
	soil	OU4-4710QS-70,130	2/2/2001	2/12/2001		7.98	
	soil	OU4-4710QS-70,110	2/2/2001	2/12/2001		20.0	
	soil	OU4-4710QS-70,70	2/2/2001	2/12/2001		15.9	
	soil	OU4-4710QS-70,50	2/2/2001	2/12/2001		56.3	
	soil	OU4-4710QS-70,30	2/2/2001	2/12/2001		7.46	
	soil	OU4-4710QS-70,10	2/2/2001	2/12/2001		8.03	
	soil	OU4-4710QS-50,130	2/2/2001	2/12/2001		6.16	
	soil	OU4-4710QS-50,110	2/2/2001	2/12/2001		19.6	
	soil	OU4-4710QS-50,90	2/2/2001	2/12/2001		30.7	
	soil	OU4-4710QS-50,70	2/2/2001	2/12/2001		30.8	
	soil	OU4-4710QS-50,50	2/2/2001	2/12/2001		6.58	
	soil	OU4-4710QS-50,30	2/2/2001	2/12/2001		9.74	
	soil	OU4-4710QS-30,110	2/2/2001	2/12/2001		6.82	
	soil	OU4-4710QS-30,90	2/2/2001	2/12/2001		39.1	
	soil	OU4-4710QS-30,70	2/2/2001	2/12/2001		38.6	
	soil	OU4-4710QS-30,50	2/2/2001	2/12/2001		6.97	
	soil	OU4-4710QS-10,90	2/2/2001	2/12/2001		41.5	
	soil	OU4-4710QS-10,70	2/2/2001	2/12/2001		12.5	
	soil	OU4-4710QS-DUP01	2/2/2001	2/12/2001		21.3	
	soil	OU4-4710QS-DUP02	2/2/2001	2/12/2001		22.0	

>13 ppm, < 26 ppm
> 26 ppm, < 43 ppm
> 43 ppm

J - Result is estimated due to a minor QA/QC problem (see report for specific explanation).
U - Analyte not detected at the quantitation limit.
D - Sample was diluted due to matrix interferences.
B - Nondetect due to laboratory blank contamination.

SPRING VALLEY OU-4
4710 Quebec Street Grid Sampling Data
(PRELIMINARY / UNVALIDATED)

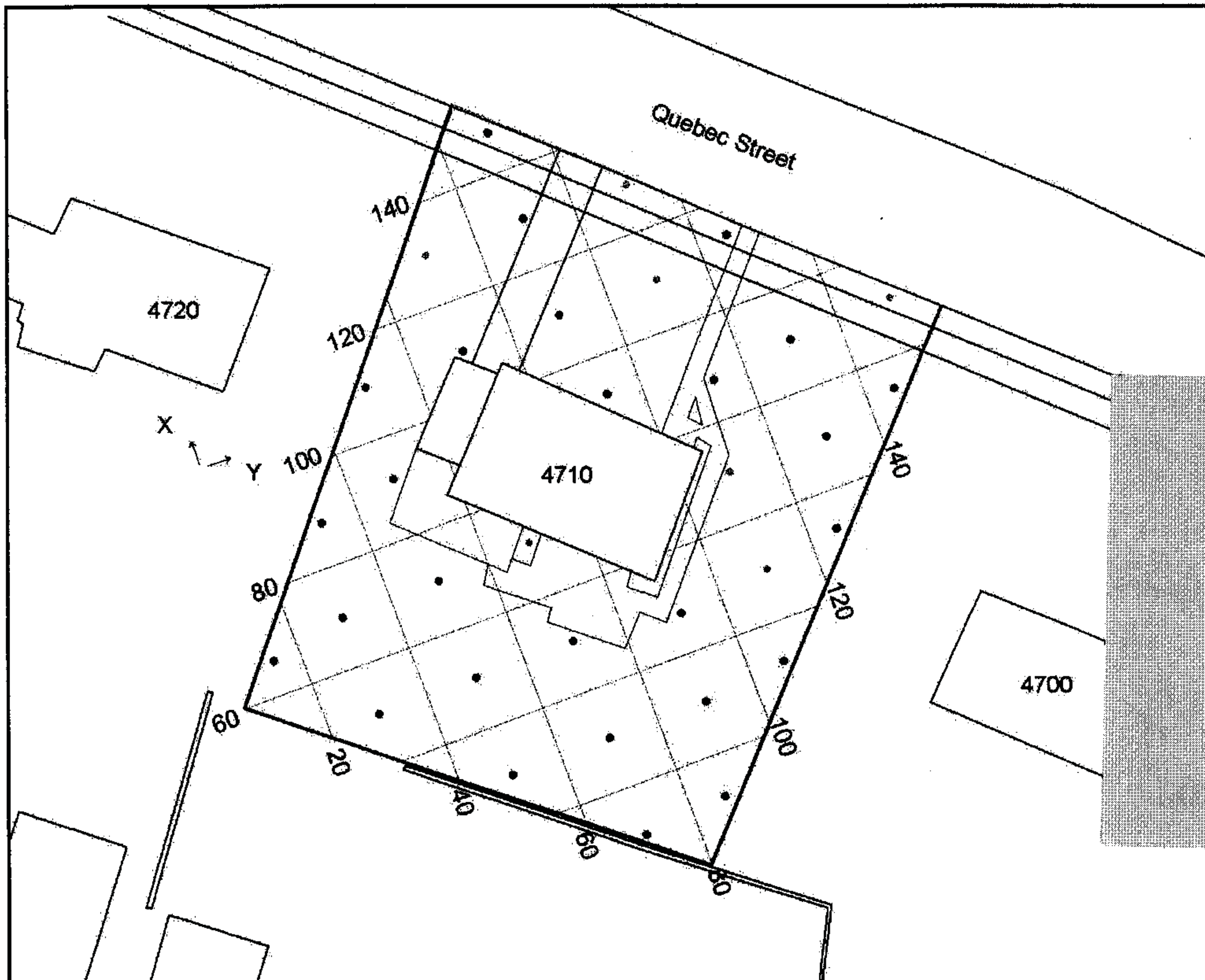
Lot Number	Sample Type	Sample ID	Date Collected	Date Reviewed	Data Validated	PARAMETER Arsenic mg/kg	Qualifier
4710 Quebec Grid	soil	OU4-4710QS-150,90	2/2/2001	2/12/2001		5.70	
	soil	OU4-4710QS-130,110	2/2/2001	2/12/2001		20.8	
	soil	OU4-4710QS-130,90	2/2/2001	2/12/2001		3.52	
	soil	OU4-4710QS-130,70	2/2/2001	2/12/2001		17.2	
	soil	OU4-4710QS-110,130	2/2/2001	2/12/2001		12.5	
	soil	OU4-4710QS-110,110	2/2/2001	2/12/2001		25.3	
	soil	OU4-4710QS-110,90	2/2/2001	2/12/2001		27.2	
	soil	OU4-4710QS-110,70	2/2/2001	2/12/2001		49.4	
	soil	OU4-4710QS-110,50	2/2/2001	2/12/2001		42.7	
	soil	OU4-4710QS-90,150	2/2/2001	2/12/2001		17.2	
	soil	OU4-4710QS-90,130	2/2/2001	2/12/2001		5.38	
	soil	OU4-4710QS-90,110	2/2/2001	2/12/2001		35.1	
	soil	OU4-4710QS-90,90	2/2/2001	2/12/2001		10.4	
	soil	OU4-4710QS-90,50	2/2/2001	2/12/2001		5.13	
	soil	OU4-4710QS-90,30	2/2/2001	2/12/2001		10.6	
	soil	OU4-4710QS-70,150	2/2/2001	2/12/2001		3.52	
	soil	OU4-4710QS-70,130	2/2/2001	2/12/2001		7.98	
	soil	OU4-4710QS-70,110	2/2/2001	2/12/2001		20.0	
	soil	OU4-4710QS-70,70	2/2/2001	2/12/2001		15.9	
	soil	OU4-4710QS-70,50	2/2/2001	2/12/2001		56.3	
	soil	OU4-4710QS-70,30	2/2/2001	2/12/2001		7.46	
	soil	OU4-4710QS-70,10	2/2/2001	2/12/2001		8.03	
	soil	OU4-4710QS-50,130	2/2/2001	2/12/2001		6.16	
	soil	OU4-4710QS-50,110	2/2/2001	2/12/2001		19.6	
	soil	OU4-4710QS-50,90	2/2/2001	2/12/2001		30.7	
	soil	OU4-4710QS-50,70	2/2/2001	2/12/2001		30.8	
	soil	OU4-4710QS-50,50	2/2/2001	2/12/2001		6.58	
	soil	OU4-4710QS-50,30	2/2/2001	2/12/2001		9.74	
	soil	OU4-4710QS-30,110	2/2/2001	2/12/2001		6.82	
	soil	OU4-4710QS-30,90	2/2/2001	2/12/2001		39.1	
	soil	OU4-4710QS-30,70	2/2/2001	2/12/2001		38.6	
	soil	OU4-4710QS-30,50	2/2/2001	2/12/2001		6.97	
	soil	OU4-4710QS-10,90	2/2/2001	2/12/2001		41.5	
	soil	OU4-4710QS-10,70	2/2/2001	2/12/2001		12.5	

[ ] >13 ppm

J - Result is estimated due to a minor QA/QC problem (see report for specific explanation).
U - Analyte not detected at the quantitation limit.
D - Sample was diluted due to matrix interferences.
B - Nondetect due to laboratory blank contamination.

Figure 1-6
Grid Sampling Plan
4710 Quebec Street

Spring Valley Operable Unit 3
Washington D.C.



Legend

- Property Line
- Sample Points
  - < 13 ppm
  - > 13 ppm AND < 26 ppm
  - > 26 ppm
- Roads/Residences
- 20ft Grid

Results given to Mr Curtis Bohlens over the phone on 2/22

Scale:	1 : 240
Created By:	Parsons ES
File:	[illegible]
Date:	01/29/2001
Figure Number:	X-X
Page Number:	X-X

PARSONS ENGINEERING SCIENCE

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

May 15, 2001

REPLY TO
ATTENTION OF
Programs and Project
Management Division

Mr. Geza Teleki
3819 48th Street
Washington, D.C. 20016

Dear Mr. Teleki:

Enclosed are the preliminary results of the arsenic sampling that we conducted on your property on February 7 and 8, 2001. These results have been validated in accordance with standards set by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency (EPA). The results for your property are within the range of arsenic levels that are expected to occur in this area.

Please note that arsenic is a naturally occurring element that is widely distributed in the environment. Because of this, some arsenic is expected to be found in virtually all soil. This level is sometimes referred to as "background," and it varies from area to area. To ascertain the background level for your area, the EPA took soil samples in August and September 1999. The sample results showed that background levels of arsenic in the soil in your area ranges in value from 3.3 mg/kg to 18 mg/kg. The results for the samples we took from your property fall within this range.

If you have any questions regarding these results, please feel free to contact me at 410-962-6782.

Sincerely,

Patience N. Nwanna
Spring Valley OU4 Project Manager

Enclosure

Appendix 3

Appendix 3

While ROE language and notification have evolved over the years of the Spring Valley project, USACE has never intentionally sampled a property in Spring Valley without the property owner's knowledge and consent. The following attachments are provided in support of this USACE position:

- **Attachment O:** Signed Right-of-Entry for 3819 48th Street. Included in this attachment is the cover letter accompanying the ROE that was sent to the property owner for signature. It should be noted that neither the ROE nor the cover letter limited the planned sampling to just arsenic. It should also be noted that the ROE form signed by the property owner had not been updated before sending so is misdated as 2000 instead of 2001 like the cover letter. Regardless of this clerical error, the ROE was in effect for 18 months from the date of owner approval and, thus, was active at the time of AUES List sampling in February 2001.
- **Attachment P:** Signed ROE for 4625 Rockwood Parkway, dated May 25, 2000.
- **Attachment Q:** Signed ROE for 4633 Rockwood Parkway, dated September 10, 2000. Attached with this ROE is the letter sent by USACE showing its efforts to keep the property owner informed of the sampling plan for arsenic, which was the initial impetus for obtaining this ROE.
- **Attachment R:** Signed ROE for 4710 Quebec Street, dated May 22, 2000.
- **Attachment S:** USACE e-mail dated January 12, 2001 demonstrating USACE's plans for notifying property owners about impending sampling events. This e-mail also notes that the owner of 3819 48th Street was already aware of the planned sampling event.
- **Attachment T:** Letter dated February 5, 2001 to the owners of 4633 Rockwood Parkway informing them that in addition to the arsenic sampling, three surface samples from their property and 4625 Rockwood (another OU4 AUES residential property) will be "analyzed for a complete suite of contaminants….to verify that there are not elevated levels of other contaminants in this area."
- **Attachment U:** USACE e-mail dated February 6, 2001 acknowledging that the property owner of 4710 Quebec Street agreed to the USACE plan to conduct additional sampling on their property, and instructing that a telephone call be placed to the owner to explain the planned sampling. AUES List sampling was conducted on this property on February 8, 2001.
- **Attachment V:** Summary memorandum dated May 24, 2002 prepared by Parsons in follow-up to partnership discussions at the May 22, 2002 Partnering meeting. This memo describes the sampling activities at 3819 48th Street on February 7 and 8, 2001 and notes the presence of the property owner during sampling and the concerns he expressed. The description is supported by the logbook field notes made on those two dates.

3819 48th Street, NW.
Washington, DC 20016-2301

DEPARTMENT OF THE ARMY

RIGHT-OF-ENTRY

This Right-of-Entry sets forth the arrangements by which the United States Government (the "Government") will conduct certain operations relating to the investigation of the Camp American University (Spring Valley) site on the lot of the homeowner (s) whose signature (s) appear (s) below (the "Owner"). The Owner, by this instrument, in consideration of the potential assistance and advantages to be derived by the owner, does hereby grant to the Government a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government the right to enter the lot located at the address identified above at any time during daylight hours of the investigation to inspect and survey the lot. The purpose of this right-of-entry is to permit the Government to perform surface and subsurface soil sampling. The investigation will include a physical walk-through of the lot, and a survey of the lot using such non-intrusive equipment as it determined appropriate by the Government. If intrusive measures are required to complete a satisfactory investigation, these shall be subject to the provisions of Paragraph 4 below.

2. The Owner may revoke this right-of-entry at any time by notice delivered to the Government at its Spring Valley Resident Office, 5201 Little Falls Road, NW., Washington, DC (behind Sibley Memorial Hospital), telefax No. (202) 686-3596. This right-of-entry shall expire without further action by the owner on the earlier of (a) completion of the investigation, or (b) 18 months from the date of execution of this MOU by the Owner. Owner will use its best efforts to notify the Government at any time during the investigation if owner will be away for an extended period of time.

3. The Government will use its best efforts to give the Owner at least 24 hours prior notice of the non-intrusive inspection, such notice to be delivered either by telephone, mail, or to the Owner's front door. Owner hereby grants the Government a right of ingress and egress to the lot for purposes of the non-intrusive inspection, provided, however, that entry into any enclosed structures shall occur only with the further permission of the Owner.

4. If the Government determines, in its best judgement, that an intrusive inspection of the Owner's lot is necessary and appropriate, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the Owner's lot the Government proposes to conduct subsurface exploratory work, and the methods by which it proposes to conduct its exploration. Such methods may include, but not be limited to, surface and subsurface soil sampling, test borings, and the drilling of monitoring wells for ground water testing.

5. The Government shall promptly notify the Owner of the results of any inspection or investigation of Owner's lot. If the Government determines, based on such inspection or investigation, that it will be necessary to remove any buried materials or soil, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the Owner's lot the Government proposes to conduct removal operations and the methods by which it proposes to conduct the removal work. The Government shall obtain the Owner's permission before beginning any removal operations.

6. Data gathered during any inspection of the lot by the Government, and any written summaries or evaluations of such data, shall promptly by made available for review and copying by the Owner or Owner's agents, subject to the Freedom of Information Act. However, the Owner will not need to make a formal, written Freedom of Information Act request to obtain these documents.

7. Without prejudice to any other rights the Owner may have, the Government is responsible, in accordance with applicable law, for the acts and omissions of its employees and agents which cause injuries to persons or damages to property, including any claims arising from such injuries or damages, caused by or arising from the inspections or removal actions, unless such injuries or losses are caused by the Owner's negligence. The Government represents that funds have generally been available for such purposes and that it will seek on an annual basis from Congress such funds as may be required for these purposes.

8. The Government may use private contractors to assist in or conduct the inspections, tests, and other response actions. The Government will ensure that independent contractors participating in the investigation and possible response actions on the Owner's property are required to carry levels of insurance coverage that are appropriate for the activities to be conducted on the property. The Owner shall have the right to review and copy, at the Government's expense, any contract between the Government and such private contractors.

9. All tools, equipment, and other property taken upon the lot by the Government shall remain the property of the Government and shall be removed by the Government as soon as reasonably possible with the completion of the work covered by this right-of-entry.

10. The Government shall have the right to patrol the lot during the period of this right-of-entry.

11. Subject to the availability of funds, the Government shall, at its sole election, either (1) restore the premises to the same condition as that existing at the time of entering, or (2) pay to the Owner a sum of money representing the actual cost of restoration. Interim restoration will be considered on a case by case basis if requested by the Owner. The Government represents that funds have generally been available for such purposes and that it will seek on an annul basis from Congress such funds as may be required for these purposes.

12. Nothing in this instrument shall be deemed to waive any rights of any kinds the Owner now has, or may hereinafter have, to assert any claim against the Government or any other person or entity, including, without limitation, claims with respect to any and all past events and activities of the Government or of any other person or entity.

WITNESS MY HAND AND SEAL this 5th day of February 2000.

(OWNER)

GEZA TELEKI
(OWNER)

3819 48th St, NW
(ADDRESS)

202 362-1993
(TELEPHONE)

THE UNITED STATES OF AMERICA

JAMES S. TURKEL
Chief, Real Estate Division
U.S. Army Corps of Engineers
Baltimore District
P.O. Box 1715, Baltimore, MD 21203-1715
Telephone: (410) 962-3000

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U. S. ARMY CORPS OF ENGINEERS
P. O. BOX 1715
BALTIMORE, MD 21203-1715

REPLY TO
ATTENTION OF

January 30, 2001

Real Estate Division
Special Projects Support Branch

Ms. Geza Teleki
3819 48th Street, NW.
Washington, DC 20016-2301

Dear Ms. Geza:

As you may be aware, the Baltimore District, U.S. Army Corps of Engineers has been conducting an exhaustive investigation of the Spring Valley area of Washington, DC to determine the presence of possible buried munitions, remnants thereof, or associated materiel. These efforts have focused on a formerly used defense site known as American University Experiment Station/Camp Leach.

Although the initial Spring Valley Project field work was concluded in 1996, document reviews, analyses and recent additional field work have occurred in order to ensure every possible precaution is taken to protect residents of the area and the environment. Based on these efforts, we have determined it necessary to conduct limited additional investigations in the vicinity of our recent field work. Your property is one of those on which we would like to conduct additional investigations. This investigation will include an additional survey of your property to take surface soil samples and possibly subsurface soil samples. All work will be coordinated in advance with you.

Weather permitting, we anticipate the investigation will begin in February. To do so, we first need your signature on the enclosed Right of Entry. This Right of Entry is the same document that has been used during previous investigations in the Spring Valley area. Please sign and return two copies of the Right of Entry to this office in the envelope provided. Once the agreement has been fully executed by the government, a copy will be returned to you for your records.

We greatly appreciate your cooperation in allowing us to proceed with this important work. If you have any questions at any time, or would like one of our representatives to meet with you to discuss this matter, please feel free to call either Major Brian Plaisted at 202-686-3359 or Ms. Melissa Jones at 410-962-5166.

Sincerely,

SIGNED.

James S. Turkel
Chief, Real Estate Division

DEUTSCH/CENAB-RE-S/md/20994

PENN/CENAB-RE

TURKEL/CENAB-RE

Enclosures

1526 0806

March 26, 2001

Real Estate Division
Special Projects Support Branch

Mr. Geza Teleki
3819 48th Street, NW.
Washington, DC 20016-2301

Dear Mr. Teleki:

Enclosed is a fully executed copy of Department of the Army Right-of-Entry for Survey and Exploration in connection with the Camp American University (Spring Valley), Washington, DC.

Thank you for your cooperation. If you have any questions, please feel free to call either Major Brian Plaisted at (202) 686-3359 or Ms. Melissa Jones at (410) 962-5166.

Sincerely,

James S. Turkel
Chief, Real Estate Division

Enclosure

mc

DEUTSCH/CENAB-RE-S/md/20994

PENN/CENAB-RE

TURKEL/CENAB-RE

4625 Rockwood Parkway, NW.
Washington, DC 20016-3206

DEPARTMENT OF THE ARMY

RIGHT-OF-ENTRY

This Right-of-Entry sets forth the arrangements by which the United States Government (the "Government") will conduct certain operations relating to the investigation of the Camp American University (Spring Valley) site on the lot of the homeowner (s) whose signature (s) appear (s) below (the "Owner"). The Owner, by this instrument, in consideration of the potential assistance and advantages to be derived by the owner, does hereby grant to the Government a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government the right to enter the lot located at the address identified above at any time during daylight hours of the investigation to inspect and survey the lot. The purpose of this right-of-entry is to permit the Government to perform surface and subsurface soil sampling. The investigation will include a physical walk-through of the lot, and a survey of the lot using such non-intrusive equipment as it determined appropriate by the Government. If intrusive measures are required to complete a satisfactory investigation, these shall be subject to the provisions of Paragraph 4 below.

2. The Owner may revoke this right-of-entry at any time by notice delivered to the Government at its Spring Valley Resident Office, 5201 Little Falls Road, NW., Washington, DC (behind Sibley Memorial Hospital), telefax No. (202) 686-3596. This right-of-entry shall expire without further action by the owner on the earlier of (a) completion of the investigation, or (b) 18 months from the date of execution of this MOU by the Owner. Owner will use its best efforts to notify the Government at any time during the investigation if owner will be away for an extended period of time.

3. The Government will use its best efforts to give the Owner at least 24 hours prior notice of the non-intrusive inspection, such notice to be delivered either by telephone, mail, or to the Owner's front door. Owner hereby grants the Government a right of ingress and egress to the lot for purposes of the non-intrusive inspection, provided, however, that entry into any enclosed structures shall occur only with the further permission of the Owner.

4. If the Government determines, in its best judgement, that an intrusive inspection of the Owner's lot is necessary and appropriate, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the Owner's lot the Government proposes to conduct subsurface exploratory work, and the methods by which it proposes to conduct its exploration. Such methods may include, but not be limited to, surface and subsurface soil sampling, test borings, and the drilling of monitoring wells for ground water testing. The Government shall obtain the Owner's written permission before beginning any intrusive inspection.

5. The Government shall promptly notify the Owner of the results of any inspection or investigation of Owner's lot. If the Government determines, based on such inspection or investigation, that it will be necessary to remove any buried materials, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the owner's lot the Government proposes to conduct removal operations and the methods by which it proposes to conduct the removal work. The Government shall obtain the Owner's permission before beginning any removal operations.

6. Data gathered during any inspection of the lot by the Government, and any written summaries or evaluations of such data, shall promptly be made available for review and copying by the Owner's agents, subject to make a Freedom of Information Act. However, the Owner will not need to make a formal, written Freedom of Information Act request to obtain these documents.

7. Without prejudice to any other rights the Owner may have, the Government is responsible, in accordance with applicable law, for the acts and omissions of its employees and agents which cause injuries to persons or damages to property, including any claims arising from such injuries or damages, caused by or arising from the inspections or removal actions, unless such injuries or losses are caused by the Owner's negligence. The Government represents that funds have generally been available for such purposes and that it will seek on an annual basis from Congress such funds as may be required for these purposes.

8. The Government may use private contractors to assist in or conduct the inspections, tests, and other response actions. The Government will ensure that independent contractors participating in the investigation and possible response actions on the Owner's property are required to carry levels of insurance coverage that are appropriate for the activities to be conducted on the property. The Owner shall have the right to review and copy, at the Government's expense, any contract between the Government and such private contractors.

9. All tools, equipment, and other property taken upon the lot by the Government shall remain the property of the Government and shall be removed by the Government as soon as reasonably possible consistent with the completion of the work covered by this right-of-entry.

10. The Government shall have the right to patrol the lot during the period of this right-of-entry.

11. Subject to the availability of funds, the Government shall, at its sole election, either (1) restore the premises to the same condition as that existing at the time of entering, or (2) pay to the Owner a sum of money representing the actual cost of restoration. Interim restoration will be considered on a case by case basis if requested by the Owner. The Government represents that funds have generally been available for such purposes and that it will seek on an annual basis from Congress such funds as may be required or these purposes.

12. Nothing in this instrument shall be deemed to waive any rights of any kinds the Owner now has, or may hereinafter have, to assert any claim against the Government or any other person or entity, including, without limitation, claims with respect to any and all past events and activities of the Government or of any other person or entity.

WITNESS MY HAND AND SEAL this 25 day of May 2000.

p.p. Jodi Praf
(OWNER)

(OWNER)

4625 Rockwood Pkwy, NW
(ADDRESS)

202 - 364 6590
(TELEPHONE)

THE UNITED STATES OF AMERICA

James S Turkel
JAMES S. TURKEL
Chief, Real Estate Division
U.S. Army Corps of Engineers
Baltimore District
P.O. Box 1715, Baltimore, MD 21203-1715
Telephone: (410) 962-3000

DEPARTMENT OF THE ARMY

RIGHT-OF-ENTRY

This Right-of-Entry sets forth the arrangements by which the United States Government (the "Government") will conduct certain operations relating to the investigation of the Camp American University (Spring Valley) site on the lot of the homeowner (s) whose signature (s) appear (s) below (the "Owner"). The Owner, by this instrument, in consideration of the potential assistance and advantages to be derived by the owner, does hereby grant to the Government a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government the right to enter the lot located at the address identified above at any time during daylight hours of the investigation to inspect and survey the lot. The purpose of this right-of-entry is to permit the Government to confirm the absence of buried munitions, remnants thereof, and associated material. The investigation will include a physical walk-through of the lot, and a survey of the lot using such non-intrusive equipment as it determined appropriate by the Government. This non-intrusive equipment may include a magnetometer, a ground conductivity meter, and ground penetrating radar. If intrusive measures are required to complete a satisfactory investigation, these shall be subject tot he provisions of Paragraph 4 below.

2. The Owner may revoke this right-of-entry at any time by notice delivered to the Government at its Spring Valley Resident Office, 5201 Little Falls Road, NW., Washington, DC (behind Sibley Memorial Hospital), telefax No. (202) 686-3596. This right-of-entry shall expire without further action by the owner on the earlier of (a) completion of the investigation, or (b) 18 months from the date of execution of this MOU by the Owner. Owner will use its best efforts to notify the Government at any time during the investigation if owner will be away for an extended period of time.

3. The Government will use its best efforts to give the Owner at least 24 hours prior notice of the non-intrusive inspection, such notice to be delivered either by telephone, mail, or to the Owner's front door. Owner hereby grants the Government a right of ingress and egress to the lot for purposes of the non-intrusive inspection, provided, however, that entry into any enclosed structures shall occur only with the further permission of the Owner.

4. If the Government determines, in its best judgement, that an intrusive inspection of the Owner's lot is necessary and appropriate, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the Owner's lot the Government proposes to conduct subsurface exploratory work, and the methods by which it proposes to conduct its exploration. Such methods may include, but not be limited to, surface and subsurface soil sampling, test borings for the purpose of subsurface magnetometer equipment readings, and the drilling of monitoring wells for ground water testing. The Government shall obtain the Owner's written permission before beginning any intrusive inspection.

5. The Government shall promptly notify the Owner of the results of any inspection or investigation of Owner's lot. If the Government determines, based on such inspection or investigation, that it will be necessary to remove any buried materials, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the owner's lot the Government proposes to conduct removal operations and the methods by which it proposes to conduct the removal work. The Government shall obtain the Owner's permission before beginning any removal operations.

6. Data gathered during any inspection of the lot by the Government, and any written summaries or evaluations of such data, shall promptly be made available for review and copying by the Owner's agents, subject to make a Freedom of Information Act. However, the Owner will not need to make a formal, written Freedom of Information Act request to obtain these documents.

7. Without prejudice to any other rights the Owner may have, the Government is responsible, in accordance with applicable law, for the acts and omissions of its employees and agents which cause injuries to persons or damages to property, including any claims arising from such injuries or damages, caused by or arising from the inspections or removal actions, unless such injuries or losses are caused by the Owner's negligence. The Government represents that funds have generally been available for such purposes and that it will seek on an annual basis from Congress such funds as may be required for these purposes.

8. The Government may use private contractors to assist in or conduct the inspections, tests, and other response actions. The Government will ensure that independent contractors participating in the investigation and possible response actions on the Owner's property are required to carry levels of insurance coverage that are appropriate for the activities to be conducted on the property. The Owner shall have the right to review and copy, at the Government's expense, any contract between the Government and such private contractors.

9. All tools, equipment, and other property taken upon the lot by the Government shall remain the property of the Government and shall be removed by the Government as soon as reasonably possible consistent with the completion of the work covered by this right-of-entry.

10. The Government shall have the right to patrol the lot during the period of this right-of-entry.

11. Subject to the availability of funds, the Government shall, at its sole election, either (1) restore the premises to the same condition as that existing at the time of entering, or (2) pay to the Owner a sum of money representing the actual cost of restoration. Interim restoration will be considered on a case by case basis if requested by the Owner. The Government represents that funds have generally been available for such purposes and that it will seek on an annual basis from Congress such funds as may be required or these purposes.

12. Nothing in this instrument shall be deemed to waive any rights of any kinds the Owner now has, or may hereinafter have, to assert any claim against the Government or any other person or entity, including, without limitation, claims with respect to any and all past events and activities of the Government or of any other person or entity.

WITNESS MY HAND AND SEAL this 10th day of September 2000.

(OWNER)

(OWNER)

4633 Rockwood Parkway, NW
Washington DC 20016
(ADDRESS)

202-362-1964
(TELEPHONE)

THE UNITED STATES OF AMERICA

JAMES S. TURKEL
Chief, Real Estate Division
U.S. Army Corps of Engineers
Baltimore District
P.O. Box 1715, Baltimore, MD 21203-1715
Telephone: (410) 962-3000

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

REPLY TO
ATTENTION OF
Programs and Project
Management Division

Dear Resident,

I have enclosed a summary sheet detailing the plans for the arsenic sampling to be conducted on your property. Susan McQuilkin will call to coordinate the specific dates for the sampling activities. Please sign below to allow us to conduct the sampling. The signed copy can be returned in the enclosed envelope.

If you have any questions on this matter, please feel free to contact Susan McQuilkin at (703) 218-1093.

Sincerely,

Brian D. Plaisted
Major, Corps of Engineers
Deputy District Engineer
for Spring Valley

Enclosure

Property Owner Approval

I have reviewed the attached summary sheet outlining the plans for the arsenic sampling to take place on my property. I approve of the implementation of these plans.

Signed _____

Printed Name Scott Greenberg Cynthia Welsh

Property 4633 Rockwood Pkwy, NW

4710 Quebec Street, NW.
Washington, DC 20016-3227

DEPARTMENT OF THE ARMY

RIGHT-OF-ENTRY

This Right-of-Entry sets forth the arrangements by which the United States Government (the "Government") will conduct certain operations relating to the investigation of the Camp American University (Spring Valley) site on the lot of the homeowner (s) whose signature (s) appear (s) below (the "Owner"). The Owner, by this instrument, in consideration of the potential assistance and advantages to be derived by the owner, does hereby grant to the Government a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government the right to enter the lot located at the address identified above at any time during daylight hours of the investigation to inspect and survey the lot. The purpose of this right-of-entry is to permit the Government to perform surface and subsurface soil sampling. The investigation will include a physical walk-through of the lot, and a survey of the lot using such non-intrusive equipment as it determined appropriate by the Government. If intrusive measures are required to complete a satisfactory investigation, these shall be subject to the provisions of Paragraph 4 below.

2. The Owner may revoke this right-of-entry at any time by notice delivered to the Government at its Spring Valley Resident Office, 5201 Little Falls Road, NW., Washington, DC (behind Sibley Memorial Hospital), telefax No. (202) 686-3596. This right-of-entry shall expire without further action by the owner on the earlier of (a) completion of the investigation, or (b) 18 months from the date of execution of this MOU by the Owner. Owner will use its best efforts to notify the Government at any time during the investigation if owner will be away for an extended period of time.

3. The Government will use its best efforts to give the Owner at least 24 hours prior notice of the non-intrusive inspection, such notice to be delivered either by telephone, mail, or to the Owner's front door. Owner hereby grants the Government a right of ingress and egress to the lot for purposes of the non-intrusive inspection, provided, however, that entry into any enclosed structures shall occur only with the further permission of the Owner.

4. If the Government determines, in its best judgement, that an intrusive inspection of the Owner's lot is necessary and appropriate, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the Owner's lot the Government proposes to conduct subsurface exploratory work, and the methods by which it proposes to conduct its exploration. Such methods may include, but not be limited to, surface and subsurface soil sampling, test borings, and the drilling of monitoring wells for ground water testing. The Government shall obtain the Owner's written permission before beginning any intrusive inspection.

5. The Government shall promptly notify the Owner of the results of any inspection or investigation of Owner's lot. If the Government determines, based on such inspection or investigation, that it will be necessary to remove any buried materials, the Government shall give the Owner at least 72 hours prior written notice of its determination with a plan or drawing showing where on the owner's lot the Government proposes to conduct removal operations and the methods by which it proposes to conduct the removal work. The Government shall obtain the Owner's permission before beginning any removal operations.

6. Data gathered during any inspection of the lot by the Government, and any written summaries or evaluations of such data, shall promptly be made available for review and copying by the Owner's agents, subject to make a Freedom of Information Act. However, the Owner will not need to make a formal, written Freedom of Information Act request to obtain these documents.

7. Without prejudice to any other rights the Owner may have, the Government is responsible, in accordance with applicable law, for the acts and omissions of its employees and agents which cause injuries to persons or damages to property, including any claims arising from such injuries or damages, caused by or arising from the inspections or removal actions, unless such injuries or losses are caused by the Owner's negligence. The Government represents that funds have generally been available for such purposes and that it will seek on an annual basis from Congress such funds as may be required for these purposes.

8. The Government may use private contractors to assist in or conduct the inspections, tests, and other response actions. The Government will ensure that independent contractors participating in the investigation and possible response actions on the Owner's property are required to carry levels of insurance coverage that are appropriate for the activities to be conducted on the property. The Owner shall have the right to review and copy, at the Government's expense, any contract between the Government and such private contractors.

9. All tools, equipment, and other property taken upon the lot by the Government shall remain the property of the Government and shall be removed by the Government as soon as reasonably possible consistent with the completion of the work covered by this right-of-entry.

10. The Government shall have the right to patrol the lot during the period of this right-of-entry.

11. Subject to the availability of funds, the Government shall, at its sole election, either (1) restore the premises to the same condition as that existing at the time of entering, or (2) pay to the Owner a sum of money representing the actual cost of restoration. Interim restoration will be considered on a case by case basis if requested by the Owner. The Government represents that funds have generally been available for such purposes and that it will seek on an annual basis from Congress such funds as may be required or these purposes.

12. Nothing in this instrument shall be deemed to waive any rights of any kinds the Owner now has, or may hereinafter have, to assert any claim against the Government or any other person or entity, including, without limitation, claims with respect to any and all past events and activities of the Government or of any other person or entity.

WITNESS MY HAND AND SEAL this 22 day of May 2000.

_____	Curtis Bohler
(OWNER)	(OWNER)
_____	202-362-0094
(ADDRESS)	(TELEPHONE)

THE UNITED STATES OF AMERICA

James S. Turkel

JAMES S. TURKEL
Chief, Real Estate Division
U.S. Army Corps of Engineers
Baltimore District
P.O. Box 1715, Baltimore, MD 21203-1715
Telephone: (410) 962-3000

Hughes, Edward T NAB02

From: Plaisted, Brian D MAJ NAB02
Sent: Friday, January 12, 2001 11:10 AM
To: Jones, Melissa J NAB02; Deutsch, Marion NAB02
Cc: Rogers, Michael J NAB02; Reeser, Leland H NAB02; 'McQuilkin, Susan'
Subject: Additional ROEs for OU-4 Sampling

Melissa & Marion,

Attached is a spreadsheet with 6 additional properties in the vicinity of OU-4 where we will need to do sampling. For two of them I have the names of the property owners. Those property owners are aware of the sampling. I will be sending letters on Tuesday to the others explaining the details. I want to sample these with the additional sampling that we will do in February, so I would like to send out the ROEs in the next week or so. Thanks.

Brian Plaisted

OU-4 Phase 2.xls

Property	Name	Phone	Remarks
4900 Quebec	Roger Gerstenfeld		Check name spelling
4705 Quebec			
4711 Quebec			
3700 University Blvd			
3819 48th Street	Geza Teleki		Check name spelling
4900 Indian Lane			

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, U.S. ARMY CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

February 5, 2001

REPLY TO
ATTENTION OF
Programs and Project
Management Division

Mr. and Mrs. Scott Greenburg
4633 Rockwood Parkway, NW
Washington, DC 20016

Dear Mr. and Mrs. Greenburg,

This letter is to follow-up on my letter from December with the details of how we plan to conduct the additional sampling at your property. All six properties along Rockwood Parkway that border the university will be sampled over a 20-foot grid. A sample will be taken every 20 feet and analyzed for arsenic. In addition, at 4625 and 4633 Rockwood three surface sample locations will be analyzed for a complete suite of contaminants. This is to verify that there are not elevated levels of other contaminants in this area.

We began sampling at other properties on February 1, 2001. Susan McQuilkin from Parsons ES will be contacting you to set up a sampling date. I appreciate your patience in this matter. If you have questions regarding the sampling you can reach me at 202-686-3359.

Sincerely,

Brian D. Plaisted

Brian D. Plaisted
Major, U.S. Army
Deputy District Engineer
for Spring Valley

Hughes, Edward T NAB02

From: Plaisted, Brian D MAJ NAB02
Sent: Tuesday, February 06, 2001 10:41 AM
To: Reeser, Leland H NAB02
Subject: 4710 Quebec Street

Lan,

I got a call from Susan McQuilkin and Mrs. Bohlen from 4710 Quebec Street has approved the addtional sampling that we wanted, but she wanted to talk to some about the rationale for why the additional sampling is needed. Can you or one of your guys call her at 202-362-0094? Thanks.

Brian Plaisted

DRAFT

PARSONS

Memo

To: Major Peloquin, CENAB

From: Tom Bachovchin, Parsons

CC:

Date: 5/24/02

Re: 3819 48th Street Sampling

The following summarizes the sampling that was performed on Geza Teleki's property at 3819 48th Street.

Originally, this property was an OU-4 procedure, including surface quadrant composite sampling for arsenic only and a single boring for arsenic only. As described below, additional sampling was also performed.

Feb 7, 2001. James Taylor of Parsons arrives to place the boring. The proposed location was in the front yard based on the original OU-4 logic, i.e., a fill area if available. Our map (prior to the newer OU-5 info with detailed groundscars) at the time showed the only non cut area to be in the front yard. That's where we proposed to take it. However, using anomaly avoidance protocols, we could never find a clear area. Based on that and after conferring with Mr. Teleki who further explained that there was construction debris in that area, we placed it in the backyard where he wanted it. He pointed to a location he described as undisturbed, and that's where it went in.

James prepared to take the random surface samples, but Mr. Teleki had concerns about the surface soil 0-6 inch interval because he had brought in new topsoil for landscaping. James returned to the trailer and conferred with Maj. Plaisted and Lan Reeser (by phone) and the decision was made to sample 0-6 inches and 12-18 inches (see log book documentation of this situation). That is, for the 6 random sub-sample locations per quadrant, there would be a 0-6 inch sample and a 12-18 inch sample. The 0-6 and the 12-18 were taken from the same sub-sample location.

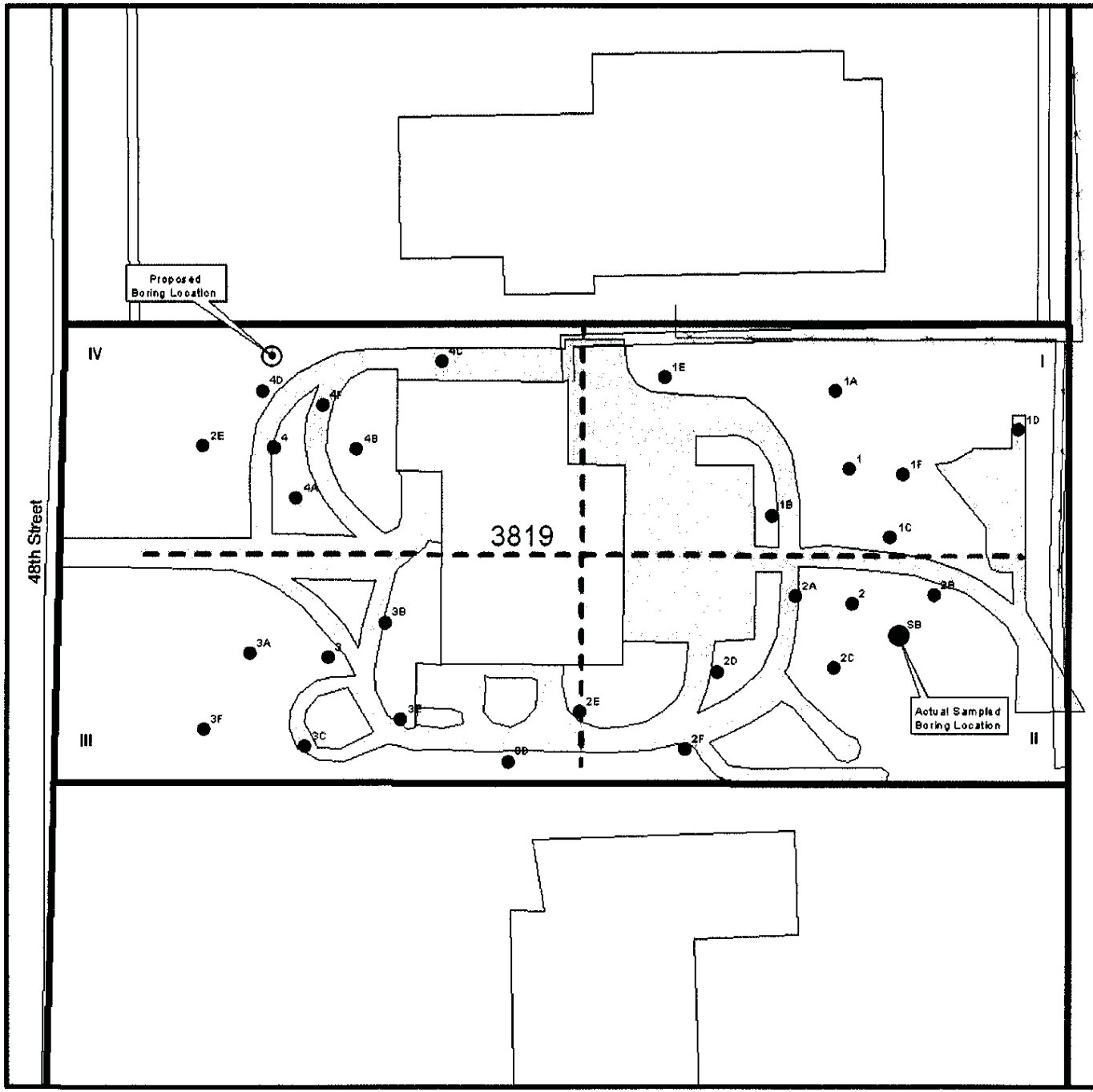
Feb 8, 2001. James placed the flags randomly in each quadrant to take the samples (for the OU-4 work, those sub-sample locations were surveyed, so we have

the exact locations plotted on the map). At some point Mr. Teleki had some input on some of those random locations and James accommodated his requests to move flags for whatever reason. For the 12-18 inch interval, anomaly avoidance protocols applied, so some of the sub-sample location flags had to be moved to find a clear spot. James is certain no flags were moved more than1-2 feet from the original locations. Mr. Teleki never complained or indicated his concern with moved flags.

In addition to the standard OU-4 level sampling, this property was selected for the full AUES List sampling. On the same day, Feb 8th, James collected one sample from each of the 4 quadrants for the AUES List parameters. These were random locations with discrete samples collected at the 1-foot level. *Note that there is a slight error in the Final Report of Results for these recently sent to Jim Baron and copied to you. I mistakenly called these 12-18 inch samples. They were collected at the bottom of the 1-foot level (actually, with the amount of dirt, it is realistically a ~9-15 inch sample). I can clean this up when responding to the comments Jim has or when we firm up Frank's suggestions of further reviewing the relative toxicities or Stoichiometry, etc.*

Attachments:

Map
Log Book Field Notes



3819 48th St

Spring Valley Operable Unit 4
Washington D.C.

Legend

Borings
- Composite Sub-Sample Locations (One at 0-6" and one at 12-18")
- AUES List Sample (12")
- Subsurface Boring 6'
- Proposed Boring Location

Retaining Wall
Fence
Roads
Quadrant
Buildings
Parcels
Walkway/Patio

N
W E
S

20 0 20 Feet

1 Inch = 20 feet

Scale:	1 : 200
Created By:	Parsons
File:	Y:\Projects\Fed\Usace\springva\springva.APR
Date:	05/22/2002
Figure Number:	X-X
Page Number:	X-X

PARSONS

Logbook Input on 3819 48th Street Sampling, Page 1

(24)

07 Feb. 01

0655 - on site at Fed. property. will start at 4710 WL & 3819 48th St. HFA contracts on site

0730 preparing sample kit & ex equip.

0810 called [illegible] about the grid layout for 4710 WL it turns out it is upside down need to redo it. Also talked to the Surveyors he will be on site at 0830. got a call from 4604. she informed me that the main gates on site 4710 WL, informed the P.O. that we will be sampling today as soon as the surveyors lay out the grid at 4710 WL.

0900 starting to clear boring location at 3819. P.O. [illegible]

0910 got a refusal. P.O. informs us that our locate is in construction rubble.

0925 starting new location. move boring locatn to back of the house to an area that apparently has not been developed by the P.O.

0930 CPJA laying grid at 4710 WL. There is a question about grid numbering. Ec will investigate. O.C. Tech also on site to do the borings.

1010 We have cleared the boring location to 6' in native S.V. soil.

1015 - 3819-SB-1 R: 100 %

Transcription of Logbook Notes for 3819 48th Street Sampling

Note: The writer is James Taylor of Parsons. As Sample Team Leader, he is overseeing 2 teams sampling concurrently. In various notations below, he is responding to cell phone calls from the other site and writing information about the other property.

This is a verbatim transcript of the logbook notes. Abbreviations are presented at the end of this transcript.

Page 24 **07 Feb. 01**

0655 Onsite at Fed. property, Will start SX at 4710 WL and 3819 48th Street. HFA contractor on site.

0730 Preparing sample kit and SX equip.

0810 Called Marianne about the grid layout for 4710WL; it turns out it is upside down, need to redo it. Also talked to the surveyors. He will be onsite at 0830. Got a call from 4604. She informed me that the main gates…are open (unfinished thought)

On site 4710 WL, informed the P.O. that we will be sampling today as soon as the surveyors layout the grid at 4710WL.

0900 Starting to clear boring location at 3819. P.O. home.

0910 Got a refusal. P.O. informs us that our locate is in construction rubble.

0925 Starting new location. Move boring location to back of the house to an area that apparently has not been developed by the P.O.

0930 CPJA laying grid at 4710 WL. There is a question about grid numbering. EC will investigate. Col. Tech. also onsite to do the borings.

1010 We have cleared the boring location to 6' in native S.V. soil.

1015 -3819-SB-1

R:100%

PID:0.0

Brown silty clay with some top soil.

1020 -SB-2 [Dup04]* JOT
PID:0.0
R:80%
Brown to yellow brown, with greenish tinge, silty sand with trace mica.

1025 -SB-3

R:100
P.D.: 0.0

Brown to yellow brown silty sand with some remnant structures.

1030 -SB-4

R: 100%
P.D.:0.0

SAA, probably native soil.

1035 -SB-5

P.D.:0.0
R:100%

Brown to rusty brown silty sand with mica

1040 -SB-6

P.D.:0.0
R:100%

SAA

1050 Have finished the subsurface SX at

3819 48th. Will head to 4710 WL to continue grid SX. Calling Marianne to clarify the grid coordinates.

1100 Collecting SX – OU4-3819-EB04.
Continuing to Sx perimeter grids. (at 4710 WL)

1155 GPL courier on site. JT heading over to AU trailer to deliver SX.

1220 Back at 4710WL. JT will start the additional non-grid sampling at 4710 WL with HFA.

1240 Collecting sample OU4-4710 WL-4-SB-A(1) – brown silty soil

1250 Starting to collect OU4-4710 WL-4-SB-B. The boring is located to the (right-if back is to house) left of the driveway when facing the lot from Woodway Lane.

1330 - -4-SB-B

brown silty soil

1400 Spoke to MAJ Plaisted (at Fed Prop trailer) about 3819 48th. P.O. expressed some reservations about sampling his top soil as opposed to a 1' below. MAJ P. suggested it might make sense to get the SX at a deeper level. Will call Lan R.-CENAB to confer.

1415 Conference call with Lan Reeser. → We

should take a 2nd composite at the 12-18" interval and composite for each quadrant (for arsenic—these aren't AUES samples). Essentially we will have 2 samples from each sub location within the quadrant, (0-6") and (12-18").

1420 Back at 4710 WL continuing to sample grids.

1700 Have ended sampling at 4710 WL for the day.

1730 OU4-4710 WL-EB01

1735 OU4-4710 WL-EB02

1810 JT leaving site for the day. We still have about 8.5 rows to complete the sampling at 4710 WL.

Signature of James Taylor

0710 Arriving at Fed. Property. We will sample 3819 48th quadrant and non-quadrant samples and continue to sample 4710 WL. CPJA, Columbia Technologies and HFA onsite.

0745 Preparing sampling equipment. We will also be taking encore (special VOC sampling device) SX at 4710 QS and 3819 48th street.

0815 Heading out to site. EC/MH will collect (0-6") sample and JT with HFA and Col. Tech will collect the 12-18" samples.

0920 -3819-3 (12-18") (arsenic, not AUES)

brown to yellow brown silty to sandy clay with trace mica

0945 -3819-2 (12-18") (arsenic, not AUES)

brown to yellow brown silty sand

0946 P.O. outside talking to contractors (and James—this is not second hand info). He is concerned about his 6 year old son, 'cause his cat and dog died of cancer. He mentioned that the ridge between AU and UA is artificial and that it had been sampled and was hot. He is not impressed with the way the Army has handled this issue. He will call MAJ Plaisted in 3 weeks to check on the outcome of the sampling.

1010 3819-1 (12-18") (arsenic, not AUES)

brown to tan silty sand

1030 3819-4 (12-18") (arsenic, not AUES)

brown silty clay with quartz crystals

1040 Have finished the quadrant SX. EC/MH will head to 4710 WL and start SX and JT/HFA will do the non-quadrant SX. Col. Tech is done for the day.

1055 CPJA on site to survey flags.

1100 -3819-4 (12") (additional/other samples) (AUES Sample – realistically a 9"-15" sample)

brown silty sand to be sent to SWRI.

1135 -3819-3 (AUES Sample)

brown silty sand with mica

1205 -3819-2 (AUES Sample)

brown to yellow brown silty sand

1245 -3819-1 (AUES Sample)

brown to yellow brown silty sand

1255 Have finished sampling at 3819. Informed P.O. we were done SX. He will call MAJ P. and Susan M. with questions.

1410 Heading to 4710QS to collect additional samples/resample with encore samplers.

1415 4710QS-4

brown silty soil

1430 4710 QS-3

brown to reddish brown silty soil

1445 4710 QS-1

B.S.S. with trace mica

1500 Have finished sampling at 4710 QS. Will head to 4710 WL to continue grid SX.

1630 Have finished sampling at 4710 WL for the day.

1616 EB02-

1620 EB04

1640 EC/MH off site for the day.

1710 JT heading to FedEx to ship samples to SWRI. Will call Tom B. to update him.

1740 Call Tom B. We reportedly got some perimeter hits at 4710 WL. Will head back to Fed. Property to get COCs for Tom. B. Will fax detailed sheets for Tom B. Printer at Fed. property malfunctioning. Will fax from home.

1748 Done for the day. JT leaving Fed property.

Signature of James Taylor

Abbreviations:

P.O. – Property Owner
PID – Photo ionization detector
R% - percent recovery
SAA – same as above
-3819-SB-1 – Partial sample ID
SX – Sample or Sampling
UA – University Avenue
EB – Equipment Blank

Parsons personnel:
EC – Eric Cheng
JT/JOT – James Taylor
MH – Monica Harrington
Susan M – Susan McQuilkin
Tom B – Tom Bachovchin

MAJ P. – Major Plaisted (USACE)
Lan R – Lan Reeser (USACE)
CPJA – Surveyors
HFA – Anomaly Aviodance/UXO Contractor
Columbia Technologies – Geoprobe Contractor
GPL – Haz Waste Lab Contractor
SWRI – Southwest Research Institute-Lab Contractor

Appendix 4

Appendix 4

This appendix responds to comments provided by DC DOH on 23 specific chemicals. Some of DC DOH chemical-specific comments were made in the main body of the report, and some were made in the attachments. USACE has reviewed each of the 23 compounds identified by DC DOH in its comments; the resulting USACE responses are grouped into the following categories:

- Ubiquitous Chemicals
- Hydrocarbons and Combustion Products
- Natural Products
- Analytical Artifacts
- Other Chemicals

USACE maintains the following with regard to the compounds in question:

- 8 of the 23 compounds are likely to have originated as naturally occurring contaminants, or have a large number of industrial sources not associated with the AUES.
- 9 of the 23 compounds are either hydrocarbon constituents of fuels or are products of incomplete wood combustion in fireplaces and woodstoves.
- 3 of the 23 compounds are components of food items.
- 2 of the 23 compounds are almost certainly analytical artifacts.
- The remaining compound is a potential contaminant in a widely used adhesive component.
- None of the 23 compounds listed are experimental chemical warfare agents, and only two could be a precursor compound to a potential agent. Finally, all chemicals are present at levels likely to correspond to a *de minimis* risk.

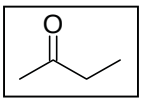
It is worth noting that USACE found several statements by DC DOH that mischaracterize the content of the standard references utilized to discuss the toxicity and potential health impacts of various compounds. The toxicological, production, and occurrence information used to address these chemical-specific comments by DC DOH in the following sections was collected primarily from the following sources:

- EPA Region III Risk-Based Concentration Table (October 2002 and April 2003). Available on line at http://www.epa.gov/reg3hwmd/risk/index.htm
- Hazardous Chemical Desk Reference (Sax, N. I.; Lewis, R. J., Van Nostrand Reinhold, NY, 1987
- Merck Index, (Merck & Co., Inc., Whitehouse Station, NJ)
- EPA, Office of Pollution Prevention and Toxics, Chemical Fact Sheets. Available on line at http://www.epa.gov/opptintr/chemfact/

Ubiquitous Chemicals

Of the 23 compounds listed in DC DOH's Tab B, 8 are likely either to have originated as naturally occurring chemicals or to have large potential sources not associated with the AUES. Furthermore, these chemicals appear likely to be ubiquitous contaminants in an urban residential environment.

2-Butanone

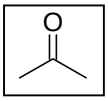


2-Butanone (CAS Registry No. 78-93-3), also known as Methyl Ethyl Ketone (MEK), occurs in the environment at low levels as a natural product (produced by some trees and found in small amounts in some fruits and vegetables). It occurs naturally and has been found in a number of foods and beverages, including Swiss cheese, cream, barley, bread, honey, oranges, black tea, rum, non-alcoholic beverages, and ice cream. It is also released to the air from car and truck exhausts. 2-Butanone is produced in large quantities for use in paints and other coatings, in adhesives, and as a cleaning agent. It is also found in cigarette smoke. Annual production in the United States in the late 1980s was on the order of 500-700 million pounds.

Tab B in the DC DOH report comments that 2-butanone is "toxic by ingestion and dermal, affects peripheral nervous system," citing *Hazardous Chemical Desk Reference* (Sax, N. I.; Lewis, R. J., Van Nostrand Reinhold, New York, 1987). This statement by DC DOH mischaracterizes the content of that reference. A complete reading of Sax and Lewis shows that 2-butanone is "moderately toxic by ingestion, skin contact, and intraperitoneal routes." The moderate toxicity is reflected in EPA Region III's risk-based concentration for residential soil. 2-Butanone was detected at levels ranging from 0.003 to 0.030 mg/kg at the OU4 residential properties, whereas EPA Region III has established a risk-based concentration for residential soil at 46,900 mg/kg. Because 2-butanone is a non-carcinogen, USACE screened the concentrations detected at OU4 using an adjusted risk-based concentration of 4,600 mg/kg.

2-Butanone is not listed on the AUES list of chemicals, and has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is used extensively in industry and is potentially of natural origin. Given its use in consumer products, it is likely to be a ubiquitous contaminant in an urban residential environment.

Acetone



Acetone (CAS Registry No. 67-64-1) is a manufactured chemical that is also found naturally in the environment. It occurs naturally in plants and trees at low concentrations. Low levels of acetone are normally present in the body from the breakdown of fat; the body can use it in normal processes to make sugar and fat. It is present in vehicle exhaust, tobacco smoke, and landfill sites. Acetone is used to make plastic, fibers, drugs, and other chemicals. It is also sold commercially as a solvent and in such consumer products as nail polish remover. The reported total production volume of acetone in the United States was 2.3 billion pounds in 1990. Industrial processes contribute more acetone to the environment than natural processes.

Acetone was detected at levels ranging from 0.027 to 0.120 mg/kg, whereas EPA Region III has established a risk-based concentration for residential soil at 7,800 mg/kg. Because acetone is a non-carcinogen, USACE screened the concentrations detected at OU4 using an adjusted risk-based concentration of 780 mg/kg.

Acetone is not listed on the AUES list of chemicals and has never been considered an experimental chemical warfare agent, although it can be an agent precursor compound. It is used extensively in industry and is potentially of natural origin. Given its use in consumer products, it is likely to be a ubiquitous contaminant in an urban residential environment.

Carbon Disulfide

Carbon disulfide (CS_2, CAS Registry No. 75-15-0) is a natural product of anaerobic biodegradation. It is also used to manufacture viscose rayon, cellophane, carbon tetrachloride, dyes, and rubber. Some solvents, waxes, and cleaners contain carbon disulfide. It is also used as an insecticide. In 1985, commercial production was estimated to be 315 million pounds.

Carbon disulfide was detected at levels ranging from 0.008 to 0.170 mg/kg, whereas EPA Region III has established a risk-based concentration for residential soil at 7,800 mg/kg. Because carbon disulfide is a non-carcinogen, USACE screened the concentrations detected at OU4 using an adjusted risk-based concentration of 780 mg/kg.

Carbon disulfide is listed on the AUES list of chemicals, but it has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is used extensively in industry, is potentially of natural origin, and is likely to be a ubiquitous contaminant in an urban residential environment.

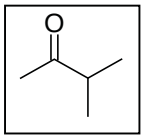
Chloromethane

Chloromethane (CH_3Cl, CAS Registry No. 74-87-3), also known as methyl chloride, is both an anthropogenic and naturally occurring chemical. Anthropogenic sources include industrial production, polyvinyl chloride burning, and wood burning; natural sources include the oceans, microbial fermentation, and biomass fires (e.g., forest fires, grass fires). Other sources of exposure to methyl chloride include cigarette smoke, polystyrene insulation, aerosol propellants, and chlorinated swimming pools. Chloromethane is produced industrially; 994 million pounds were produced in 1994.

Chloromethane was detected at levels ranging from 0.001 to 0.007 mg/kg, whereas EPA Region III has established a risk-based concentration for residential soil at 49 mg/kg. Because chloromethane is a carcinogen, USACE screened the concentrations detected at OU4 using an unadjusted risk-based concentration of 49 mg/kg. (Note: In 2003, the EPA eliminated the risk-based concentration for chloromethane in soil.)

Chloromethane is not listed on the AUES list of chemicals and has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is used extensively in industry, is potentially of natural origin, and is likely to be a ubiquitous contaminant in an urban residential environment.

3-Methyl-2-Butanone

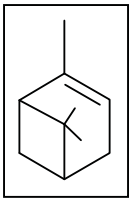


3-methyl-2-butanone (CAS Registry No. 563-80-4) is also known as Methyl Isopropyl Ketone (MIPK). The analysis indicates that there is sufficient evidence to make a tentative identification of MIPK as present in some of the samples. MIPK is used as an intermediate in the synthesis of other chemicals and as an industrial solvent. It may also find some use as a solvent in specialty coatings applications, such as nitrocellulose lacquers. It can be used as an MEK substitute. No production data for MIPK were readily available.

The MIPK concentration was estimated at levels ranging from 0.002 to 0.040 mg/kg; EPA Region III has not established a risk-based concentration for MIPK. Given its structural similarity to MEK, it likely corresponds to a *de minimis* risk.

MIPK is not listed on the AUES list of chemicals and has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is used extensively in industry and is likely to be a ubiquitous contaminant in an urban residential environment.

2,6,6-Trimethylbicyclo[3.1.1]hept-2-ene



2,6,6-Trimethylbicyclo[3.1.1]hept-2-ene (CAS Registry No. 80-56-8) is also known as α-pinene. The analysis indicates that there is sufficient evidence to make a tentative identification of α-pinene as present in some of the samples. α-Pinene is a monoterpene that is a major component of wood turpentine; it is obtained from the resinous sap of pine trees by steam distillation. Terpenes are widely used as solvents for paints, protective coatings, polishes, and waxes; flavorings; deodorants; and medicines (as in the treatment of acne). α-Pinene is continuously emitted into the atmosphere from all plants, mainly from conifers. Estimates of biogenic and anthropogenic emissions indicate that all human exposure to α-pinene is essentially from biogenic sources. No production data for α-pinene were readily available.

The α-pinene concentration was estimated at levels ranging from 0.010 to 0.080 mg/kg; EPA Region III has not established a risk-based concentration for α-pinene. Based on toxicity data for laboratory mammals (LD_{50} of 3,700 mg/kg), this concentration is not anticipated to present any adverse health effects. In addition, α-pinene is recognized as a food additive by the U.S. Food and Drug Administration.

α-Pinene is not listed on the AUES list of chemicals, although turpentine is listed (α-pinene is a component of turpentine). α-Pinene has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is of natural origin, is used extensively in industry, and is likely to be a ubiquitous contaminant in an urban residential environment.

Dichlorodifluoromethane

The DC DOH's Tab B lists "dichlorofluoromethane," whereas the USACE report indicates that dichlorodifluoromethane (CCl_2F_2, CAS Registry No. 75-71-8) was found in samples from the site. Dichlorodifluoromethane is also known as CFC-12. Because it is an ozone-depleting chemical, production of CFC-12 was halted on 1 January 1996. However, prior to being banned, it was used as a refrigerant in domestic and automobile air conditioners, aerosol propellant, foam-blowing agent, and solvent, as well as in the manufacture of fluoropolymers. Peak annual production in the United States was over 500 million pounds.

The CFC-12 concentration was estimated at levels ranging from 0.067 to 0.160 mg/kg; EPA Region III has established a risk-based concentration for CFC-12 in residential soil at 16,000 mg/kg. Because CFC-12 is a non-carcinogen, USACE screened the concentrations detected at OU4 using an adjusted risk-based concentration of 1,600 mg/kg. As an indicator of the non-toxic nature of CFC-12, it is noted that existing stocks continue to be used as propellants in bronchial dilator pharmaceutical preparations.

CFC-12 is not listed on the AUES list of chemicals and has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is almost certainly unrelated to AUES activities; the compound was only discovered in the late 1920s and the first patent application for the manufacture of CFC-12 was filed on 5 April 1930 (Midgley et al., *Manufacture of aliphatic fluoro compounds*, U.S. Patent 1,930,129). It has been used extensively in industry and consumer products and is likely to be a ubiquitous contaminant in an urban residential environment.

Carbonyl Sulfide

Carbonyl sulfide (COS, CAS Registry No. 463-58-1) is also known as carbon oxide sulfide. The analysis indicates that there is sufficient evidence to make a tentative identification of carbonyl sulfide as present in some of the samples. Carbonyl sulfide is a gas at normal temperatures and pressures. It is used as an intermediate in the synthesis of organic sulfur compounds and alkyl carbonates. The compound can be released to the atmosphere naturally from marshes, soils, and deciduous and coniferous trees. It can also be released to the ambient environment as a result of the combustion of sulfur-containing fuels. Anthropogenic emissions have been estimated to be less than one-third of natural emissions.

The carbonyl sulfide concentration was estimated at levels ranging from 0.006 to 0.010 mg/kg; EPA Region III has not established a risk-based concentration for carbonyl sulfide. Based on data summarized by the EPA's Office Pollution Prevention and Toxics (1994), this concentration in soil is not anticipated to present any adverse health effects.

Carbonyl sulfide is not listed on the AUES list of chemicals and has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is used extensively in industry, is potentially of natural origin, and is likely to be a ubiquitous contaminant in an urban residential environment.

Hydrocarbons and Combustion Products

Of the 23 compounds listed in DC DOH's Tab B, 9 are either hydrocarbon constituents of fuels—such as gasoline (octane, *E*-2-octene, 3-methyleneheptane)—or are aldehydes (acetaldehyde, hexanal, 5-methylhexanal, octanal, pentanal, 14 octadecenal). Aldehydes are formed as a result of incomplete wood combustion in fireplaces, woodstoves, forest fires, and wildfires. They are also produced during pulp and paper production and emitted from stationary internal combustion engines and turbines, vehicle exhaust, and wastewater processing. The analysis indicates that there is sufficient evidence to make a tentative identification of these compounds as present in some of the samples.

These compounds are not listed on the AUES list of chemicals and they have never been considered either an experimental chemical warfare agent or an agent precursor compound. They are mostly of natural origin and used to a minor degree in industry; some are components of gasoline and other fuels. They are likely to be a ubiquitous contaminant in an urban residential environment. Estimated concentrations are given in Table App.4-1.

Table App.4-1: Estimated Concentrations of Hydrocarbons and Combustion Products

Compound	Synonym	CAS Registry No.	Estimated concentration (µg/kg)
Octane		111-65-9	8-20
E-2-octene	Trans-2-octene	13389-42-9	7-60
3-methyleneheptane	2-ethyl-1-hexene	1632-16-2	6-10
Acetaldehyde		75-07-0	4-40
Hexanal		66-25-1	10-100
5-methylhexanal		1860-39-5	3-10
Octanal		124-13-0	4-20
Pentanal isomer 1		NA	3-30
14 octadecenal		NA	180

In Tab B, DC DOH states that acetaldehyde "causes respiratory paralysis" and cites the Ninth Edition of the Merck Index. This statement mischaracterizes the content of that reference and fails to take into account the concentration of the chemical reported at the OU4 properties. The Merck Index entry for acetaldehyde notes that "large doses may cause death by respiratory paralysis" and provides an oral LD_{50} of 1.9 g/kg in laboratory rats; this roughly corresponds to a dose of 140 g for 70 kg human. At soil concentrations of 0.040 mg/kg, acute poisoning would require consumption of over 3,000 metric tons of soil. Although children are potentially more susceptible, they would still need to consume many times their body weight in contaminated soil in order to experience toxic effects. EPA Region III does not list an RBC for acetaldehyde in soil, likely because it is essentially non-toxic by ingestion as demonstrated by its use as a flavoring agent. Acetaldehyde is a by-product of yeast production and is a naturally occurring compound in wine, bread, soy sauce, and other yeast-fermented products.

Tab B in the DC DOH report states that octane is an "asphyxiant and blister agent" and cites Sax and Lewis. This statement mischaracterizes the content of the reference. Sax and Lewis write that octane "may act as a simple asphyxiant." Elsewhere, the reference describes the action of a simple asphyxiant as "excluding O_2 from the lungs. The effect of simple asphyxiant gases is proportional to the extent to which they diminish the amount (partial pressure) of O_2 in the air that is breathed." Parts per million levels in soil will not significantly diminish the amount of oxygen in the air that is breathed. Similarly, Sax and Lewis write that "human dermal exposure to undiluted octane for five hours resulted in blister formation." This effect is unrelated to the class of chemical warfare agents classified as blister agents and is very unlikely to occur at the levels found in the samples.

Tab B of the DC DOH's comments states that hexanal is "toxic [by] ingestion and inhalation, (acrid smoke)," citing Sax and Lewis. This statement mischaracterizes the content of that reference. Sax and Lewis write that hexanal is "mildly toxic" and "when heated to decomposition, it emits acrid smoke and fumes." The oral LD_{50} for hexanal in laboratory rats is 4,890 mg/kg, which corresponds to a dose of 342 grams (0.8 lb) for an adult human. At soil concentrations on the order of 0.100 mg/kg, acute poisoning would require consumption of over 3,000 metric tons of soil.

Natural Products

Of the 23 compounds listed in Tab B of the DC DOH's comments, 3 are major components of a number of food items, are likely to have originated as naturally occurring contaminants, or have large potential sources that are not associated with the AUES.

Hexadecanoic Acid

Hexadecanoic acid (CAS Registry No. 57-10-3) is also known as palmitic acid. The analysis indicates that there is sufficient evidence to make a tentative identification of this compound as present in some of the samples.

The DC DOH's Tab B confuses "hexadecanoic acid" with "decanoic acid." The DC DOH material on hexadecanoic acid indicates that "decanoic acid is a poison (acrid smoke)." Decanoic acid (chemical formula $C_{10}H_{20}O_2$) is a different chemical compound than hexadecanoic acid (chemical formula $C_{16}H_{32}O_2$). Sax and Lewis have an entry under "palmitic acid" that indicates that it is a poison by the intravenous route; the substance is essentially non-toxic by the oral route. Sax and Lewis also write that when heated to decomposition, it emits acrid smoke and irritating fumes; the relevance of smoke generation, as cited in the DC DOH report, to parts per billion levels in soil is unclear. Palm oil contains 44 percent palmitic acid esters; other natural

oils contain significant quantities of palmitic acid esters. Enzymatic digestion of the oil produces the free acid.

The palmitic acid concentration was estimated at levels ranging from 0.089 to 0.670 mg/kg. EPA Region III has not established a risk-based concentration for palmitic acid, most likely because it is essentially non-toxic and is a major component of many food items.

Palmitic acid is not listed on the AUES list of chemicals and has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is of natural origin, is used extensively in industry, and is likely to be a ubiquitous component of the environment.

Oleic Acid

Oleic Acid (CAS Registry No. 112-80-1) is also known as Z-9- octadecenoic acid. The analysis indicates that there is sufficient evidence to make a tentative identification of this compound as present in some of the samples.

The DC DOH's Tab B states that oleic acid is a "poison and skin irritant," citing Sax and Lewis. This statement mischaracterizes the content of that reference. Sax and Lewis write that oleic acid is a "poison by intravenous route;" they also cite toxicological data for laboratory rats indicating an intravenous LD_{50} of 2,400 µg/kg versus an oral LD_{50} of 74 g/kg; this indicates that oleic acid is 30,000 times less toxic by ingestion. Olive oil contains 55-85 percent oleic acid esters. Extra virgin olive oil can have up to 1 percent free oleic acid, virgin between 1 and 3 percent free oleic acid. Other natural oils contain significant quantities of oleic acid esters. Enzymatic digestion of these oils produces the free acid.

The oleic acid concentration was estimated at levels ranging from 0.130 to 4.20 mg/kg; EPA Region III has not established a risk-based concentration for oleic acid, most likely because it is essentially non-toxic and is a major component of many food items.

Oleic acid is listed on the AUES list of chemicals, but it has never been considered either an experimental chemical warfare agent or an agent precursor compound. It is of natural origin, is used extensively in industry, and is likely to be a ubiquitous component of the environment.

1-Eicosanol

The analysis indicates that there is sufficient evidence to make a tentative identification of 1-eicosanol (CAS Registry No. 629-96-9) as present in some of the samples. 1-Eicosanol is used by plants and animals to make wax, which is a mixture of esters of long-chain alcohols and long-chain carboxylic acids. The alcohol has been found in the secretions from the abdominal tips of queen bees, and beeswax samples have included eicosyl hexadecanoate and eicosyl octadecanoate. It is also present in plant waxes, including Jojoba wax.

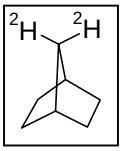
The 1-eicosanol concentration was estimated at levels ranging from 0.190 to 0.200 mg/kg. EPA Region III has not established a risk-based concentration for 1-eicosanol, most likely because it is essentially non-toxic and is a major component of a number of natural products.

1-Eicosanol is not listed on the AUES list of chemicals and has never been considered either an experimental chemical warfare agent or an agent precursor compound.

Analytical Artifacts

Of the 23 compounds listed in the DC DOH's Tab B, 2 are likely to be analytical artifacts—false positives—because they are not present in the soil samples collected from the OU4 residential locations. These compounds are unlikely to be present in the soil at AUES.

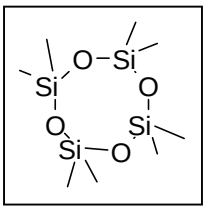
Bicyclo[2.2.1]heptane-7,7-d



Bicyclo[2.2.1]heptane-7,7-d is almost certainly a misidentified substance or an analytical artifact. The analysis indicates that this is a tentatively identified compound (TIC). In practice, TICs result from analyses using gas chromatography/mass spectrometry (GC/MS) when a compound not on the target analyte list is detected. The instrument compares the pattern of ions produced in the MS part of the instrument with a computer library and tentatively identifies the compound with the library spectrum that provides the best match. In this case, the best match apparently was an isotopically-labeled compound that is unlikely to occur outside a laboratory. It almost certainly would not result from AUES activities, as isotopically labeled compounds did not become common research tools until well after World War II. Isotopically labeled compounds have never been considered either experimental chemical warfare agents or agent precursor compounds.

It is possible that identification could be made by an analyst reviewing the reconstructed ion chromatogram from the data package. However, it is very likely that this is a monoterpene (similar in structure to α-pinene) of some sort; a more specific identification may not be possible. Given that the concentration of this compound is estimated at 0.006 to 0.050 mg/kg, further effort at identification may not be reasonable.

Octamethylcyclotetrasiloxane

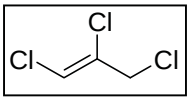


Octamethylcyclotetrasiloxane (CAS Registry No. 556-67-2) is an analytical artifact. Traditional polysiloxane-type GC column stationary phases degrade at elevated temperatures. The degradation process is well documented and consists of the thermal rearrangement of the siloxane backbone to produce cyclosiloxanes, such as octamethylcyclotetrasiloxane. These compounds are volatile and elute from the column as column "bleed". The estimated concentrations reported (0.003 to 0.010 mg/kg) are typical of column bleed; the likelihood that this substance was present in the samples as taken is very small. Where octamethylcyclotetrasiloxane is a suspected contaminant, the analysis must be performed using an extra-low bleed capillary column to avoid this potential for interference.

Other Chemicals

There was only one chemical that could not be characterized within the other groups listed above.

1,2,3-Trichloropropene



The analysis indicates that there is sufficient evidence to make a tentative identification of 1,2,3-trichloropropene (CAS Registry No.96-19-5) or a similar compound as present in some of the samples. 1,2,3-Trichloropropene is generally found as a contaminant of epichlorohydrin, which is used in turn to manufacture glycerin and unmodified epoxy resins.

The 1,2,3-trichloropropene concentration was estimated at levels ranging from 0.100 to 0.280 mg/kg, whereas EPA Region 3 has established a risk-based concentration for residential soil at 390 mg/kg. Because 1,2,3-trichloropropene is a non-carcinogen, USACE screened the concentrations detected at OU4 using an adjusted risk-based concentration of 39 mg/kg.

1,2,3-trichloropropene is not listed on the AUES list of chemicals; 1,2,3-trichloropropane, which is on the list, is a different substance. 1,2,3-Trichloropropene has never been considered an experimental chemical warfare agent, although it can be an agent precursor compound.

Sampling Procedure Supporting Memoranda

Spring Valley Operable Unit 5
Washington, DC

Prepared for US Army Corps of Engineers (USACE)
Prepared by Parsons

Selection of Appropriate Sampling Methodology for the Comprehensive Sampling Area

BACKGROUND

A comprehensive soil sampling operation will be conducted as part of the Spring Valley Operable Unit 5 investigation. The area investigated has been divided into two distinct areas: the central testing area (CTA), where field testing of Chemical Warfare Materiel (CWM) has been documented, and the rest of the Spring Valley acreage, designated the Comprehensive Sampling Area (CSA). Surficial soil sampling for arsenic will be performed in each area. However, each area has different sampling procedures based on the assumption that the CSA will contain lower arsenic concentrations than the CTA.

PROBLEM

In general accordance with the EPA's *Soil Screening Guidance, 1996*, each CTA site or exposure area (EA) is to be divided into four quadrants. Each quadrant will have one soil sample comprising six sub-samples, i.e., six (6) random locations within the quadrant are composited into one sample for the quadrant. Because the CSA is expected to have lower arsenic concentrations, a more limited sampling effort is to be conducted to screen for potential contamination. For the CSA, each EA is to be divided, as evenly as possible, into two halves. The question to be resolved is how many sub-samples must be collected per half to retain the statistical power of the CTA procedure. (A detailed description of the quadrant sampling methodology is provided in the *Work Management Plan, Final, Spring Valley OU-4, August 14, 2000, Parsons Engineering Science*.)

SOLUTION

Because arsenic concentrations in soil vary spatially within an EA, increasing the number of sub-samples in each composite sample has the effect of increasing the ability of the measured sample arsenic concentration to accurately represent the overall average arsenic concentration within the EA.

Arsenic concentrations in the composite soil samples are compared to a soil screening level (SSL). In this case, the SSL for arsenic in surface soil was determined to be 12.6 mg/kg, which is the 95^{th} percentile of the background distribution. If the mean contaminant concentration on an EA exceeds the SSL, a decision is made to investigate

with additional intensive (grid) sampling. If the mean concentration is less than the SSL, a decision is made to not investigate further.

Because all sample data include uncertainty, errors can be made in the decision to investigate further or not investigate further any given EA. The rate of these errors can be controlled, however. Deciding to not investigate further when the true average concentration in an EA exceeds the SSL (additional investigation is warranted) is called a Type I error. Deciding to investigate further when the correct decision would be to not investigate further is a Type II error. Type II errors cause additional expense, but are typically of less concern than Type I errors. USEPA Soil Screening Guidance Technical Background Document Part 4 (EPA Document Number: EPA/540/R-95/128) (EPA, 1996) establishes the following goals for Type I and Type II decision error rates:

- Type I: Less than 0.05 (5%) probability of not investigating further when "true mean" of the EA is 2 times the SSL.

- Type II: Less than 0.2 (20%) probability of investigating further when "true mean" of the EA is 0.5 * SSL.

The "gray region" from 0.5 SSL to 2 SSL represents the range of contaminant concentrations levels near the SSL, where uncertainty in the data (i.e., the variability) can make the decision "too close to call." By specifying the upper edge of the gray region as twice the SSL, it is possible that exposure areas with mean values slightly higher than the SSL may be screened from further study. However, an upper and lower value is required to determine the power and significance of the test. While the gray region discussed in the EPA Guidance (1996) is based on a risk-based decision criteria and the decision criteria of 12.6 mg/kg is based on the distribution of the background data, a similar rationale was used in this study. Please note that the EPA Soil Screening Guidance decision error rates meet the USACE's goal of being more conservative than the minimums recommended in *EPA's Guidance for Data Usability in Risk Assessment.*

The purpose of this exercise was to identify the minimum number of sub-samples per composite sample in a CSA site that would limit the Type I error rate to 5% or less and the Type II error rate to 20% or less.

In order to do this, existing data from outside the CTA were used to estimate the coefficient of variation (CV) for arsenic concentrations in the study area. The data from six EAs on Rockwood Parkway that had been quadrant sampled and then had follow-on grid sampling, were used. The mean value and standard deviation of the samples from these six EAs are 19.8 mg/ kg and 34.4 mg/kg, respectively. Therefore, the CV is 1.73. Additionally, as with other data collected in the region, the arsenic concentrations in soil followed a log-normal distribution.

Using information from this field data, 5,000 computer simulations using the Monte Carlo process were used to estimate the percentage of Type I and Type II errors that

would be expected for a range of sub-sample values. 1,000 simulations were used in the EPA Guidance calculations, however, with the EAs divided into 2 sectors (as opposed to 4 or more), additional simulations were required to achieve stable, reproducible results for this analysis. Because the sub-samples were drawn randomly, the calculated sample results incorporate the distribution of arsenic values that could be expected to occur naturally through sampling.

To quantify the Type I error, the mean of the population was assumed to be 2* decision criteria of 12.6 mg/kg (= 25.2 mg/kg). The standard deviation for a population with this mean was estimated using the CV from the field data (1.73). Therefore, the standard deviation for the simulated populations was set equal to 43.6 mg/kg (= 1.73 * 25.2). These parameters were used to generate random samples from a log-normal population that represented a distribution of arsenic concentrations. For each simulation, two averaged composite samples (one for each half of the EA) were randomly generated using from 4 to 12 sub-samples. The maximum of these two values was compared with the decision criteria of 12.6 mg/kg. If this value was greater than 12.6 mg/kg, the decision was made to "further investigate." If this value was less than 12.6 mg/kg, the decision was made to "not investigate further". The Type I error was calculated by determining the proportion of the 5,000 simulations in which the decision was made to "not investigate further."

To quantify the Type II error, the mean of the population was assumed to be 0.5* decision criteria of 12.6 mg/kg (= 6.3 mg/kg). The standard deviation was estimated using the coefficient of variance from the field data (1.73). Therefore, the standard deviation for the simulated populations was set equal to 10.9 mg/kg (= 1.73 * 6.3). As discussed above, simulated maximum values were compared to 12.6 mg/kg, with maximum values greater than the SSL requiring further investigations. Values less than 12.6 mg/kg are not studied further. The Type II error was calculated by determining the proportion of the 5,000 simulations in which the decision was made to "further investigate."

A summary of the results of the Max Test as applied to the simulations is provided in the Table 1. As expected, increasing the number of sub-samples per composite sample reduces the incidence of both Type I and Type II errors. The Type I error column indicates the proportion of time that the decision is made to not conduct further investigations (i.e., the max is less than the decision criteria of 12.6 mg/kg), given that the true mean of the sample population used in the simulation is 2* decision criteria of 12.6 mg/kg. This number must be less than 5% for this project. For example, with five (5) sub-samples, 4.6% of the time the decision is erroneously made to not investigate further when the true concentration is at 2* decision criteria of 12.6 mg/kg. The Type II error column indicates the percentage of time that the decision is made to conduct further study when the true concentration at the site is less than 0.5* decision criteria of 12.6 mg/kg. This must be less than 20% for this project.

Table 1 shows that a minimum of five (5) sub-samples composited into one sample per EA half will meet the project goals for Type I and Type II errors.

Table 1. Summary of Simulation Results

(N^1=2; CV^2 = 1.73; 5,000 simulations)

Number of Sub-Samples per Composite Sample	Percentage of Random Samples Resulting in Type I error Mean = 2*SSL	Percentage of Random Samples Resulting in Type II error Mean = 0.5*SSL
4	6.8	16.9
5	**4.6**	**14.9**
6	3.1	13.1
7	2.6	12.9
8	1.6	10.8
9	1.2	10.6
10	1	9
11	0.6	8.9
12	0.6	8.3

[1] – Each EA was divided into N sectors (2 halves).

[2] – The CV value was obtained from the Rockwood Parkway 6 dataset.

It should be noted that a relatively recent recalculation of the 95th percentile of the background distribution revealed that this value should be 12.9 mg/kg instead of 12.6 mg/kg. The recalculation was based on a field duplicate sample result that was incorrectly included in the dataset. The above analysis was performed using the updated value of 12.9 mg/kg and the result was the same conclusion as for the 12.6 mg/kg value. For the sake of consistency, the decision criteria of 12.6 mg/kg was used in this study and will be continue to be used for the project.

Spring Valley Operable Unit 4
Washington, DC

ANALYSIS OF EFFECT OF DIFFERENT SAMPLING METHODOLOGIES ON FURTHER ACTION DECISIONS

Parsons performed quadrant soil screening at numerous residences or exposure areas (EAs) of the Spring Valley neighborhood of Washington, DC, for the Spring Valley Operable Unit 4 RI/FS project. The quadrant sampling method utilized to composite subsamples into samples for analysis deviated slightly from the method specified in the EPA Soil Screening Guidance User's Guide (User's Guide). Each of the EAs were divided as evenly as possible into four quadrants. In each quadrant, six subsamples were randomly collected and composited into a single sample for each quadrant and submitted for analysis. This resulted in four samples per EA, one per quadrant. The User's Guide states six samples should be collected by compositing 4 subsamples, with one subsample randomly selected from each quadrant. This results in six samples representing the entire EA rather than the alternate procedure used that results in four samples representing the EA and provides additional information about the spatial distribution among the quadrants.

Parsons evaluated the data collected to date to determine the following:

1. Does the difference in sample compositing methodology (User's Guide versus alternate method) result in a different screening decision?

2. If so, which method is more conservative or protective of human health?

3. If the alternative procedure could result in decisions to "walk away" from an EA without further investigation (i.e., fail to identify an EA with a level above the soil screening level (SSL) when the level exist) when the User's Guide methodology would result in a decision to investigate further, could the screening decision criteria for the alternate method be adjusted such that it would be as conservative (protective)?

The alternate procedure utilized has the advantage of yielding more information about the spatial distribution of contaminant within the EA. Contaminant concentrations in soil are seldom found to be spatially uniform across an EA. Thus, this alternative method intuitively should be more protectively conservative when decision rules are based on the maximum observed concentration. That is, by compositing samples within the quadrant rather than across the EA, a single high quadrant will not be diluted by the remaining quadrants. However, fewer samples used to make the estimates of the average concentration of a contaminant over the entire EA may result in a higher variance, thereby reducing the statistical power to discern differences from the Soil Screening Level (SSL).

Six EAs on Rockwood Parkway had been quadrant sampled and then grid sampled (with from 20 to 42 non-composited samples equally spaced on 20 foot centers across each EA). It was assumed these were representative of the actual population of concentrations in the EA. Next, Parsons statistically re-sampled these gridded EAs one thousand times by both the User's Guide method and the alternate procedure. This resulted in one thousand

possible combinations (for each method) of 6 total samples (User's Guide) or 4 total samples (alternative method). The Chen test (one of the tests recommended in the EPA Guidance) was applied to each of these possible combinations to identify the likelihood of decisions to investigate further or walk away (no further investigation) by either method. The results are summarized in Table 1.

The SSL for arsenic for the Spring Valley site is 12.6 parts-per-million (95th percentile of the background concentration). For four of the six EAs, including those with the highest arsenic levels, application of the alternate procedure compositing method resulted in the same decision (investigate further or walk away) as the User's Guide method 100% of the time. In two EAs, however, application of the alternate procedure could have resulted in a higher probability that the decision would be to walk away. This observation was confirmed with theoretical lognormal concentration distributions. The attempt was made to counter this tendency toward a higher probability of making the walk away decision by artificially adjusting the SSL downward in the Chen test. It was determined that by reducing the SSL from 12.6 to 12.1 (4%) with the alternate procedure compositing method, the results were at least as conservative as those obtained using the SSL of 12.6 and the User's Guide compositing method. In simulations using theoretical lognormal concentration distributions of arsenic, it was found that the reduction in SSL required to be equally conservative did not exceed 4 %, and in some cases was as small as 0.5%.

Next, the Chen test was applied to 39 of the 42 EAs quadrant sampled in the initial phase of the residential sampling using only the alternate procedure. The Chen test indicated that 10 of the 39 required further investigation. We then adjusted the SSL from 12.6 to 12.1 in the Chen test and applied it to the same data from the 39 EAs. The results were identical, with 10 sites requiring further investigation. Thus, the adjustment to the Chen test to achieve an equal probability of deciding to not investigate further did not result in any changes in decision for the 39 Spring Valley sites.

In conclusion, the alternative method did not affect the result of the decision on whether further investigation was required. However, this could change if there is a wide variation of concentrations within an EA. Such properties may be better sampled using the User's Guide method. However, the alternative method provides important information on the spatial distribution of contaminant concentrations within an exposure area.

Based upon the results to date, we recommend continuing with the alternative procedure. Any property with any result greater than 12.6 ppm will receive additional investigation. Data from the remaining properties will be analyzed with the Chen test with the SSL artificially lowered to 12.1 ppm. In addition, as additional grid results for properties become available, it is recommended that the analysis reported above be performed periodically to confirm the value of the SSL for the alternative method.

TABLE 1
Comparison of Results for Gridded Rockwood Parkway EAs
Based on Grid Sampling on Rockwood Parkway

EA	Probability of making the decision to "walk away" based on the Chen test.		
	User's Guide Method	Alternate Method	
	SSL = 12.6	SSL = 12.6	SSL = 12.1
4621 Rockwood	0%	0%	0%
4625 Rockwood	0%	0%	0%
4629 Rockwood	23%	61%	11%
4633 Rockwood	1%	3%	1%
4637 Rockwood	0%	0%	0%
4641 Rockwood	0%	0%	0%